Diabetes Education SERVICES

15 years

Welcome to CDE Exam Boot Camp 6

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

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Boot Camp:
Class 5

- Nutrition guidelines
- Exercise Guidelines

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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

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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

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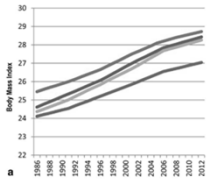
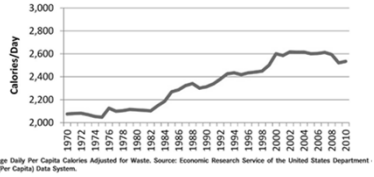
Obesity in America



- 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 ... ility (Per Capita) Data System.

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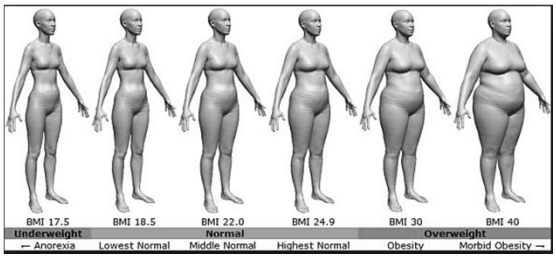
BMI – Visual Image



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BMI Chart with Ranges

Body Mass Index Table

	Normal						Overweight					Obese						
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Height (inches)	Body Weight (pounds)																	
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295

	Obese			Extreme Obesity														
BMI	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Height (inches)	Body Weight (pounds)																	
58	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258
59	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267
60	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276
61	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285
62	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295
63	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304
64	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314
65	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324
66	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334
67	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344
68	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354
69	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365
70	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376
71	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386
72	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397
73	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408
74	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420
75	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431
76	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.*

Medical Nutrition Therapy – ADA 2015

- 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.

RDs Rock

Meeting with a RD can result in a 1-2% drop in A1c

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.

Final Regulation for Medical Nutrition Therapy – What Medicare Covers

- 3 hours initial benefit in first calendar year
- 2 hours follow-up annually
- Must be ADA/AADE Recognized
- MNT for diabetes and renal

Assess Knowledge, Self Management Skills

- Eating Patterns
  - Preferences, portion sizes, timing of meals and snacks, eating environment, disordered eating

Approach Depends on Patient

- New Type 2
  - Portion Control
  - Plate Method
  - Record Keeping
  - Education
- On Insulin?
  - Intensive insulin therapy with carb counting should be offered
  - Simpler approach may be required for some patients

4. Goals of Medical Nutrition Therapy – ADA

Promote and support healthful eating patterns

- Emphasize eating a variety of nutrient dense foods in appropriate portions to:
  - Attain individualized B/P, BG and lipid goals
  - Attain and maintain body wt goals
  - Delay and/or prevent complications
- Address individual nutrition needs based on
  - personal and cultural preferences, access to food, willingness and barriers
- Maintain pleasure of eating by providing positive messages about food
  - Limit food choices only when backed by science
- Provide practical tools for day-to-day planning rather than focusing on individual macronutrients.

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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

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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?

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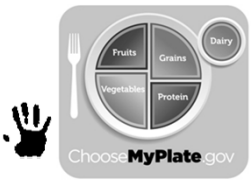
Teaching About Eating Healthy

Major food groups
"Handy Diet"
Plate Method
Exchange Lists
Food Diaries / Glucose Records
Carbohydrate Counting

Assess what is best for the situation.



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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.

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Another plate example

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Mindful Eating

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Nutrition Content from CDE Outline

- 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

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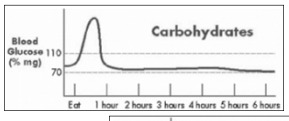
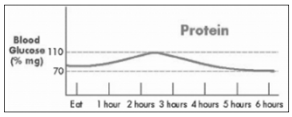
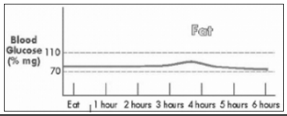
How nutrients affect blood sugar







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Carbs affect Post meal Blood Glucose

- No ideal amount of daily carb intake
- However, monitoring carb intake and available insulin are key strategies for post meal BG

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Poll Question 1

- Mary can't figure out why her BG always spikes after breakfast. How many grams of carb is in the following breakfast? I cup of oatmeal, ½ cup of milk, ¾ cup of berries and 2 eggs with salsa?
  a. 57 gms
  b. 36 gms
  c. 51 gms
  d. 37 gms

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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

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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

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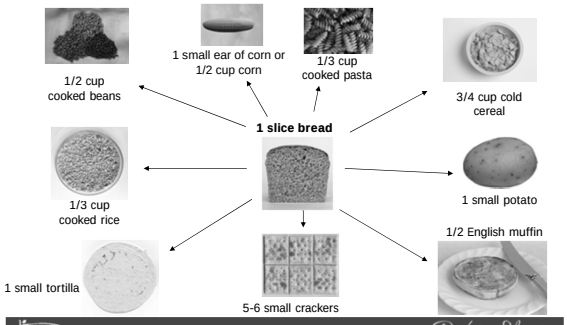
Carb Counting - Starch

Each Food has:
80 Calories
15 grams carb



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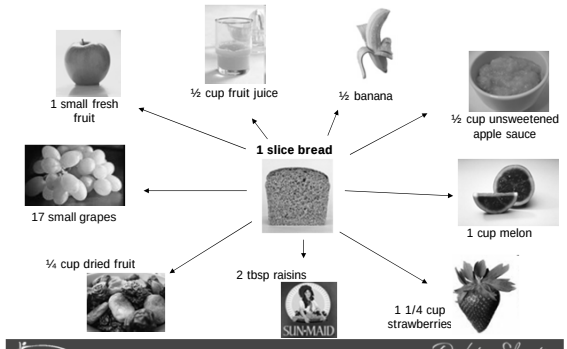
Carb counting- fruit

Each Food has:
60 Calories
15 grams carb



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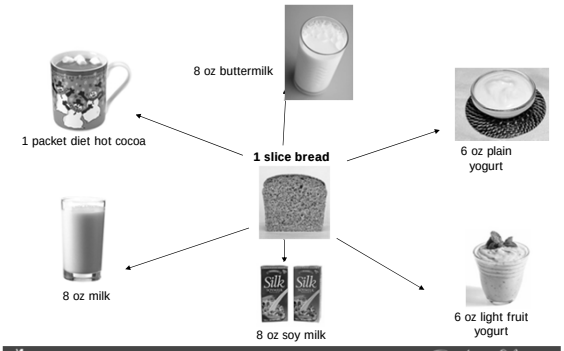
Carb Counting - Milk

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



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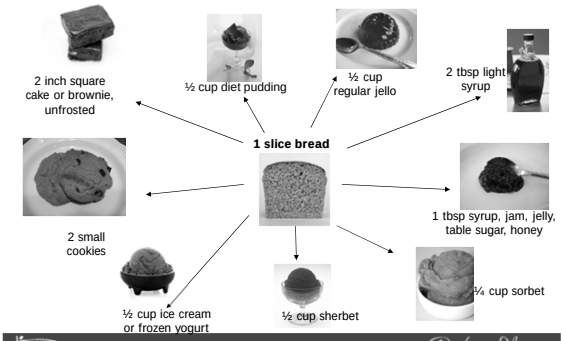
Carb Counting - Sweets

Each Food has:
Calories vary
15 grams carb



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

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

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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, maltilol, erythritol, isomalt, xylitol, lactitol, mannitol, tagtose

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Nonnutritive Sweeteners

- FDA: 6 approved for use
  - NutraSweet/Equal
  - Sweet One / Sunett
  - Splenda
  - Sweet N' Low
  - Neotame (mixed with other products)
- 200 to 600 times sweeter than sugar
- FDA Stance - No indication that they will cause wt loss or wt gain.
- Safe for public, people with diabetes, pregnant women

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Choose Healthy Carbs

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

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10 Superfoods

- Beans
- Dark Green Leafy Vegs
- Citrus Fruit
- Sweet Potatoes
- Berries

- Tomatoes
- Fish High in Omega-3 Fatty Acids
- Whole Grains
- Nuts
- Fat-Free Milk and Yogurt

1 tsp sugar ⟹ =4 gms

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

Calories per gram: Fat 9 Carbohydrates 4 Protein 4

Fooducate App – gives grade and nutrition info.

Fooducate
eat a bit better™

Poll Question 2

- You are teaching your patient about label reading. If the patient ate 2 servings of this Macaroni and Cheese, how much saturated fat would they be eating?

a. 12 gms
b. 3 gms
c. 24 gms
d. 6 gms

Sample Label for Macaroni and Cheese

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

Calories 250	Calories from Fat 110
	% Daily Value*
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
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	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Poll Question 3

- You are teaching your patient about counting fat. If the patient ate 1 serving of this Macaroni and Cheese, how many calories would come from total fat?
  - a. 12 cals
  - b. 108 cals
  - c. 27 cals
  - d. 18%

Sample Label for Macaroni and Cheese

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving
Calories 250 | Calories from Fat 110

% Daily Value*

Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
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	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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Fat – From ADA 2015 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

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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

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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

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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”.

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Protein Recommendations -2015

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

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Protein – 4 cals 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

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Nutrition Guidelines Continued

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

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Poll Question 4

- Alice has type 1, drank 4 rum and cokes and ate some snacks around 9pm. She took 3 units insulin via her pump. At bedtime, BG is 162. Drinking alcohol puts Alice at risk for:

a. DKA due to ketone production associated with alcohol
b. Hyperglycemia during night due to gluconeogenesis
c. Hyperglycemia from alcohol and appetizers
d. Hypoglycemia

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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

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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

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Losing 2-8kg Early in diagnosis Type 2 Helpful

ADA 2015

- 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 cals
  - Decrease intake 250-500 cals daily + exercise

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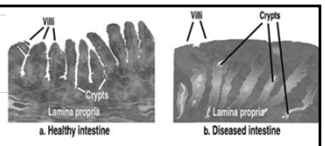
Bariatric Surgery

- 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

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.

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

Ex of Gluten Containing Foods

- Brown rice syrup
- Breading & 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

Poll question 5

- John has gastroparesis and is struggling with bloating and nausea after meals. What is the best recommendation?

a. Eat raw vegetables and limit fruit
b. Eat low fiber, small meals
c. Always take insulin after meals
d. Avoid foods containing wheat

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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

Poll question 6

- 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

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

Know these Facts

- Fat - 9 cals per gm
- Carb – 4 cals per gm
- Protein – 4 cal per gm

- Common food carb count
- Milk is 12 gms of carb
- 1 lb = 3,500 cals
- 10,000 steps recommended a day
- 2000 steps – 1 mile

2015 Dietary Guidelines Advisory Committee Report

Americans should shift to a pattern of eating that includes **more plant-based foods, less sugar and meat** (specifically red meat and processed meat).

"We're not talking about excluding red meat completely, but we are recommending reducing red meat intake," says **Frank Hu**, a professor of nutrition and epidemiology at the Harvard School of Public Health who is one of the committee members.

The committee concludes that a **Plant Focused Diet** not only promotes health, but is also more environmentally sustainable. They say an optimal pattern of eating includes a broad range of foods including fruits and vegetables, whole grains, legumes, nuts and seeds, as well as fish and low-fat dairy.

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

Physical Activity - ADA

- All children 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

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

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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

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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

Poll question 7

- According to ADA guidelines, who needs a graded exercise test with EKG?

a. 25 year old, overwt 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

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

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.

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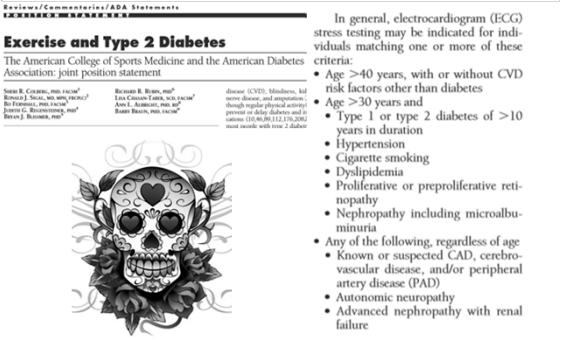
When to Consider Stress Testing



Reviews/Commentaries/ADA Statements

Exercise and Type 2 Diabetes

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

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

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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.*

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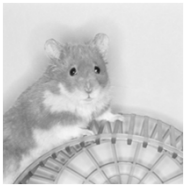
Poll question 8

- 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

Exercise effects on BG – No Diabetes

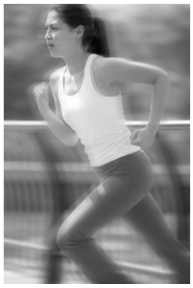
- Insulin action suppressed
- Counter regulatory hormones
  - Release stored glycogen from muscle and liver
  - Increase gluconeogenesis
- To replace glycogen stores
  - Glucose uptake continues for up to 48 hours



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?



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?

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.

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

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.

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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

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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

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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

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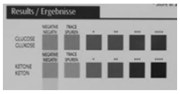
Ketone Testing

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

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



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Poll question 9

- 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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Thank You

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

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