

Diabetes and Nutrition Eating Right to Manage Blood Glucose Levels

Satellite Conference and Live Webcast
Wednesday, February 11, 2009
2:00 – 4:00 p.m. (Central Time)

Produced by the Alabama Department of Public Health
Video Communications and Distance Learning Division

Faculty

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Two Primary Kinds of Diabetes

- Type 1
- Type 2

Type 1 – IDDM Insulin Dependent Diabetes Mellitus

- Accounts for 5-10% of diagnosed cases
- Dietary control has a little more focus on a concern with sudden drop in BGL (hypoglycemia) in Type 1

Recreational-Education Resource for Children with Type 1

- Alabama's summer camp for children with Type 1 Diabetes
– Camp Seale Harris
 - Located at Camp ASCCA
 - During month of June

Southeastern Diabetes Education Services

- www.southeasterdiabetes.org

www.southeasterdiabetes.org

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SOUTHEASTERN DIABETES EDUCATION SERVICES

Our Mission - To motivate persons with diabetes and their families through educational, social, and recreational experiences to a safe and healthy environment.

SDES NEWS FOR CHILDREN WITH DIABETES

- ☐ Family Movie Day in Birmingham Dec. 18th, Come and join a registered diabetes team. Kids are required to discuss diet and activities during the hockey and see the new Super 2000 Pump all while the kids watch a Great movie for free!! Click [HERE](#) for more info and details on how to register.
- ☐ Training with Endulzer 2007! Endulzer and BBQ was a big success!! Close to \$15,000 was raised for the SDES Scholarship Fund. Click [HERE](#) to read all about it.
- ☐ See all the new additions to the website: photos, videos, blogs and more, updated during camp! Don't forget to leave feedback and let us know what you want to see!
- ☐ Youth Yachting Program, Ages 16-17, 2008
- ☐ Upcoming Events: 2008 SDES Camp and Program Dates!
- ☐ SDES Movie Forum: THANK YOU for helping SDES "teach Endulzer how to live with diabetes!"

Email Diabetes Support: Support@SDES.org
CSH Blog: blogs.southeasterdiabetes.org
This Year's Pictures: photos.southeasterdiabetes.org
Newsletter: newsletter.southeasterdiabetes.org


Type 2 – NIDDM Non Insulin Dependent Diabetes Mellitus

- Accounts for 90-95% of cases
- Strong lifestyle component
 - Obesity, inactivity, high fat/calorie diet but genetics can play a part
- Increasing in over weight & obese children/adolescents

Diabetes Statistics

- 1 in 10 Alabamians have Diabetes
- 41% Americans 40-74 years old have Pre-Diabetes
- Childhood obesity has increased 10 times in last 20 years
- Estimates now suggest of children born since 2000, 1 in 3 will develop Diabetes

BMI Chart



Alabama Department of Public Health

Workforce Wellness Division

www.adph.org/wellnessdivision

Body Mass Index Table

	Normal					Overweight					Obese					Extreme Obesity																						
BMI	18	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 (feet)	Body Weight (pounds)																																					
5' 0"	115	126	137	148	158	168	178	188	198	208	218	228	238	248	258	268	278	288	298	308	318	328	338	348	358	368	378	388	398	408	418	428	438	448	458	468	478	488
5' 1"	121	132	143	154	165	176	187	198	209	220	231	242	253	264	275	286	297	308	319	330	341	352	363	374	385	396	407	418	429	440	451	462	473	484	495	506	517	528
5' 2"	127	138	149	160	171	182	193	204	215	226	237	248	259	270	281	292	303	314	325	336	347	358	369	380	391	402	413	424	435	446	457	468	479	490	501	512	523	534
5' 3"	133	144	155	166	177	188	199	210	221	232	243	254	265	276	287	298	309	320	331	342	353	364	375	386	397	408	419	430	441	452	463	474	485	496	507	518	529	540
5' 4"	139	150	161	172	183	194	205	216	227	238	249	260	271	282	293	304	315	326	337	348	359	370	381	392	403	414	425	436	447	458	469	480	491	502	513	524	535	546
5' 5"	145	156	167	178	189	200	211	222	233	244	255	266	277	288	299	310	321	332	343	354	365	376	387	398	409	420	431	442	453	464	475	486	497	508	519	530	541	552
5' 6"	151	162	173	184	195	206	217	228	239	250	261	272	283	294	305	316	327	338	349	360	371	382	393	404	415	426	437	448	459	470	481	492	503	514	525	536	547	558
5' 7"	157	168	179	190	201	212	223	234	245	256	267	278	289	300	311	322	333	344	355	366	377	388	399	410	421	432	443	454	465	476	487	498	509	520	531	542	553	564
5' 8"	163	174	185	196	207	218	229	240	251	262	273	284	295	306	317	328	339	350	361	372	383	394	405	416	427	438	449	460	471	482	493	504	515	526	537	548	559	570
5' 9"	169	180	191	202	213	224	235	246	257	268	279	290	301	312	323	334	345	356	367	378	389	400	411	422	433	444	455	466	477	488	499	510	521	532	543	554	565	576
5' 10"	175	186	197	208	219	230	241	252	263	274	285	296	307	318	329	340	351	362	373	384	395	406	417	428	439	450	461	472	483	494	505	516	527	538	549	560	571	582
5' 11"	181	192	203	214	225	236	247	258	269	280	291	302	313	324	335	346	357	368	379	390	401	412	423	434	445	456	467	478	489	500	511	522	533	544	555	566	577	588
6' 0"	187	198	209	220	231	242	253	264	275	286	297	308	319	330	341	352	363	374	385	396	407	418	429	440	451	462	473	484	495	506	517	528	539	550	561	572	583	594
6' 1"	193	204	215	226	237	248	259	270	281	292	303	314	325	336	347	358	369	380	391	402	413	424	435	446	457	468	479	490	501	512	523	534	545	556	567	578	589	600
6' 2"	199	210	221	232	243	254	265	276	287	298	309	320	331	342	353	364	375	386	397	408	419	430	441	452	463	474	485	496	507	518	529	540	551	562	573	584	595	606
6' 3"	205	216	227	238	249	260	271	282	293	304	315	326	337	348	359	370	381	392	403	414	425	436	447	458	469	480	491	502	513	524	535	546	557	568	579	590	601	612
6' 4"	211	222	233	244	255	266	277	288	299	310	321	332	343	354	365	376	387	398	409	420	431	442	453	464	475	486	497	508	519	530	541	552	563	574	585	596	607	618
6' 5"	217	228	239	250	261	272	283	294	305	316	327	338	349	360	371	382	393	404	415	426	437	448	459	470	481	492	503	514	525	536	547	558	569	580	591	602	613	624
6' 6"	223	234	245	256	267	278	289	300	311	322	333	344	355	366	377	388	399	410	421	432	443	454	465	476	487	498	509	520	531	542	553	564	575	586	597	608	619	630
6' 7"	229	240	251	262	273	284	295	306	317	328	339	350	361	372	383	394	405	416	427	438	449	460	471	482	493	504	515	526	537	548	559	570	581	592	603	614	625	636
6' 8"	235	246	257	268	279	290	301	312	323	334	345	356	367	378	389	400	411	422	433	444	455	466	477	488	499	510	521	532	543	554	565	576	587	598	609	620	631	642
6' 9"	241	252	263	274	285	296	307	318	329	340	351	362	373	384	395	406	417	428	439	450	461	472	483	494	505	516	527	538	549	560	571	582	593	604	615	626	637	648
6' 10"	247	258	269	280	291	302	313	324	335	346	357	368	379	390	401	412	423	434	445	456	467	478	489	499	510	521	532	543	554	565	576	587	598	609	620	631	642	653
6' 11"	253	264	275	286	297	308	319	330	341	352	363	374	385	396	407	418	429	440	451	462	473	484	495	506	517	528	539	550	561	572	583	594	605	616	627	638	649	660
7' 0"	259	270	281	292	303	314	325	336	347	358	369	380	391	402	413	424	435	446	457	468	479	490	501	512	523	534	545	556	567	578	589	600	611	622	633	644	655	666

Source: National Health and Medical Research Council, 1987. BMI is a measure of body fat based on height and weight that is widely used in the medical industry.

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How Is Diabetes Managed

- Diet
- Physical activity
- Medications as prescribed

Nutrition & Activity Goals Are The Same For Most, Regardless Of Diabetes

- Eat more fruits and vegetables
- Get enough calcium from dairy or other sources to help maintain bones
- Limit the amount of fats and simple sugars eaten

Nutrition & Activity Goals Are The Same For Most, Regardless Of Diabetes

- Try to get 30-60 minutes of some kind of physical activity each day
- Diabetes adds the focus of achieving optimal blood glucose levels while preventing excessive hypoglycemia

Diet Management Tools

- Exchange system
- Carbohydrate counting
- MyPyramid

Exchange System

- System that has been used to help diabetics plan balanced meals since 1940's
- Food is divided into six categories based on amount of carbohydrates, protein and fat
- Average serving sizes are based on calories and nutrient composition

Exchange System

- System has been used with weight loss programs like Weight Watchers, 'Deal-A-Meal'
- Information can be found under 'Home Health Guidelines'

EXCHANGE SYSTEM

Food Exchange Group	Grams of CHO	Calories
Starch	15	80
Fruit	15	60
Milk (skim/lowfat)	12	90-100
Meat (medium fat)		75
Vegetables	5	25
Fat		45

Carbohydrate Counting

- A newer method used by diabetics to manage food intake
- Emphasis is more on amount of carbohydrates than calories
- Formula to calculate amount of insulin needed to cover grams of carbohydrates

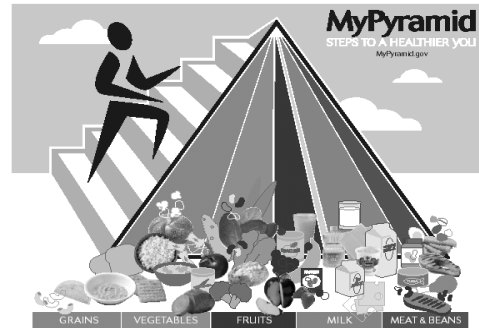
Carbohydrate Counting

	Examples	
Meat	3 oz. baked chicken	
Starch	1/3 cup Rice	15 gm CHO
Starch	1/2 cup Lima Beans	15 gm CHO
Vegetable	1 sliced tomato	5 gm CHO
Starch	1 dinner roll	15 gm CHO
Milk	3/4 cup plain yogurt	12 gm CHO
Fruit	1/2 cup sliced strawberries	15 gm CHO
Fat	1 tsp butter/margarine	77 gm CHO

If Recommendation Is

- 1 unit insulin/15 gm CHO
– $77 \div 15 = 5.1$ units insulin
- For 1 unit insulin/10 gm CHO
– $7 \div 10 = 7.7$ units insulin

MyPyramid.gov



Are All Carbohydrates The Same?

Yes and No

All Carbohydrates Are Broken Down To Glucose

- Glucose is the main 'sugar' found in our blood
- The health & proper working of every cell in body depends to an extent on BGL
- Cells in our brain & nervous system depend almost entirely on glucose

However

- With some foods the carbohydrates are broken down & released more quickly into the blood stream
- Generally the more processed the food & the higher in sugar, the more rapid the rise in BGL
- Foods with higher amounts of fiber generally cause a more gradual increase in BGL

What Is The Glycemic Response

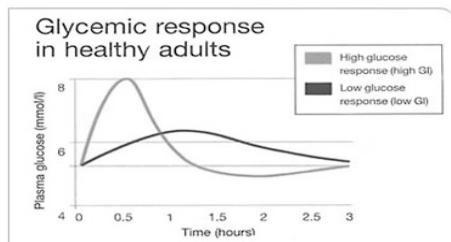
- Certain foods increase BGL & insulin concentrations higher compared to a reference food
– Usually glucose or white bread
- Seems to vary from person to person, even by time of day in same person

What Is The Glycemic Response

- Scale used to measure Glycemic Response
 - Is called the Glycemic Index (GI)



Glycemic Ranking



Plasma glucose response (mmol/L) from a high vs. low GI food. The change in blood glucose concentration over time is expressed and calculated as the area under the curve (AUC)
 – Wolever et.al., 1991
 Low = 0-55 Medium = 56-69 High = 70 or more

**To Help Maintain BGL,
What Should People
With Diabetes Be
Encouraged To Eat?**

Grains

One Way To Increase Intake of Low GI Foods

- Eat high fiber breakfast cereals
 - Bran, barley, oats
- Add berries, nuts, flaxseed or cinnamon to high GI fiber diets

Grains Are Divided Into Two Subgroups

- Whole grains
 - Want to encourage intake
- Refined grains
 - Want to limit intake

Whole Grains

- Have the entire grain kernel
 - Bran, germ, endosperm
- Examples
 - Bulgur (cracked wheat)
 - Oatmeal
 - Whole cornmeal
 - Brown rice
 - Whole-wheat flour

Refined Grains

- Refined grains have a finer texture and they last longer
 - Milling removes dietary fiber, iron, and many B vitamins
 - The B vitamins (thiamin, riboflavin, niacin, folic acid) and iron are added back to refined grains but fiber is usually not

Refined Grains

- Refined grains have added folic acid, more than 2X amount in whole grains
- Examples
 - Degermed cornmeal
 - White bread
 - White rice
 - White flour

Why Include Fiber?

- Helps with weight loss
 - You feel full so you stop eating
- Helps to maintain blood sugar level (Glycemic Response)
- Helps maintain muscle tone of the gut

Why Include Fiber?

- Helps lower blood cholesterol levels
- Caution
 - When fiber is increased, fluids **MUST** be increased
 - If not, severe constipation or impaction can occur

Fruits & Vegetables



Another Way To Increase Intake of Low GI Foods

- Eat 5-9 servings of fruits and vegetables
- Nothing!
(Mom was right all along!)

Aim For More 'Whole' Fruits & Veggies

- Closer to picked state, the more fiber
- Will usually cause slower rise in BGL
 - Can vary by individual
- Helps to create feeling of 'fullness' to limit caloric intake

Aim For More 'Whole' Fruits & Veggies

- Food groups with lowest calories per serving
- Majority of vitamins and minerals needed are obtained for fruits & vegetables

Frozen & Canned Also Good Choices

- May have vitamins & minerals preserved better than fresh
- Can be more economical when certain produce is out of season
- Easier to chew
- Watch for how much sugar or salt is used in preserving

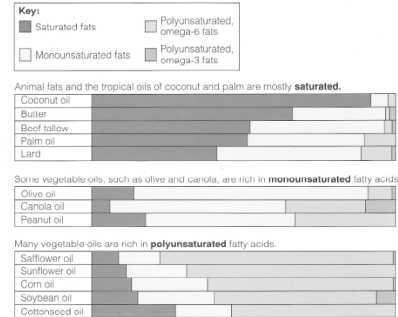
Effects of Certain Fats on BGL



Types of Fats Affecting BGL

- Saturated
- Monounsaturated
- Polyunsaturated
- Omega 3 fatty acid
- Omega 6 fatty acid
- Trans fatty acid

Comparison of Dietary Fats



Influence of Fat on BGL

- Insulin sensitivity
 - Saturated fatty acids (SFA) decrease insulin sensitivity
 - Monounsaturated fatty acids (MUFA) and Omega-6 polyunsaturated fatty acids (PUFA) appear to improve insulin sensitivity

Influence of Fat on BGL

- Insulin sensitivity
 - Long chain of Omega-3 fatty acids don't seem to have an effect on insulin sensitivity

More Ways Types of Fat Affect Health

- Inflammation
 - Pro-inflammatory
 - Foods high in SFA, Omega-6 fatty acids and trans-fatty acids
 - Anti-inflammatory
 - Foods high in Omega-3 fatty acids

Fat Affects Health

- Lipid profile
 - LDL
 - Increase with SFA and trans fats
 - HDL
 - Decrease with too many PUFA and trans fats

Fat Affects Health

- **Adiposity**
 - Trans fats may trigger redistribution of fat to abdominal area
 - Too much total fat gives excess calories

How Much & What Kind of Fats Should Be Eaten

- **Include more monounsaturated fats**
 - Olive oil, canola oil, peanut oil, etc.
- **Reduce saturated fat**
 - Butter, lard, shortening

How Much & What Kind of Fats Should Be Eaten

- **Limit trans fats to less than 1% of total calories (1g/1000 calories)**
- **To provide Omega 3 fatty acids**
 - Eat flaxseeds, walnuts, soybeans
 - Include 1-2 servings of fatty fish per week

Questions????

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