


## Medical Nutrition Therapy for People with Diabetes – What is New?

Speaker: Ms. Sylvia S.W. Lam  
Senior Registered Dietitian, Qualigenics Diabetes Centre  
Chairlady of Hong Kong Dietitians Association 2007-2011

CME Activity  
28th March 2010  
The Association of Licentiate of Medical Council of Hong Kong

Some IDF Facts:



On average, people with T2DM will die 5-10 years before people without diabetes

Diabetes currently affects 246 million people worldwide and is expected to affect 380 million by 2025.

Every 10 seconds a person dies from diabetes-related causes

Every 10 seconds two people develop diabetes

**Type 2 Diabeetus**

## Situation in Hong Kong

- 9th commonest cause of deaths in Hong Kong
- Aged adjusted prevalence 7.7% (1990) → 8.5% (1996)<sup>1</sup>
- The age standardized mortality rate showed an increasing trend from early 1980's to 2000, but decreased slightly from 2001.
- 32.2% male and 13.6% female being obese (2008)
- 52.6% under – diagnosed DM (2006)

Cockram CS, Woo J, Lau et al. The prevalence of diabetes mellitus and impaired glucose tolerance among the Hong Kong Chinese Adults of working age. *Diabetes Res Clin Pract* 1993; 21:67-73.

Department of Health, Hong Kong

Kam Cheong Wong and Zhiqiang Wang. *Diabetes Research and Clinical Practice* (2006) Prevalence of Type 2 Diabetes of Chinese Population in Mainland China, Hong Kong and Taiwan.

Have you ever given some of these diet advices to your DM patients?



"I don't approve of low-carb, high-carb, low-fat or vegetarian. Frankly, I don't approve of food."

## Commonly heard DM diet advices from family/friends/HCP

- Eat less rice** 食少啲飯
- Totally avoid sugary foods**  
唔好食甜嘢
- Do not eat fruits that are too sweet, especially bananas, grapes and mango.**  
唔好食甜嘅生果，尤其是香蕉、提子和芒果

## Commonly heard DM diet advices from family/friends/HCP

- Avoid congee**  
唔好食粥
- Avoid high fat foods**  
唔好食肥膩食物
- Encouraged to lose weight**  
最好減肥

## Goals of Medical Nutrition Therapy (MNT) for Prevention and Treatment of DM

To decrease the risk of DM and CVD by promoting healthy food choices and physical activity leading to moderate weight loss that is maintained

Nutrition Recommendation and Intervention for Diabetes – A position statement of the American Diabetes Association 2008

## Goals of MNT for DM

1. Achieve and maintain optimal metabolic control including BG, lipid profile and BP.
2. To prevent, or at least slow, the rate of development of the chronic complications of DM by modifying nutrient intake and lifestyle

Nutrition Recommendation and Intervention for Diabetes – A position statement of the American Diabetes Association 2008

## Goals of MNT for DM

3. To address individual nutrition needs, considering personal and cultural preferences, and willing to change
4. To maintain a pleasure of eating by only limiting foods choices when indicated by scientific evidence

Nutrition Recommendation and Intervention for Diabetes – A position statement of the American Diabetes Association 2008

Type of intervention	Study (Reference)	Study length	No. of subjects	Outcomes
Non-randomized controlled trials				
USPDS (Camp, 1992) (3)	1 decade	5452 newly diagnosed patients with type 2 diabetes		In 2,807 patients who received intensive nutrition therapy and counseling for diabetes (USA, achieved 1.9% HbA1c by 7th follow-up), the 7-month follow-up HbA1c was 7.5% (range 6.5-10.5%) compared with 8.0% (range 7.0-11.0%) in the control group (diabetes of duration < 5 years)
	Prato et al., 1997 (5)	6 months	176 patients with type 2 diabetes in a computer group (diabetes of duration < 5 years)	HbA1c decreased from 8.0 to 7.4% with intensive patient guidance (in USA, increased 0.6% to 6.5% in the control group with intensive counseling (by 4-6%)
	Kalishman et al., 1998 (7)	6 months	74 patients with type 2 diabetes newly diagnosed	HbA1c decreased from 8.0 to 7.4% in the intensive patient guidance arm and 8.0 to 8.1% in the control arm
MNT for cardiovascular risk (MNT)				
	Shaw et al., 1995 (6)	6 months	142 type 2 diabetes patients over the age of 40 years	HbA1c decreased from 7.4 to 6.4% in the control intervention group and 7.4 to 6.4% in the intervention group (USA, increased 0.6% to 6.5% in the control group with intensive counseling (by 4-6%)
	Saber et al., 1995 (8)	6 months	183 adult patients with diabetes	HbA1c decreased from 7.4 to 6.4% in the control intervention group and 7.4 to 6.4% in the intervention group (USA, increased 0.6% to 6.5% in the control group with intensive counseling (by 4-6%)
Observational studies				
Cardiovascular	Orsholov and DeFronzo, 1997 (10)	7 years	421 patients with type 1	Patients who received intensive follow-up had lower HbA1c (6.4%) compared with 6.8% in the control group (USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)
Dietary intake	DCCT Research Group, 1993 (11)			DCCT group assigned the importance of the risk of the HbA1c following patients on intensive and diabetes treatment (4-6% vs. 7-9% in the control group) (USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)
Protein	Prato, 1998 (12)			DCCT study assigned the importance of the risk of the HbA1c following patients on intensive and diabetes treatment (4-6% vs. 7-9% in the control group) (USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)
Cholesterol	Johann and Valdes, 1995 (13)	6 months	11 patients with type 2 diabetes	As 7 months, blood glucose levels decreased 50% in 70% of patients receiving intensive therapy (in USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)
Weight	Johann and Thomas, 2005 (14)	1 year	142 adult patients	As 7 months, blood glucose levels decreased 50% in 70% of patients receiving intensive therapy (in USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)
Intensive diet intake	Cherone et al., 2000 (15)	3 months	102 patients (11 type 1 and 91 type 2 diabetes patients with duration of diabetes < 10 years)	HbA1c levels decreased 1.9% to 1.7% (also related to weight loss)
Macronutrient intake	Wolcott, 1998 (16) (17)		49 studies	Intensive intervention and weight loss (intensive MNT) had overall beneficial effects on cardiovascular risk factors (including HbA1c, HDL, triglyceride, and blood pressure) (USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)
	Padgett et al., 2008 (18)		7471 patients	Intensive intervention and weight loss (intensive MNT) had overall beneficial effects on cardiovascular risk factors (including HbA1c, HDL, triglyceride, and blood pressure) (USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)
	Norris et al., 2005 (19)		72 studies	Intensive intervention and weight loss (intensive MNT) had overall beneficial effects on cardiovascular risk factors (including HbA1c, HDL, triglyceride, and blood pressure) (USA, increased 0.4% to 6.2% in the control group with intensive counseling (by 4-6%)

**Outcome of MNT**

- ◆ Shown effectiveness in 3 – 6 months after initiation of MNT.
- ◆ ↓HbA1c by 1% in T1DM 1-2% in T2DM
- ◆ ↓LDL-C by 0.4 – 0.6 mmol/L

Pastors JG. Diabetes Care 25:608-613; 2002  
Pastors JG. J Am Diet Assoc 103: 827-831, 2003

## Recommendation by ADA 2008

Individuals who have pre-diabetes or diabetes should receive individualized MNT; such therapy is best provided by a registered dietitian familiar with the components of diabetes MNT. (Grade B – ADA 2008)

Nutrition Recommendation and Intervention for Diabetes – A position statement of the American Diabetes Association 2008

## History of DM diet prescription on macronutrients

Year	Carbohydrates (% TEI)	Protein (% TEI)	Fat (% TEI)
Before 1921	Very low calorie and starvation diet		
1921	20	10	70
1950	40	20	40
1971	45	20	35
1986	≤ 60	12-20	< 30
1994	*	10-20	**
2002	<b>60-70 (CHO + MUFA ++)</b>	<b>15-20</b>	<b>**</b>

\* Based on nutrition assessment and treatment goals, which differ with each patient  
+ < 10% from saturated fat.  
++ CHO: carbohydrates; MUFA: monounsaturated fatty acids  
Source: American Diabetes Association

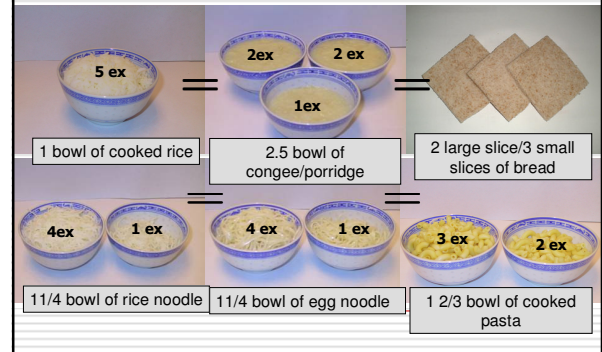
# What now?

Nutrient	ADA (2008)	EASD (2004)	Diabetes UK (2003)	CDA (2008)
Protein	15-20% TEI	10-20 % TEI	< 1 g/kg BW	15-20 % TEI
Fat	Individualized	< 35 % TEI	< 35 % TEI	≤ 30 % TEI
Saturated fat	< 7 % TEI	< 10 % TEI (SFA + trans fat)	< 10 % TEI (SFA + trans fat)	≤ 7 % TEI
Trans Fat	Minimized	< 8 % TEI if LDL ↑		Minimized
Cholesterol	≤ 200 mg	< 300mg	N/A	≤ 200mg
Mono-unsaturated fatty acids	Individualized	60-70 for CHO + cis MUFA individually tailored	10-20 % TEI cis MUFA	Should be in the meal plan when possible
Poly-unsaturated fatty acids	Individualized N-3: fish intake 2 or more servings weekly	≤ 10 % TEI 2 - 3 servings oily fish weekly	N - 6 < 10 % TEI N - 3: fish intake 1 - 2 servings weekly	< 10 % TEI (food rich in N-3 and plant oils)
Carbohydrates	<input type="checkbox"/> Individualized <input type="checkbox"/> No < 130g/d	<input type="checkbox"/> 45-60 % TEI	<input type="checkbox"/> 45-60 % TEI	<input type="checkbox"/> 45- 60 % TEI
Glycemic Index (GI)	<input type="checkbox"/> GI and GL provide a modest additional benefit	<input type="checkbox"/> Emphasized low GI foods	<input type="checkbox"/> Emphasized low GI foods	<input type="checkbox"/> Choose low GI foods more often
Dietary Fiber	<input type="checkbox"/> 14g/1000kcal dietary fiber/d	<input type="checkbox"/> 40g/d (20g dietary fiber/1000kca/d) <input type="checkbox"/> about ½ should be from soluble fiber	<input type="checkbox"/> N/A	<input type="checkbox"/> 25-50g dietary fiber/d
Sugars	<input type="checkbox"/> Sucrose can be substitute for other CHO source	<input type="checkbox"/> < 10% TEI from sucrose) (up to 50g/day)	<input type="checkbox"/> < 10% TEI sucrose	<input type="checkbox"/> < 10% TEI sucrose

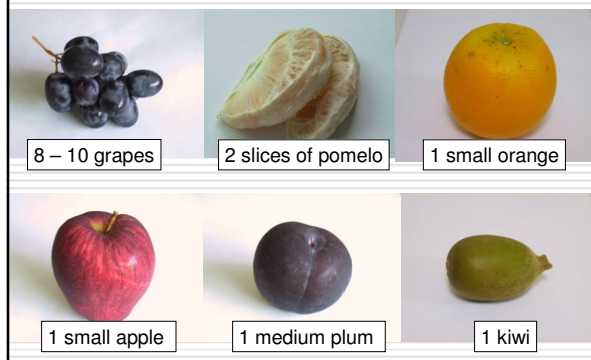
## Highlights of CHO recommendations

- Very low CHO diet not recommended
- GI less than 130g/day (ADA 2008)
- Emphasized low glycemic index (GI) choices
- Ensure adequate dietary fiber intake (> 20g/day)
- Carbohydrate intake should be individualized based on weight, activity, and preferences
- Sucrose can be substituted for other CHO sources
- Individualized carbohydrate intake (ADA approach)

## Example: 50 g of carbohydrates



## 1 serve of fruit -10 g carbohydrates



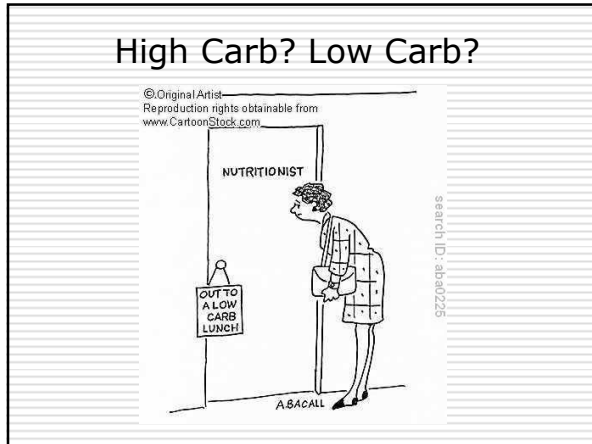
## 1 serve of dairy product - 12 g carbohydrates



250 ml low fat/skim milk



200 ml low fat yoghurt



## High CHO Low Fat Diet VS Low CHO high MUFA Diet

High CHO (~ 49-60%) Low fat diet	Low CHO (~37-50%) High MUFA
<input type="checkbox"/> lowers LDL	<input type="checkbox"/> lowers LDL
<input type="checkbox"/> higher TG	<input type="checkbox"/> lower TG
<input type="checkbox"/> higher postprandial glycemic response	<input type="checkbox"/> lower postprandial glycemic response
<input type="checkbox"/> weight loss similar	<input type="checkbox"/> weight loss similar
<input type="checkbox"/> Less palatable	<input type="checkbox"/> Improved HDL
	<input type="checkbox"/> More palatable

Nutrition Recommendation and Intervention for Diabetes – A position statement of the American Diabetes Association 2008  
Emilio Ros. Am J Clin Nutr 2003; 78 (suppl): 617S-25S

## High CHO Low Fat VS Low CHO high MUFA diet

- No conclusive evidence to show low CHO high MUFA diet has improvements on FBG, HbA1c and insulin sensitivity (ADA 2008).
- Individualized energy restriction
- Should be individually tailored, with energy restriction
- Lower CHO (no  $\leq$  130g /day) intake if TG persistently elevated

Nutrition Recommendation and Intervention for Diabetes – A position statement of the American Diabetes Association 2008  
Emilio Ros. Am J Clin Nutr 2003; 78 (suppl): 617S-25S

## Glycemic Index and Glycemic Load

- Glycemic Index
  - A scale that ranks carbohydrates by how much they raise blood glucose compared to a reference foods (glucose or white bread)

**High > 70**

**Medium 56-69**

**Low < 55**

## Factors affecting GI Ranking

<ul style="list-style-type: none"> <li><input type="checkbox"/> Amylose</li> <li><input type="checkbox"/> Physical entrapment</li> <li><input type="checkbox"/> Viscous fiber (soluble)</li> <li><input type="checkbox"/> Fat content</li> <li><input type="checkbox"/> Protein content</li> <li><input type="checkbox"/> Acidity</li> </ul>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Lowers Glycemic Index</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Amylopectin</li> <li><input type="checkbox"/> Surface area</li> <li><input type="checkbox"/> Cooking method</li> <li><input type="checkbox"/> Ripeness</li> <li><input type="checkbox"/> Cooking time</li> <li><input type="checkbox"/> Temperature</li> <li><input type="checkbox"/> Moisture</li> <li><input type="checkbox"/> Alkalinity</li> </ul>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Increases Glycemic Index</p>
--	--	--	---

## Glycemic Index At-a-glance

Low GI (<55)	Moderate GI (55 – 70)	High GI (>70)
Wholegrain, multigrain, rye bread, rolled oats, All bran, barley, pasta, cellophane noodle, buckwheat noodle	Pita bread, muesli, brown rice, basmati rice, vermicelli noodle	White bread, bagel, baguette, cornflakes, rice bubbles, glutinous rice, jasmine rice
Apple, orange, pear, peach, plum, cherries, grapes	Banana (just ripe), kiwi, mango, papaya, pineapple, rock melon	Watermelon, dates, lychee
Corn, sweet potato, carrots, lentils, baked beans, kidney beans, soy bean	New potato, taro, broad beans,	Potato (baked, boil, mashed), pumpkin
Fruit biscuits Rich Tea biscuits	Popcorn, digestive biscuits, Vita wheat	Water crackers, rice cakes, pretzels

Glycemic Index and GI Database ----- <http://www.glycemicindex.com>

## Benefits of Low GI Diet

Randomized, parallel study  
N= 210 T2DM

6 months treatment - Low GI VS high cereal fiber diet

### Low GI group

pumpnickel, rye pita, and quinoa and flaxseed and breakfast cereals, large flake oatmeal, oat bran, and Bran Buds pasta, parboiled rice, beans, peas, lentils, and nuts

### High cereal fiber diet group

whole grain breads; whole grain breakfast cereals; brown rice; potatoes with skins; and whole wheat bread, crackers, and breakfast cereals

JAMA. Dec 17 2008;300(23):2742-2753.

## Benefits of Low GI Diet

Low GI diet helps lower blood glucose levels

### Lower GI Group

↓ HbA1c by 0.5 % (p<.001)

↑ Increase HDL level by 1.7 mg/dl (P=.005)

### High cereal fiber diet group

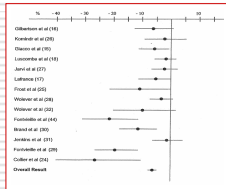
↓ HbA1c by 0.18% (p<.001)

↓ HDL by 0.2mg/dl (p=.005)

JAMA. Dec 17 2008;300(23):2742-2753.

## Benefits of Low GI Diet

Low GI diet helps lower blood glucose levels.  
Meta-analysis of 14 studies, 356 subjects (types 1 & 2 DM), 2-52 weeks duration



### Mean difference

- 7.4% in glycated proteins reduction from low GI diet.
- 0.43% points in HbA1c reduction from high GI diet

Brand-Miller et al. *Diabetes Care*. 2003; 26; 2263. (<http://www.glycemicindex.com>)

## Benefits of Low GI Diet

### Low GI diet improves lipid levels.

23 obese young adults, 18-35 y, BMI > 27, 12 months duration

	GL	TC	LDL	HDL	TG
Ad libitum low GL diet	53	-8.5	-9.7	12.2	-37.2
Low calorie, low fat diet	77	-6.2	-7.4	1.1	-19.1

Ebbeling et al. *Am J Clin Nutr*. 2005; 81; 981.

## Benefits of Low GI Diet

### Low GI diet aids in weight control.

Nurses' Health Study, 1984-1996 n=74,091 women, 38-63 y

Calculated odds ratios (lowest > highest quintiles)

	BMI (≥30) n = 6,400
Whole grains	-19%
Refined grains	+18%
Dietary fiber	-34%

Lin et al. *Am J Clin Nutr*. 2003; 78; 923.

## Glycemic Load (GL)

- GL measures the degree of glycemic response and insulin demand produced by a specific amount of a specific food

$$GL = GI / 100 \times CHO (g) \text{ per serving}$$

$$\text{E.g. Apple } 40/100 \times 15g = 6$$

## GL Ranking

### Individual Foods

**Low 0 -10**  
**Moderate 11-19**  
**High > 20**

### Whole Day

**Low < 80**  
**Moderate 100**  
**High > 120**

	Low GI (<55)	Med GI (56-69)	High GI (>70)
<b>Low GL (0-10)</b>	All bran (8,42) Pumpkinseed bread (5,41) Apple (6,38) Grapes (8,46) Skim milk (4,32) Yogurt (6,36) Soybean (1,18) Cashew nut (3,22) Sweet corn (9,54) Honey (10,55)	Rye bread (8,58) Cantaloupe (4,65) Pineapple (7,59) Ice cream (8,61) Sucrose (7,68) Digestive biscuit (10,59)	White wheat flour bread (10,70) Whole wheat flour bread (9,71) Watermelon (4,72) Pumpkin (3,75) Popcorn (8,72) Glucose (10,99)
<b>Med GL (11 - 20)</b>	Brown rice (18,55) Instant noodle (19,47) Chocolate (12,43) Banana (12, 52) Orange juice (12,46) Wheat spaghetti (16,37) Boiled potato (14,50)	Quick Oats (17,66) Raisin Bran (12,61) Creamed cracker (11,65) Rye crisp bread (11,64) Sweet potato(17,61)	Bran flakes (13,74) Weetabix (13,70) Shredded Wheat (15,75) Soda crackers (12,74) Pretzels (16,83) Lychee (16,79) Parsnip (12,97)
<b>High GL (&gt;20)</b>	Udon (26,55) White spaghetti (21,44) Linguine (22,46) Macaroni (23,47)	White rice (23,64) Risotto rice (36,69) Rice vermicelli (22,58) Cranberry juice (23,68)	Cornflakes (21,81) Rice bubbles (22,87) Glutinous rice (44,92) Jasmine rice (46,109) Frozen French fries (22,75) Dried dates (42,103)

(GL, GI): GI values in reference to glucose  
 Kaye Foster-Powell AJCN 2002: 76:5-56 International table of glycemic index and glycemic load values 2002

## Pictures of Low/High GI Meals



GI = 60 GL = 48



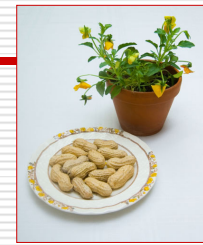
GI = 42 GL = 31

Reference: <http://www.glycemicindex.com>

## Pictures of Low/High Snacks



GI = 83 GL = 19  
(30g)



GI = 14 GL = 1  
(50g)

Reference: <http://www.glycemicindex.com>

## Emphasized on MUFA (per 100g)

Sources	Total fat (g)	SFA (g)	MUFA (g)	PUFA (g)
High Oleic sunflower oil	100	9.7	83.6	3.8
<b>Olive oil</b>	<b>100</b>	<b>13.5</b>	<b>73.7</b>	<b>8.4</b>
<b>Canola Oil</b>	<b>100</b>	<b>7.1</b>	<b>58.9</b>	<b>29.6</b>
Macadamia nut	75.8	12.1	58.9	1.5
Hazelnut	60.7	4.5	45.7	7.9
Almond	50.6	3.9	32.2	12.2
Peanuts	49.2	6.8	24.4	15.6
Avocado	15.3	2.4	9.6	2.0

USDA Nutrient Database

## Conversion to Foods

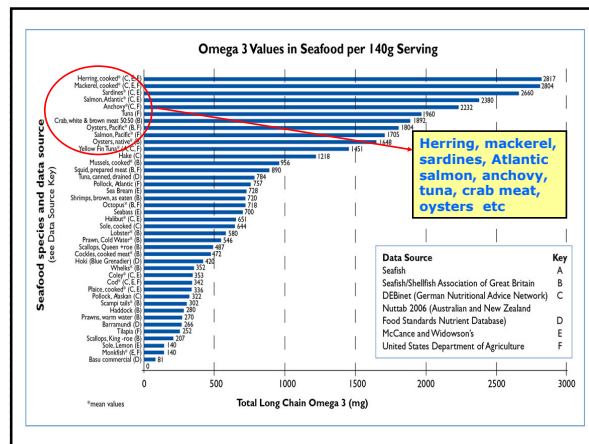
Based on a 1,500 kcal diet, one needs about average 25 g MUFA per day

- = 42 g (17 kernels) macadamia nuts
- = 78 g (61 kernels) almond
- = 34 g (7 tsps) olive oil
- = 42 g (8 tsps) canola oil
- = 260 g (1.5) avocado

## PUFA

- [http://www.heart.org/healthycare/healthydiet/healthydiet\\_040107a.jsp](http://www.heart.org/healthycare/healthydiet/healthydiet_040107a.jsp)
- Omega 3 supplementation shown to improve TG of T2DM with hyper- triglyceridemia.
- Supplementation of 2 – 4 g omega 3 supplements per day.

American Heart Association 2007

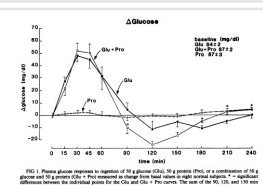


## Sucrose

- Sucrose or sucrose-containing foods can be substitute for other CHO in a meal plan, if added to the meal plan, covered with insulin or other glucose-lowering medications (GRADE A -ADA 2008).
- Beware of excess energy intake
- < 10% of energy

## Protein

- Ingesting protein along with carbohydrates doesn't effect BG but improve insulin responses.
- Protein increases satiety which help weight loss.
- Protein alone should not be used for nocturnal hypoglycemia prevention



Nuttall et al. Diabetes Care 7: 465. 1984  
 Gannon et al. J Clin Endocrinol Metab 86: 1040, 2001  
 Krezowski et al. The effect of protein ingestion on the metabolic response to oral glucose in normal individual. 44 (6): 847. (1986)  
 Marion J. Franz. Protein Controversies in Diabetes. Diabetes Spectrum. Volume 13 Number 3, 2000, Page 132

## Alcohol

- Moderate intake of alcohol with foods has no acute effect on blood glucose and insulin level.
- Avoid mixed drinks as they may raise blood sugar levels
- Drink with foods, especially for those who are on insulin
- NO evidence for recommendation of alcohol use to persons with or without diabetes who do not currently drink.

1 standard drink contains ~ 15 g ethanol



## Antioxidants

- Routine supplementation on Vitamin E, C and carotene not advised (GRADE A – ADA 2008)
- Benefit of chromium not clearly demonstrated (GRADE E – ADA 2008)

## Weight Management for DM

- For those who are overweight should reduce caloric intake and increase energy expenditure so that BMI moves towards the recommended range. (GRADE A – EASD 2004)
- Apply to both pre-DM and DM
- To achieve 7 – 10% weight loss

## Who shall be told to lose weight?



Any 2 of the 4 following factors:

- **Raised TG level** (> 1.7 mmol/L) or specific treatment on this lipid abnormality
- **Reduced HDL** (<1.03 mmol/L in male and < 1.39 mmol/L in female) or specific treatment on this lipid abnormality
- **Raised BP** (>130/85 mmHg) or Dx of HT
- **Raised FBG** (>5.6 mmol/L) or Dx of DM

## How to achieve?

- Either low CHO or low fat calorie-restricted diets may be effective up to 1 year (GRADE A - ADA 2008).
- Weight loss medication + lifestyle modification might help (GRADE B - ADA 2008).
- Bariatric surgery may be considered for whom with T2DM and BMI  $\geq 35$  kg/m<sup>2</sup> (GRADE B - ADA 2008).

## Lifestyle Modification Program

- Reduced caloric intake by 500 – 1000 kcal per day
- Individualized counseling
- Nutrition education
- Regular physical activity
- Frequent contact with participants

## Physical Activity Recommendations

- Improve blood sugar uptakes by increasing insulin sensitivity and suppressing hepatic glucose production.
- 150 minutes of moderate intensity physical activity per week
- Aerobic activity should be performed in intervals of at least 10 minutes, and preferably divided throughout the week
- Muscle strengthening activities can be done 2 or more days a week.

Nathan Y. Weltman et al. The Use of Exercise in the Management of Type 1 and Type 2 Diabetes. Clin Sport Med 28 (2009) 423-439

## Physical Activity Recommendations

- For prevention of weight gain:
  - 60 minutes/day
- To avoid regain of weight loss
  - 60-90 minutes/day
- No more than 2 days without exercise

2008 Physical Activity Guidelines for Americans

## Self-Monitoring

- Food Record
- SMBG
  - Fasting, pre-meal, post meal
  - Test on different foods/meals/cuisines
  - Test before and after exercise

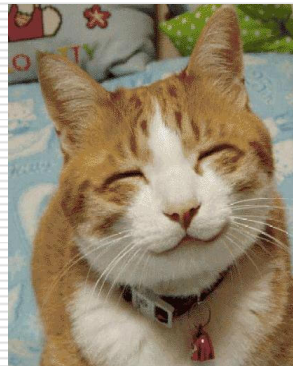
	時間	地點	食物份量及烹法	體重
早餐	8時	家	火雞三文治 1份+ 脫脂奶 1杯	65 公斤
小食	--	--	--	
午餐	1時	出外	雲吞麵 1碗+ 灼菜 (走油) 1碟	運動 急行 1小時
小食	4時	辦公室	橙 1個	
晚餐	7時	家	白飯 1碗 + 上湯芥蘭 1碟 + 蒸魚 2兩 + 切雞 1兩 (去皮) + 蘋果 1個	情緒 輕鬆
小食	10時	家	脫脂奶 1杯	

## Take Home Message on DM Diet

請向專科醫生查詢

PLEASE REFER YOUR PATIENTS TO  
OUR WEBSITE FOR DMJ ADVICE

<http://www.hkda.com.hk>



**Thank  
You!!**