

Insulin Resistant, Syndrome X, Metabolic Syndrome

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Diet and Diabetes: Strength of Evidence for Benefits

- Next 4 slides
 - Accumulate data and identify lifestyle issues that relate to the strength of the implication of the disease
 - Research results range from “Convincing” to “Insufficient Evidence”
 - Certain lifestyle pieces tend to emerge consistently

Diet and Diabetes: Strength of Evidence for Benefits

	Convincing	Probable	Possible	Insufficient Evidence
Insulin Resistance	Higher intakes of: • Whole grains.	Higher intakes of: • Vegetable oils or PUFA. • Dairy. Lower intakes of: • Refined carbs (GI/GL). • Processed meats.	Higher intakes of • Fruits and vegetables. • MUFA or PUFA in place of SFA. • Coffee. Lower intake of: • Dietary cholesterol.	• Carbs in place of SFA. • Unprocessed meats. • Fish or EPA+DHA.

Mozaffarian D. In preparation. From: de Ferranti S, and Mozaffarian D. The Perfect Storm: Obesity, Adipocyte Dysfunction, and Metabolic Consequences. Clinical Chemistry 54:5 945-955 (2008)

Diet and Diabetes: Strength of Evidence for Benefits

	Convincing	Probable	Possible	Insufficient Evidence
Obesity	Higher intakes of: • Whole unprocessed foods (e.g., whole grains, vegetables, nuts, fruits). Lower intakes of: • Sugar-sweetened	Higher intakes of: • Dietary fiber. Lower intakes of: • Large portion sizes. • Refined carbs (GI/GL). • Energy-dense foods. Less TV watching.	Higher intakes of: • Green tea. Lower intakes of: • Deep-fried foods. • Fast food meals. • Trans fat.	Total fat (% E). • SFA, MUFA, or PUFA

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	Convincing	Probable	Possible	Insufficient Evidence
Atherogenic Dyslipidemia	Higher intakes of: • Medit/Dash diet pattern • MUFA or PUFA. • Fish or EPA+DHA. Lower intakes of: • Refined carb (GI/GL). • Trans fat.	Higher intakes of: • Dairy	Higher intakes of: • Fruits and vegetables	

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	Convincing	Probable	Possible	Insufficient Evidence
Systemic Inflammation	Higher intakes of: • Fruits, vegetables.	Higher intakes of: • Medit/DASH diet pattern. • Whole grains. • EPA+DHA (supplement). Lower intakes of: • TFA.	Higher intakes of: • Fish, EPA+DHA, ALA. • PUFA. • Nuts. Lower intakes of: • Refined carbs (GI/GL).	SFA or MUFA.

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Systemic Inflammation

- Discovery of interleukins (IL), the concept of systemic inflammation developed
- Chronic systemic inflammation (SI) is the result of release of pro-inflammatory cytokines from immune-related cells and the chronic activation of the innate immune system
- Role of NFκB in severe systemic inflammation and multiple organ dysfunction syndrome (MODS). MODS, a serious and often fatal complication

Reduce Systemic Inflammation

- Adipose tissue may act as an additional source of systemic inflammation
- Researchers also identified a strong interaction between metabolic syndrome and smoking status
- Many chronic inflammation diseases shows relationship to vitamin D deficiency

Use Frequently	Reduce Systemic	Inflammation
Appropriate portion sizes	Use small plates and serving sizes. May always return for more	
Low Fat Diet	25-30 % of calories For whole meal, therefore may use a high fat food plus lots of low fat foods	3 gm fat/100 calories
Whole foods	Fruits, vegetables, nuts, whole grains, legumes, herbs/spices	Variety of colors will give variety of antioxidants
Carbohydrate quality	Dietary fiber, glycemic index/load	Amylose (20-30%) chain-like + amylopectin (70-80%) branched
Energy density	Decrease density with adding more water	
Dairy	Use skim or 1% milk; alternative is full fat soy milk	RCT: Especially good for the calcium and vitamin D
Protein	Evaluate food intake for quantity of protein: 55-60 g/d	
Omega 3 fatty acids	Fatty fish, fish oil supplements, DHA supplements	

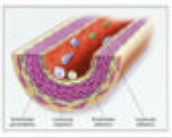
ADDITIONAL	Reduce Systemic	Inflammation
25(OH)D3 / calcitriol supplement	Also known as vitamin D	Acts as a anti-inflammatory
Calorie restriction	Reduce total calories per day by 100 less than you body needs	Weight loss decreases pro-inflammatory and increases anti-inflammatory factors* Appears to be anti-aging
TV watching	Monitor type and amount of watching – decrease amount	Get up and move

*Fontana & Klein, JAMA 2007; 297:986-94
**Reuben, J Am Geriatr Soc 2003;51:1125.

ADDITIONAL	Reduce Systemic	Inflammation
Exercise/ activity	Acts as anti-inflammatory**	Muscle resistance and aerobics
Sleep duration	7-8 hours per day, all in a row	
NSAIDs, anti-inflammatory Cox-2 inhibitors	Medication, omega-3 fish oil, vitamin D3	
Probiotics	Possibilities in the future: still need more research	In the meantime....

*Fontana & Klein, JAMA 2007; 297:986-94
**Reuben, J Am Geriatr Soc 2003;51:1125.

AVOID	Reduce Systemic	Inflammation
Trans Fats	Check labels; recommended less than 6 mg/day	Cooking or refining changes structure + can not digest
Sugar Sweetened Beverages	Overpower mouth and system	Causes more cavities
Vitamin – Mineral Supplement	Do not protect from cancer	If get enough plant foods for phytochemicals, will get enough vitamins/ minerals
Excess calories	Excess makes fat which makes inflammation	

AVOID	Reduce Systemic	Inflammation
Smoking + tobacco	Stop using. Get help	
Excessive aerobic training	Ironic, but true	
Highly processed food	Chemicals, lack of phytonutrients	
Excess calories	Excess makes fat which makes inflammation	

Increase Soluble Fiber

- Plant foods
 - Legume family
 - Cereal family
- Supplements
 - ***Use every day at meals, as if part of foods
 - Use as laxative
- Avoid juicing
 - Removes the fiber

	Soluble Fiber	
Psyllium	Metamucil, Konsyl	70% soluble; best known
Glucomannan from Konjac	Not an ingredient	? Soluble; traps bile; bulks stool
Inulin	Fiber One Cereals, FOS	100% soluble; no help medically
Methyl-cellulose	Citrucel	100% soluble; traps bile; no other help medically
Polycarbophil	Fibercon	100% soluble; no help medically; bulks stool
Wheat Dextrin	Benefiber	

Thanks Again for your attention