Metabolic Syndrome: Modern Nutritional Therapy

Mr. LEE Chee Cheow (M.Sc.)
Chief Scientific Officer
International Advanced Bio-Pharmaceutical Industries Pte Ltd.

Promoting the Medical Science of Preventive Self-care
Modern Solution Model for Obesity & Metabolic Syndromes

The Metabolic Syndrome & Obesity Treatment Pyramid

Clinical Intervention

Pharmacological Therapy

Personalized Nutriceutical Aids (Applied Nutrigenomic)

Balanced Diet (Nutrition)

Physical Activities (Exercise)

See the Doctor

Nutritional knowledge

Do it Yourself

Increase severity in Metabolic Syndromes

Those with BMI >35 or / and high risk with:
• Coronary artery disease
• Type 2 diabetes
Exercise

An essential tool in treating metabolic syndrome

Maintain a sustainable program:
- 30 minutes regime each time
- 3-5 times a week
- Adopt interval training regime
- Expose to Sunlight & fresh air

Beneficial effect:
- Blood pressure
- Cholesterol levels
- Insulin sensitivity
- Weight loss
- Build muscle & endurance
- Detoxification (sweating)
- Strengthen Immunity
Balanced Diet?

- Carbohydrate: 65%
- Fats: 20%
- Protein: 15%
- Saturated Fat: 6%
- Unsaturated Fat: 14%

% of total calories intake
Excessive exposure to dietary fats is an important factor in the initiation of obesity & metabolic syndrome associated pathologies.
Coconut oil contains medium chain triglycerides (MCTs)
Helps prevent heart disease, stroke, and hardening of the arteries
MCT results in a higher resting metabolic rate (RMR) is suggested in the treatment of weight reduction.
## Dietary Fats 101

<table>
<thead>
<tr>
<th>Types of Fats</th>
<th>Class of Fat</th>
<th>Other Names</th>
<th>Effect LDL</th>
<th>Effect HDL</th>
<th>Effect on BP</th>
<th>Insulin sensitivity</th>
<th>Other effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential</td>
<td>Poly unsaturated</td>
<td>Omega 3</td>
<td>▼</td>
<td>▲</td>
<td>▼</td>
<td>Improve</td>
<td>Note A</td>
</tr>
<tr>
<td>Essential</td>
<td>Poly unsaturated</td>
<td>Omega 6</td>
<td>▼</td>
<td>—</td>
<td>—</td>
<td>Improve</td>
<td></td>
</tr>
<tr>
<td>Non Essential</td>
<td>Mono unsaturated</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>If &lt; 38% Improve</td>
<td></td>
</tr>
<tr>
<td>Non Essential</td>
<td>Medium Chain Saturated</td>
<td>Medium Chain</td>
<td>▼</td>
<td>—</td>
<td>▼</td>
<td>—</td>
<td>Coconut Oil</td>
</tr>
<tr>
<td>Non Essential</td>
<td>Long Chain Saturated</td>
<td>Triglycerides</td>
<td>▲</td>
<td>—</td>
<td>▲</td>
<td>Worsen</td>
<td>Fatty Liver</td>
</tr>
<tr>
<td>Non Essential</td>
<td>Ring Saturated</td>
<td>Cholesterol</td>
<td>▲</td>
<td>—</td>
<td>▲</td>
<td>Worsen</td>
<td>Fatty Liver</td>
</tr>
<tr>
<td>Non Essential</td>
<td>Hydrogenated</td>
<td>Transfat</td>
<td>▲</td>
<td>▼</td>
<td>▲</td>
<td>Worsen</td>
<td>Fatty Liver</td>
</tr>
</tbody>
</table>

**A = Omega-3 is anti inflammation, anti cancer & helps in various mental illnesses: depression, attention-deficit, hyperactivity & dementia.**
Nutrition

Fat Distribution in Common Cooking Oils

- Safflower Oil: 10.2 g, 2.0 g, 0.6 g
- Canola Oil: 8.2 g, 2.8 g, 1.3 g
- Flaxseed Oil: 8.0 g, 2.5 g, 1.3 g
- Sunflower Oil: 8.9 g, 1.7 g, 0.1 g
- Corn Oil: 7.9 g, 0.6 g, 0.1 g

- Olive Oil: 10.0 g, 1.8 g, 0.1 g
- Sesame Oil: 5.4 g, 1.9 g, 0.5 g
- Soybean Oil: 6.9 g, 2.0 g, 0.6 g
- Peanut Oil: 6.2 g, 2.3 g, 0.7 g
- Lard (Pork Fat): 5.8 g, 1.3 g, 0.6 g

- Beef Tallow: 6.4 g, 5.4 g, 0.4 g
- Palm Oil: 6.7 g, 5.0 g, 1.2 g
- Butter: 7.2 g, 3.3 g, 0.2 g
- Palm Kernel Oil: 11.8 g, 11.1 g, 0.2 g
- Coconut Oil: 11.8 g, 11.1 g, 0.2 g

Polyunsaturated Fats:
- Linoleic Acid
- Alpha-Linoleic Acid

Saturated Fat: Brown
Monounsaturated Fat: Light Blue
Other: Yellow

Trans-fat is worst than Animal Fats
**Major Sources of Trans-fat**

- **Confectionary**: 40%
- **Fried Foods**: 30%
- **Animal Fats**: 21%
- **Others**: 9%
Guideline for Dietary Fat intake

Prevention of metabolic syndrome is targeted:
• To correct overweight
• To improve insulin sensitivity

- Limits the total dietary Fat intake < 20% TCI
- Take High Quality Fat
  (i.e. high polyunsaturated & low saturated)
- Minimize intake of saturated fat & cholesterol
- Avoid trans-fat (hydrogenated fat)
Protein

• Every cell in the human body contains protein
  – body repair cells and make new ones

• All enzymes are proteins

• Nerves systems functioning

• Many hormones are proteins
• **Animals protein**
  – Is very similar to human protein needs.
  – You can get all 9 essential amino acids
  – Can be synthesized very efficiently

• **Plant protein**
  – No plant contains all 9 essential amino acids.
  – Most vegetables are low in lysine

While we need to get all of nine essential amino acids, we don't need to get them together, or even in the same day
Protein: Homocysteine Health Risk

Methionine (dietary protein)

Homocysteine (amino acid)

Excess

Folate
B2, B6, B12

Metabolic Enzymes

Detoxifier

Glutathione

SAMe

Brain Hormones

Atherosclerosis

Normal Artery
Mild Atherosclerosis
Severe Atherosclerosis
Nutrition Homocysteine Risk:

Adapted with permission from: Alfthan, G., et al. Lancet 1997;349:397
5 units reduction of Homocysteine level will results in reduction of:

- 75% CVD
- 50% Alzheimer’s
- 33% Cancer
- 50% Death (ac)

Nutrition

Animal based Diets
associated diseases:

Osteoporosis –
• Animal diets is **acidifying**
• encourage calcium loss.

Animal based diets are often:
• Higher in fat & contains cholesterol
• Used in highly heated foods (>140°C)

⇒ **Cancer promotion**
Nutrition

Carbohydrate

Monosaccharides: Glucose
Disaccharides: Sucrose, Lactose
Polysaccharides (Digestible): Starch
Polysaccharides (Indigestible): Cellulose / Fibre

Glycemic Index

Carbohydrate → Blood Glucose → Produce Energy

Excess

- Store as Fat → Obesity
- Insulin resistance → Diabetes
- Hypertension → CVD
- Accelerated aging

Produce Energy
Low glycemic load diet:
- Lower net calories intake
- Easier to lose weight
- Keep BS more consistent
- Prevent insulin resistance

Foods with a low glycemic load of <10:
- Fiber-rich fruits and vegetables, like carrots, green peas, apples, grapefruit, and watermelon
- Kidney, garbanzo, pinto, soy, black beans, Lentils, Cashews, Peanuts
- Whole-grain breads like barley, pumpernickel, and whole wheat

Foods with a high glycemic load of >20:
- High-sugar beverages
- Candy
- Sweetened fruit juices
- White rice, White pasta
- French fries and baked potatoes
- Cereals (high in added sugar)
- Macaroni and cheese, Pizza
- Raisins and dates
**Plant > Carbohydrate**

**Micro Nutrients**

<table>
<thead>
<tr>
<th>Vitamins</th>
<th>Minerals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

**Digestive Enzymes**

<table>
<thead>
<tr>
<th>Amylase; Catalase</th>
<th>Protease; Peroxidase</th>
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</tbody>
</table>

**Phyto-Chemicals**

<table>
<thead>
<tr>
<th>Bioflavonoids (anti oxidants)</th>
<th>Carotenoids (anti oxidants)</th>
<th>Chlorophyll</th>
<th>Isoflavonoids (phytoestrogens)</th>
<th>Lentinan, Lutein: (anti cancer)</th>
<th>Probiotics (GI health)</th>
<th>Quercetin (anti inflammation)</th>
<th>Triterpenes: (anti-cancer/inflammation)</th>
</tr>
</thead>
</table>

**Essential for gastrointestinal health**

- Polysaccharides (Digestible): Starch
- Polysaccharides (Indigestible): Cellulose / Fiber
- Amylase; Catalase; Protease; Peroxidase
- Bioflavonoids, Carotenoids, Chlorophyll, Isoflavonoids, Lentinan, Lutein, Probiotics, Quercetin, Triterpenes
<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Useful plants for Obesity &amp; Metabolic Syndromes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bitter melon</strong></td>
<td>Blood sugar regulation</td>
</tr>
<tr>
<td><strong>Celery</strong></td>
<td>Hypertension, Weight loss, Anti cancer, Bone health</td>
</tr>
<tr>
<td><strong>Cinnamon</strong></td>
<td>Blood sugar regulation, High cholesterol</td>
</tr>
<tr>
<td><strong>Garlic</strong></td>
<td>Hypertension, Blood sugar regulation, High cholesterol</td>
</tr>
<tr>
<td><strong>Banaba Tea</strong></td>
<td>Blood sugar regulation, Hypertension, Weight loss</td>
</tr>
<tr>
<td><strong>Green Tea</strong></td>
<td>Blood sugar regulation, High cholesterol, Weight loss</td>
</tr>
</tbody>
</table>
## Useful MS Nutritional Supplements

<table>
<thead>
<tr>
<th></th>
<th>BS</th>
<th>BP</th>
<th>TC</th>
<th>Common food source</th>
<th>Max Daily Toler limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamins B complex</td>
<td></td>
<td></td>
<td>■</td>
<td>Meat, all whole, unprocessed foods, bananas, liver, yeast</td>
<td>B3 - 35 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(niacin)</td>
<td>B6 -100mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B9 - 1mg</td>
</tr>
<tr>
<td>Vitamins D</td>
<td>■</td>
<td></td>
<td>■</td>
<td>Fish, liver, cheese, egg yolks</td>
<td>250 ug</td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td>■</td>
<td></td>
<td>Dairy products, Chinese cabbage, kale, and broccoli</td>
<td>2,500 mg</td>
</tr>
<tr>
<td>Magnesium</td>
<td>■</td>
<td>■</td>
<td></td>
<td>legumes, nuts, whole grains</td>
<td>350 mg</td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td></td>
<td>■</td>
<td>Oysters, meat, beans, nuts, crab</td>
<td>40 mg</td>
</tr>
<tr>
<td>Co Q10</td>
<td>●</td>
<td>■</td>
<td></td>
<td>Fish: mackerel, herring</td>
<td>1200 mg</td>
</tr>
<tr>
<td>Omega-3</td>
<td></td>
<td></td>
<td>■</td>
<td>Fish Oil</td>
<td>None</td>
</tr>
<tr>
<td>L- Arginine</td>
<td>●</td>
<td></td>
<td>■</td>
<td>Semi essential amino acid</td>
<td>None</td>
</tr>
<tr>
<td>L- Lysine</td>
<td></td>
<td>■</td>
<td>■</td>
<td>Meats, legumes</td>
<td>None</td>
</tr>
</tbody>
</table>

* B-12 is not available from plant products,

Those at risk for Lysine deficiency: Vegetarians & Athletes
Dietary recommendation

The general dietary recommendations:

- **Do not Over Eat** (periodic fasting)
- **Keep a Balanced Diet**: (65-75% C : 15-20% F : 10-15% P)
- **Low glycemic load** –
  Rich in fruits and vegetables, low in sugar / refined carbohydrates
- **Low intake of saturated fats, cholesterol & trans fats**
- **Low in red meat, processed meat, rich in nuts & fish**
- **Cut back on salt & MSG**
- **Avoid alcohol**

- **Improve Digestion with:**
  - Probiotics & Food Enzymes
  - Learn to use Nutraceuticals
Modern Remedies for Obesity & Metabolic Syndromes is based on:

- A Balanced & Healthy Diet
- Sustainable Physical Activity
- Applied Nutrigenomic Supplementation

Thank you