Healthy Eating for the Elderly

10 Sep 2016

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Principal Dietitian

Khoo Teck Puat Hospital
Alexandra Health
Outline

• Statistic and background
• Common Nutrition Related Issue
• Prevention
  – Screening Tools
• Dietary Intervention
Statistics

Figure 2.4
Changes in the Population Pyramid

1950

- 4.9% 65 and over
- 59.6 15-64
- 35.4 0-14

2014

- 26.0% Males
- 61.3 Females
- 12.8 0-14

2050 (Projection)

- 38.8% Males
- 51.5 Females
- 9.7 0-14

Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare.
### Statistic: Actual & Projected Elderly Population in Singapore, Year 1980 - 2030

<table>
<thead>
<tr>
<th>Year</th>
<th>Population Aged 65-74 Years</th>
<th>Population Aged 75 Years &amp; Above</th>
<th>Total Elderly Population Aged 65 Years &amp; Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>81,200</td>
<td>30,700</td>
<td>111,900</td>
</tr>
<tr>
<td></td>
<td>3.6%</td>
<td>1.3%</td>
<td>4.9%</td>
</tr>
<tr>
<td>1990</td>
<td>104,700</td>
<td>59,400</td>
<td>164,100</td>
</tr>
<tr>
<td></td>
<td>3.9%</td>
<td>2.2%</td>
<td>6.1%</td>
</tr>
<tr>
<td>1997 (June)</td>
<td>135,400</td>
<td>82,000</td>
<td>217,400</td>
</tr>
<tr>
<td></td>
<td>4.4%</td>
<td>2.6%</td>
<td>7.0%</td>
</tr>
<tr>
<td>2000</td>
<td>152,300</td>
<td>82,200</td>
<td>234,500</td>
</tr>
<tr>
<td></td>
<td>4.7%</td>
<td>2.5%</td>
<td>7.2%</td>
</tr>
<tr>
<td>2010</td>
<td>196,300</td>
<td>116,000</td>
<td>312,400</td>
</tr>
<tr>
<td></td>
<td>5.2%</td>
<td>3.1%</td>
<td>8.2%</td>
</tr>
<tr>
<td>2020</td>
<td>373,200</td>
<td>156,900</td>
<td>530,100</td>
</tr>
<tr>
<td></td>
<td>9.1%</td>
<td>3.8%</td>
<td>12.9%</td>
</tr>
<tr>
<td>2030</td>
<td>508,800</td>
<td>290,000</td>
<td>798,700</td>
</tr>
<tr>
<td></td>
<td>11.7%</td>
<td>6.7%</td>
<td>18.4%</td>
</tr>
</tbody>
</table>
### Statistic: Comparing Singapore & Asia aged 65 and above

One of the fastest ageing population

<table>
<thead>
<tr>
<th>Country</th>
<th>Year 1995</th>
<th>Year 2000</th>
<th>Year 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>6.1</td>
<td>6.7</td>
<td>14.4</td>
</tr>
<tr>
<td>India</td>
<td>4.6</td>
<td>5.0</td>
<td>9.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td>4.3</td>
<td>4.7</td>
<td>9.7</td>
</tr>
<tr>
<td>Thailand</td>
<td>5.0</td>
<td>5.8</td>
<td>14.4</td>
</tr>
<tr>
<td>Philippines</td>
<td>3.4</td>
<td>3.6</td>
<td>8.3</td>
</tr>
<tr>
<td>Vietnam</td>
<td>4.9</td>
<td>5.2</td>
<td>9.3</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>9.8</td>
<td>11.1</td>
<td>27.7</td>
</tr>
<tr>
<td>South Korea</td>
<td>5.6</td>
<td>6.7</td>
<td>17.4</td>
</tr>
<tr>
<td><strong>Singapore</strong></td>
<td><strong>6.8</strong></td>
<td><strong>7.2</strong></td>
<td><strong>18.4</strong></td>
</tr>
<tr>
<td>Japan</td>
<td>14.2</td>
<td>16.5</td>
<td>26.3</td>
</tr>
</tbody>
</table>
Comorbidity

AGE

Physical Activities

Diet – Fats & Na

BMI

Diabetes

Hypertension

High LDL-CHOL

CKD
# Effect of Aging and Potential Influence on Nutrition status

<table>
<thead>
<tr>
<th>Physical/Medical</th>
<th>Psychological</th>
<th>Lifestyle /social</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal digestion</td>
<td>Anxiety</td>
<td>Alcohol consumption</td>
</tr>
<tr>
<td>Anorexia/ Rapid satiety</td>
<td>Bereavement (spouse, friends, family)</td>
<td>Difficult adaptation to change</td>
</tr>
<tr>
<td>Decrease activity</td>
<td>Confusion</td>
<td>Incorrect dietary beliefs</td>
</tr>
<tr>
<td>Decreases senses (taste, smell)</td>
<td>Dementia</td>
<td>Financial constraints/ Poverty</td>
</tr>
<tr>
<td>Dental/Denture Problems</td>
<td>Depression</td>
<td>Inability to shop and/ or cook</td>
</tr>
<tr>
<td>Drug interference/ Polypharmacy</td>
<td>Lack of socialization</td>
<td>Inconvenient food preparation</td>
</tr>
<tr>
<td>Endocrine disorder (DM, Thyroid)</td>
<td>Taste preferences</td>
<td>Isolation and loneliness</td>
</tr>
<tr>
<td>Bowel Issues (constipation, diarrhoea)</td>
<td></td>
<td>Lack of knowledge about needs and disease</td>
</tr>
<tr>
<td>Increase nutrient requirements</td>
<td></td>
<td>Susceptibility to fad claims</td>
</tr>
<tr>
<td>Infections (UTI, other)</td>
<td></td>
<td>Lifetime eating patterns</td>
</tr>
<tr>
<td>Lactose intolerance</td>
<td></td>
<td>If hospitalized or in care facility:</td>
</tr>
<tr>
<td>Mobility/ Physical weakness</td>
<td></td>
<td>Slow eating and limited time for meals</td>
</tr>
<tr>
<td>Multiple comorbid condition</td>
<td></td>
<td>Limited choices and/or poor presentation</td>
</tr>
<tr>
<td>Neurological disorders</td>
<td></td>
<td>Lack of accommodation for religion or</td>
</tr>
<tr>
<td>Nutrient deficiencies</td>
<td></td>
<td>cultural preferences</td>
</tr>
<tr>
<td>Physical limit (reach, utensils, packaging)</td>
<td></td>
<td>Needs feeding help or supervision</td>
</tr>
<tr>
<td>Respiration disorders</td>
<td></td>
<td>Unpleasant sight, sounds and smell</td>
</tr>
<tr>
<td>Swallowing disorders</td>
<td></td>
<td>Missed meals due to tests and other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>activities</td>
</tr>
</tbody>
</table>

Cumulative Effect would lead to Progressive undernutrition
Under-nutrition
Prof David Thomas, St Louis University Health Sciences Center, USA

Starvation
- Pure calorie deficiency
- Conserve lean body mass
- Deplete fat mass
- Reverse by feeding

Cachexia
- Inflammatory disease
- Mediated by cytokines
- Not affected by feeding

Sarcopenia
- Deplete lean body mass
- Weight may not change
- Mediated by testosterone, growth hormones
- Immobility
- Severe anorexia

Increase morbidity and mortality
Malnutrition

- Prolong restrictive pre-dialysis diet
- Uremia symptoms
- Misconception on CKD diet and HD diet

Inadequate food intake
PREVENTION
Nutrition Markers of Malnutrition

- Body Mass Index $\leq 18.5$ kg/m$^2$

- Unintentional loss of weight of $\geq 10\%$ in the previous 6 months

- Serum Albumin & nPCR (on dialysis)

- Subjective Global Assessment (SGA scores) of
  - based on features of the history:
    - Weight changes,
    - Gastrointestinal symptoms,
    - Dietary intake and
    - physical (muscle mass and fat mass store) examination
  1 – 2 severe loss of protein stores
  3 – 5 mild to moderate loss of protein stores
# BODY MASS INDEX for Kidney Patients

<table>
<thead>
<tr>
<th>BMI</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20</td>
<td>May be associated with health problems and <strong>malnutrition</strong></td>
</tr>
<tr>
<td>20 - 25</td>
<td><strong>“Ideal”</strong> index range associated with the lowest risk of illness in people without kidney disease</td>
</tr>
<tr>
<td>&gt;25 - 27</td>
<td>May be associated with health problems related to <strong>overweight</strong> in some persons</td>
</tr>
<tr>
<td>Over 27</td>
<td>Associated with increased <strong>risk of health problems</strong> related to obesity, such as heart disease, high blood pressure and diabetes</td>
</tr>
<tr>
<td>KDOQI</td>
<td><strong>23.6</strong> for women and <strong>24.0</strong> for men MD patients who are <strong>BMI &gt;30</strong> may benefit from weight reduction.</td>
</tr>
</tbody>
</table>

**References:** *Classifications of Body Mass Index by Health and Welfare. Canada; 1988.*

NUTRITIONAL ASSESSMENT FORM (SGA)
Nutrition & Dietetics Department

Weed / Bed: 

OBJECTIVE ASSESSMENT

Weight: _______ kg  Height: _______ m  BMI: _______ kg/m²  Age: _______ yr (Sex: _______)

Please stick Patient's Name Label within the box.

SUBJECTIVE GLOBAL ASSESSMENT

I. History
   a. Weight Change
      Usual Body Weight: _______ kg
      Overall loss in past 6 months: _______ kg
      %: _______% (small)  _______% (potentially significant)  _______% (definite significant)
      Change in past 2 weeks: _______ Increased  _______ No Change  _______ Decreased

   b. Dietary Intake
      Compare to normal: _______ Good & No Change (± share meal)  _______ Borderline (14-19 share meals)
      Change: _______ Poor (1-13 share meals)  _______ Very Poor (NM or 0 share meals)

   c. Gastronomical Functions
      None or < 2 weeks: _______  _______ Persisted > 2 weeks: _______
      Nausea: _______ Vomiting: _______ Anorexia: _______

   d. Functional Ability
      Full Capacity: _______ Dysfunction: _______ weeks Mild to Moderate Loss of Blunting
      One-handled: _______ Bedridden: _______ Anorexia: _______

   e. Metabolic Cascade
      No Stress: _______ Low Stress: _______ Moderate Stress: _______ High Stress: _______

II. Physical (refer to next page)

<table>
<thead>
<tr>
<th>Loss of subcutaneous fat (flabby chest)</th>
<th>Normal</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle wasting (bulldozer abdomen)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oedema (ankle, edema)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthenia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. SGA Rating

<table>
<thead>
<tr>
<th>Well Nourished</th>
<th>Mild to Moderate Malnutrition</th>
<th>Severe Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recently weight gain</td>
<td>Mild loss &amp; muscle loss</td>
<td>Moderate fluid loss</td>
</tr>
<tr>
<td>Increased appetite</td>
<td>Oedema</td>
<td>Fluid accumulation</td>
</tr>
</tbody>
</table>

Dietitian: _______ Date: _______
Mini Nutritional Assessment
MNA®

Last name: ____________________________
First name: ____________________________

Sex: ____________________________
Age: ____________________________
Weight, kg: ____________________________
Height, cm: ____________________________
Date: ____________________________

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes
2 = no

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems

F1 Body Mass Index (BMI) (weight in kg) / (height in m²)
0 = BMI less than 19
1 = BMI 16 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater

Screening score
(max. 14 points)

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished
# DETERMINE – Nutrition checklist for older adults

<table>
<thead>
<tr>
<th>Possible Problem</th>
<th>Questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eating Poorly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tooth Loss/Mouth Pain</td>
<td></td>
<td>0 – 2 Good</td>
</tr>
<tr>
<td>Economic Hardship</td>
<td></td>
<td>3 - 5 Moderate Risk</td>
</tr>
<tr>
<td>Reduced Social Contact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involuntary Weight Loss/Gain</td>
<td></td>
<td>6 or &gt; High Risk</td>
</tr>
<tr>
<td>Needs Assistance in Self Care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elder Years &gt; Age 80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[http://www.acsu.buffalo.edu/~drstall/nutrition.html](http://www.acsu.buffalo.edu/~drstall/nutrition.html)
DIETARY INTERVENTION
Energy Balance

Energy In $>$ Energy Out $=$ Weight Gain

Energy Out $>$ Energy In $=$ Weight Loss
## Different Textured diet

<table>
<thead>
<tr>
<th>Texture A</th>
<th>Texture B</th>
<th>Texture C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soft</strong></td>
<td><strong>Minced and Moist</strong></td>
<td><strong>Smooth Pureed</strong></td>
</tr>
<tr>
<td>Food may be naturally soft or may be cooked or cut to alter its texture</td>
<td>Food is soft, moist and easily mashed with a fork; lumps are smooth and rounded</td>
<td>Food is smooth, moist and lump free; may have a grainy quality</td>
</tr>
</tbody>
</table>
Aims of dietary management

1. Obtain adequate nutrition
2. Near normal blood sugar levels (HbA1c)
3. Normal blood pressure
4. Normal blood cholesterol
5. Reasonable body weight
6. Reduce acute symptoms
7. Reduce risk of long term complications
## Renal Diet

- **High calories**

<table>
<thead>
<tr>
<th>4 Nutrients to know</th>
<th>Kidney disease (not on dialysis)</th>
<th>HD</th>
<th>PD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Salt</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Low Potassium</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Low Phosphate</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Protein</td>
<td>Limit</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>
Aims of a renal diet

• Control build up of waste products and fluid in blood
e.g. Fluid overload, hyperphosphatemia, hyperkalemia
• To replace intradialytic nutrient loss with adequate intake
• Prevent and minimize complications of ESRD
  E.g. malnutrition, heart disease, renal bone disease.
• Promote flexibility in the diet plan to maintain a good appetite.
Energy / Calories

- Inadequate energy will lead to undesirable weight loss.
- Protein cannot perform its more valuable body building function.

- Recommended by KDOQI guidelines (2000):
  < 60 years of age : 30-35 kcal/kg BW/day
  ≥ 60 years of age : 30 kcal/kg BW/day

• Needs for calories differ for age, medical condition.
Protein

- 2 sources:
  - High Biological Value (HBV) protein
  - Low Biological Value (LBV) protein
HBV (HIGH BIOLOGICAL VALUE)

- Complete protein
- Better utilization
- Less waste product produced
- Recommend 50 - 70% intake
- 7g protein = 1 exchange protein

Food source
LBV (Low biological value)

Grains, fruits & vegetables.

- More waste products produced
- Provide adequate calories
• Protein - Meat, Fish or Tofu
• Calcium – Milk, soy bean milk
• Wholegrain – Fruit & Vegetable
• Salt
The Plate Concept

1 bowl rice (6 to 8 tablespoons)

Palm size of protein

¾ cup of vegetables
Different Textured diet

Texture A
Soft
Food may be naturally soft or may be cooked or cut to alter its texture

Texture B
Minced and Moist
Food is soft, moist and easily mashed with a fork; lumps are smooth and rounded

Texture C
Smooth Pureed
Food is smooth, moist and lump free; may have a grainy quality
Breakfast foods

**Instead of:**
- Jam or butter on toast
- Porridge with pickled and/or salted vegetables
- Fried bee hoon
- Oats made with water and condensed milk

**Have:**
- Eggs with wholegrain toast
- Porridge with peanuts and tofu
- Fried bee hoon with egg
- Oats made with low-fat high-calcium milk/soybean milk with HCS
White or Brown?

Switch to whole-grain varieties, not just eat less white rice

6/13/2016

The Singapore Nutrition and Dietetics Association (SNDA) has been receiving views on white rice consumption triggered by recent articles in The Straits Times. There have also been queries to clarify the context of the articles. The SNDA’s position is that the articles may be misunderstood as advising back on rice intake and that it is acceptable to consume sugared drinks without thinking.

This is not the right thinking.

The SNDA is aligned with the Health Promotion Board (HPB) in terms of our evidence and the dietary advice on refined carbohydrates such as white rice.

Management of carbohydrate quantity and quality in clinical settings reliably and well documented.

The effects of carbohydrate portioning and substitution from refined to whole and well-documented.

Given that Singaporeans consume a lot more refined carbohydrates from starch effectiveness of carbohydrate management as part of diabetes care, we support intervention to the population level as a first approach to diabetes prevention. Carbohydrate literacy and encourage an adoption of whole-grain varieties.

Singapore’s 2010 National Nutrition Survey showed that dietary energy from carbohydrates is recommended allowance.

However, much of the refined carbohydrate in the local diet comes from starch noodles and refined breads.

A highly refined carbohydrate diet, coupled with Asians' predisposition to high responses to carbohydrate intake, is a contributing factor to rising diabetes prevalence.

Singaporeans in modern living should focus on switching to whole-grain varieties on white rice intake.


Advocating whole grains consumption as a key approach in diabetes prevention

18th August 2016

The evidence for dietary carbohydrate management for diabetics is clear.

Advisory on dietary carbohydrate has been an integral part of clinical practice guideline for secondary intervention of diabetes (MOH, 2014). Management of carbohydrate quantity and quality in clinical setting reliably reduces elevated blood glucose. A recent 2016 American Diabetes Association position paper stated consumption of carbohydrate-rich processed foods as one of the reasons for hyperglycaemia among diabetic patients.

The effects of carbohydrate portioning and substitution from refined to unrefined sources are immediate and well-documented (Feinman et al., 2004, Levy, 2014; Al Essa, 2015) These clinical improvements are supported by established principles in carbohydrate biochemistry and physiology.

The health benefits to diabetic individuals, when refined carbohydrates are replaced by whole grains in the diet are further supported by a series of evidence based research (Sun et al. 2010, Ye et al. 2012, Aune et al. 2013 and Wang et al. 2013). Individuals with diabetes are encouraged to replace refined carbohydrates and added sugars with whole grains, legumes, vegetables, and fruits. The consumption of sugar-sweetened beverages and “low-fat” or “non-fat” products with high amounts of refined grains and added sugars should be discouraged (ADA, 2016).

The carbohydrate strategy - an urgency to move from secondary management to primary prevention at the population level.

Similarly, in the context of primary setting, evidence from both epidemiological & randomised control trials, is emerging that there is a dose-response relationship between levels of consumption of refined carbohydrate foods (white rice, noodles, white breads) and risk of developing type 2 diabetes (Chanson-Rolle, 2015). On average, every additional serving (250g plate) of white rice increases the risk of type 2 diabetes by 11% (Hu et al., 2012). Randomised control trials have similarly shown that substituting brown rice for white...
Take Home Message

• Be considerate
• Use large print of materials, picture & food model
• Give written materials
• Be as liberal as possible with meal plan
• Include patient’s favorite food
• Consider cultural, ethnic and religious preference
• Include family members
• Accommodate physical limitation
Resources

- Pocket Guide to Nutrition Assessment of the Patient with Kidney Disease 5th edition, NKF
- [www.hpb.gov.sg](http://www.hpb.gov.sg)
- [www.nkfs.org.sg](http://www.nkfs.org.sg)
- [http://www.acsu.buffalo.edu/~drstall/nutrition.html](http://www.acsu.buffalo.edu/~drstall/nutrition.html)
Thank You