Clinical Application of Qualitative and Quantitative Dietary Methods 2

Melissa Armstrong, APD, CDE
St Vincent’s Hospital Diabetes Centre
Jenny McQueen, AdvAPD
SWAHS community dietitian

March 2008

Overview

◆ Quantitative assessment
◆ Formulae - energy, protein, fluid
◆ Ready reckoners
◆ Break
◆ Ready reckoner case studies

Art of Dietetics

◆ Translators of nutritional science into dietary choices & patterns for groups & individuals
◆ Quantitative = nutrients
◆ Qualitative = food

◆ Be able to effectively:
  ◆ Assess
  ◆ Prescribe
  ◆ Implement
  ◆ Monitor outcomes

Qualitative vs Quantitative

◆ Qualitative Assessment of Intake
  ◆ Looking at the overall QUALITY of the diet
  ◆ i.e. comparing intake to a general measure of appropriate intake e.g. Food Groups

◆ Quantitative Assessment of Intake
  ◆ Looking at the measurable QUANTITY of the diet
  ◆ i.e. ensuring an absolute quantity is being provided
  ◆ e.g. computerised nutrient analysis or using ready reckoner to check amount ingested/provided/prescribed

Nutrition adequacy – Quantitative

◆ When greater accuracy required
◆ Used for
  ◆ individualised assessments
  ◆ diet calculation
  ◆ diet prescription
◆ Important clinical tools
  ◆ ready reckoners
  ◆ computerised nutrient intake analysis

Useful Hints / Practice Tips

◆ Adequate servings from the food groups will meet RDIs for nearly all essential nutrients, but not necessarily for
  ◆ Vitamins D & E
  ◆ Iron
  ◆ Potassium
  ◆ Folate
  ◆ Zinc
  ◆ depending on age, gender, food choices (small amounts of specific nutrient-dense foods may help to overcome these problems, e.g. nuts/seeds, oily fish, unsatd oils)
Practice Tips

- Always combine qualitative and quantitative methods for assessment and diet prescription/plan
  - Do not assume serving size - check carefully
  - Practise calculating the diet until you are very good at it
  - Be practical – effective use of time

Quantitative Ax and Prescription

What do you need to calculate…?

- Quantitative (quantity / how much)
  - Be specific re food items: 150g lean meat, 2 tsp butter, 1/2 cup peas, 200 ml milk etc
  - Then calculate intake & requirements: e.g. energy intake 6000kJ vs energy req/ment 8000kJ
  - or protein intake 60g vs protein req/ment 100g
  - or K intake 150 mmol vs K restriction 70 mmol
  - or folate intake 200ug vs folate req/ment 400ug

Example

- Estimated intake from diet hx = 5000kJ/day
- Estimated requirement based on: age, dx, weight loss, etc = 7500kJ/day
- Meal Plan - need to add 2500kJ/day
- Example: Negotiate with the patient…
  - Drink 250ml Sustagen made with FC milk: 1500kJ
  - and Add 20g fat (1 T) to meals: 600kJ
  - and Add a snack: 400kJ
  - Examples: 30g cheese or 200ml fruit juice or 2 scoops icecream or 1x muesli bar or 2x sweet biscuits
  - TOTAL = 2500kJ

Practice Tips

- Nutrient levels can vary a lot depending on the “type” of foods included in each food groups
  - e.g. for a low K diet, appropriate choices of “type and amount” of fruit /vegetables can lower K, but maintain other nutrients
- In general : a diet <6000 KJ (1500 Kcal/d) & <60g/d protein becomes marginal in some vitamins & minerals

Using Quantitative Methods in Clinical Practice

Important clinical tools
- Formulae
- Ready Reckoners
- Computerised nutrient intake analysis

Energy requirements

Schofield Equation (MJ/day)

<table>
<thead>
<tr>
<th>Age</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td></td>
</tr>
<tr>
<td>10-18</td>
<td>(0.074 x wt) + 2.754</td>
</tr>
<tr>
<td>18-30</td>
<td>(0.063 x wt) + 2.896</td>
</tr>
<tr>
<td>30-60</td>
<td>(0.048 x wt) + 3.653</td>
</tr>
<tr>
<td>over 60</td>
<td>(0.049 x wt) + 2.459</td>
</tr>
<tr>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>10-18</td>
<td>(0.056 x wt) + 2.898</td>
</tr>
<tr>
<td>18-30</td>
<td>(0.060 x wt) + 2.036</td>
</tr>
<tr>
<td>30-60</td>
<td>(0.034 x wt) + 3.538</td>
</tr>
<tr>
<td>over 60</td>
<td>(0.038 x wt) + 2.755</td>
</tr>
</tbody>
</table>
Energy requirements

- Healthy individuals
  - REE x activity factor
  - Physical activity level (PAL)
    - 1.2 very sedentary (frail, older persons)
    - 1.4 - 1.5 low active (office employees)
    - 1.6 - 1.7 active (students)

- Hospitalised individuals
  - REE x activity factor x injury factor

Energy Requirements

- Clinical situations
  - enteral feeding
  - burns & nutritional support
  - wound healing
  - weight loss
  - paediatrics
  - renal/liver
  - respiratory
  - basically everywhere!

Protein requirements - RDI

- Men –
  - 19 – 70 yrs: 0.84g/kg body weight
  - > 70yrs: 1.07g/kg body weight

- Women –
  - 19 – 70 yrs: 0.75g/kg body weight
  - > 70 yrs: 0.94g/kg body weight

Protein requirements

- Clinical situations e.g.
  - enteral feeding
  - renal disease/CAPD/haemodialysis
  - liver disease
  - wound healing
  - cancer
  - repletion

Fluid Requirements

Number of formulas available for estimating fluid requirements

1. 30ml/kg body wt
2. 30ml/kg body wt (min.1500ml/day)
3. 1ml/kcalorie energy consumed
4. 100ml/kg for first 10kg body wt
5. 50ml/kg for next 10kg body wt
6. 15–20ml/kg for remaining kgs of body wt

Fluid Requirements

- Clinical uses
  - enteral feeding
  - ICU
  - Burns
  - Paediatrics
  - Fever
  - Poor oral intake e.g. Post op/stroke, etc

- fluid restriction/avoid fluid overload may be required
Using Quantitative Methods

Important clinical tools
- Formulae
- Ready Reckoners
- Computerised nutrient intake analysis

Ready Reckoners

- Quick calculation e.g. protein & energy but does not replace food composition table or computer analysis
- Assists qualitative and quantitative assessment
- May need to adjust P/F/CHO content for some foods:
  - Bread & cereal group - biscuits contain added fat
  - Protein foods - higher fat content of some meats
  - Dairy – full cream vs skim varieties

Ready reckoners

- Create your own ready reckoners & add items or nutrients of interest
- Add/adjust serving sizes, as required
- Keep it simple!
- Keep it handy!
- Calculator is not necessary!

Ready Reckoner - Example

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Serving size</th>
<th>P (16)</th>
<th>F (27)</th>
<th>CHO (71)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread &amp; Cereals</td>
<td>1 slice</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/2c rice</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BF cereal 1 serve</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/2c pasta</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Fruit</td>
<td>1 serve</td>
<td>1</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Starchy vegetables</td>
<td>1 med (90g, 1/2c) potato</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/2c sweet potato/corn</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Meat, etc</td>
<td>30g lean, cooked</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 egg</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25g cheese</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>150ml full cream milk</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>200g full cream flav yoghurt</td>
<td>8</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>200g LF/diet yoghurt</td>
<td>10</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Margarine</td>
<td>1 line spread</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RDI – FoodWorks case study 1

13150KJ 123 g

- Energy
- Thiamin
- Riboflavin
- Niacin
- B5
- B6
- B12
- Magnesium
- Potassium
- Phosphorus
- Iron
- Zinc

- 0% 10% 20% 30% 40% 50% 60%