

## LECTURE 1:

Case: 24 year old female; 55 kg (121 lbs); 166 cm; activities: full-time university student, works every Saturday, plays badminton twice weekly

$$\begin{aligned} \text{H-B Equation for BEE (female)} &= 655.1 + [9.563 \times \text{wt (kg)}] + [1.850 \times \text{ht (cm)}] - [4.676 \times \text{age}] \\ &= 655.1 + 9.563 (55) + 1.850 (166) - 4.676(24) \\ &= \mathbf{1376 \text{ kcal}} \end{aligned}$$

$$\begin{aligned} \text{M-SJ Equation for BEE (female)} &= -161 + 10(\text{wt in kg}) + 6.25 (\text{ht in cm}) - 5 (\text{age}) \\ &= -161 + 10(55) + 6.25(166) - 5(24) \\ &= \mathbf{1306 \text{ kcal}} \end{aligned}$$

$$\begin{aligned} \text{TEE} &= \text{BEE} \times \text{activity factor} + \text{stress factor} && \text{for our pt: } 1.375 \text{ activity factor (lightly active = light exercise 1-3 d/wk)} \\ &= 1306 \text{ or } 1376 \text{ kcal} \times 1.375 \\ &\approx \mathbf{1800 \text{ kcal/d to maintain current weight}} \end{aligned}$$

## LECTURE 8:

**CASE 1:** Jayne is a 55-year old woman newly diagnosed by her family physician with type 2 diabetes. She works full time in a sedentary role. She has two children who she takes to various afterschool activities. While she feels she should get more exercise, she doesn't know how to make time in her busy schedule.

She is 160 cm tall, and weighs 65 kg. her usual adult weight until about 2 years ago was 60 kg. She was referred to an outpatient dietician for diabetes education and counselling to support the knowledge, skills and behaviors for diabetes self-care.

Below is provided Jayne's actual dietary intake for the past week. Her food choices and routines vary little from week to week. Therefore her actual intake is fairly representative of her usual dietary intake.

Jayne's actual dietary intake for the past week							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>Breakfast</b>	Black coffee, 175mL	Black coffee, 175mL	Black coffee, 175mL Oatmeal, 250mL Raisins, 50mL 1% milk, 125mL	Black coffee, 175mL	Black coffee, 175mL	Black coffee, 350mL Oatmeal, 250mL Raisins, 50mL 1% milk, 125mL	Black coffee, 350mL Oatmeal, 250mL Raisins, 50mL Sunflower seeds, 30mL 1% milk, 125 mL
<b>Snack</b>	Black coffee, 175mL	Black coffee, 175mL	Black coffee, 175mL	Black coffee, 175mL	Black coffee, 175mL	-	-
<b>Lunch</b>	Chicken noodle soup (1 can condensed) 7-leaf mixed greens, 750mL Balsamic vinaigrette, 60mL Water Black coffee	Tomato soup (1 can condensed) 7-leaf mixed greens, 750mL Creamy cucumber dressing, 65mL Water	Minestrone soup (1 can condensed) 7-leaf mixed greens, 750mL French dressing, 60mL Water	Butternut squash soup (1 can condensed) 7-leaf mixed greens, 750mL French dressing, 65mL Water	Tomato soup (1 can condensed) 7-leaf mixed greens, 750mL Balsamic vinaigrette, 60mL Water	Turkey sandwich; 2 slices whole wheat bread, 80 g deli style turkey slices, mayonnaise, 10mL 180 g raspberry flavoured yogurt Banana, 1 Water	Cheddar cheese, turkey sandwich; 2 slices whole wheat bread, 50 g cheddar cheese, 80 g deli style turkey slices, mayonnaise, 10mL Apple, 1 Water
<b>Snack</b>	Homemade banana bread, 1/5 loaf orange juice, 450mL bottle	bran muffin, Large orange juice, 450mL bottle	Scone, 2 Cola, 355mL can	Chocolate chip cookies, 5 Chocolate 2% milk, 500mL carton	Bran muffin, large Chocolate 2% milk, 500mL carton	-	-
<b>Dinner</b>	Roast chicken with skin, ¼ breast Boiled carrots and broccoli mix, 250mL Butter 15mL	Chili con carne ½ lean ground beef, 1/2 chili beans 400mL Whole wheat bread, 2 slices Butter 15mL	Large pizza, Hawaiian 2 slices	Chili con carne ½ lean ground beef, 1/2 chili beans 400mL Whole wheat bread, 2 slices Butter 20mL	Chinese take-out BBQ pork fried rice, 250mL Deep fried tofu with green vegetables, 300mL Fortune cookies, 2	Salmon 150g, grilled w/ drizzle of olive oil Brussels sprouts, 300mL Butter 30mL Potato baked, 1 med	Roast chicken with skin, ¼ breast Boiled carrots and broccoli mix, 250mL Butter 15mL White rice, 125mL
<b>Snack</b>	Cola, 355mL Soda crackers, 20	Cola, 355mL	Cola, 355mL	Cola, 355mL	Beer (ale), 5%, 341mL	Digestive biscuits 2 Water	Digestive biscuits 2 Water

Compare Jayne's dietary pattern to the CFG recommendations and the CDA Tips for healthy eating, and calculate her estimated needs and recommended macronutrient intake/distribution.

### 1. How does Jayne's dietary intake pattern compare with the guides?

- Skips breakfast
- Unbalanced meals (large portions of protein, starch)
- Goes long time without carbs, so she is hungrier at meal times = larger portion sizes
- Alcohol intake (1 beer) is consistent with mod intake
- Lack of variety in her foods (meat/alt or fruits/vegs)
- TOO MUCH ADDED SUGAR (pop)
- High sodium intake (canned foods, baked goods)
- Vitamin D supplement needed (> 50 yo)

2. Calculate Jayne's estimated energy and protein needs.
  - Energy needs = kcal to maintain normal body weight
    - H-B equation:  $1267.7 \text{ kcal} \times 1.2$  (sedentary lifestyle) = 1521.24 kcal
      - USE NORMAL BODY WEIGHT (60 kg) because this is the metabolically active weight. You don't want to feed the excess, inactive adipose tissue (65 kg)
    - Use 25 kcal/kg estimate (useful in ambulatory patients) = 1500 kcal
  - Protein needs = 8 g/kg RDA = 480 g
  
3. What is the Acceptable Macronutrient Distribution Range (AMDR)? How many grams per day of carbohydrate, fat and protein does this translate into for Jayne?
  - If energy needs is 1500 kcal then:
    - 45 - 65% carbs:  $675 - 975 \text{ kcal} \rightarrow 4 \text{ Cal/g} = 169 - 243 \text{ g carbs}$
    - 10 - 35% proteins:  $150 - 525 \text{ kcal} \rightarrow 4 \text{ Cal/g} = 38 - 131 \text{ g protein}$
    - 20 - 35% fats:  $300 - 525 \text{ kcal} \rightarrow 9 \text{ Cal/g} = 33 - 58 \text{ g fats}$
  
4. How many grams of added sugar does Health Canada recommend Jayne limit herself to? How does this compare to the WHO recommendations and the CDA practice guidelines for nutrition therapy?
  - Health Canada:  $\leq 25\%$  of total daily calories
  - WHO:  $< 5\%$  of total daily calories, aimed to prevent dental caries
  - CDA:  $< 10\%$  of total daily calories
  
5. If after some motivational interviewing you identify that Jayne is ready to try some changes to her eating pattern and/or day-to-day activities, what would you recommend she consider? How would you prioritize these recommendations?
  - Decrease sugar, processed foods
  - Increase exercise
  - More carbs that maintain long-term energy
  - Vitamin D supplement

**CASE:** You are working at a local pharmacy and a patient, Mrs Young, comes in and expresses concern regarding her medication warfarin. She was discharged from hospital two days ago and despite discussing warfarin and vitamin K intake she feels that she did not fully understand it. To add to her list of worries, she had been on a low potassium diet in hospital and told to continue on it when discharged and she is now worried how to manage both. You take a look at her medication list and see that she is also on spironolactone. She does not have a history of chronic kidney disease.

You ask her when she is next seeing her family doctor and she says tomorrow and that she has a requisition for blood work for next week that includes potassium and INR.

You ask the patient if she can recall what they ate yesterday and the day before to get a better idea of what she is currently consuming. You give her a pen and paper and the patient writes out to the best of her memory the foods they ate.

You ask her if this food intake record is fairly typical and she says yes. You ask her if she has had any weight loss or appetite changes and she tells you that while she may have ate less in the hospital when she wasn't feeling well that she typically eats well. She thinks she lost maybe 1.5 kg in hospital. Her current weight is 67 kg, height 5'6" and you calculate the BMI to be 23.8

#### Day 1: Sunday

Breakfast: Yogurt with  $\frac{1}{2}$  banana and  $\frac{1}{2}$  cup blueberries,  $\frac{1}{2}$  plate home made breakfast potatoes with a boiled egg, Cup of coffee

Lunch: Cheese and tomato toasted sandwich and Salad with 1 cup of mixed greens (spinach, arugula, romaine), cherry tomatoes, peppers cut up, cucumber, almonds,  $\frac{1}{2}$  avocado, feta and balsamic dressing

Snack: whole mango, small piece of cheese

Dinner: Rice, bbq chicken thigh, stir fried broccoli (1/2 cup), kale (1/2 cup) and shredded cabbage (1/2 cup) with oyster sauce

Dessert: 2 pieces of chocolate

#### Day 2: Monday

Breakfast: Yogurt with  $\frac{1}{2}$  cup strawberries, Toast with peanut butter (about 1 tbsp) and Cup of coffee

Snack: donut at a meeting

Lunch: Tuna sandwich (green onions and mayo in the tuna) with Cut up carrots, cucumber and cherry tomatoes with humus dip

Snack: 2 kiwi fruits and yogurt

Dinner: Spaghetti and meat sauce with mushrooms

1. Before you address her questions about potassium and vitamin K, you complete a MUST score to see if there is any risk that malnourishment could play a role on her INR and overall nutrition status.
  - a. What are your findings?
    - i. Step 1: BMI 23.8 = score of 0
    - ii. Step 2: unplanned weight loss in past 3-6 months was <5% = score 0
    - iii. Step 3: patient is not acutely ill = score 0
    - iv. Step 4: add step 1-3 together = score 0
  - b. Are you concerned?
    - v. Step 5: score 0 = low risk of malnutrition
2. To further answer her questions use the BC Renal Agency handout, circle the foods in her food record that are listed as high potassium.
  - High potassium foods: tomatoes, potatoes, avocados, bananas, mushrooms, yogurt, etc
3. Next underline the low potassium foods
  - Low potassium foods: fresh/raw kale, spinach, arugula, romaine, cucumber, cherry tomatoes, pepper, etc
4. Using the HealthLink BC resource for vitamin K, circle the foods that would have a higher content of vitamin K.
  - High vitamin K: green leafy veggies (kale, spinach, broccoli), blueberries, kiwi
5. What do you notice about vitamin K and low potassium foods? What would be some of the suggestions that you might need to tell this patient.
6. What substitutions might you make in the food record to keep vitamin K intake consistent and potassium intake low.

Answer to 5 & 6:

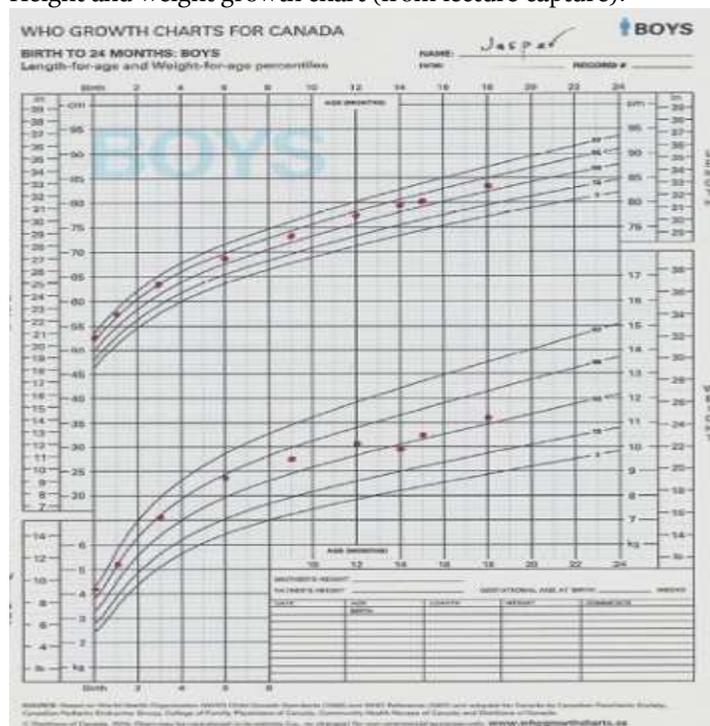
- A lot of low potassium foods are high in vitamin K
  - Because of her warfarin, she wants to keep vitamin K foods consistent
    - Kale is not recommended because it is VERY high in vitamin K, unless she can keep it the same everyday
  - Substitute vitamin K-high foods with other veggies/salads that are low in potassium (ex// cucumbers, peppers)
7. You give the patient the resources and ask whether she has seen a dietician before. She says she has not. What might you recommend to the patient for ongoing dietary support from a dietician with her meal planning and diet modifications?
    - IDK???? Go talk to a dietician about it?

**LECTURE 8 MOVED TO LECTURE 11:**

<b>Jasper's dietary intake for the past 3 days</b>			
	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>
<b>Morning</b>	Breast milk	Breast milk	Breast milk
<b>Breakfast</b>	Whole wheat toast, ½ slice Peanut butter, 7mL Blueberries, 10 Cheerios, 4 Water	Congee with chicken, 150mL Banana, 1 Water	Bran flakes, 100mL Whole milk, 100mL Blueberries, 15
<b>Snack</b>	Whole milk, 50mL	Whole milk, 200mL	Plums, 2 Cheerios, 5
<b>Lunch</b>	Macaroni, 75mL Mozzarella cheese, 25g Avocado, 1/6 Orange juice, 125mL	Sole, 50g Fried brown rice, 100mL with egg, ½ Steamed broccoli, 3 florets Butter 10mL Orange juice, 75mL	Lentil stew, 150mL Whole wheat toast, 1 slice Butter 10mL Whole milk, 150mL Water
<b>Snack</b>	Whole milk, 200mL Hummus, 80mL Pita, ¼ Water	Whole milk, 200mL Apple slices, 1/2 Apple Water	Plums, 1 Rye crackers, 2 Almond butter, 5mL Water
<b>Dinner</b>	Sole, 70g Brown rice, 30mL Chopped spinach in cream sauce, 40mL Strawberry, 1 medium Water	Lentil stew, 200mL Pita, 1/3 Margarine, 10mL Blueberry yogurt, 175g Water	Meat balls, 3 cm diameter, ½ Tomato sauce, 45mL Brown rice, 30mL Chopped spinach in cream sauce, 30mL Cheddar cheese, 20g Water
<b>Snack</b>	Apple crisp, 50mL Whole milk, 150mL	Whole wheat crackers, 3 Peanut butter, 10mL Water	Whole milk, 300mL
<b>Bedtime</b>	Breast milk	Breast milk	Breast milk

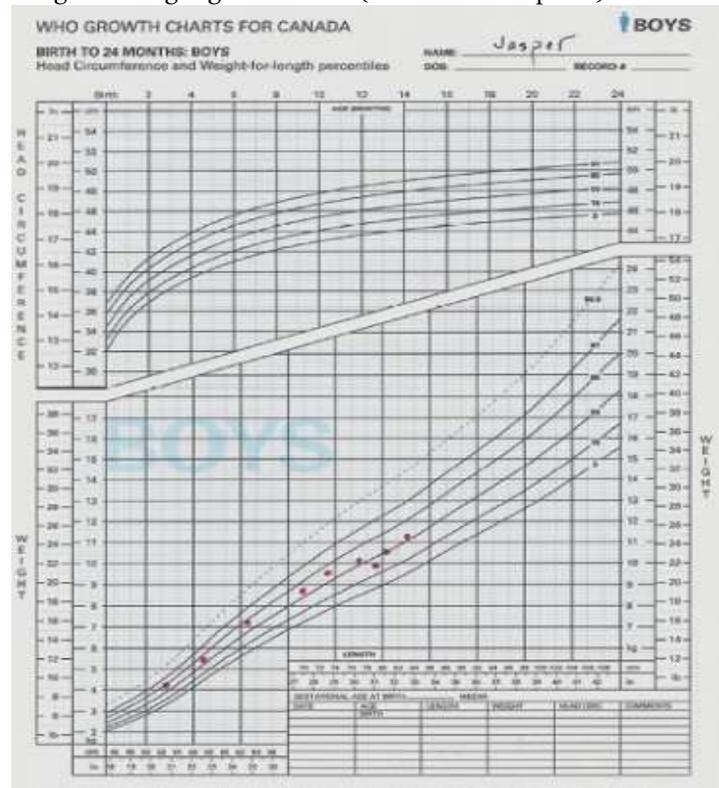
**CASE:** Jasper is an 18 month old boy. His mom visits you at your community pharmacy unsure of whether she should offer him “vitamins” or PediaSure Grow and Gain and seeks your advice. Find below the information his mom provides you; including a 3-day (representative) record of his food and beverage intake and copy of his weight and length measures.

Height and weight growth chart (from lecture capture):



Weight-to-length growth chart (from lecture capture):

Age (months)	Weight (kg)	Length (cm)
Birth (term)	4.21	52.4
1	5.23	57.3
3	7.15	63.3
6	8.72	68.9
9	9.50	73.1
12	10.12	77.1
14	9.84	79.2
15	10.44	80.3
18	11.20	83.4



1. Select indicators that are pertinent for an assessment of Jasper's nutrition status.
  - Food/nutrition-related indicators: micro and macro nutrient intakes
  - Anthropometric indicators: BMI, weight history, growth patterns
2. Using these indicators identify any potential nutrition problems.
  - a. Compare his dietary intake to the Daily food suggestions for toddlers aged 12 to 24 months (page 60-61) in Toddlers first steps.

	Recommended	Actual
<b>Fruits/vegs</b>	<ul style="list-style-type: none"> <li>• 1 dark green, 1 orange veg</li> <li>• <math>\geq 5</math> times per day</li> <li>• 125 mL 100% juice</li> </ul>	<ul style="list-style-type: none"> <li>• Not enough fruits/vegs, especially green/orange</li> <li>• ~ 125 mL orange juice</li> </ul>
<b>Grain products</b>	<ul style="list-style-type: none"> <li>• 100% whole-grain products</li> <li>• 5-6 times each day</li> </ul>	<ul style="list-style-type: none"> <li>• Some whole grain products, others are not</li> <li>• 5-6 times each day</li> </ul>
<b>Milk and alternatives</b>	<ul style="list-style-type: none"> <li>• Breast milk</li> <li>• Give about 500 mL whole milk if toddler is no longer breastfeeding</li> </ul>	<ul style="list-style-type: none"> <li>• Breast milk in mornings</li> <li>• ~ 500 mL whole milk throughout day</li> </ul>
<b>Meat and alternatives</b>	<ul style="list-style-type: none"> <li>• Offer 2-3 times each day</li> </ul>	<ul style="list-style-type: none"> <li>• 2-3 times per day</li> </ul>

- b. Utilizing Jasper's serial weight and length measurements, plot his length-for-age, weight-for-age and weight-for-length.
  - i. Evaluate Jasper's growth pattern, using the recommended criteria for normal growth.
    - Previous page (screenshot from lecture capture)
  - ii. How does his growth pattern substantiate your conclusions about his dietary intake?
    - Height: channel surfing, but starts to follow a curve between the 50<sup>th</sup> and 85<sup>th</sup> percentile
    - Weight: initial channel surfing, but gradually falling in line with growth velocity of 50<sup>th</sup> percentile
    - Weight-to-height: plotting close to 50<sup>th</sup> percentile = proportional growth

- Overall: normal growth (follows normal curves), but check against his parents height too!
- c. Do you recommend his mom offer him PediaSure? What is your rationale?
- No, because his overall dietary intake is adequate
  - Cow's milk provides vitamin D (would otherwise need to be supplemented if only being breastfed)

### LECTURE 10:

A 27-year old female asks for your recommendation for a prenatal multivitamin. She is hoping to become pregnant in the upcoming months. She is nulliparous, and has no medical conditions. She has an allergy to shellfish (hives).

She is at low risk for NTD pregnancy, so a regular (non-prenatal) multivitamin that contains 0.4 mg of folic acid is sufficient.

### LECTURE 12:

#### CASE: Food record for a 60 year old male

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• <b>Breakfast:</b> <ul style="list-style-type: none"> <li>• 2 pces of toast (2 G/S)</li> <li>• 1 tbsp peanut butter (1/2 M/A)</li> <li>• 3/4 cup yogurt (1 D/A)</li> <li>• 1/2 banana (1F/V)</li> </ul> </li> <li>• <b>Lunch</b> <ul style="list-style-type: none"> <li>• 1 cup pasta (2 G/S)</li> <li>• 2.5 oz of chicken (1 M/A)</li> <li>• 1 cup salad (1F/V)</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Snack</b> <ul style="list-style-type: none"> <li>• Apple (1 F/V)</li> <li>• 1.5 oz cheese (1 D/A)</li> <li>• 15 gummy bears (Extra)</li> </ul> </li> <li>• <b>Dinner</b> <ul style="list-style-type: none"> <li>• 5 oz steak (2 M/A)</li> <li>• 1 cup mashed potatoes (2G/S)</li> <li>• 1/2 cup cooked carrots (1 F/V)</li> </ul> </li> <li>• <b>Snack</b> <ul style="list-style-type: none"> <li>• Bagel (2 G/S)</li> <li>• 1.5 oz cheese (1 D/A)</li> </ul> </li> </ul> |
|---|---|

#### 1. How does his intake compare to the food guide servings for a 60 year old male?

	Total	CFG recommendation
G/S	8 servings	7 servings
F/V	4 servings	7 servings
D/A	3 servings	3 servings
M/A	3.5 servings	3 servings
Extra	Candies, chocolate, treats, etc (sugar)	

#### 2. What is high? What is too low?

- Grain/starch is too high
- Fruits/veggies too low

**CASE:** Mr. Fitzgerald is an 80 year old man who lives on his own in an apartment. He recently has been struggling with his energy, activity, and sleep. His appetite he states is ok but he often skips meals and he says his clothes feel looser and you are curious what he is eating throughout the day.

He goes out to get groceries once a week but is finding that he can only carry a small amount. He lives off his pension from being a high school principle, retired at age 65. He has 2 adult children but they do not live in the city. They call once a week to catch up with him. His wife died 1 year ago.

Medical history: diabetes type 2, hypertension (takes his BP medications and metformin regularly)

Weight: 70 kg Height: 5 ft 11 inch

Labs: HbA1C 9.4

Activity level: some walking (15 min)

You meet with him and gather a 24 hour recall and ask him select FFQ questions.

- Breakfast:
  - Tea and 2 Toast with butter
  - 1 cup orange juice
- Lunch:
  - Skip or sometimes a can of soup
- Dinner:
  - Cheese (3 oz) and tomato (1/2 a medium) sandwich (2 slices of white bread)
  - Apple
  - Tea
  - 3 chocolate chip cookies

#### Select FFQ Questions

- *How often do you eat out?*
- I dine out with 3 of my friends once a week on Sundays for lunch at our local Fish and chipper we have been going to since our 30s after a day of fishing. The food is greasy but delicious. I usually top it off with a big piece of pie after. I look forward to seeing my friends all week.
- *Do you often skip meals?*
- Yes probably most lunches 5 days a week. I couldn't be bothered with it sometimes.
- *How often do you eat fresh fruit and vegetables?*
- 2 per day, its easier in summer with the softer fruits. I get tired of apples and my dentures aren't great for chewing.

1. What are your first impressions from his food record? Compare his food group servings to the food guide.
  - Deficient in predominantly all food groups, especially overall protein intake
2. How might his intake and eating pattern be impacting his diabetic management and hypertension?
  - Food pattern (skipping lunches), low protein, etc = impacting diabetes (high A1C)
  - Processed foods = lots of salt = impacts hypertension (high BP)
3. What are some suggestions you have?
  - Involve his kids more
  - Help with groceries
  - Meal plans
  - Social eating is good but maybe healthier choices
4. Calculate his energy needs using H-B and using 25-35 kca/kg equations.
  - H-B equation (depending on activity factor): 1665 – 1700 kcal
  - 25-35 kcal/kg = 1750 – 2450 kcal
5. Does he appear to be meeting his needs?
  - Probably not since he is not eating much