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Introduction to Nutrition Care Process

S3470C Nutrition Care Process

Lesson 1

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Content

- Fundamental Nutrition – Lifespan Nutrition
- Nutrition Care Process
  - Nutrition Assessment using ABCD Framework
  - Nutrition Diagnosis
  - Nutrition Intervention
  - Nutrition Monitoring

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Lifespan Nutrition

Each stage of the human life cycle has **unique nutritional needs** specific to the physiological requirements of the body. That is the reason why we are learning lifespan nutrition as part of fundamental nutrition.

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Childhood

- A wide variety of foods should be introduced to children to meet all the nutritional requirements.
- Energy needs start at about 1150 kcal/day at age one and increase gradually every year by approximately 100 kcal/ day to about 2250 kcal/day at age ten.
- Recommended Dietary Allowances (RDA) for children are different than for adults.

Adolescence

- Adolescence is the transition period from childhood to adulthood. The nutrient intake helps to support rapid growth and higher energy expenditure of teenagers.
- From the age of 10 to 15 years old:
  - ✓Energy needs for boys increase from about 2200 to 2650 kcal/day; Energy needs for girls increase from about 1950 to 2150 kcal/day
  - ✓The difference in energy needs is due to boys being bigger in body size and have higher lean muscle mass, girls have higher body fat.
  - ✓Higher energy is needed for those who are physically more active
- Iron needs for girls increase: Start menstruating, losing iron

RDA for Normal Healthy Children and Adolescents in Singapore – both genders

Age Group	Ht (cm)	Wt (kg)	Protein (g)	Iron (mg)	Vit A (retinol) equiv. (mcg)	Vit D (mcg)	Thiamin (mg)	Riboflavin (mg)	Niacin Equiv (mg)
3 - < 6 mths	-	7	16	7	300	10.0	0.28	0.42	4.6
6 - < 9 mths	-	8.5	17	7	300	10.0	0.32	0.49	5.3
9 - < 12 mths	-	9.5	18	7	300	10.0	0.38	0.57	6.3
1 - < 2 yrs	-	11	19	7	250	10.0	0.46	0.69	7.6
2 - < 3 yrs	-	13.5	22	7	250	10.0	0.54	0.81	8.9
3 - < 5 yrs	-	16.5	25	7	300	10.0	0.62	0.93	10.2

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Adults

- The nutritional requirements vary with age and gender in adults. Singapore HPB divides this class into three groups:
  - 18 – 29 years
  - 30– 59 years
  - 60 years old and above.

- Energy requirements decrease with age due to loss of lean body mass and decrease in physical activity.

RDA for Normal Healthy Adults in Singapore – both genders

	Men			Women		
Age Group	**18 - < 30 yrs**	**30 - < 60 yrs**	**60 yrs and above**	**18 - < 30 yrs**	**30 - < 60 yrs**	**60 yrs and above**
Ht (cm)	170	170	170	160	160	160
Wt (cm)	63.5	63.5	63.5	54	54	54
Protein (g)	68	68	68	58	58	58
Iron (mg)	8	8	8	18	18	8
Vit A (retinol) equiv. (mcg)	750	750	750	750	750	750
Vit D (mcg)	2.5	2.5	2.5	2.5	2.5	2.5
Thiamin (mg)	1.18	1.16	0.98	0.84	0.86	0.80
Riboflavin (mg)	1.77	1.74	1.47	1.26	1.29	1.20
Niacin Equiv. (mg)	19.5	19.1	16.2	13.9	14.2	13.2

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Older Adults

Body changes and metabolism

- Aging adults experience body changes such as decrease in lean body mass, total body water and bone density, and an increase in the proportion of total body fat.

- The metabolism of aging adults decreases and lesser energy is required by them. Exactly how much the aging adult should eat depends on how active the he/she is.

Nutrient Needs

- The nutrient needs for aging adults, however, do not change much (except for iron for females).
- For older adults female:
  - Iron need decreases from 19 to 6 mg/day above 60 years old. The need for iron to replace menstrual losses ceases after menopause.
  - Calcium need increases from 800 mg/day to 1000 mg/day for above 50 years old .

- As the older adults are eating less food, to maintain a healthy weight, they should choose **low-fat and nutrient-rich foods**, which contain more micronutrients per unit of calorie.

RDA for Normal Healthy Adults in Singapore – both genders

	Men			Women		
Age Group	**18 - < 30 yrs**	**30 - < 60 yrs**	**60 yrs and above**	**18 - < 30 yrs**	**30 - < 60 yrs**	**60 yrs and above**
Ht (cm)	170	170	170	160	160	160
Wt (cm)	63.5	63.5	63.5	54	54	54
Protein (g)	68	68	68	58	58	58
Iron (mg)	8	8	8	18	18	8
Vit A (retinol) equiv. (mcg)	750	750	750	750	750	750
Vit D (mcg)	2.5	2.5	2.5	2.5	2.5	2.5
Thiamin (mg)	1.18	1.16	0.98	0.84	0.86	0.80
Riboflavin (mg)	1.77	1.74	1.47	1.26	1.29	1.20
Niacin Equiv. (mg)	19.5	19.1	16.2	13.9	14.2	13.2

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Sodium and Fat Intake in Older Adults

- Salt intake has a greater effect on blood pressure for older adults.
  - ✓Excessive salt intake increases water reabsorption and blood volume, resulting in higher blood pressure
  - ✓Rise in blood pressure can lead to Cardiovascular Diseases (CVDs) such as strokes, heart attacks and heart failure.
- It is recommended to keep sodium intake to less than 2000 mg of sodium per day
- Polyunsaturated and monounsaturated fats should also be chosen over saturated fats to reduce risks of getting CVDs

RDA

- The Recommended Dietary Allowance (RDA) contains more information on the specific nutrients for the different age groups.

S3470C RDA

Click to find out more!

Chronic Diseases

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Diabetes Mellitus

- Chronic disease that occurs when the pancreas do not produce enough insulin or body cannot effectively use insulin it produce
- Insulin is a hormone that regulates blood glucose
- Affect how the body uses blood sugar
- Glucose is an important source of energy for the cells that make up the muscles and tissues.
- Also known as hyperglycaemia (raised blood glucose)
- Over time leads to serious damage to many body system such as nerves and blood vessels

Prevalence of Diabetes

- Diabetes affect about 422 million adults worldwide
- 8.8% of the world population has diabetes → projected to be 12% by 2045
- In 2019, diabetes was the direct cause of 1.5 millions death. 48% of all death due to diabetes occurred before the age of 70 years.
- In Singapore, 8.3% in 2010 to 9.5% in 2020.
- International Diabetes Federation estimates a DM prevalence of 13.7% for the entire adult population of Singapore by 2030

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Aetiology Of Type 1 Diabetes Mellitus

- When body's immune system destroys the pancreatic beta cells.
- The only cells in the body that produces the hormone insulin that regulates blood glucose level.
- Usually diagnosed in children and young adults.
- Risk factors can include genetics, autoimmune status and environmental factors.

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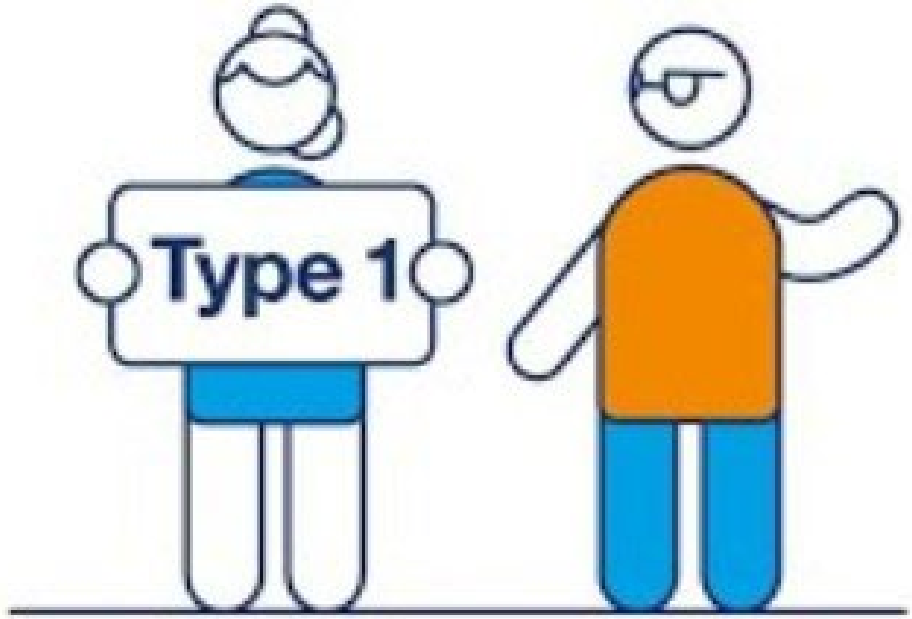
WHAT IS TYPE 1 DIABETES?



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Aetiology of Type 2 Diabetes Mellitus (Type 2 DM)

- Characterized by a combination of insulin resistance and beta-cell failure.
- Endogenous level of insulin can be normal, depressed or even elevated
- Unable to overcome related insulin resistance, i.e. decreased tissue sensitivity or responsiveness to insulin.
- Blood glucose level starts to accumulate and hyperglycemia kicks in
- Can be asymptomatic 5 – 10 years prior to onset of hyperglycemia
- Up to 50% of beta-cell function loss at point of diagnosis

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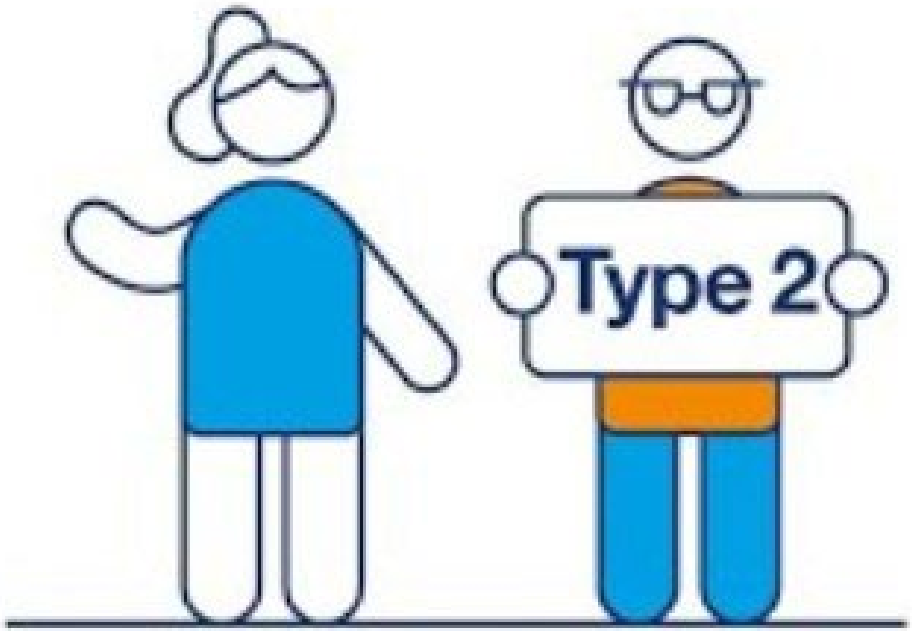
WHAT IS TYPE 2 DIABETES?



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Aetiology of Gestational Diabetes Mellitus (GDM)

- Similar to Type 2 DM
- Normally older woman
- Higher pre-pregnancy weight → ∴ insulin resistant prior to pregnancy
- Late pregnancy stage significantly decreases insulin sensitivity
- Recommended to be screened for GDM at 24 – 28 weeks of gestation.

- Test: OGTT

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Signs & Symptoms of Diabetes Mellitus

- Common signs and symptoms to look out for
- Displays signs and symptoms when hyperglycemia occurs:
  - Polyuria
  - Glycosuria
  - Polydipsia
  - Polyphagia
  - Ketonemia/ketoacidosis
  - Ketonuria
  - Acanthosis Nigricans (Type 2 DM)
- When ketonemia is not detected or managed, an individual will run into risk of diabetic coma.

Diagnostic Criteria of Diabetes Mellitus

- In patients with typical symptoms, diabetes mellitus can be diagnosed if any one of the following is present.

Type of test	Diagnostic Ranage
Casual plasma glucose	≥11.1 mmol/l
Fasting plasma glucose	≥7.0 mmol/l
2-hour post-challenge plasma glucose OR Oral glucose tolerance test (OGTT)	≥11.1 mmol/l

- Diagnosis of diabetes is confirmed when result of two tests is above the diagnostic thresholds.

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Nutritional Management of Diabetes Mellitus

- Emphasizes the role of lifestyle in improving glucose control, lipid profile, and blood pressure
- Improve health through food choices and physical activity
- To manage the nutrition of an individual, we should be knowledgeable in assessing, implementing and aware of expected outcomes of nutrition therapy.
- Proper data collection, assessment, intervention & nutrition goals, and evaluation of interventions.
- Topics that should be covered are shown in the next slide.

Goals of DM Nutrition Therapy

1. **Attain and maintain optimal metabolic outcomes**
   - Blood glucose levels in the normal range or as close to normal as is safely possible to prevent or reduce the risk for complications of diabetes.
   - A lipid and lipoprotein profile that reduces the risk for macrovascular disease.
   - Blood pressure levels that reduce the risk for vascular disease.

2. **Prevention & Treatment of complications**
   - Modify nutrient intake and lifestyle as appropriate for the prevention and treatment of obesity, dyslipidemia, cardiovascular disease, hypertension and nephropathy.

3. Healthy food choices & Physical Activity

- Aim to improve health with the advocating of healthy food choices along with increasing physical activity

4. **Addressing Individual Nutritional Needs**

- Taking into consideration personal and cultural preferences and lifestyle while respecting the individual's wishes and willingness to change.

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Goals of DM Nutrition Therapy

REPUBLIC POLYTECHNIC

Type 1 Diabetes

- To provide adequate nutrition to ensure normal growth and development, integrate insulin regimes into usual eating.

Type 2 Diabetes

- To facilitate changes in dietary habits and physical activity level for weight management that reduces insulin resistance and improves metabolic status

Pregnant and Lactating Women

- Provide adequate energy and nutrients needed for optimal outcomes

Older Adults

- Provide for the nutritional and psychosocial needs of an aging individual.

Insulin Users

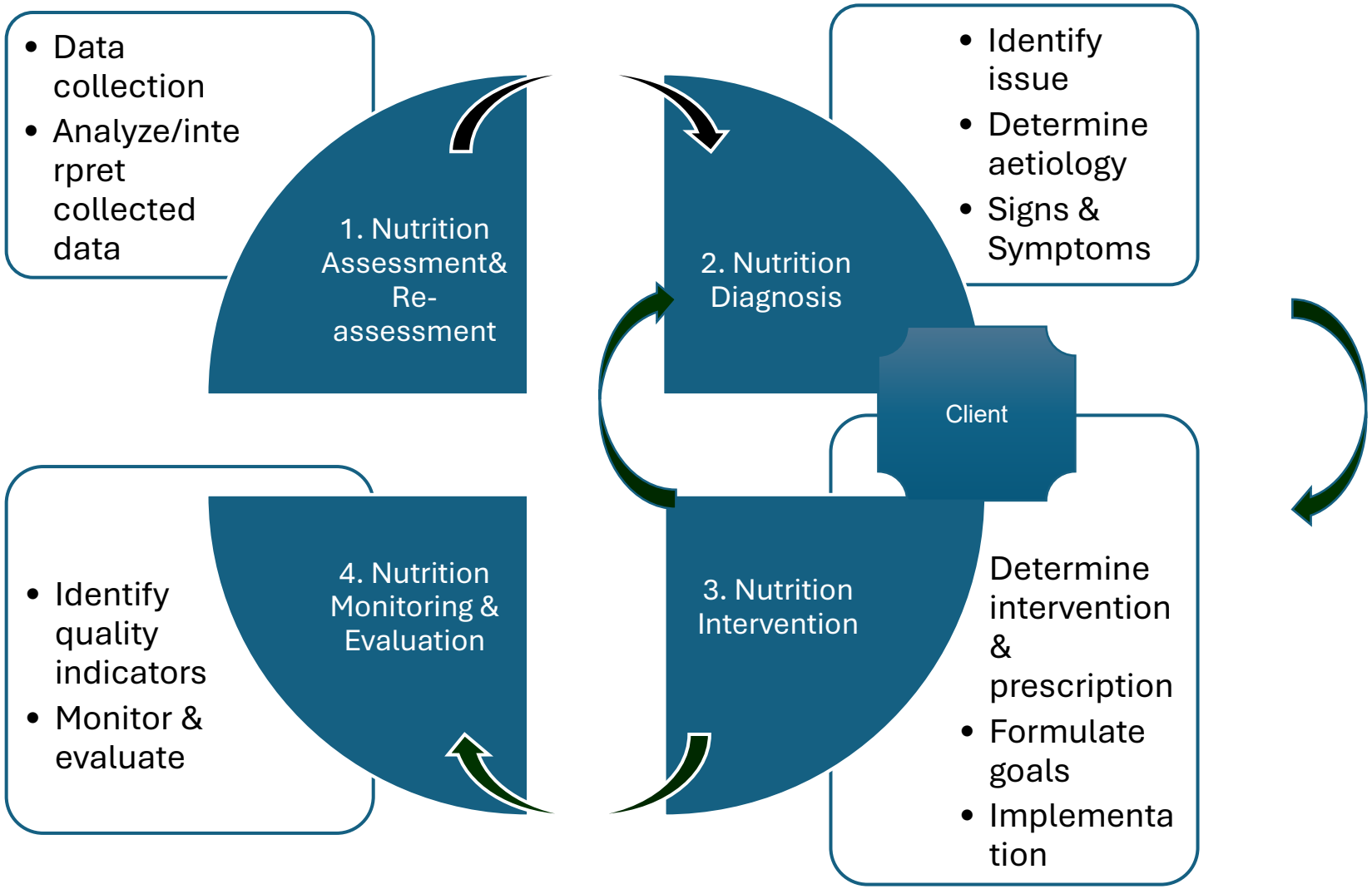
- Provide self-management education for treatment (and prevention) of hypoglycemia, acute illness, and exercise-related blood glucose problems

Individuals at risk for diabetes

- Decrease risk by encouraging physical activity and promoting food choices that facilitate moderate weight loss or at least prevent weight gain

Nutrition Care Process

Overview of NCP



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Overview of NCP

- Why is NCP important?
  - It is a systematic method in providing high-quality nutrition care
  - Using the NCP does not mean the same level of care to all clients – individualized care and taking into account client's needs and values
  - It is a framework for critical thinking and decision-making
  - Leads to more efficient and effective care

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Nutrition Care Process (NCP)

1. Nutrition Assessment
2. Nutrition Diagnosis
3. Nutrition Intervention
4. Nutrition Monitoring & Evaluation

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Nutrition Care Process (NCP)

- 1. Nutrition Assessment using ABCD framework

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Nutrition Assessment Form

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Nutrition Assessment

- Systematic process of
  - Obtaining
  - Verifying and
  - Interpreting the data
- Make decisions about the nature and cause of nutrition related problems

- *Re-assessment at subsequent encounters addresses Monitoring and Evaluation parameters*

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Nutrition Assessment

- Determining appropriate data to collect
- Determining the need for additional information
- Selecting assessment tools and procedures that match the situation
- Applying assessment tools in valid and reliable ways
- Distinguishing relevant from irrelevant data
- Distinguishing important from unimportant data
- Validating the data

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Case Study

Mr Lee is a 72 years old and currently works as a landscaper. His height is 165cm and his weight is 62kg. He mentioned that he would like to find out more on his nutritional requirements and shared with you that his appetite has been decreasing in the last few years.

- List down the known information
- List down the information you would like to find out in order to help Mr Lee

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A - Anthropometric Measurements

- Involves obtaining physical measurements of an individual
- Compare to standards that reflect the growth and development of that individual
- Use to evaluate over-nutrition, under-nutrition or the effects of nutritional management and prevention.
- Variety of anthropometric measurements used in different settings

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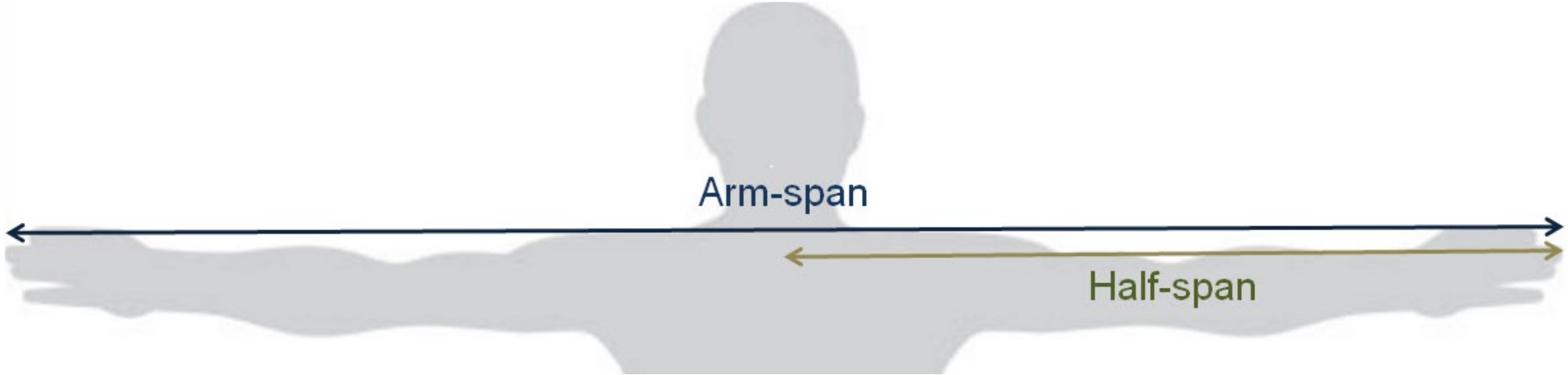
A - Anthropometric Measurements

Height

- Important determinant in many clinical parameters
- Many nutritional assessments require this information, e.g.
  - BMI, EER
- Different to measure in bedridden or wheel-bound clients
- In such cases, height can be estimated through the use of demi-span and knee height

A - Anthropometric Measurements

Height – Demi-span (also known as half span)



A - Anthropometric Measurements

Height – Demi-span (also known as half span)

- Suitable for clients who are unable to stand or fully outstretch both arms
- Requires two people to do this measurement
- Bulky clothing are removed
- Client stand against a vertical surface (e.g. wall) for support
- Slide finger from middle of chin down the throat until a bone is felt at the base of the neck. Mark this point with a soft pen which rubs off easily.
- Client to stretch out the left arm only. Hands and fingers should also be outstretched with palms facing forwards.
- Placed measuring tape at the end of the middle finger on the left hand and held in place.
- The second measurer should then stretch out the tape across the body to the marked point
- Check that the tape is horizontal to the floor.

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A - Anthropometric Measurements

Height – Demi-span – Equations

- Bassey et al. (1986):
  - Male height (cm) = 57.8 + (1.40 x demi-span)
  - Female height (cm) = 60.1 + (1.35 x demi-span)

Both genders, aged 20 to 45 years old

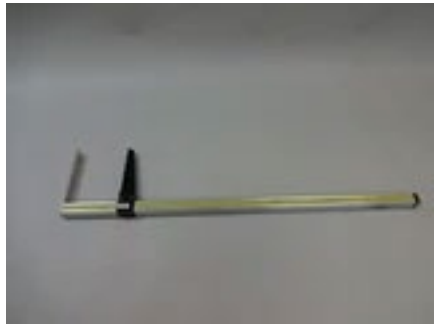
- Hirani & Aresu (2012):
  - Male height (cm) = 73.0 + (1.30 x demi-span) – (0.10 x age)
  - Female height (cm) = 85.7 + (1.12 x demi-span) – (0.15 x age)

Both genders, aged ≥65 years old

A - Anthropometric Measurements

Height - Knee Height Measurement

- Use the left leg for measurement
- Client can be lying face upwards or seated at the edge of bed or table (see figure 1 below)
- Bend the left knee and left ankle to 90 degree angles
- Angles should be verified using right angle triangle or square
- A sliding broad-blade caliper or a measuring tape can be used to measure



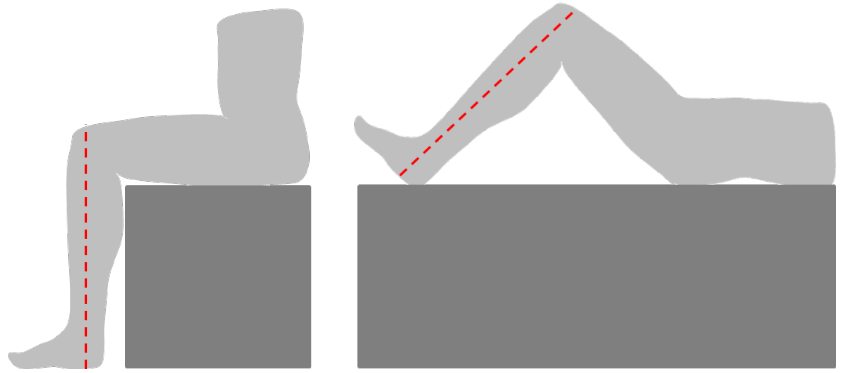


Figure 1

A - Anthropometric Measurements

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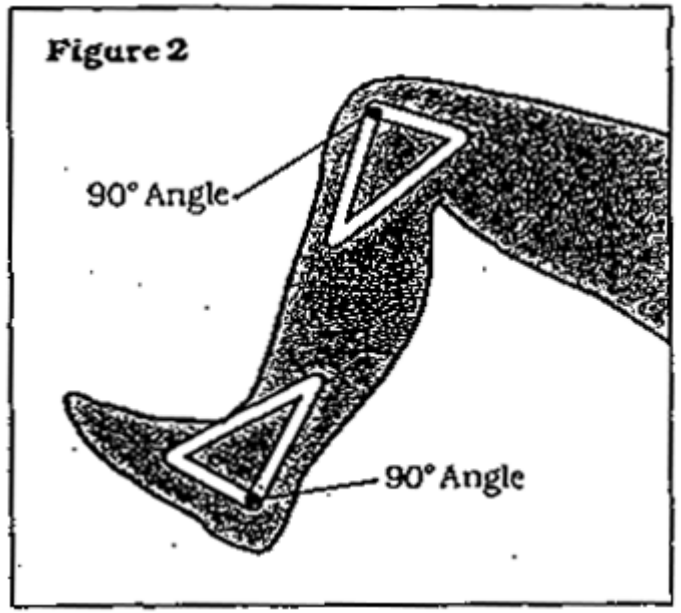

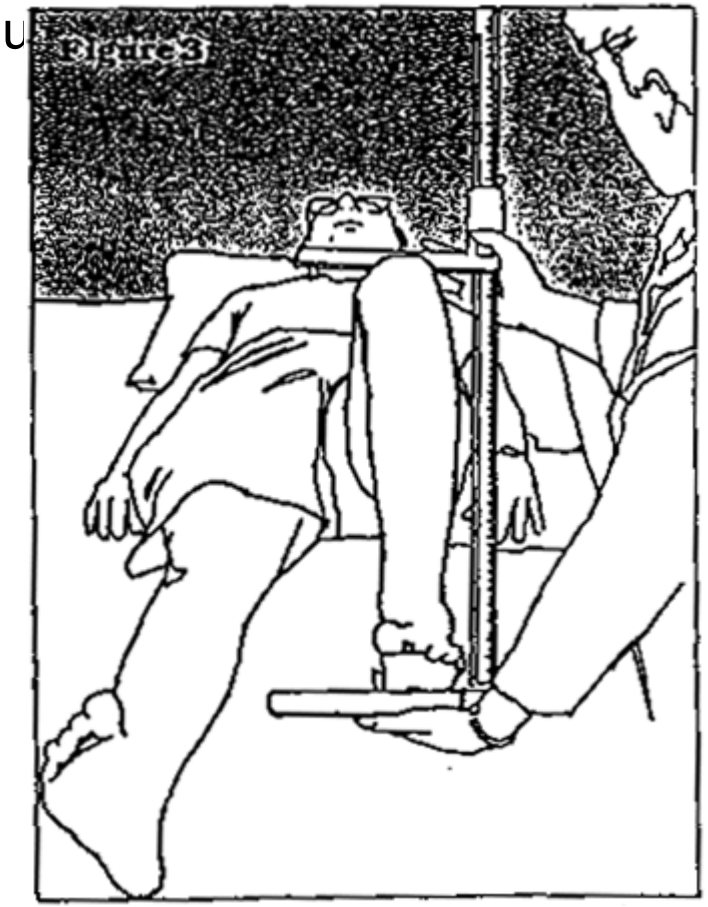

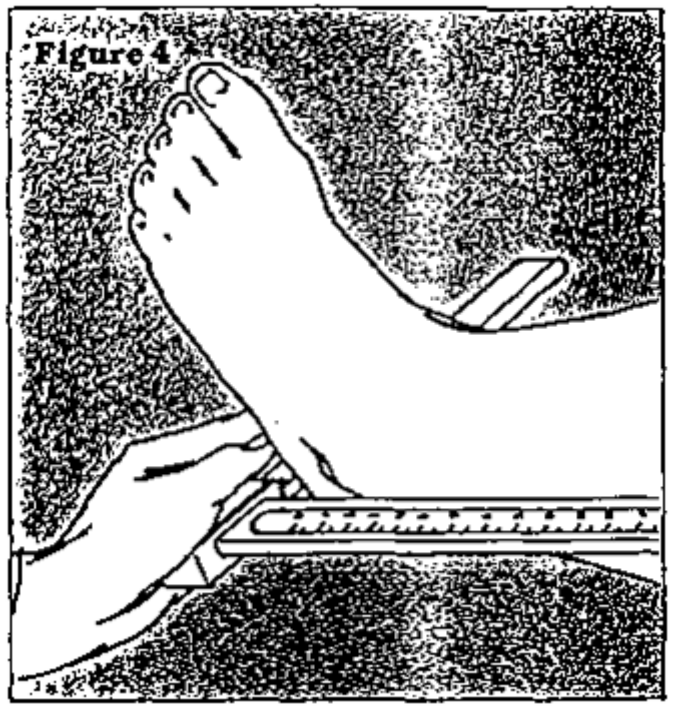

A - Anthropometric Measurements

Height - Knee Height Measurement – Equations

- Men (height in cm) = 64.19 x (0.04 x Age) + (2.02 x knee height in cm)
- Female (height in cm) = 84.4 x (0.24 x Age) + (1.83 x knee height in cm)

- However, different population might have some difference in the measurements, as done by a study on Malaysians

  - Malaysian men = (1.924 x knee height in cm) + 69.38
  - Malaysian women = (2.225 x knee height in cm) + 50.25

Shahar S & Pooy NS (2003). Predictive equations for estimation of statue in Malaysian elderly people. Asia Pac J Clin Nutr 12(1): 80–84

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A - Anthropometric Measurements

Weight

- Client's weight is important to the nutrition assessment
- Clients can be of normal weight but still be malnourished due to fluid retention (or fluid overload)
- Use client's ideal body weight to determine energy requirement

A - Anthropometric Measurements

Body Mass Index (BMI)

- It is calculated based on the formula:
- BMI= Body weight (kg) / [Height (m) X Height (m)]

Table 2 BMI cut-off points for public health action in Asians (WHO 2004)

Cardiovascular disease risk	Asian BMI cut-off points for action (kg/m2)	Current WHO BMI cut-off points (kg/m2)
	<18.5	<18.5
Low	18.5 to 22.9	18.5 to 24.9
Moderate	23.0 to 27.4	25.0 to 29.9
High	27.5 to 32.4	30.0 to 34.9
Very high	32.5 to 37.4	35.0 to 39.9
	More or equal to 37.5	More or equal to 40.0

Source: MOH CPG on obesity, 2004 page 17[28]

Overweight
Obese
Extremely Obese

A - Anthropometric Measurements

Limitation of BMI

- It does not tell you how much of the body weight is fat, muscles etc.
- A person may have high BMI (overweight or obese) but has body fat in the healthy range. Or a person may be in the healthy BMI range but has high body fat which is unhealthy.
- It does not shows you where the fat is deposited.
- Individuals who are very muscular may have a BMI placing them in an overweight category when they are not overly fat.
- Not applicable to pregnant women.

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A - Anthropometric Measurements

Ideal Body Weight (IDW)

- This can be done by using the BMI range of 18.5 to 22.9 kg/m^2

For example: Height 1.65m, you can take BMI 21

BMI = weight ÷ (height x height)

21 = weight ÷ (1.65 x 1.65)

Weight = 21 x 2.7225

= 57.2kg

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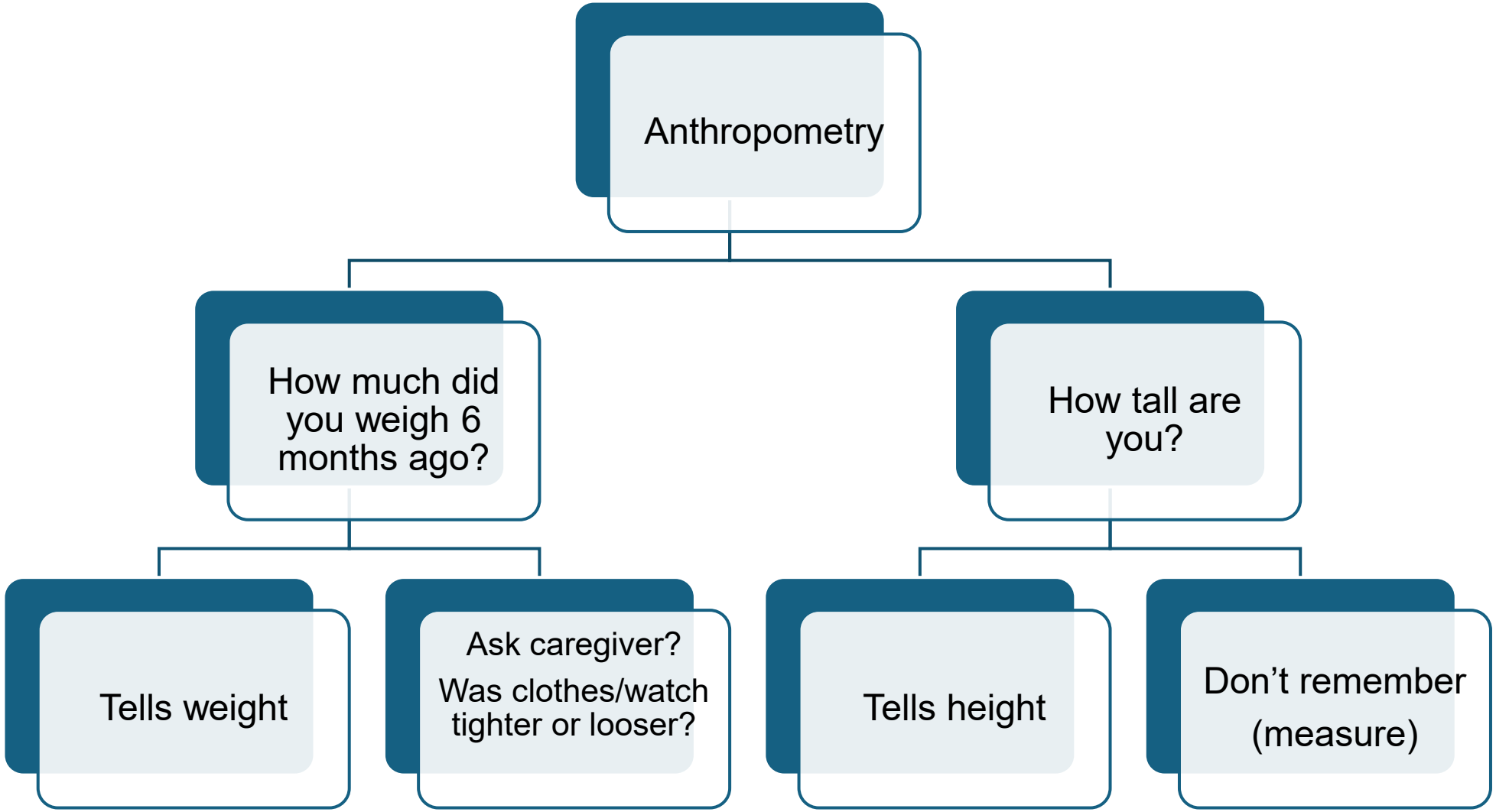
A - Anthropometric Measurements

Weight history

- Formulas for calculating weight changes:
  - % Ideal body weight = (current weight ÷ ideal body weight) x 100
  - % Usual body weight = (current weight ÷ usual body weight) x 100
  - % of Weight change = [(usual body weight – current weight) ÷ usual body weight] x 100

Anthropometry - Weight and Height collection



A - Anthropometric Measurements

Percentage Weight Change

- Interpretation of Percentage Weight Change
  - Weight loss/gain of 1% to 2% in 1 week is significant.
  - Weight loss/gain of > 2% in 1 week is severe.

Time	Significant Weight Loss (%)	Severe Weight Loss (%)
1 week	1 - 2	> 2
1 month	5	> 5
3 months	7.5	> 7.5
6 months	10	> 10

Source: Executive Director Annex Nutrition Services Elmsford New York Jacqueline Morris, & Morris, J. C. (2010). *Dietitian's guide to assessment and documentation*. Jones & Bartlett Publishers.

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A - Anthropometric Measurements

Waist Circumference

- The presence of excess fat in the abdomen is an independent predictor of risk factors and morbidity.
- Measuring waist circumference is recommended in clients with a BMI less than 32.5kg/m^2
- Waist circumference is the most practical anthropometric measurement for assessing a patient's abdominal fat content before and during weight loss treatment.
- best anthropometric predictor of visceral fat

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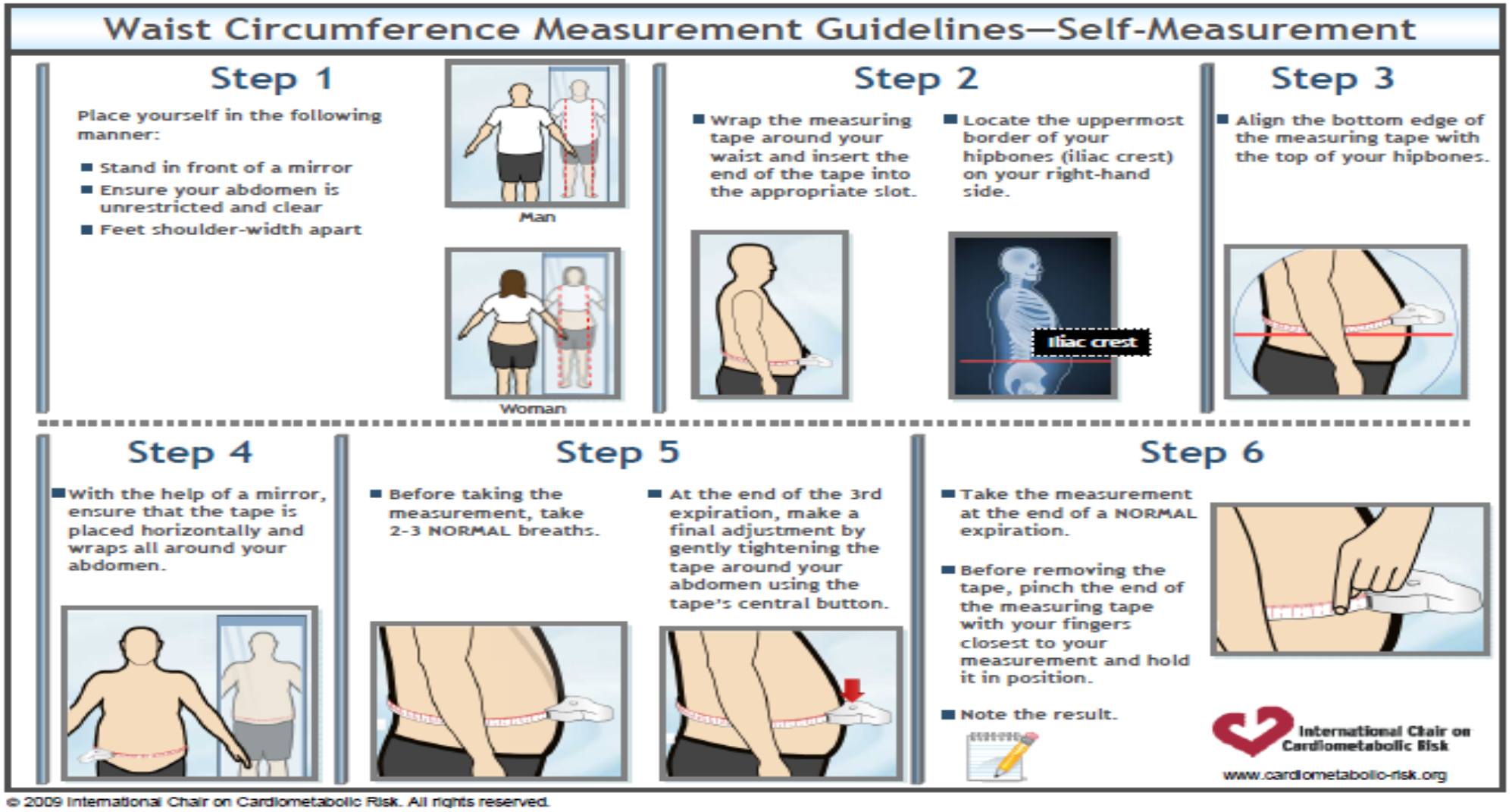
A - Anthropometric Measurements

Waist Circumference

- The waist-hip ratio (WHR) also has been used to show increased risk for diabetes, coronary artery disease, and hypertension.
- However, waist circumference has been found to be a better marker of abdominal fat content than is WHR.
- Therefore, the waist circumference appears to carry greater prognostic significance.

Anthropometry – Waist Circumference



Adopted from - https://kityeng.wordpress.com/2013/01/06/bmi-vs-waist-circumference/

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A - Anthropometric Measurements

Waist Circumference

- Gender-specific cut-offs in waist circumference measurement is particularly useful in patients who are categorized as normal or overweight on the BMI scale. It has little added predictive power of disease risk for those who are obese.

- Current WHO waist circumference cut-offs of 102 and 88cm to define excess risk in males and females respectively. Cut-offs of 90 and 80cm respectively are appropriate for Asians.

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A - Anthropometric Measurements

Limitations of Waist Circumference

- Assessor error (hence require 2 measurements)
- Embarrassment for clients
- Require privacy for measurement
- Unsuitable for pregnant client
- Difficult to use it accurately on elderly clients due to loose skins/muscle wasting

A - Anthropometric Measurements

- Body Composition Analysis

Method		Advantage/ Limitation
Skinfold Callipers : Used to measure the thickness of fat that is located just under the skin in the arm, in the back etc. Skinfold Thickness Measurements		**Advantage:** Convenient **Limitation:** Measure body density and need second equation to calculate fat % which makes it unreliable
Bioelectric Impedance: An electric current flows through the body and its resistance is measured		**Advantage:** Reproducible **Limitation:** Results distorted when individual has above average bone mass
Dual-Energy X-Ray Absorptiometry (DEXA) A beam of energy is used to measure bone, fat and lean tissue		**Advantage:** New and more accurate **Limitation**: Expensive

A - Anthropometric Measurements

- Body Composition Analysis

Method		Advantage/ Limitation
Hydrostatic (Under water) Weighing: A person is weighed on land first and will get into a large tank of water. While sitting on a special scale, he is lowered under water and expel all the air from his lungs & remain motionless while his underwater weight is taken. This is repeated 3 times. Calculation is then made to determine his lean weight and fat weight.		**Advantages:** Accurate **Limitations:** • Tedious • Must abstain from food for at least 8hours and 12 hours from exercise before testing • Assumes all fat-free mass components are the same

A - Anthropometric Measurements

Body Fat Percentage

- Refers to the amount of body fat mass compared to total body weight

Gender & BMI	20-39 years old (%)	40-59 years old (%)	60-70 years old (%)
Women			
BMI < 18.5	25	25	25
BMI ≥ 25	35	35	36
BMI ≥ 30	40	41	41
Men			
BMI < 18.5	13	13	14
BMI ≥ 25	23	24	24
BMI ≥ 30	28	29	29

Source: Gallagher et al., American Journal of Clinical Nutrition, Vol 72, Sept., 2000.

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A - Anthropometric Measurements

Limitation of Body Composition Analysis

- Accurate method but often expensive and not readily available clinically
- Results require interpretation from clinicians or trained personnel

A - Anthropometric Measurements

Predicted % Body Fat Ranges by Gender for African Americans and Whites				Predicted % Body Fat Ranges by Gender for Asians		
Gender & BMI	**20 – 39 yrs old (%)**	**40 – 59 yrs old (%)**	**60 to 70 yrs old (%)**	**20 – 39 yrs old (%)**	**40 – 59 yrs old (%)**	**60 to 70 yrs old (%)**
Women						
BMI < 18.5	21	23	24	25	25	25
BMI ≥ 25	33	34	36	35	35	36
BMI ≥ 30	39	40	42	40	41	41
Men						
BMI < 18.5	8	11	13	13	13	14
BMI ≥ 25	20	22	25	23	24	24
BMI ≥ 30	25	28	30	28	29	29

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A - Anthropometric Measurements

- It will be good to also observe for the followings in elderly:
  - Signs of muscle wasting
  - Edema (water retention)
  - Painful or swollen joints
- Possible signs of malnutrition

Anthropometry

Anthropometry Data:									
Height (cm):				Weight:					
% Body Fat:				BMI:	#DIV/0!	#DIV/0!			
Waist Circumference (cm):				Waist-Hip Ratio:	#DIV/0!		Male:	#DIV/0!	
Hip Circumference (cm):							Female:	#DIV/0!	

- Most common anthropometry data are weight, height, calculated BMI.
- Body fat % may be measured at clinic or home
- Waist circumference can be measured at home

Energy Requirement Calculation

Energy Requirement Calculation:						
Intensity of Exercise:						
Estimated Energy Requirement (EER) using Harris-Benedict Equation:						
For Men:	EER (kcal/day)	66.47	0	0	0	0
For Women:	EER (kcal/day)	655.1	0	0	0	0
Diet History:	(Refer to Tab 2 - Diet History)					

- Men:

  EER (kcal/day) = (66.47 + 5 x Height [cm] + 13.75 x Weight [kg] – 6.755 x Age) x PAL*

- Women:

  EER (kcal/day) = (655.1 + 1.85 x Height [cm] + 9.56 x Weight [kg] – 4.676 x Age) x PAL*

- If weight gain is required, to add 500kcal/day to promote 0.5kg weight gain per week.

B – Biochemical Data

- Many types of diagnostic tests
- Valuable in assessing clinical and nutritional status
- A list of testing is usually ordered when a client is admitted into acute or long term care settings
- The table in the next slide provide helpful information for evaluation these tests

B – Biochemical Data

Evaluation of Basic Metabolic Panel Results

Test	Normal Values*	Comments
Glucose	70 -120 mg/dL	Elevated fasting blood glucose indicates need for further evaluation for diabetes
Sodium	135-145 mEq/L	Evaluates fluid and electrolyte balance in conjunction with physical exam
Potassium	3.5-5.2 mEq/L	Important in some patients with chronic kidney disease or those taking some diuretics
Chloride	101-110 mmol/L	Can be associated with disturbances in acid base balance. Evaluate in conjunction with other information
Carbon Dioxide (CO_2)	20-29 mmol/L	Can be used to evaluate acid/ base disorders
Blood Urea Nitrogen (BUN)	7-20 mg/dL	Measures waste products of protein metabolism (urea nitrogen). Normally filtered by kidney, elevated BUN might indicate declining kidney function.
Creatinine	0.8 -1.5 mg/dL	Waste product of muscle metabolism. Healthy kidneys excrete most creatinine produced. Elevated creatinine may indicate kidney disease.

*Normal range for laboratory tests may vary depending on the test methods and local practice. Be sure to check with your lab for normal values.

Medline Plus: Basic Metabolic Panel. http://www.nlm.nih.gov/medlineplus/ency/article/003462.htm Accessed March 3, 2010.

Biochemistry (Lab Results)

Lab Results:

Diabetic Profile			Result Status		Lipid Profile		Result Status
HbA1C (%):			NIL		T. Chol (mmol/L):		NIL
Fasting Blood Glucose (mmol/			NIL		HDL (mmol/L):		NIL
2 Hours Post Prandial (mmol/L			NIL		LDL (mmol/L):		NIL
					TG (mmol/L):		NIL

Others			Result Status	
Sodium (mmol/L):			NIL	
Potassium (mmol/L):			NIL	
BP (mmHg):	*Systolic*	*Diastolic*	NIL	NIL
Urea (mmol/L):			Male - NIL	Female - NIL
Creatinine (µmol/L):			Male - NIL	Female - NIL

Others:

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Biochemistry (Lab Results)

Ordered by doctor:

- Home monitoring results can be used:
  - Diabetic who may monitor blood sugar daily,
  - Hypertensive individual monitoring blood pressure readings
  - Out of range results are indications on poor control and management of disease.
  - Nutrition goal setting will have to be more stringent.

Reference

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E-learning Lesson 2

- Complete SCORM Package
- Attendance will upon complete of learning package