MINISTRY OF HEALTH & WELLNESS

PAHO

Pan American Health Organization

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Protocol for the Nutritional Management of Non-communicable Diseases in Jamaica

Nutrition & Dietetic Services

Ministry of Health & Wellness

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ADAPTED FROM PROTOCOL FOR THE NUTRITIONAL MANAGEMENT OF OBESITY, DIABETES AND HYPERTENSION IN THE CARIBBEAN

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Acknowledgements

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Abbreviations

ABW	Actual Body Weight
ASCVD	Atherosclerotic cardiovascular disease
BEE	Basal energy expenditure
BMI	Body Mass Index
BP	Blood Pressure
CARICOM	Caribbean Community
CBC	Complete blood count
CVD	Cardiovascular disease
DASH	Dietary Approaches to Stop Hypertension
DM	Diabetes Mellitus
EDNP	Energy-dense and nutrient-poor
EN	Enteral nutrition
GDM	Gestational Diabetes Mellitus
GI	Gastrointestinal
GLOBOCAN	Global Cancer Observatory
HBP	High Blood Pressure
HCC	Healthy Caribbean Coalition
HDL	High Density Lipoproteins
HTN	Hypertension
IARC	The International Agency for Research on Cancer
IBW	Ideal Body Weight
IDF	International Diabetes Federation
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
IOM	Institute of Medicine
JHLS	Jamaica Health and Lifestyle Survey

JNC	Joint National Committee
Kcal	Kilocalories
MNT	Medical Nutritional Therapy
MAC	Mid Arm Circumference
MAMC	Mid Arm Muscle Circumference
MNT	Medical Nutrition Therapy
MOHW	Ministry of Health & Wellness
MST	Malnutrition screening tool
MUAC	Mid upper arm circumference
NCD	Non-communicable Disease
NCP	Nutrition Care Process/Plan
NICE	National Institute for Health & Clinical Excellence
OGTT	Oral Glucose Tolerance Test
OTC	Over the counter
PA	Physical Activity
PAHO	Pan American Health Organization
PSA	Prostate specific antigen
RDAs	Recommended dietary allowances
SES	Socio economic status
SGA	Subjective Global Assessment
SSBs	Sugar sweetened beverages
TPN	Total Parenteral Nutrition
TSF	Triceps skinfold
UNDP	United Nations Development Programme
UNIATF	UN Interagency Task Force on NCDs
WC	Waist Circumference
WHO	World Health Organization
WHR	Waist -to- Hip Ratio

Introduction

Non-communicable diseases (NCDs) have gradually displaced communicable diseases as the main causes of mortality in Jamaica. Nutrition-related chronic diseases such as obesity, diabetes, hypertension and cancer are major contributors to disability, illness and premature deaths. Worldwide 7 in 10 people die every year from NCDs. That translates to 41 million deaths and includes 15 million people between 30 and 69 years of age [1]

In Jamaica, 15,800 of the 20,000 total deaths that occurred in 2016 resulted from complications of NCDs and risk of premature deaths (30-70 years old) was 15% overall. Approximately four out of five individuals die from NCDs, and a 30-year-old has a 17% chance of dying prematurely from any of the four main NCDs (cardiovascular disease, diabetes, chronic respiratory disease, and cancer) before reaching his or her 70th birthday [2]. The impact of NCDs goes beyond health, and their economic and social effects are staggering. Of concern is the fact that while the prevalence and mortality rates of these diseases are highest in the elderly, they are not restricted to that group. Hypertension and diabetes rank as the two leading chronic disorders among the general population and are also major risk factors for other conditions such as cerebrovascular disease (stroke) and coronary heart disease [1] [3].

Interventions aimed at controlling the risk factors of chronic non-communicable diseases and their complications include the adoption of healthy lifestyle practices such as engaging in regular physical activity, making healthy food choices, reducing alcohol consumption and avoiding smoking. An inter-sectoral approach to facilitating the behaviour change needed is a key strategy in NCD prevention and control. Interventions must take place various settings, workplaces, schools, clinics and hospitals; to increase effectiveness.

The critical role of nutrition in disease prevention, health promotion and chronic disease management is undisputed. Nutrition intervention is a low cost and effective way to promote health. With guidance and attention to what is consumed, people can improve their nutrition and health status. Maintaining optimal nutritional status at any age is important and can contribute to preventing some chronic diseases, less frequent episodes of illness, shorter and less expensive hospital stays, fewer complications and a higher survival rate [1].

The burden of these NCDs on health and productivity is astronomical as they affect men and women in their productive years. Loses in economic output due to NCDs, between 2011-2030 is projected to cost low- and middle-income countries more than US $21 trillion. Nearly one-third of that figure is lost to cardiovascular disease. Direct government spending on NCDs is also significant. In countries where disease-level spending accounts are available, an average 13.4% of total expenditure on health is devoted to cardiovascular disease

The results of the study *NCD Investment Case/"Best Buys",* show that NCD action has positive returns and supports economic growth plans by alleviating the financial and human toll on health and social services and generating resources (through increased tobacco and alcohol tax revenues) which can be invested into social programs including Universal Health Care. With a break-even Return on Investment (ROI) of 1 at year 5, primary prevention can be billed as paying itself off in the near-term while saving billions in the medium and longer term (2017-2032) [4].

At the individual and household levels, NCDs represent diminished quality of life (along with productivity) as lengthy and expensive treatments that can rapidly drain household resources which diverted away from food, education, and savings. At a population level, these trends can result in poverty traps [2].

Much of the burden, however, can be prevented. The cost of treating one patient in hospital per admission could well cover the cost of treating several individuals in the primary care setting if effective preventive management strategies were employed. Effective management strategies include establishing programmes aimed at preventing, as well as managing, the targeted nutrition-related chronic diseases at the primary care level. Using standard protocols for treatment and prevention of NCDs (for select interventions) can reduce the cost of delivery of care by 5.5%, amounting to up to $J 2.1 billion over 15 years [2].

There is much evidence to suggest that effective management is very important for persons already diagnosed with these NCDs. For example, the report and guidelines of the Eighth Joint National Committee (JNC-8), have confirmed positive and continuous relationship between blood pressure levels and the risk of major coronary heart disease events.

This Protocol recognizes that there is limited availability of specialized nutrition and dietetic professionals in the Jamaican setting. However, it is not a replacement for the specialized professional services of nutritionists and dietitians. The Protocol should provide a framework for nutritional care which will guide standard care using a set of core nutritional care parameters. It should serve as a practical management tool, with timely referral of the client to the appropriate health professional for care beyond the knowledge, training and skills of particular members of the multi-disciplinary health care team.

This Protocol is intended to serve as a resource document for nutrition and dietetic personnel and other health professionals involved in the management of clients with the selected chronic diseases – obesity, diabetes, hypertension and cancer – in the primary and secondary health care settings. It is not intended to be a comprehensive technical and clinical care document and individual clients, who will differ in their personal, medical, social, ethnic and cultural characteristics, may require referral for more specialized care.

This document provides:

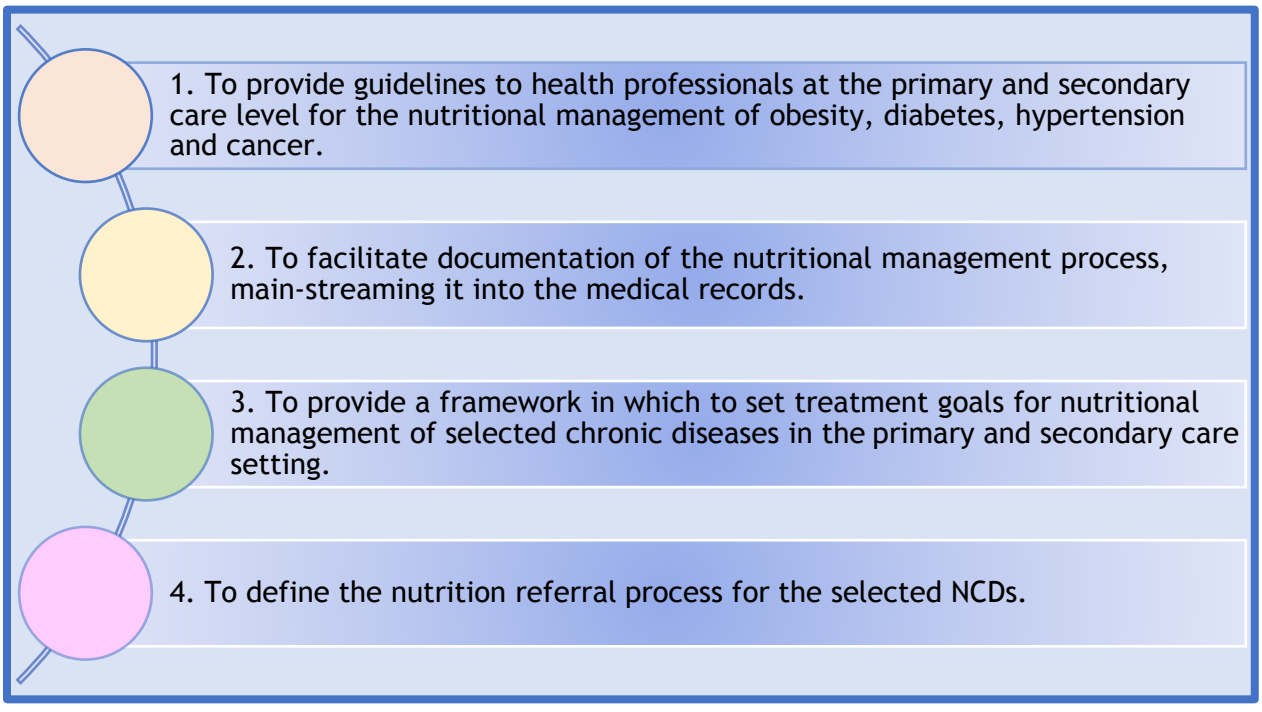
- Goal and objectives of the protocol
- The general nutrition management process
- An overview of the targeted chronic diseases: obesity, diabetes, hypertension and cancer
- Nutritional management for the specified diseases
- Indicators for referral

It is anticipated that this protocol will be reviewed and updated periodically as new scientific information is made available.

Goal of the Protocol

To facilitate standardized nutritional practices and management of clients with selected nutrition-related chronic diseases (obesity, diabetes, hypertension and cancer) in primary and secondary health care setting in Jamaica.

Objectives of the Protocol

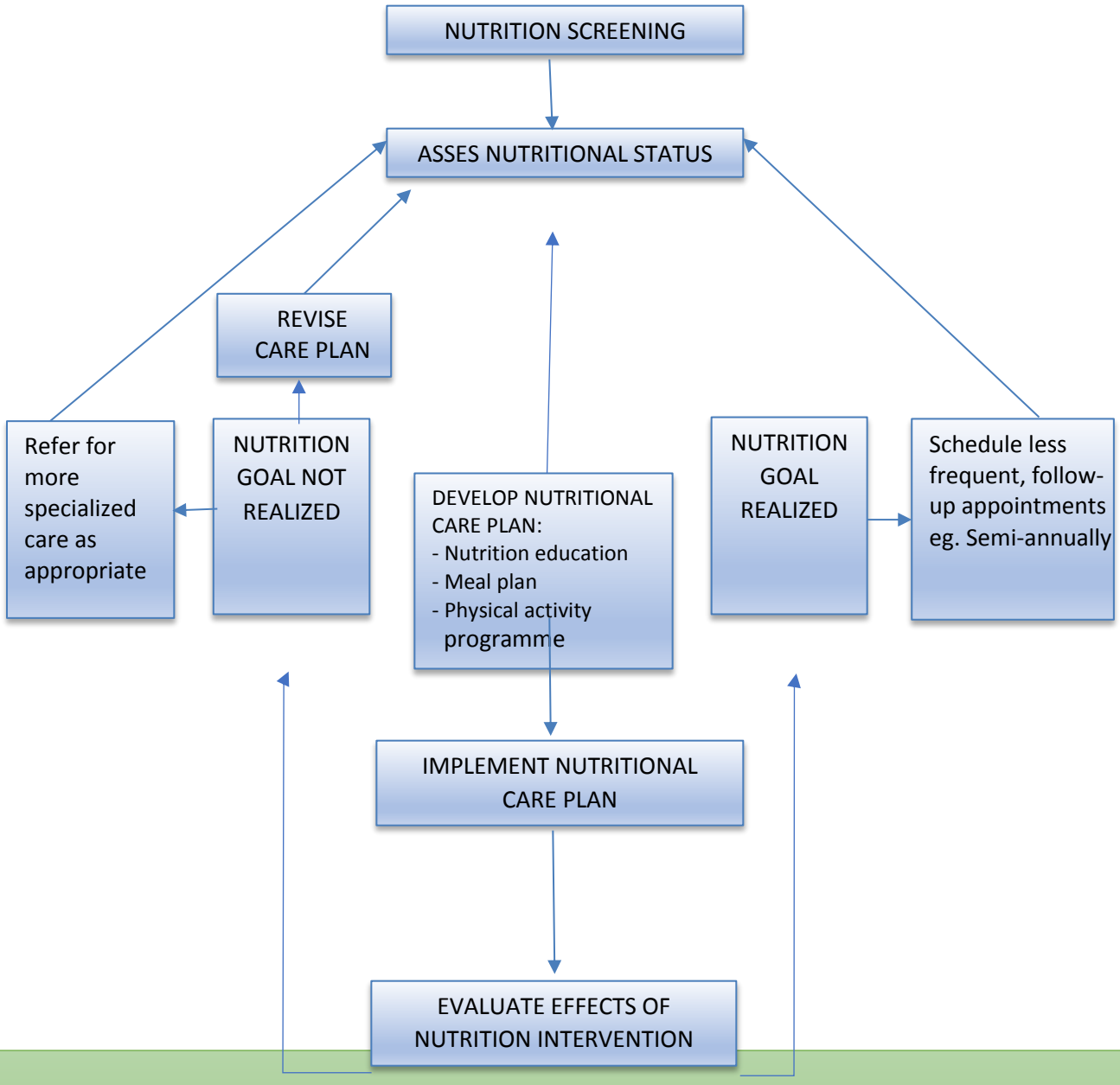


The Nutritional Care Process

The Nutritional Care Process

Proper Nutritional Care is integral to the successful management of obesity, diabetes, hypertension and cancer. Compliance with nutrition and meal planning principles, however, remains one of the most challenging aspects of care. The conceptual framework in Figure I identifies the steps necessary for successful management of non-communicable diseases.

Figure 1: Conceptual Framework for the Team Approach

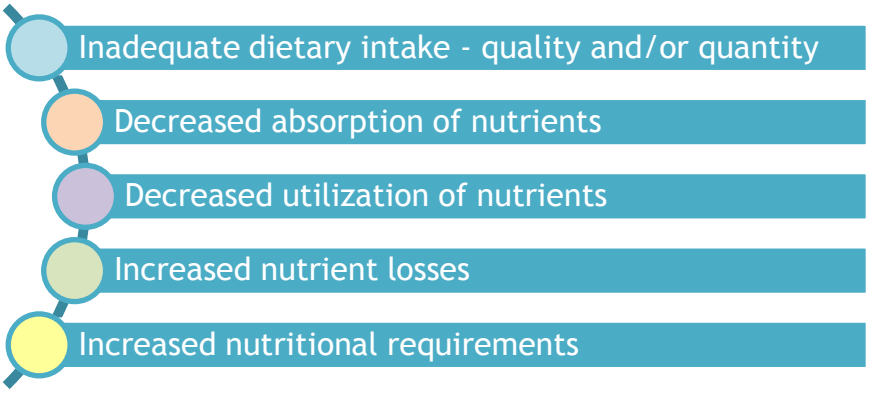


Assessment

The first step of the nutrition care process is assessing the nutrition status of the client. The assessment begins with a nutrition screening. This is the process of identifying characteristics known to be associated with nutrition problems. The purpose of a nutrition screen is to identify individuals at nutritional risk or likely to become at risk and determine whether a more detailed nutrition assessment is warranted [5].

Indicators of Nutritional Risk

A risk indicator is any measurable characteristic or circumstance that is associated with a poor outcome or any increased likelihood of such outcomes. A nutritional risk indicator is one that will lead to poor nutritional status. These indicators are:



Nutrition assessment is a comprehensive evaluation of both objective and subjective data related to a client's food and nutrient intake, lifestyle, and medical history. A registered nutrition practitioner interprets data from the nutrition screen then defines a client's nutritional status using medical, social, nutrition and medication history; anthropometric measurements; physical examination/clinical data and laboratory data. The information is organized and assessed to make a professional decision with regards to the client's nutrition status [5].

Nutrition assessment is an ongoing process and must be completed for every person with obesity, diabetes, cancer or hypertension who presents for care. It identifies existing or potential problems and generates the information needed to formulate a comprehensive plan for nutrition intervention.

The Assessment Process

The assessment process requires a systematic collection of subjective and objective information about the client, his/her environment and support systems. The results of the assessment gives some insight into the challenges the client might face and the resources that are available to cope with them. The process includes:

1. Review of medical history
2. Data collection including:
   - Anthropometric
   - Biochemical
   - Clinical
   - Dietary
3. Determination of exercise/activity level.
4. Assessment of client's / caregiver's ability and readiness to participate in his/her care.
5. Assessment of client support network – home, community and school.
6. Analysis and Interpretation of data.
7. Use of the data to provide appropriate Medical Nutritional Therapy.

On completion of the assessment a nutrition care plan should be developed, implemented and tailored for the individual client and the appropriate setting (home, hospital, [6] [5]).

Review of Medical Data

The client's medical history provides an insight into any relevant past illnesses or circumstances that may directly or indirectly impact on the client's nutrition needs and health status. Important medical history to be reviewed include:

- Health history – explore health factors and/or family history that provide insight into nutrition related problems and that may influence the client's nutrition status. Include present and past illnesses, allergies, pending or past surgeries, mental or physical disabilities, etc.

- **Drug history** – review medications (prescription, alternative or complementary medicine, over the counter drugs, nutrient supplements, and illegal drugs that may affect nutrition status). Food and drugs interact and might affect nutritional status and the effectiveness of drug therapy.

- **Socio-economic history** – Check for environmental, personal, religious, social and economic factors that can influence food availability and preferences, food needs, food intake and nutrient needs and dietary intervention.

- **Diet history** – is used to obtain dietary intake information. Review the client's usual intake pattern to identify possible nutritional inadequacies or nutrient imbalances. Investigate alternative nutrition therapies such as the use of herbs and supplements (See Appendix I).

Sources of medical history include medical records, family members and/or significant others and the client [6] [5].

Data Collection

This is an important phase of assessment it involves various parameters which are detailed below. (See Appendix II for instrument "Data Collection for Nutritional Assessment")

Anthropometric Data

Anthropometry is the science of measuring the size, weight and proportions of the human body. The measures used are non-invasive. Measurements obtained are, compared to standards that reflect normal growth and development of the individual/client, used to evaluate nutritional status, to provide information about the body's stores of fat and muscle and to monitor the effects of nutrition intervention. Anthropometric measurements include:

- Height or length and weight
- Circumferences – waist, hip, arm
- Skinfold measurements- triceps, biceps etc.

Anthropometric data are most valuable when measurements are done accurately and recorded over a period. Measurements are used to calculate indicators of nutrition status [5]. Table 1 outlines commonly used anthropometric measures, their use and tools required to execute accurate measurements.

Table 1: Commonly Used Anthropometric Measures

ANTHROPOMETRIC MEASURE	IMPORTANCE (USE)	TOOLS REQUIRED
Weight	A sensitive indicator of nutritional status that reflects recent nutritional intake. Provides a crude evaluation of overall fat and muscle stores.	Scale (digital or mechanical)
Height/Length	An important indicator of growth in children; used along with weight in adults to determine nutritional status. Height measurement shall be recorded as a basic initial screen for all clients presenting for care. Height or length measurements are useful for calculating: * Appropriate weight for height/lenght(WFH/L); height/lenght for age (HFA/LFA) * Body mass index (BMI) * Basal energy expenditure (BEE)	Stadiometer
Body mass index (BMI)	Determines nutritional status and hence health risk by mathematically comparing weight with height	Scale & Stadiometer
Waist Circumference (WC)	An indicator of intra-abdominal fat, and level of risk for certain chronic diseases eg. Type 2 Diabetes Mellitus (DM), high cholesterol, high blood pressure and cardiovascular disease	Tape measure (non-stretch)
Waist : Hip ratio (WHR)	A proportion that indicates where body fat is stored; a high value indicates an increased risk of obesity-related problems	Tape measure (non-stretch)
Mid Arm Muscle Circumference (MAMC)	Provides a measure of muscle mass which correlates with protein status	Tape measure (non-stretch)

Body Mass Index (BMI)

The Quetelet's index, commonly referred to as body mass index (BMI), is a widely accepted indicator of nutritional status. This index is calculated using weight and height measurements. That is, weight of the client in kilograms (kg) divided by their height in meters squared (m^2). While BMI provides a useful measure of underweight, overweight and obesity, it is a rough guide as it may not correspond to the same degree of fatness in different individuals [5] [7]. Table 2 shows the WHO's Classification of BMI in adults and associated risks.

Table 2: WHO Standard Classification of BMI and Associated Risks (adults)

CLASSIFICATION	BMI KG/M^2	RISK OF CO-MORBIDITIES
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5 – 24.9	Average
Overweight	≥ 25	
Pre-obese	25 – 29.9	Increased
Obese class I	30.0 – 34.9	Moderate
Obese class II	35.0 – 39.9	Severe
Obese class III	≥ 40.0	Very severe

Source: Obesity: Preventing and managing the global epidemic: Report of a WHO consultation. WHO Technical Report Series; 89, Geneva 2000

Waist Circumference (WC)

Waist circumference above the cut-offs is associated with an increased risk for type 2 diabetes, high cholesterol, high blood pressure and cardiovascular disease (Table 3).

Waist Hip Ratio (WHR)

Waist-to-hip ratio is calculated by dividing the measured waist circumference by the measured hip circumference. WHR rather than BMI appears to be a more appropriate yardstick for risk among older adults over age 70 and may be related to muscle loss and to regional body fat distribution seen in the aged (Table 3) [8].

Table 3: Cut-off Points and Risks of Metabolic Complications (WHO)

Indicator	Cut-off Points	Risk of Metabolic Complications
Waist Circumference	Men: >94 cm; Women: > 80 cm	Increased
Waist Circumference	Men: >102 cm; Women: > 88 cm	Substantially increased
Waist-Hip Ratio	Men: ≥0.90; Women: ≥ 0.85	Substantially increased

Source: World Health Organization, Waist circumference and waist-hip ratio: report of a WHO expert consultation, Geneva 8 – 11 December 2008. Geneva (Switzerland): WHO: 2011

WHR greater than 1.0 is an indicator of intra-abdominal fatness and is a good indicator of abdominal fat.

Anthropometric Data for Children

Measure the weight, length/height and head circumference of all infants and children presenting at health-care facilities. This will facilitate the determination of the following indicators:

- Weight for Length/Height
- Weight for age
- Height for age/Length for age
- Body Mass Index for age
- Head Circumference for age

Standard charts are used for the above measures, and includes those for: Prematurely born neonates, Down Syndrome, and Cerebral Palsy.

[N.B. Use proxy measurements such as arm span, demi-span and knee-height when required.]

The definitions in Tables 4 and 5 applies to children 0-5 years of age and Table 6 for children 5-19 years of age.

Table 4: Growth Indicators for Children 0-5 years (Z-scores)

	Growth indicators			
Z-score	**Length/height-for-age**	**Weight-for-age**	**Weight-for-length/height**	**BMI-for-age**
Above 3	*See note 1*	*See note 2*	*Obese*	*Obese*
Above 2			*Overweight*	*Overweight*
Above 1			*Possible risk of overweight (see note 3)*	*Possible risk of overweight (see note 3)*
0 (median)				
Below -1				
Below -2	*Stunted (see note 4)*	*Underweight*	*Wasted*	*Wasted*
Below -3	*Severely stunted (see note 4)*	*Severely underweight (See note 5)*	*Severely wasted*	*Severely wasted*

Notes:

Measurements in the shaded boxes are in the normal range.

1. *A child in this range is very tall. Tallness is rarely a problem, unless it is so excessive that it may indicate an endocrine disorder such as a growth-hormone-producing tumor. Refer a child in this range for assessment if you suspect an endocrine disorder (e.g. if parents of normal height have a child who is excessively tall for his or her age).*
2. *A child whose weight-for-age falls in this range may have a growth problem, but this is better assessed from weight-for-length/height or BMI-for-age.*
3. *A plotted point above 1 shows possible risk. A trend towards the 2 z-score line shows definite risk.*
4. *It is possible for a stunted or severely stunted child to become overweight.*
5. *This is referred to as very low weight in IMCI training modules. (Integrated Management of Childhood Illness, In-service training. WHO, Geneva, 1997)*

Source: **[9]**

Table 5: Growth indicators for Children 0-5 years (Classifications)

Classifications	Cut-offs
Overweight	Weight-for-height above +2 SD of the WHO Child Growth Standard median
Obesity	Weight-for-height above +3 SD of the WHO Child Growth Standards median.
Underweight	Weight -for age below -2 SD of the WHO Child Growth Standards median
Stunting	Height-for-age below -2 SD of the WHO Child Growth Standards median.
Wasting	Weight-for-height below -2 SD of the WHO Child Growth Standard median

Stunting vs Wasting

Stunting: *the impaired growth and development that children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation.*

Wasting or Thinness: *indicates in most cases a recent and severe process of weight loss, often associated with acute starvation and/or severe disease. However, it could also be the result of a chronic unfavourable condition.*

Table 6: Growth Indicators for Children 5-19 years

Classifications	Cut-offs
Severe Thinness	BMI-for-age below -3 SD from the WHO 2007 Growth Reference median
Thinness	BMI-for- age below -2 SD from the WHO 2007 Growth Reference median
Overweight	BMI-for-age above +1 SD from the WHO 2007 Growth Reference median
Obesity	BMI-for-age above +2 SD from the WHO 2007 Growth Reference median
Severe Obesity	BMI-for-age above +3 SD from the WHO 2007 Growth Reference median

Biochemical Data

Biochemical data is used in nutrition assessment as a support for nutrition diagnosis. Biochemical data are also used in monitoring and evaluation of the patient's response to nutrition intervention. Biochemical tests are the most objective and sensitive measures of nutrition status. Examples of nutrition-related biochemical markers are:

- Haemoglobin
- Blood sugar levels
- Blood lipids
- Serum protein
- Blood urea nitrogen
- Serum creatinine
- Serum potassium
- Serum sodium
- Urinary ketones

Clinical Data

Clinical data are gathered by physical examinations. Give attention to areas where signs of nutritional deficiencies appear. These areas include the skin, hair, teeth, gums, lips, tongue and eyes. The following are some findings that could indicate poor nutrition:

- Physical Appearance: loosely fitting clothing
- Pallor: eyes, lips, mouth, tongue, skin,
- Head: Hair Changes (brittle, sparse, thin), temporal lobe wasting
- Eyes: sunken, sclera jaundiced
- Mouth: lips dry, cracked, cheilosis, stomatitis, glossitis, state of dentition
- Skin: turgor dry, scaly, dermatitis, poor wound healing, pressure sores location and stage
- Intake Problems: chewing and swallowing difficulties, nausea, vomiting, altered taste
- Gastrointestinal problems: vomiting, diarrhea, altered taste, early satiety
- Extremities: hands, feet, nails, nail beds, edema peripheral
- Blood pressure: elevated or low

Dietary Data

A dietary assessment is a comprehensive evaluation of a client's past and current food intake. Dietary intake data can be assessed by collecting retrospective and/or prospective data. The type of data collected depends on the purpose and setting in which the assessment is done. A diet history or food diary provides valuable information about, dietary intake patterns; food habits and preferences and household food security (availability and access). Use diet history to estimate current nutrient intakes; determine the appropriateness of the intake and as a guide when developing a health education plan for the client. Table 7 provides a comparison of commonly used dietary assessment tools [10].

Table 7: Commonly used dietary assessment tools.

FEATURE	COMMENT	24 HR RECALL	FOOD FREQUENCY QUESTIONNAIRE	FOOD DIARY
Scope	Total diet	X	X	X
	One or a few components		X	
Captures contextual details regarding food preparation, timing and location of meals	Yes	X		X
	No		X	
Time frame of interest	Short term	X		X
	Long term		X	
Used to query diet in the distant past	Yes		X	
	No	X		X
Allows cross-cultural comparisons	Yes	X		X
	No		X	
Type of measurement error	Random	X		X
	Systematic		X	
Approximate time required to complete	15-30 mins	X	X	X
Memory requirements	Specific	X		
	Generic		X	
	Does not rely on memory			X
Cognitive difficulty	High		X	
	Low	X		X
Study Design (research purposes)	Cross-sectional	X	X	X
	Retrospective	X	X	
	Prospective			X
	Intervention	X	X	

Other assessment methods include: Usual Food Intake, Observed Food Intake and Nutrient intake. See Appendix 1 for advantages and limitations of dietary assessment methods.

Protocol for Nutrition Assessment

Conduct nutritional assessment on individuals identified through screening and referred through the formal health system. For initial screening, use the Malnutrition Screening Tool (MST) and follow up with the Subjective Global Assessment (SGA) tool (See Appendix III). This assessment should be comprehensive, client centered and performed by Nutrition and Dietetics staff.

Purpose

Nutrition assessment is necessary to link health and diet information to delivery of appropriate and individualized interventions that lead to achievement of desired health goals.

Follow and use the policies, processes and procedures defined and established by the Ministry of Health and Wellness (Nutrition Unit). Quality and comprehensive nutrition assessment:

- Defines the level of risk for appropriate nutritional management
- Facilitates the documentation and maintenance of the client's medical record for appropriate follow up care
- Provides information to other members of the health care team
- Facilitates appropriate interventions in order to prevent deleterious consequences of the specific conditions
- Facilitates research

Re-assess parameters such as weight, blood pressure, dietary intake and pertinent laboratory data each time a client presents for care. Use the review of medical data to define the level of nutrition intervention for the targeted disease. This will set the framework for all the problems/illnesses that must be targeted as part of the nutrition intervention process.

Steps in the process of Nutrition Assessment

1. Explain to the client the purpose of the assessment
2. Describe the staff relationship to the client as a partnership working to achieve positive health outcomes
3. Collect and document all relevant information using equipment and tools correctly. Refer to *WHO STEPwise Approach to NCD Risk-factor Surveillance*. (Appendix IV).
4. Collate and organize data
5. Identify pertinent risks, deficits, and needs
6. Formulate a nutrition diagnosis
7. Develop intervention/education plan in conjunction with the client
8. Follow-up with appropriate date and referral as appropriate

Staff Competencies

The Parish Nutritionist and Hospital Dietitian should ensure that all staff within their supervision are competent to carry out a nutrition assessment.

Appendix V outlines the roles and responsibilities of different members of the Health Care Team.

Quality Assurance

Quality assurance activities coordinated by the Regional Nutritionist and Regional Dietitian includes, but are not limited to the following:

1. Periodically reviewing and evaluating the nutrition care process and staff competencies.
2. Reviewing the nutrition care process that includes a review of clients' medical records and observations of the clients' nutrition assessment.
3. Recommending and making adjustments, as necessary.

The Nutrition Care Plan

The Nutrition Care Plan

The nutrition care process involves assessing nutritional status and analyzing data to identify nutrition related problems, formulation of a nutrition diagnosis, planning nutrition interventions to meet the needs identified and monitoring and evaluating the nutrition care outcomes.

Nutrition Therapy is the use of specific nutritional interventions to treat an illness, injury or condition. The care provided for each client depends on the presence of disease, the stage of growth and development and socio-economic issues. The interventions are outlined in the Nutritional Care Plan (NCP).

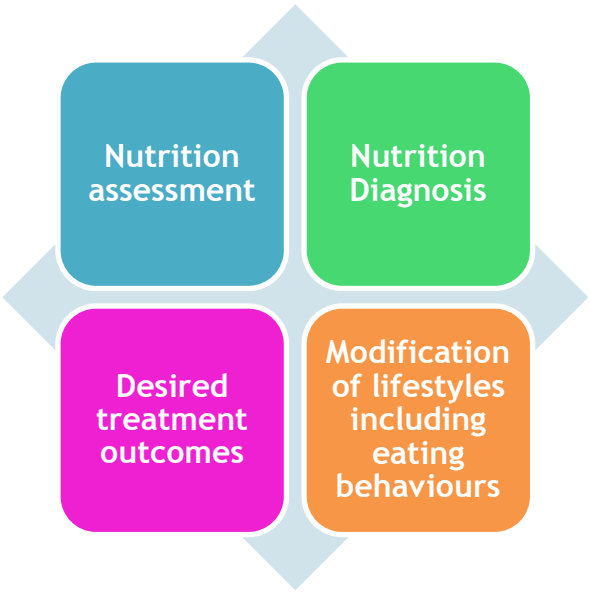
Goals of Nutrition Therapy

The goals of the nutritional therapy provided to clients in the Primary Health Care Services of the Ministry of Health and Wellness, Jamaica are:

- Improving health through optimal nutrition.
- Providing adequate calories: to attain and maintain reasonable weights for adults; for normal rates of growth and development in children and adolescents; for increased metabolic needs during pregnancy and lactation or recovery from catabolic illnesses.
- Maintaining near-normal blood-glucose levels by balancing food intake with insulin or oral medication and physical activity levels.
- Controlling blood pressure
- Achieving optimal blood lipid levels.
- Preventing, delaying or treating acute insulin-related complications such as hypoglycemia, short-term illness and exercise-related problems.
- Preventing, delaying or treating long-term complications of obesity, diabetes or hypertension. These include, but are not limited to, renal disease, neuropathy and cardiovascular disease.

Developing the Care Plan for Nutrition Therapy

The nutrition recommendations that are integrated into the overall management plan for the client are based on:



An essential component of the Nutritional Care Process is the measurement and documentation of outcomes. An evaluation of the medical, clinical, biochemical, educational and psychological outcomes provides information on the effectiveness of nutrition therapy in the overall management plan.

Engage nutrition/dietetics professionals when developing the plan. Clearly identify the client's long and short-term nutritional needs based on findings from the assessment. Outline the following in the Nutritional Care Plan:

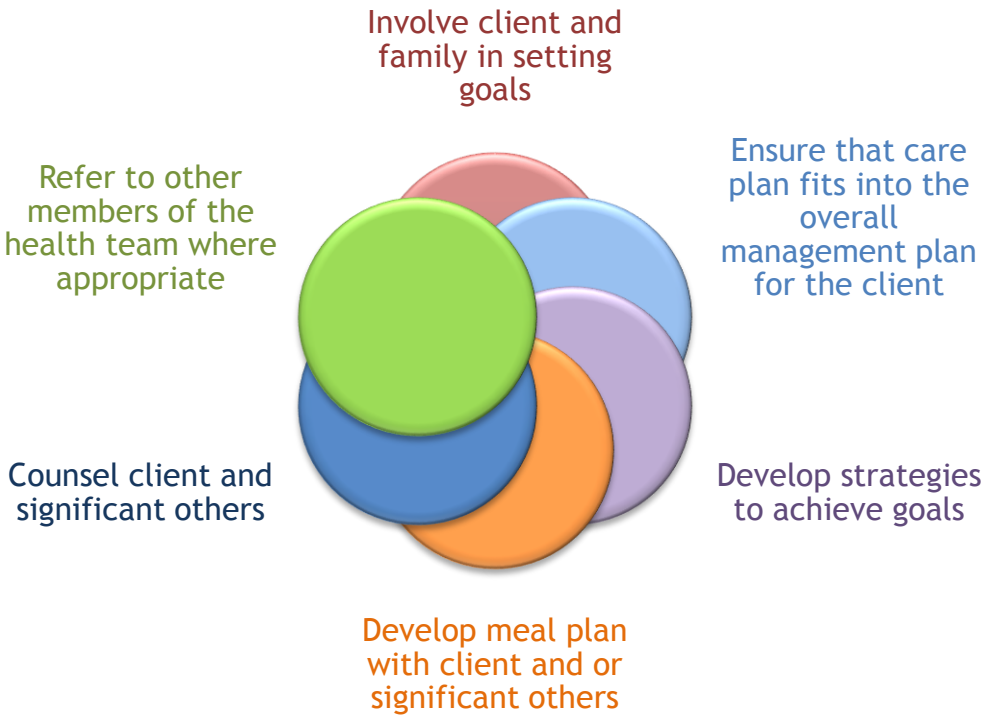
- Objectives for meeting nutrition and educational needs
- Time frame for achieving the objectives
- Content of counseling sessions

Consider the client's nutrient requirements, their sources and the strategies for meeting them. Discuss the plan with the client and his/her family. Finalize the plan after discussions with the other members of the healthcare team. Plan counselling sessions that provide guidance and recommendations for the client. The counselling process may require several sessions to outline the care plan, discuss the components of the diet and to evaluate the client's understanding and willingness to comply with the plan.

Nutrition Intervention

The purpose of nutrition intervention is to resolve or improve nutrition problems by providing education, counselling and a specific diet or meal plans tailored to meet a client's needs. Data garnered from the assessment and nutrition diagnosis process are utilized as the basis for nutrition counselling and education. To increase the effectiveness of an intervention, factors such as family involvement, the preferences of the client, and the overall plan of the health care team must be kept in mind, Figure 2.

Figure 2: Factors to consider when planning a nutrition intervention



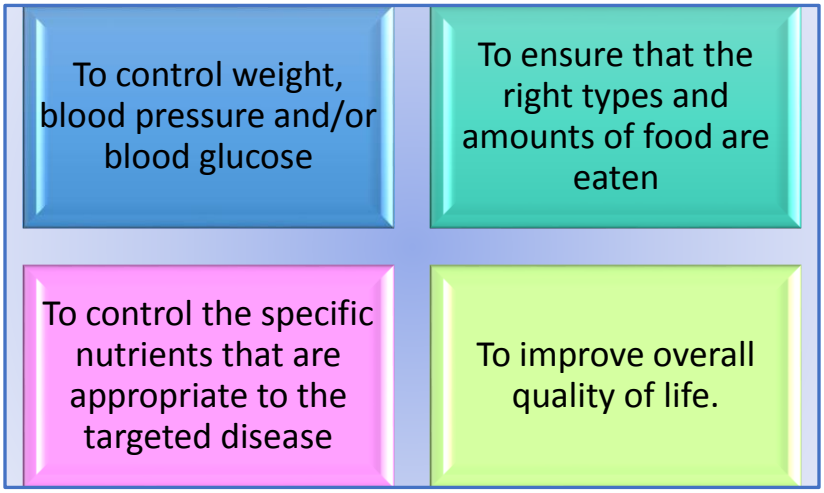
Meal planning

Meal planning is the use of foods, food groups and nutrients to facilitate variations for individual/group preferences, cultural habits, health status and socio-economic factors to achieve specific objectives. It is an interactive process between the client and the health care provider. Meal planning is a focal point in the management of obesity, diabetes, hypertension

and cancer. The meal planning process requires input from the client, including financial, religious and cultural considerations (See Appendix VI).

Goals of meal planning

The goals of meal planning are:



The principles which govern meal planning include:

- **Nutritional adequacy** – Providing adequate amounts of all the essential nutrients, energy and fibre to maintain health while ensuring any required nutrient modification specific to the disease.
- **Caloric control** – Managing the amount of energy consumed without over- or under-eating.
- **Nutrient density** – Choosing foods that give a good variety of nutrients for a small number of calories.
- **Variety and Balance** – Selecting foods from each of the food groups in proportion to each other thus preventing nutritional risks.
- **Individuality** – Using the information from the assessment to meet individual needs.
- **Flexibility** – Allowing clients to choose foods within a practical and creative setting. Meal plans that are rigid do not encourage compliance.

Developing a Meal Plan

The Nutrition/Dietetics personnel on the health team is responsible for undertaking this task. Tailored the meal plan to the needs of the client while targeting the disease. There are many meal planning options, but, generally, the food exchange system is used in Jamaica. A food exchange is a measure or portion of one type of food that may be eaten instead of another type of food from the same food group and provides similar nutrients and calories. The food exchange represents one serving of each specific food listed. (See Appendix VI).

Periodically evaluate the meal plan and alter if necessary, to improve disease control and general health. The meal plan is developed in two phases.

Phase 1: Determine the calorie/energy needs of the client

Step 1: Assess current food intake and eating pattern using a 24-hour recall. Categorize usual food intake into exchange amounts based on portions and foods consumed at each meal and snack. Using the exchange amounts for each food item, translate into calories.

Step 2: Determine caloric prescription based on age, gender, height, weight, and activity level.

The needs of clients differ there is therefore the need to conduct individual assessments to determine energy requirements. Energy requirements are based on age, gender, weight and activity level. Different methods can be used to calculate energy requirements for adults. The following are examples:

1. **Estimate daily energy needs based on actual weight:**

Obese or very inactive *Chronic dieters*	*20 kcal/kg*
Over 55 years *Active women* *Sedentary men*	*25 kcal/kg*
Active men *Very active women*	*30 kcal/kg*
Thin or very active men	*40 kcal/kg*

Source: **[5]**

2. Harris Benedict Equation:

Male: $66.5 + 13.8W + 5H - 6.8A$

Female: $655.1 + 9.6W + 1.8H - 4.7A$

W= Weight in kg H= Height in cm A= Age in years

Adjusting for Obesity

Energy requirements are dependent on body composition. The body is divided into fat-mass and fat-free mass. A component of fat-free mass is body cell mass. It is metabolically, the most active component and consumes more energy than fat-mass. Therefore, a client with higher body cell mass have higher energy needs. Obese clients have high fat-mass and an increased body cell mass which means they have higher energy requirements than they would if they were of a normal body weight.

The energy requirements for the obese can be calculated based on an adjusted body weight. When calculated, the obesity adjusted body weight can be used in the Harris Benedict Equation. See Appendix VIII for more details on determining energy requirements.

$$\text{Obesity adjusted weight} = IBW + \frac{(ABW - IBW)}{4}$$

ABW- Actual body weight
IBW- Ideal body weight

Source: **[11]**

Step 3: Subtract calories if weight loss is desired. Generally, 500 or 1000 kcal per day can be subtracted from current intake to achieve a 0.5-1.0 kg (1-2 lb) per week weight reduction.

Phase 2: Distribute calories by macronutrients and number of meals.

Step 4: Determine calorie distribution

Calorie distribution should be based on therapy goals and disease state.

- ~ Carbohydrates: 50 – 60%
- ~ Protein: 15 - 20%
- ~ Fat: ≤ 30%

Step 5: Calculate the diet prescription based on the energy requirements and calorie distribution. Outline grams of carbohydrate, protein, and fat from the exchanges and determine percentages of total calories contributed by each macro-nutrient.

$$\text{Calories from carbohydrate} = \frac{\text{grams of carbohydrate} \times 4 \times 100}{\text{total calories}}$$

$$\text{Calories from protein} = \frac{\text{grams of protein} \times 4 \times 100}{\text{total calories}}$$

$$\text{Calories from fat} = \frac{\text{grams of fat} \times 9 \times 100}{\text{total calories}}$$

Step 6: Consult exchange lists. Adjust exchange as needed to reach goal percentages for each macronutrient (see Appendix VII).

Step 7: Distribute the foods from exchanges among meals and snacks based on usual eating pattern, activity, medication regimen, and targeted diet modification.

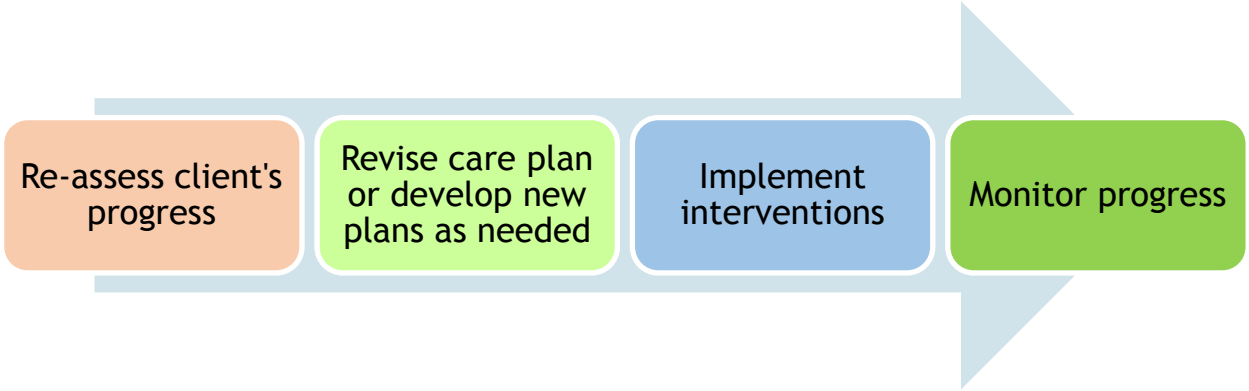
Step 8: Implementation

Implementation involves providing the appropriate meal plan along with practical hands-on nutrition education. This process includes follow-up appointments to determine client's understanding of the regime, provide motivation and gauge compliance [5] [6].

- Utilize data from assessment process to guide food choices and preparation techniques
- Involve client and family in setting goals
- Ensure that care plan fits into the overall management plan for the client
- Develop strategies to achieve goals
- Counsel client and family/caregivers
- Refer to other members of the health team where appropriate

Monitoring & Evaluating Nutritional Care

Monitoring and evaluating are important in determining the efficacy and effectiveness of the nutrition intervention. Periodic revision will be required as clients achieve short-term goals or circumstances change (eg. socio-economic situation and health condition). This will be determined from regular follow-up appointments and include the following actions:



All the strategies that were implemented must be monitored and evaluated. The client's nutrition status is evaluated at regular intervals to determine if, nutritional goals are being achieved; needs are being met or if there is a change in his/her situation. The frequency is dependent on the client's nutritional status.

The client's participation in developing the plan is integral to compliance and goal achievement. Flexibility will be required as clients and their circumstances might differ. Each case might require different strategies and techniques to achieve desired results [6].

Expected Outcomes of Nutrition Therapy

The effectiveness of an intervention is determined by clients' compliance to regime which is evidenced by several factors including: nutrition status, knowledge and self-management, clinical data and resources (Figure 3).

Figure 3: Outcomes that determine effectiveness of nutrition intervention

To achieve the expected outcomes above: [6]

- Involve the client, family members (including siblings) and caregivers in all management discussions.
- Individualize the approach to Nutrition Care.
- Provide culturally appropriate information and educational materials.
- Involve the client in the development of realistic plans, which include a variety of foods which are liked, available and fit his/her schedule and self-care regimen.
- Facilitate follow-up visits and modification of goals when necessary.

- Schedule on-going education, reviews, support and dialogue to improve acceptance and compliance.
- Give general information about the targeted chronic disease – risk factors, treatment and its side effects.
- Suggest referral to other members of the team as is necessary
- Suggest workable strategies for positive behaviour change and the adoption of healthy lifestyles.

Documentation of Nutrition Care

Documentation is an essential component of the Nutrition Care process. Document all interventions of Nutrition Care in the client's medical records. Documentation of nutrition information should be done using the ADIME format (See Appendix IX). Document nutrition care continuously as this serve to [6]:

- Establish a record of the Nutrition Care process.
- Maintain a strong professional communication network to inform all members of the health care team of the client's status, plans and actions taken.
- Provide a framework/indication for intervention, re-assessment or follow-up care by other members of the care team.
- Facilitate continuity of care, thus contributing to accuracy and better-quality management.
- Provide a reference point for evaluating the impact of nutrition therapy on medical and clinical outcomes and client's quality of life by linking assessment and nutrition diagnosis with intervention goals and strategies.
- Provide data for establishing cost-benefit and cost-effectiveness of nutrition therapy.
- Provide information on referral for other services.

Continuing Care

Continuing care is an essential component of management and allows for monitoring and evaluating as well as reassessment. Follow-up facilitates achieving behaviour change. Effective Nutrition Care requires more than one visit. The visits provide opportunities to sustain progress, control the nutrition problems identified, review the problems, observe the effect of treatment and re-design the intervention strategies if necessary. Follow-up visits can help to provide the motivation to succeed as well as to establish good relations with the client and reinforce education messages [6].

Frequency of Follow-up Visits

Clients starting nutrition therapy may initially need weekly visits until there is reasonable progress. As goals are met and there is improvement in management, visits may be less frequent. If goals are not being met, the management plan needs to be revised and goals re-assessed (Table 8).

Table 8: Monitoring Nutrition Care – Activities and Frequency

Activity	Frequency of care	
	Initial visit	Follow-up Care
Anthropometric markers	▲	Every visit
Blood Pressure	▲	Review as necessary
Other concurrent abnormalities	▲	Review as necessary
Laboratory	▲	Review as necessary
Fasting and/or 2 hr pp blood glucose	▲	Review as necessary
Fasting lipids	▲	Review as necessary
Micro-albuminuria	▲	Review as necessary
Dietary Assessment	▲	Every visit
Clinical Assessment	▲	Every visit

Frequency of visits may be influenced by any of the following - degree of obesity; severity of hypertension; type of diabetes; type and severity of cancer; changes in treatment regimen; level of compliance. Appendix X "Determinants of Client Visits", outlines the type of care which should be undertaken at specific follow-up visits [6].

Self-Management

Encourage clients to practice self-management. This strategy decreases dependence on the Health Care Team, empowers clients and motivate them to take responsibility for their own health outcomes. To realize the desired outcomes, teach clients self-management strategies. Equip them with the knowledge and skills that will help them to make informed choices and adhere to the regimen prescribed. Consider the training of clients as an important component of the nutrition intervention that facilitates the achievement of therapy goals. Tailored training

according to the clients' health condition, nutritional needs, personal circumstances and state of readiness [6].

Referrals

An important aspect of the nutrition care process in the Primary Care System is recognizing the need for timely referrals for specialist care. Treatment of chronic non-communicable diseases requires a multidisciplinary health care team. Table 9 provides guidelines for referral of clients to specific members of the health care team. Appendix IV summaries the responsibilities of team members in caring for clients [6].

Table 9: Indications for Referral to Health Care Team Members

Indicator	Team member whom client should be referred to
Development of meal plan	Nutritionist/Dietitian
Inter-current illnesses	Physician/Family Nurse Practitioner
Recurrent hypoglycaemia	Physician/Family Nurse Practitioner/Dietitian
Poor self-management	Management team
Infections	Physician/Nurse/Family Nurse Practitioner
Poor appetite or client not eating	Physician/Nutritionist/Dietitian
Vomiting	Physician/Nurse/Family Nurse Practitioner
Clients whose medication has finished	Physician/Nurse/Family Nurse Practitioner
Clients who express difficulty following any treatment regimen that must be handled beyond your level of competence or expertise	Doctor, Nurse, Family members, Nutritionist/Dietitian

Summary of the Nutritional Care Process

Table 10 summarizes the nutritional care process when clients present at primary care facilities [6].

Table 10: Nutrition Care Process Summary

Activity	Visit	Obesity	Diabetes	Hypertension	Cancer
Nutritional assessment	Initial (as necessary on follow-up)	▲	▲	▲	▲
Laboratory Evaluation	Initial and then periodic, as indicated	▲	▲	▲	▲
Review medical history	All	▲	▲	▲	▲
Set treatment goals	Initial (review as necessary)	▲	▲	▲	▲
Develop care plan	Initial	▲	▲	▲	▲
Implement	All	▲	▲	▲	▲
Set short term goals	Initial	▲	▲	▲	▲
Plan follow-up care	Initial Ongoing	▲	▲	▲	▲
Evaluate progress/outcomes	All follow-up visits	▲	▲	▲	▲
If goals are met: • *reinforce good points, frequency of visits may be reduced depending on the degree to which goals are being met*					
If goals are not met: • *re-assess/encourage client* • *revise management plan*					
Document	**All**	▲	▲	▲	▲

Protocol for the Nutritional Management of Obesity in Adults

Protocol for the Nutritional Management of Obesity in Adults

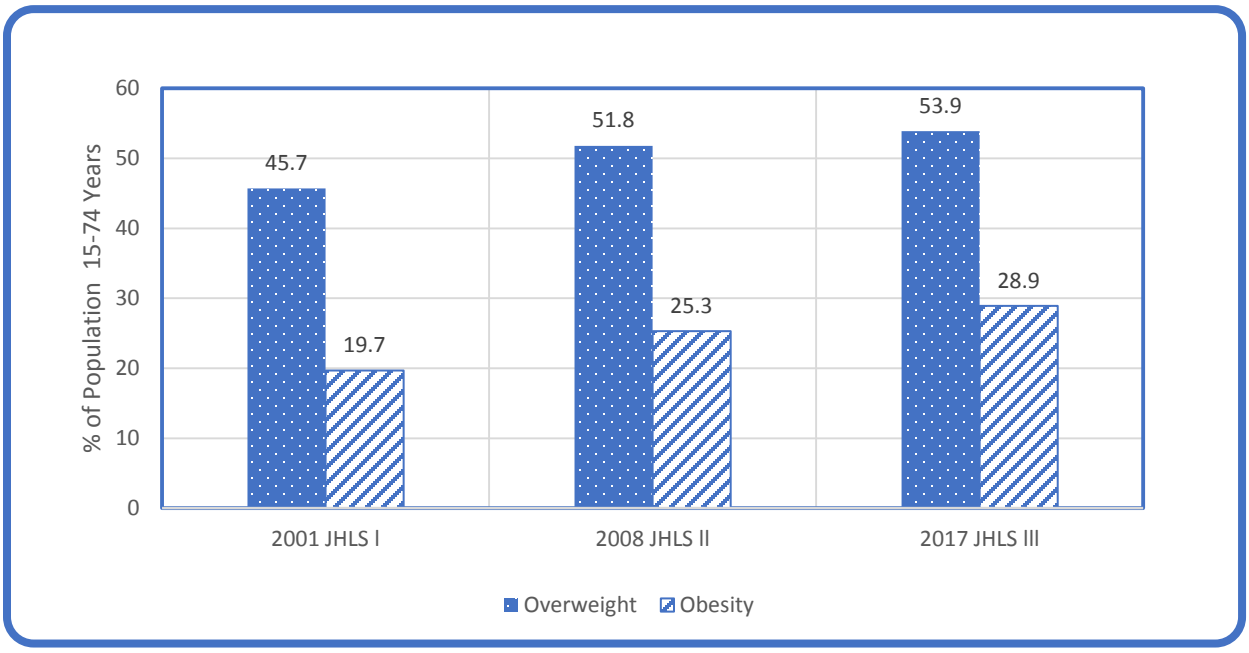
Background

Overweight and obesity are conditions defined as abnormal or excessive accumulation of body fat that may impair health. A BMI above 25 kg/m^2 is classified as overweight while BMI of 30 kg/m^2 and above indicates obesity [7]. Overweight and obesity are major risk factors for chronic diseases such as diabetes, cardiovascular diseases and cancer. Worldwide, the prevalence of obesity has nearly tripled since 1975. In 2016, it was estimated that 39% (1.9 Billion) of adults were overweight of which, 13% (650 Million) were obese [12].

In the LAC region approximately 360 million people (58%) are overweight while obesity affects 140 million or 23%. Among CARICOM countries (excluding Haiti) more than half of their population of is overweight and over 20% is obese. The increase in obesity has disproportionately affected females as the rate of obesity among women is 10% higher than that of men [13]. Obesity The epidemic of overweight and obesity has resulted in a high burden of chronic diseases and is the underlying cause of most deaths in the Caribbean. These health problems threaten to overwhelm the health systems and retard the overall health and economic development of the region [14].

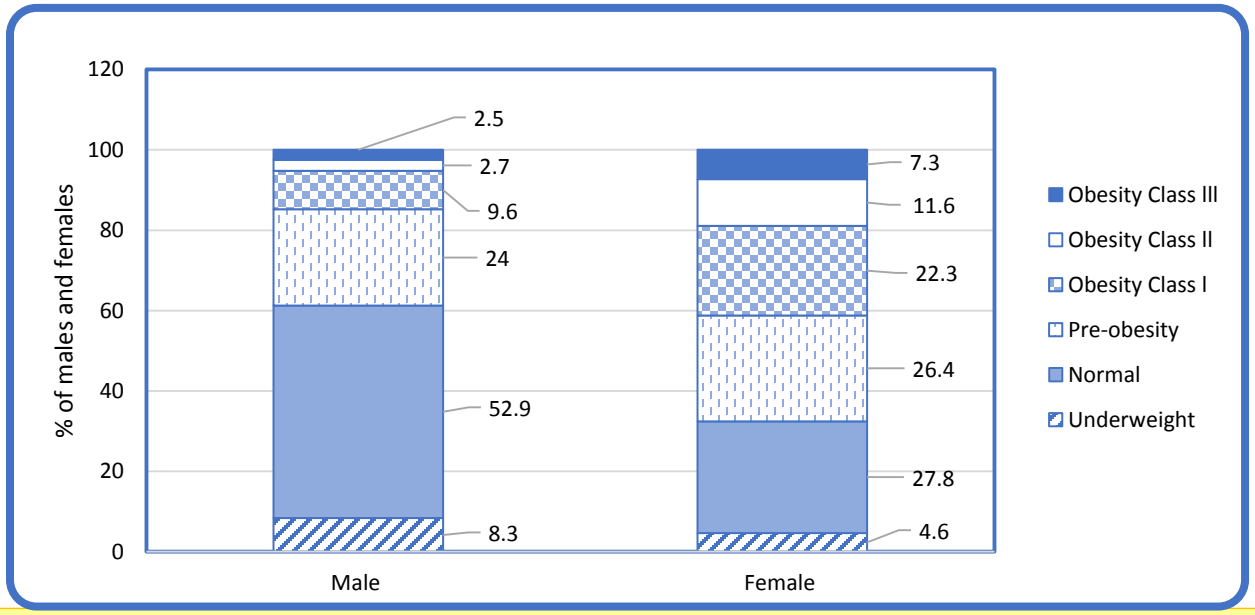
According to the Jamaica Health and Lifestyle Survey (JHLS III), conducted 2016-17, one in two or 54% of Jamaicans were classified as overweight and the prevalence of overweight and obesity was highest among persons 35-64 years old. Figure 4 shows the trend in overweight and obesity among Jamaicans 15-74 years old. The prevalence of overweight and obesity has increased by eight and nine percent respectively over the sixteen-year period 2001-2017 [15].

Figure 4: Trends in overweight and obesity among Jamaicans 15-74 years - 2001, 2008, 2017.



In the JHLS lll more females than males were overweight and obese in all age categories between 15-74 years. Figure 5 shows the percentage distribution by weight classification in both males and Females. Two-thirds of female aged 15 years or older has been classified as either overweight or obese [15].

Figure 5: Distribution of Nutrition status by gender



The causes of obesity are multifactorial. Metabolic, genetic, environmental, cultural, sociological, psychological and behavioural factors offer some explanation, but the complete aetiology remains unknown. It is agreed however that a fundamental cause of overweight and obesity is a long-term energy imbalance between calories (food energy) consumed and calories expended. Globally there has been a change in dietary and physical activity patterns which are due to environmental and societal changes that accompany development. People are less physically active due more sedentary forms of activities and work, changes in the mode of transportation and increased urbanization [12] [15].

In the Caribbean region there is an increased availability and consumption of foods that are energy-dense and nutrient-poor (EDNP). Half of CARICOM countries import more than 80% of the food they consume. As food imports rise steadily, there have been notable declines in the production of fruits and vegetables. Diets in the region have shifted from locally grown staples, fruits, vegetables, legumes, and limited foods of animal origin, to ultra-processed foods and beverages that are high in fats, oils, sugar, and sodium and more foods of animal origin.

The first line of defence against overweight and obesity is prevention. This requires the input of all stake holders. Policy makers creating the right environment and individuals making the right choices. Policies that facilitate the creation of safe, accessible spaces for physical activity and allows for availability and access to affordable healthy foods will help to make the healthier choice the easier choice.

When overweight and obesity are already issues, effective weight management strategies must be implemented. This involves a careful balance of nutrient intake, physical activity, behaviour modification and a positive attitude toward achieving appropriate body weight. The overall aim should focus on achieving good health as the same eating and physical activity habits that support a healthy lifestyle often achieve appropriate body weight.

Objectives of Obesity Management in Adults

The nutritional management of obesity, in adults, seeks to achieve the following objectives:

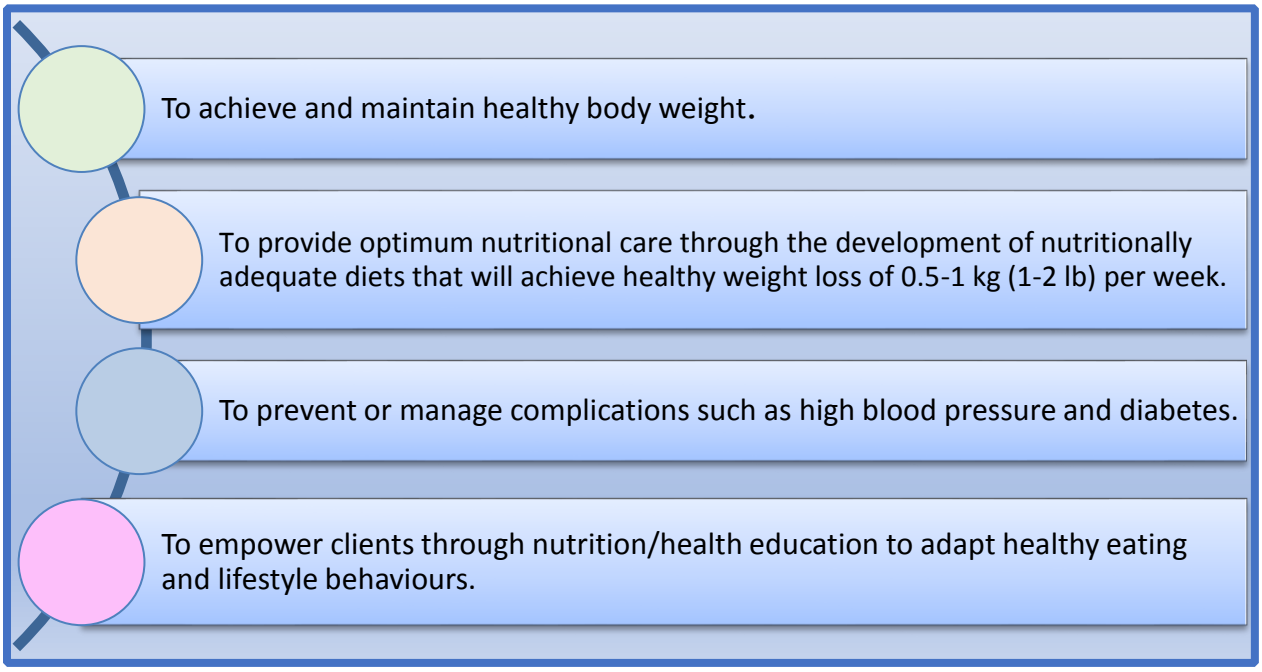
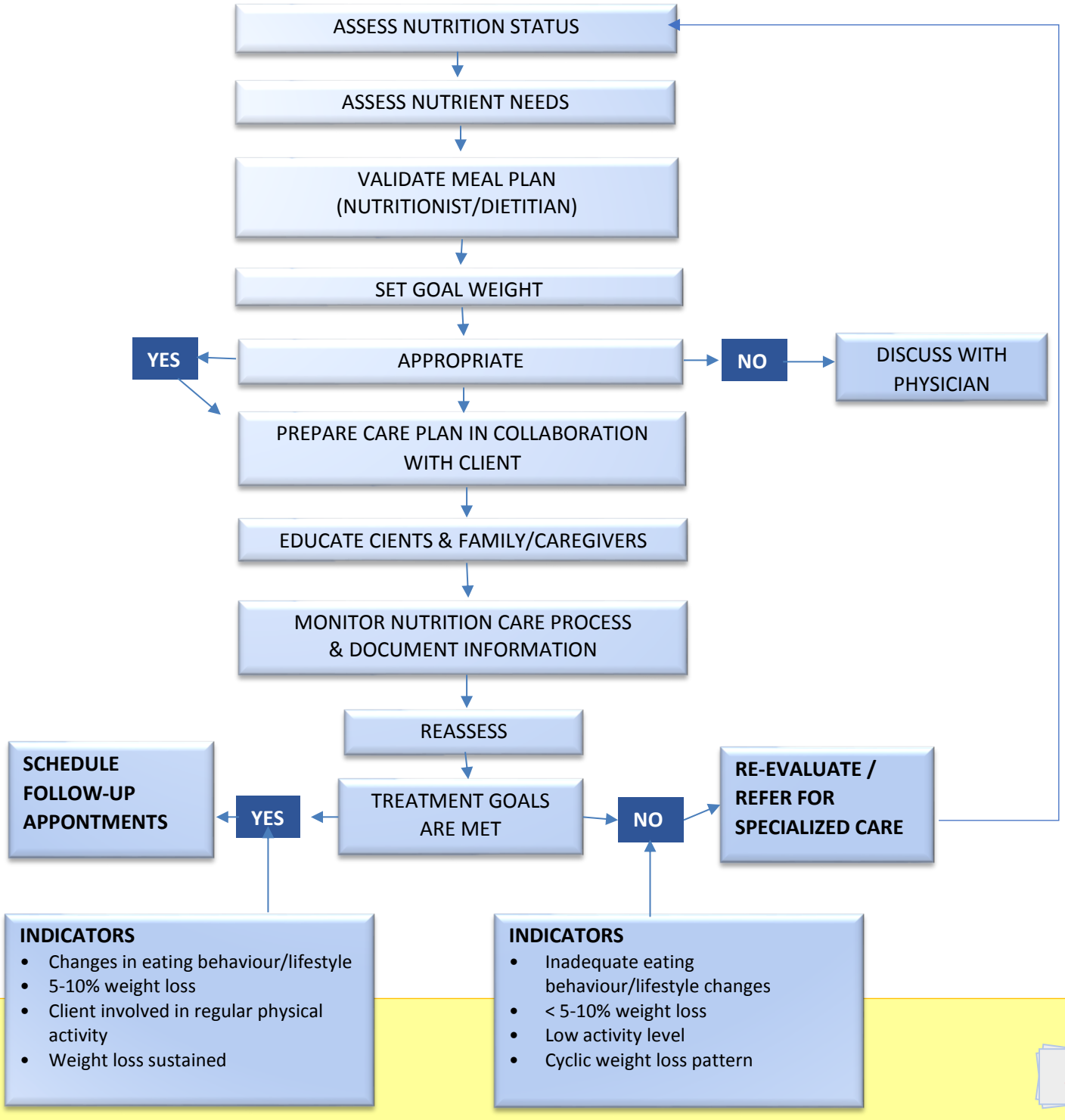


Figure 6 outlines the Critical path for the nutritional management of overweight and obesity in adults.

Figure 6: Critical Pathway for the Nutritional Management of Overweight and Obesity



Recommendations for the Nutritional Management of Adult Obesity

1. Determine the level of obesity and the specific intervention needs of the client after assessment.
2. Develop a weight loss programme with the input of the client. This therapy may take time, as weight loss is a slow process

    * Set realistic goals. Assist the client to set his/her own short, medium- and long- term goals. A realistic goal is a loss of 5-10% of initial body weight at a rate of 0.5 - 1 kg (1-2 lbs.) per week. There is no magic food that will achieve and maintain weight loss.
    * Provide individualized nutrition education and counselling. Give tips on, portion control; how to choose foods that are lower in calories; shopping and reading food labels; methods of food preparation and eating out.
    * Develop a dietary plan:
        ~ Avoid severe dietary restrictions. Very low-calorie diets may lead to reduced Resting Energy Expenditure (REE) and affect the rate of weight loss. Caloric intake less than 1200 calories will require strict clinical supervision.
        ~ Distribute calories over approximately six meals for the day, including snacks, to prevent over-eating. Where this is not possible, work within the client's schedule of activities. Discourage the skipping of meals.
        ~ Decrease the intake of high calorie foods, sugar sweetened beverages (SSB's) and ultra-processed foods.
        ~ Recommend adequate fluid intake. If there is fluid retention, decrease sodium intake.

Safe Weight Loss

Achieving weight loss is not usually easy especially in the obese individual and not many of those who lose weight are able to maintain the weight loss. The following should be considered for safe and practical weight loss that can be maintained.

During weight loss, ~ 20 kcal/kg (10 kcal/lb) of current weight is needed to spare lean body tissue while losing fat.

To achieving weight loss of 0.5 - 1kg (1-2 lbs)/week *a reduction of 500 kcal/day from present caloric intake is required. This reduction of 3500 kcals/week translates to 0.5 kg (1 lb) of fat. It will usually take about three months to see the real effects of this intervention.*

- ~ Increase the fibre content of the diet (fruits, vegetables, legumes and soluble fibres).

3. Recommend lifestyle changes that will facilitate weight loss.
    - * Encourage regular physical activity according to doctor's recommendations and client's preference.
    - * Encourage adequate sleep. Sleep deprivation disrupts the hormone that controls appetite leading to overeating.
4. Promote self-management
    - * Keeping food diaries
    - * Monitoring and recording body weight on a monthly basis
5. If client is pregnant and obese adhere to standard guidelines for weight gain in pregnancy. See Appendix XI [16].
6. Schedule follow-up appointments to monitor progress and monitor weight using the same scale.

Recommendations for Physical Activity (PA)

An effective weight management programme includes increased daily physical activity and exercise which complement dietary measures. While exercise does not necessarily reduce body weight, body fat is reduced, and basal metabolic rate is increased during and after exercise.

Clients are more likely to exercise if the activity is enjoyable. The type, duration and frequency should be tailored to individual ability, health status and personal preference.

The programme should be a combination of aerobic and resistance training. Aerobic exercises strengthen the cardiovascular system while resistance training increases bone mineral density and lean body mass which helps the body to utilize more energy. Options include,

Physical Activity Do's for Clients

The impact of exercise on weight control is based on the client's ability to engage in adequate levels of activity, frequently.

The client should start slowly with regular but low intensity exercise. Gradually increase intensity and duration with weight loss.

The minimum level recommended is 45-60 minutes of moderate-intensity physical activity, most days of the week or 20-30 minutes of high intensity activity 4-7 days/week.

Adhere to physician's guidance regarding intensity, duration and mode of exercise.

Include PA into everyday lifestyle activities (taking stairs, chores, parking at a distance and walking, etc.)

Self-monitor by keeping a physical activity diary and doing regular weigh-ins to track progress.
[40]

but are not limited to, swimming, brisk walking, jogging and playing games, such as soccer and cricket.

Consistency is the key to realizing the benefits from exercise. When planning a physical activity programme consider barriers that will affect compliance and adoption of physical activity behaviours. Select activities that are pleasant, affordable, available and easy to do. Encourage clients to exercise with friends and family. Programmes that are supervised or done in groups tend to yield better results in the long-term. Encourage clients to make physical activity a part of their lifestyle, this will help them to maintain the weight loss [5].

Clients are likely to experience other benefits such as:

- Reduced blood pressure
- Stabilized blood glucose levels
- A feeling of wellbeing.

See Appendix XII for WHO Physical Activity Guidelines

Guidelines for Promoting Self-Management

1. Develop a weight loss programme with the input of the client and family. Remind them that therapy takes time and that weight loss is a process.
2. Provide guidance to client and caregivers/family on how to maintain a proper diet.
3. Encourage the preparation of home-made lunches for work.
4. Provide tips on choosing and preparing low calorie foods, portion control and eating out.
   - Provide education on the reading of food labels, using food exchange lists
   - Prepare for or avoiding situations that may triggers over-eating and discuss with care provider
   - Choosing methods of preparation that do not add calories
5. Encourage eating behaviours that will facilitate weight loss. These include:
   - Modifying meals times
   - Chewing food properly and eating slowly
   - Substituting low calorie alternatives for high calorie foods
   - Reducing portion sizes but warn against extreme behaviours that could lead to eating disorders.
6. Help clients to develop techniques that will help them to reduce snacking and binging.
7. Discourage fad dieting which can lead to a weight fluctuation that may demotivate the client and make weight loss more difficult.

8. Encourage aerobic exercises to increase energy output. Participating in moderate physical activity for most days of the week for at least 1 hour each day
9. Establish self-monitoring techniques
   - Keeping food diaries. Record foods consumed and situations that encourage unhealthy eating. This is useful in identifying triggers and sources of excess calories.
   - Monthly weigh-ins and recording of body weight.

Protocol for the Nutritional Management of Childhood and Adolescent Obesity

Protocol for the Nutritional Management of Childhood & Adolescent Obesity

Background

Obesity among the adolescent and paediatric population has reached epidemic proportions globally. Overweight and obesity in children under five years of age is indicated by weight-for-height/length above two and three standard deviations of the WHO Child Growth Standards median. In children five to nineteen years of age the indications are BMI-for-age above one and two standard deviations of the WHO Child Growth Reference median. In 2016, it was estimated that over 340 million children and adolescents aged 5-19 and 41 million children under the age of 5 were overweight or obese. Obese children 5-19 years have increased ten-fold in the last four decades from 11 million in 1975 to 124 million in 2016. If the current trend continues it is projected that the global levels of child and adolescent obesity in this age group will surpass the number of those moderately and severely underweight by 2022 [12].

The Caribbean is also facing a double burden of under- and over-nutrition as the evidence indicates that there is a significant and growing problem of overweight and obesity among its children and adolescents even as stunting, wasting, and micronutrient deficiencies continue to occur. This double burden is fuelled by factors such as falling rates of breastfeeding, unhealthy eating patterns, sedentary lifestyles, and advertising and promotion of unhealthy diets. In 2012 the estimated prevalence of overweight among children under five in LAC countries was 7.2%. Fourteen countries including Jamaica had a prevalence above that regional average. The increased availability and consumption of ultra-processed foods that are energy-dense and nutrient-poor (EDNP) has been linked with the prevalence of obesity in the Region [13].

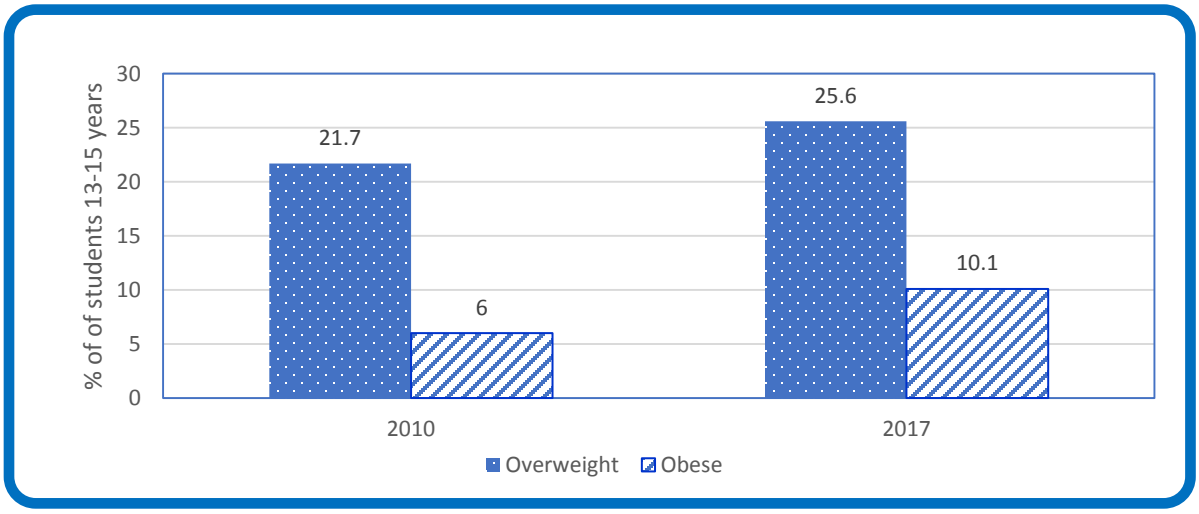
The rise in childhood overweight and obesity is associated with higher consumption of those foods and the concomitant decrease in the intake of fruits, vegetables, and water even in the school environment where unhealthy eating is facilitated with the provision of school meals that are high in fats, sugars and sodium. As a result of this transition the rates of childhood overweight and obesity in the region are staggering and among the highest in the world. Caribbean countries are reporting prevalence rates between 28% and 35% for childhood overweight and obesity and

during the decade 2001–2010, the prevalence of overweight in children less than 5 years old rose from 6% to 14% [15] [13].

The situation in Jamaica is similar. In 2013 a prevalence study carried out in one regional health authority found that overweight and obesity prevalence among children six to ten years old was 10.6% and 7.1% respectively and that prevalence was significantly higher among girls than boys [17].

The WHO Global School-based Student Health Surveys (GSHS) of 2010 and 2017 indicate that the percentage of adolescents 13-15 years who were classified as either overweight or obese increased by 4 percentage points over the seven-year period. Those classified as overweight increased from 21.7% to 25.6% while the obese increased from 6% to 10.1% [18] [19].

Figure 7: Percentage of 13-15-year old's Overweight and Obese, Jamaica 2010, 2017



The 2017 survey also indicates that among 16 and 17-year olds the prevalence of overweight and obesity was 20.5% and 8.2% respectively. The prevalence among adolescents in all the age categories 13- 17 years was 23.4% overweight and 9.2% obese. There was a higher prevalence of overweight and obesity among girls for all age categories except 13-15year olds where the percentage of obese males was 10.3% compared to 9.9% in females. A higher percentage of males from all the age categories also reported consuming one or more soft drinks per day [19].

Obesity can affect children's immediate health, educational attainment and quality of life as it undermines their physical, social and psychological well-being and is a known risk factor for adult obesity and non-communicable diseases. They also face issues such as stigmatization and bullying. Left unchecked, overweight and obesity threaten to undermine the health of entire generations and reverse development gains across the region. The problem will not be solved through individual action or by a single intervention. Successfully dealing with the challenge

requires a coordinated, comprehensive, multi-sectoral response that builds on existing national plans, policies and programmes. This includes tackling the obesogenic environment, improving primary health care services and addressing vital elements in the life course. These responses require government commitment and leadership, long-term investment and engagement of the whole society, to protect the rights of children to good health and well-being [15] [20] [13].

It is important to establish good nutrition and physical activity behaviours that reduce the risk of developing obesity during the first years of life. For example, breastfeeding exclusively for the first six months, and the timely introduction of appropriate complementary foods will enhance infants' nutrition status, growth and development.

Primary health-care services are important for the early detection and management of obesity and its complications. Regular growth monitoring at primary health care facilities is the first line of defense as it helps to identify children at risk of becoming obese, provide health and nutrition education that will empower families and individuals in making healthy knowledge-based choices [20].

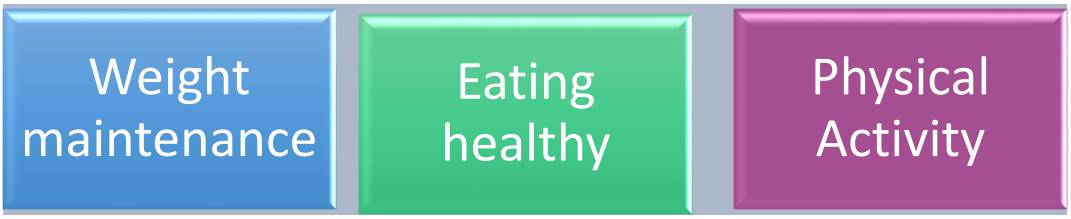
Goals of the Nutritional Management of Obesity in Children and Adolescents

It is not recommended that children be placed on reduced-calorie diets. If obese children and adolescents are exposed to rigorous dieting this may negatively affect growth and metabolism and could put them at risk of developing complications such as anorexia nervosa and bulimia.

Set treatment goals that focus on healthy eating, increasing physical activity and weight maintenance or a slowing of the rate of weight gain which will give them time to "grow into" their weight. If children are at the weight appropriate for anticipated adult height, then set the goal of maintaining that weight for the remainder of the growth period. If they are beyond their anticipated adult weight, then set a goal for yearly, incremental weight loss until they have reached their optimal adult weight. Children who are required to lose weight will need more family support. Prepare the client and family members for a long-term intervention which will span the remainder of the growth period.

For adolescents the health care provider has the additional task of helping them to develop a positive self-image and coping skills that will equip them to deal with the challenges of adolescence. Another goal of successful management is size acceptance within the context of eating healthy and being active.

Adolescents may have the desire to lose substantial amounts of weight in a short time. Guide them in establishing realistic goals based on small incremental losses. In managing obese adolescents, who are growing rapidly it is wiser to help them develop a plan to maintain current weight. If the adolescent has achieved maximum height it would be preferable to focus on stopping weight gain, start losing weight, and maintenance. See Appendix XIII for details of this three-step approach [5] [21].



Objectives of Obesity Management in Children and Adolescents

The nutritional management of obesity, in children and adolescents, seeks to achieve the following objectives:

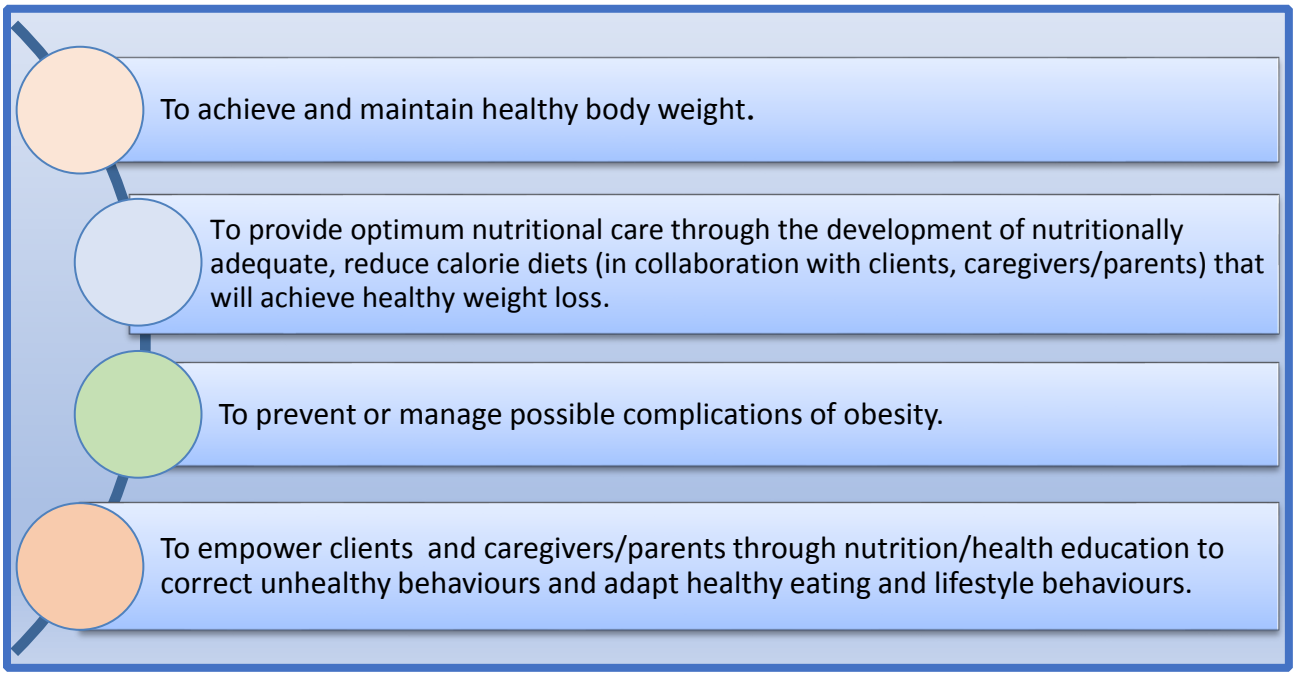
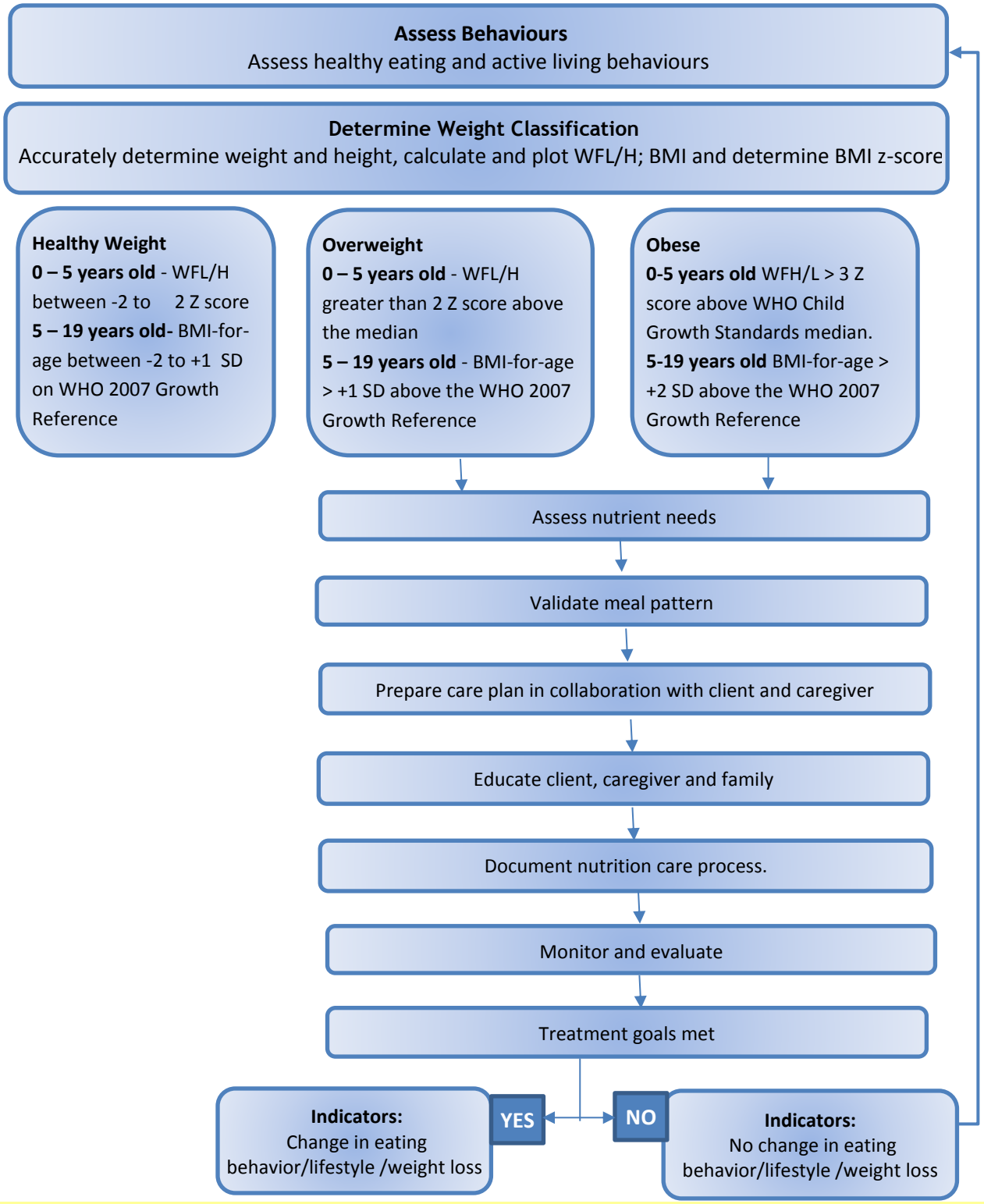


Figure 8 outlines the Critical path for the nutritional management of childhood overweight and obesity.

Figure 8: Critical Pathway for the Nutritional Management of Childhood Overweight and Obesity



Recommendations for the Nutritional Management of Childhood and Adolescent Obesity

When infants, children and adolescents present at primary health care facilities adequately trained health workers should:

1. Provide general counselling on nutrition and physical activity to the caregivers of overweight children and adolescents, schedule follow-up visits for monitoring and recommend the following:

   - Exclusive breast-feeding for infants, from birth to six months and continued breast feeding for up to two years or beyond with appropriate introduction of complementary foods.
   - Prevent the consumption of calorie-dense, nutrient-poor foods by limiting access to them
   - Develop healthy sleep patterns in children and adolescents to decrease the likelihood of developing obesity due to changes in caloric intake and metabolism related to disordered sleep
   - Balance screen time and other sedentary activities with physical activity.
   - Enlist the entire family in efforts aimed at obesity prevention

2. Assess obese children and adolescents and develop an appropriate management plan. If health workers are not adequately trained refer the client should to another clinic or local hospital [22]l.

   - Determine the nutritional status of the child/adolescent using WHO growth standards (children under 5 years) or growth reference (5-19 years).
   - Determine the specific intervention needs of the client
   - Provide individualized nutritional counselling.
     - < 5 years – nutrition counseling is provided to caregivers
     - 5 – 18 years – counseling should be directed to client in the presence of caregivers

- Set realistic goals: assist the client to set his/her own short, medium- and long- term goals.
- Distribute calories, schedule meals over several meals to prevent over-eating. Where this is not possible, work within the client's schedule of activities.
  - ~ 2 – 18-year-old: distribute calories over six meals for the day, including snacks
  - ~ 0 -2-year-old: three main meals and two snacks.
- Plan nutritionally adequate and balanced meals that accommodates the client's preferences where possible
  - ~ Increase the fibre content of the diet to encourage longer chewing, create more bulk. Include foods such as fruits, vegetables and legumes.
  - ~ Decrease the intake of high-calorie and ultra-processed foods, SSBs, foods high in fats, sugar and cholesterol. Recommend low-calorie alternatives.
  - ~ Provide adequate fluids to aid excretion
  - ~ Avoid severe dietary restrictions, since very low-calorie diets may lead to reduced Resting Energy Expenditure (REE) and affect the rate of weight loss.
    - * If a reduced calorie diet is prescribed for an adolescent the reduction should start slowly at ~ 300 kcal
- Schedule follow-up appointments to monitor progress and monitor weight using the same calibrated scale at all visits.
- Complement diet with regular physical activity according to doctor's recommendations and client's preference.
- Encourage the caregivers to participate in a support group and facilitate family involvement.

Adolescent Obesity Management

During assessment try to identify signs of yo-yo dieting and address it in nutrition counselling.

Be mindful of the physical, emotional and social problems they might be facing.

Look for signs of anorexia nervosa and bulimia.

Use counselling sessions to help them develop a positive self-image and coping skills that will help them deal with challenges.

Dispel illusions of extensive weight loss over a short time. Help them establish realistic long-term goals for incremental losses.

Introduce the Food Based Dietary Guidelines as a guide to healthy living. Encourage them to follow its suggestions.

Self-monitor by keeping a record of all intake and physical activity. Solicit the help of parents to ensure consistency.

If a reduced-calorie diet is prescribed the reduction should start slowly at ~ 300 kcals less than what the adolescent is currently consuming. This can be accomplished by making small dietary changes such as switching to skim milk, using low fat milk products, and reducing or eliminating consumption of SSBs, butter and margarine [21].

Utilize the *'Training Course on Child Growth Assessment; WHO Child Growth Standards (Module D)'* and *Job Aid-aid: Investigating Causes of Overweight*; 2008 in counseling children 0-5years old.

Guidelines for Promoting Self-Management

1. Develop a weight loss programme with the input of the client and family. Remind them that therapy takes time and that weight loss is a process.
2. Provide guidance to client and caregivers/family on how to maintain a proper diet.
3. Share innovative ways of including fruits and vegetables in meals and snacks with caregivers
4. Help young children to identify healthy and unhealthy snacks
5. Encourage the preparation of home-made lunches and snacks for school.
6. Provide tips on choosing and preparing low calorie foods, portion control and eating out.
   - Provide education on the reading of food labels, using food exchange lists
   - Prepare for or avoiding situations that may triggers over-eating and discuss with care provider
   - Choosing methods of preparation that do not add calories
7. Encourage eating behaviours that will facilitate weight loss. These include:
   - Modifying meals times
   - Chewing food properly and eating slowly
   - Substituting low calorie alternatives for high calorie foods
   - Reducing portion sizes but warn against extreme behaviours that will lead to conditions such as anorexia nervosa and bulimia.
8. Help clients to develop techniques that will help them to reduce snacking and binging.
9. Discourage fad dieting which can lead to a weight fluctuation that may demotivate the client and make weight loss more difficult.
10. Encourage aerobic exercises to increase energy output. Participating in moderate physical activity for most days of the week for at least 1 hour each day
11. Establish self-monitoring techniques
    - Keeping food diaries. Record foods consumed and situations that encourage unhealthy eating. This is useful in identifying triggers and sources of excess calories.
    - Monthly weigh-ins and recording of body weight.

Recommendations for Physical Activity

Non-active leisure activities such as playing computer and video games and watching television are linked to the prevalence of obesity among children and adolescents. Suggest how sedentary activities can be reduced and substituted with calorie burning activities.

Recommend at least 60 minutes of structured activities and several hours of free play every day. For children and adolescents, physical activity includes family, school, and community activities such as regular play, games, sports, chores, recreation, physical education, or other planned exercise. The recommended 60 minutes of moderate - to vigorous-intensity physical activity will improve cardiorespiratory and muscular fitness, bone health, and cardiovascular and metabolic health [23].

Remind clients and caregivers that the recommended duration can be accumulated by performing activities in multiple shorter bouts spread throughout the day. If children are currently doing no physical activity, starting with an amount below the recommended levels will be beneficial. Duration, frequency and intensity can be gradually increased over time.

Protocol for the Nutritional Management of Diabetes Mellitus

Protocol for the Nutritional Management of Diabetes Mellitus

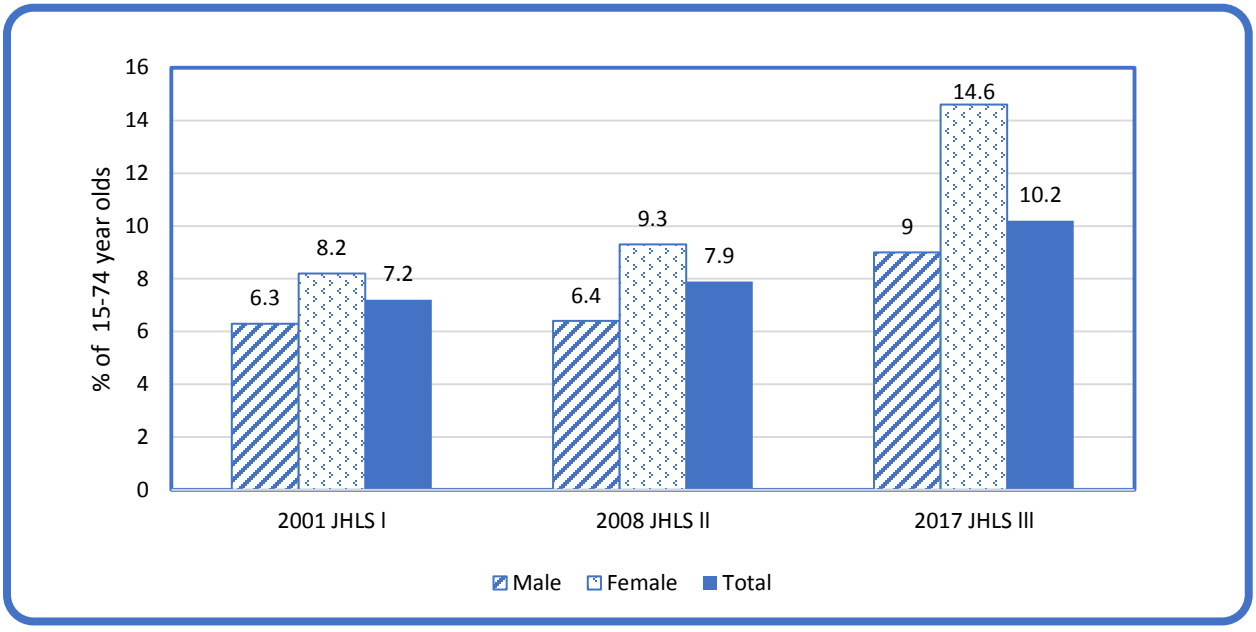
Background

Diabetes mellitus is a metabolic disorder characterized by elevated blood glucose levels resulting from defects in insulin secretion and/or uptake. In 2017 it was estimated that worldwide, 451 million people between 18-99 years were living with diabetes and it is projected that this number will increase to 693 million by 2045. Other estimates indicate that 50% of people living with diabetes are undiagnosed, 374 million people had impaired glucose tolerance (IGT) and over 20 million live births were affected by gestational diabetes. Diabetes is a burden on the world's human and financial resources as global healthcare expenditure on people with diabetes were then estimated at USD 850 billion and approximately 5 million deaths of persons between 20-99 years was attributed to the disease [24].

In 2014 CARICOM countries had an average prevalence of 11.2%. The territories reporting the highest rates were St. Kitts and Nevis (13.9%), Trinidad and Tobago (13.7%) and Barbados (13.3%). The country with the lowest prevalence was Haiti (9.2%). The prevalence was higher among women (12%) than men (10.4%) [25].

According to the Jamaica Health and Lifestyle Survey (III), conducted 2016-17, one in eight Jamaicans were diabetic but only 42% of these persons were aware of their condition. The percentage of persons classified as having pre-diabetes was 12% with the prevalence rate among men and women being 10.7% and 13.3% respectively. Jamaican women therefore have a higher risk of developing diabetes. Figure 9 shows the trend in prevalence among Jamaicans 15-74 years for the period 2001-2017. While prevalence in this age group has increased by three percent over 16 years, prevalence among its women increased by over six percent [26] [27].

Figure 9: Prevalence of Diabetes among Jamaicans 15-74 years (2001, 2008, 2017)



Diabetes develops when insulin is absent, not secreted in adequate amounts or there is insulin resistance (that is, insulin is not used properly by the target tissues). There may also be a combination of these factors. As a result, the body is not able to properly metabolize the macro-nutrients (carbohydrates, fats and proteins) in the normal way and effectively convert glucose into energy as a result high levels of glucose accumulate in the blood and spill into the urine. This can result in several complications involving long-term damage, dysfunction and failure of various organs including the eyes, kidneys, nerves, heart and blood vessels.

Several symptoms can indicate the presence of hyperglycaemia. These include polyuria, polydipsia, polyphagia, weight loss, blurred vision, itching and susceptibility to certain infections. In children, there may be growth impairment. Some persons are asymptomatic and are diagnosed at health screening sessions or when they seek medical care for other problems. Some acute life-threatening consequences are associated with diabetes these include hyperglycaemia with ketoacidosis or the non-ketotic hyperosmolar syndrome, both of which can lead to coma.

Classification of Diabetes

Diabetes mellitus is classified into the following general categories:

Type 1 Diabetes Mellitus (DM)

Type 1 DM results from cellular-mediated autoimmune destruction of beta cells on the pancreas. This leads to absolute insulin deficiency and accounts for 5–10% of individuals with diabetes. The rate of beta cell destruction varies but is usually more rapid in infants and children. Type 1 DM is more common in younger persons but can occur at any age. There is little or no insulin secretion, therefore individuals with this type of diabetes must rely on external sources of insulin for survival. Clients with Type 1 DM are usually prone to ketoacidosis (the accumulation of ketone bodies) and have an increased risk of developing very fine blood vessel (microvascular) and large blood vessel (macrovascular) complications. Some clients, particularly children, may present with ketoacidosis at diagnosis. Beta cell destruction is determined genetically and is also related to some environmental factors, which are not clearly defined. Type 1 diabetics are rarely obese; however, the presence of obesity is not incompatible with the disease. Some forms of Type 1 DM have no known cause.

Type 2 Diabetes Mellitus (DM)

Type 2 DM refers to a condition characterized by insulin resistance and relative rather than absolute insulin deficiency. It accounts for approximately 90–95% of all persons living with diabetes. It was previously a disease common among adults however in recent time an increasing number of children are being diagnosed. These children are usually obese. Most persons with this type of diabetes do not need insulin treatment to survive but some may require short-term insulin therapy to stabilize the disease, especially in periods of stress, pregnancy or surgery. For many persons with Type 2 DM, especially those who are obese, diet and exercise to achieve

Diabetic Complications

Diabetic ketoacidosis: *is a complication characterized by hyperglycaemia and the presence of ketones in the blood and urine. The ketones are formed as a result of the body using fat instead of glucose for energy.*

Hyperglycaemia *a complication of diabetes, characterized by high blood sugar levels cause by no insulin or insulin resistance.*

Hypoglycaemia: *a complication of diabetes, characterized by abnormally low blood sugar levels, which can lead to cognitive impairment, seizures, loss of consciousness, coma and even death.*

Ketosis: *metabolic condition in which ketone bodies are produced more rapidly than they are used.*

Polydipsia: *excessive thirst usually accompanied by prolonged dryness of the mouth.*

Polyphagia: *excessive hunger or increased appetite.*

Polyuria: *frequent urination*

weight loss are the main lines of therapy. Medications should only be introduced when these measures do not achieve the desired results.

Hyperglycaemia develops gradually and may not be diagnosed for several years. The specific aetiologies are not known but there is no autoimmune destruction of beta cells. Persons with Type 2 DM are not usually prone to ketoacidosis but are at increased risk for macrovascular and microvascular complications. Obesity, age, lack of physical activity and genetic pre-disposition, increase the risk of developing Type 2 DM. It occurs more frequently in women with previous history of gestational diabetes. Weight loss and/or pharmacological treatment of hyperglycaemia may improve insulin resistance.

Gestational Diabetes Mellitus (GDM)

Hyperglycaemia which begins or is first recognized in pregnancy is diagnosed as GDM. The usual window for diagnosis is between 24-28 weeks gestation. Women with this condition are at greater risk of adverse pregnancy outcomes such as pre-eclampsia, macrosomia and shoulder dystocia. The hyperglycaemia resolves after pregnancy but the women are more likely to develop DM in later life. Women who are obese; have glycosuria, a previous history of macrosomia or gestational diabetes and a strong family history of diabetes are especially susceptible. Management usually includes lifestyle changes (diet and exercise) followed by oral glucose lowering agents and insulin if necessary [28].

Complications of Pregnancy

Macrosomia: *is the term used to describe neonates who are significantly larger than average, having a birthweight more than 4 kg (8 lbs 13 oz) regardless of gestational weight.*

Shoulder dystocia: *a complication of labour/delivery. It occurs during vaginal birth when a baby's head passes through the birth canal and the shoulders become stuck in the mother's pelvis.*

Eclampsia *is the development of seizures in a woman with severe preeclampsia.*

Preeclampsia i*s a condition of pregnancy characterized by high hypertension and protein in the urine.*

Diabetes Mellitus in Pregnancy

Severe hyperglycaemia first detected in pregnancy is classified as diabetes mellitus in pregnancy and unlike GDM, it does not resolve after pregnancy. The

principles of management are similar to that used with known diabetics, especially when diagnosed early in pregnancy [28].

Diagnosis of Diabetes Mellitus

The criteria suggested by The World Health Organization (WHO) Expert Committee on the Diagnosis and Classification of Diabetes Mellitus (2000) outline three ways to diagnose the disorder. They are outlined in Figure 10. Tests used for the diagnosis of DM and cut-offs can be found in Figure 11.

DM Definitions

Blood/Plasma glucose level is the concentration of glucose in the blood at a single point in time (the moment of test).

HbA1c: refers to glycated haemoglobin, formed when glucose attaches to haemoglobin. It reflects average glucose concentration over approximately 3 months. It is an indicator of diabetes control [37].

Figure 10: Criteria for the Diagnosis of Diabetes Mellitus

Criteria for the Diagnosis of Diabetes Mellitus

1		2		3
Symptoms of diabetes ^ plus Random casual plasma glucose concentration* >200mg/dl (11.1mmol/L).	or	Fasting Plasma Glucose (FPG) ** > 126 mg/dl (7.0mmol/L).	or	2-hr PG >200mg/dl (11.1 mmol/L) during an Oral Glucose Tolerance Test (OGTT)^^

^ Classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss
** Casual refers to any time of day without regard to time since last meal.*
***Fasting is defined as no caloric intake for at least 8hours*
^^The test should be performed using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water.

Each test must be confirmed, on a subsequent day, by any one of the three methods.

Figure 11: Diagnostic Tests and Cut-off for Diagnosis

Diagnostic Criteria for Diabetes & Intermediate Hyperglycemia (Tests & Cut-off points)

Diabetes

Fasting plasma glucose: ≥ 7.0 mmol/L (126mg/dl)
or
2-h plasma glucose: ≥ 11.1mmol/L (200mg/dl)*
or
HbA1c ^: > 6.5% (48mmol/L)

Impaired Glucose Tolerance (IGT)

Fasting plasma glucose: > 7.0 mmol/L (126mg/dl)
and
2-h plasma glucose: ≥ 7.8 and > 11.1 mmol/L (140mg/dl and 200mg/dl)

Impaired Fasting Glucose (IFG)

Fasting plasma glucose: 6.1 to 6.9 mmol/L (110mg/dl and 125mg/dl)
and if measured
2-h plasma glucose: > 7.8 mmol/L (140mg/dl

Gestational Diabetes

Fasting plasma glucose: > 5.1-6.9 mmol/L (92-125mg/dl)
or
1-h plasma glucose: ≥ 10 mmol/L (180 mg/dl) following OGTT
2-h plasma glucose: 8.5 - 11.1 mmol/L (153-199mg/dl) following OGTT

Fasting is defined as no caloric intake for at least 8 hours.
**Venous plasma glucose 2 hours after ingestion of 75g anhydrous glucose dissolved in water.* If *2 hours plasma glucose is not measured, status is uncertain as diabetes or IGT cannot be excluded.*
^HbA1c test should be performed in a laboratory using a method that is NGSP-certified and standardized to the Diabetes Control and Complications Trial assay.*
**(NGSP- National Glycoheamoglobin Standard Programme)*
Source: **[49]**

Definitions of Future Risk

Insulin Resistance: impaired sensitivity to either exogenous or endogenous insulin

Intermediate Hyperglycaemia/ Prediabetes: blood glucose levels higher than normal, but not high enough to be diagnosed as diabetes; sometimes referred to as IGT or IFG depending on the test used to detect it.

Impaired Fasting Glucose (IFG): is a risk factor for future diabetes associated with impaired glucose secretion and impaired suppression of hepatic glucose output. It is the zone between the upper limit of a normal fasting blood glucose and the lower limit of the diabetic fasting blood glucose.

Impaired Glucose Tolerance (IGT): is a risk factor for future diabetes associated with muscle insulin resistance and defective insulin secretion, resulting in less efficient disposal of glucose during an OGTT.

Gestational Diabetes: *is* hyperglycaemia first detected at any time during pregnancy *[49] [5].*

Goals of Nutritional Management of Diabetes

Nutrition therapy is an integral component of successful diabetes management and has remained one of the most challenging aspects of care due to the complexity of nutrition issues. Input from the client in developing intervention is extremely important in ensuring that the plan is appropriate to the individual's lifestyle and cultural practices. A wide range of nutrients play an important role in diabetes management and moderation in dietary intake is usually the key.

The major goals of therapy are to achieve metabolic control and to prevent or delay the macro-vascular and micro-vascular complications of diabetes. Overall therapy for diabetes includes:

Type 1 Diabetes Mellitus

When providing nutrition therapy for persons with Type 1 DM, develop an individualized meal plan that is based on usual food intake, exercise and insulin regimens. If client is on conventional insulin therapy, ensure consistency in the timing and amount of food eaten and the time and action of the insulin used. Educate clients about monitoring their blood-glucose levels and when necessary adjust insulin.

Type 2 Diabetes Mellitus

The aim of nutrition therapy in Type 2 DM is to achieve glucose, lipid and blood sugar control. Many persons with Type 2 DM are overweight, therefore a weight loss diet usually improves short-term blood glucose control. For long-term control, several strategies in addition to weight loss can be implemented to achieve and maintain near-normal control. Recommend a nutritionally adequate diet determined by individual assessment with a reduction in fat,

especially saturated fat, and an increase in physical activity. Figure 12 shows the critical pathway for the nutritional management of Diabetes Mellitus.

Objectives of the Nutritional Management of Diabetes Mellitus

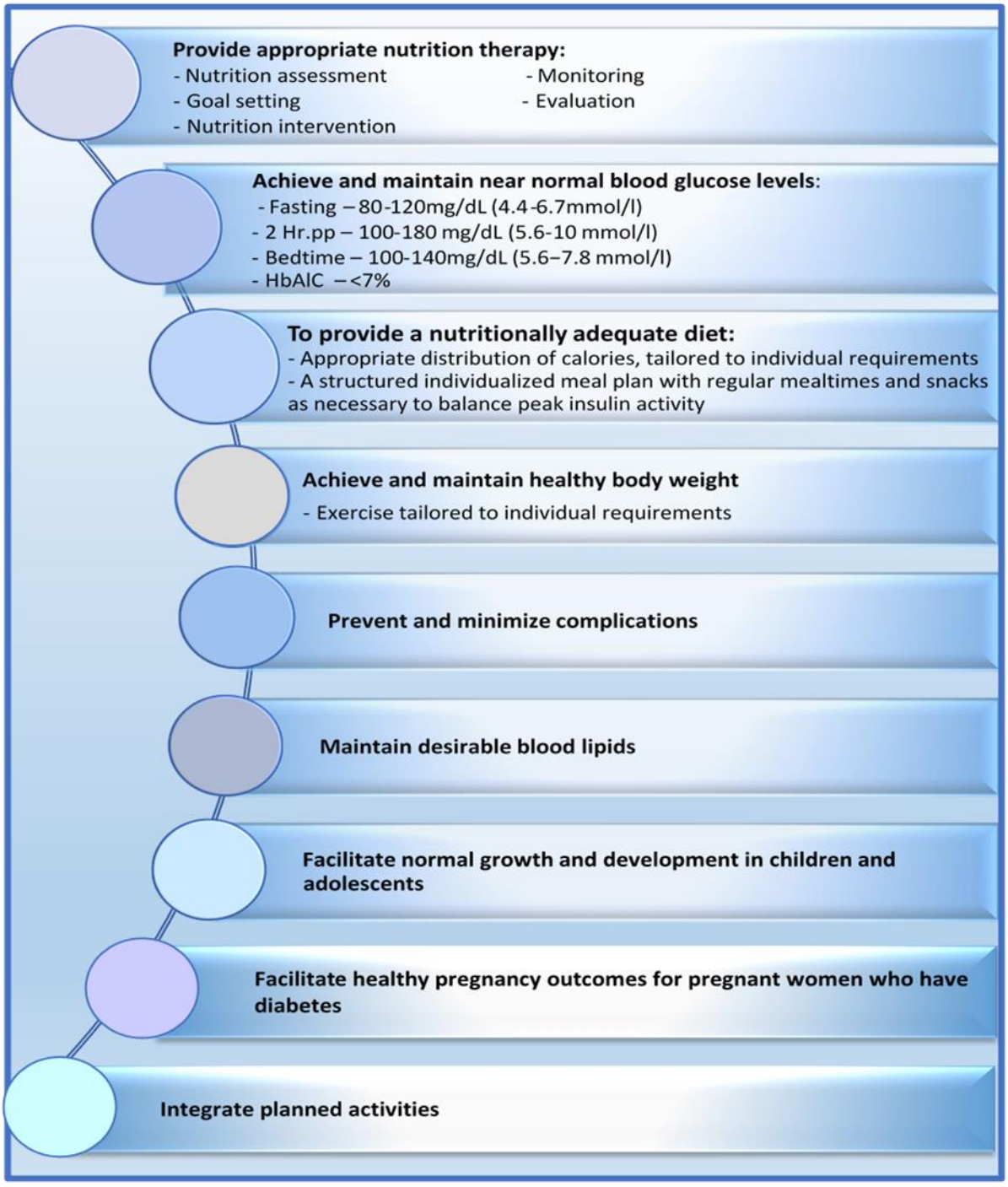
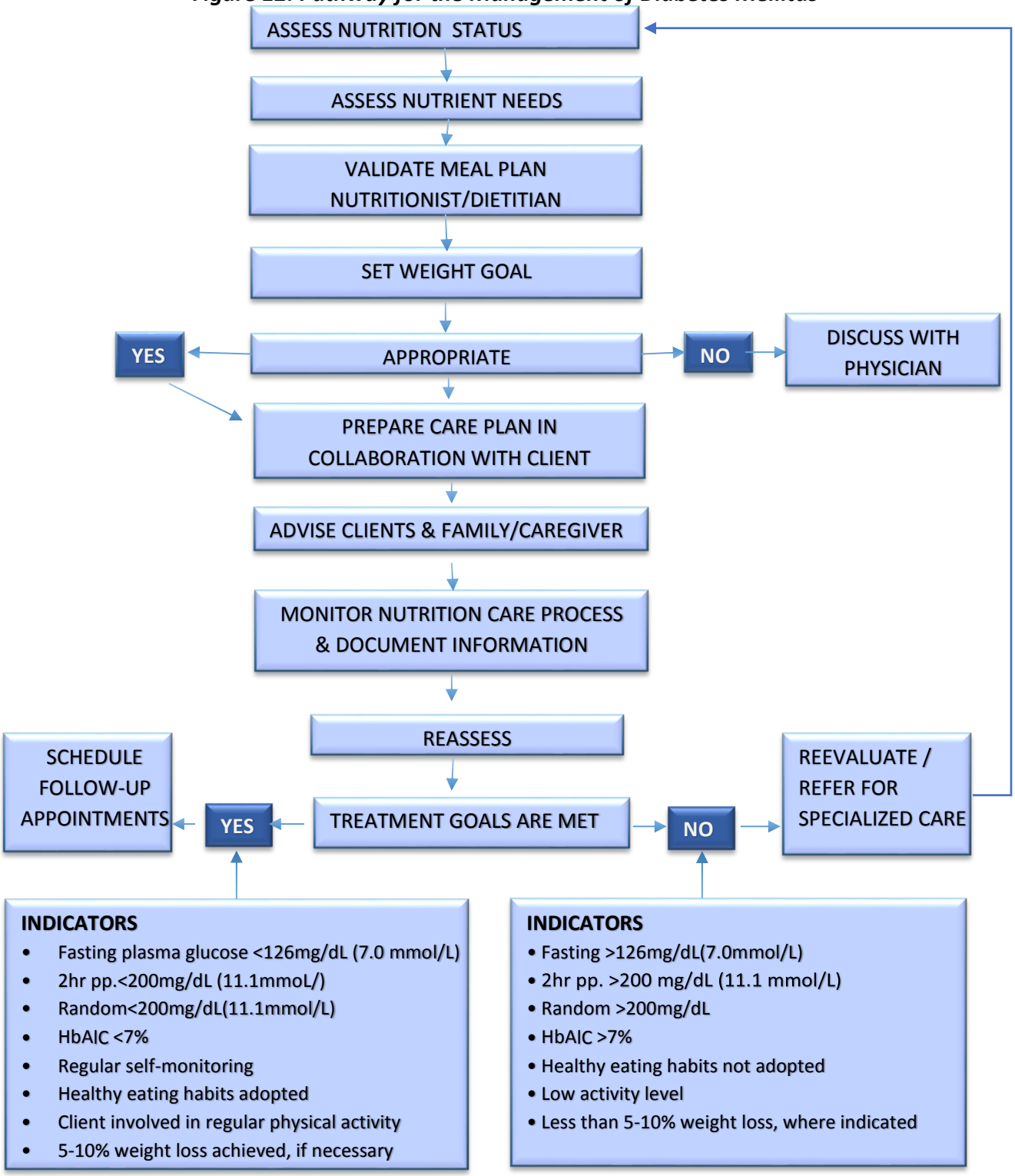


Figure 12: Pathway for the Management of Diabetes Mellitus



Recommendations for the Nutritional Management of Diabetes

When creating a nutrition plan for diabetics:

1. Assess diet history, physical activity.
2. Determine appropriate caloric level based on height, weight, age, sex, and activity level.
3. Distribute calories appropriately:
    - The meal plan should provide 50-60% of calories from carbohydrate:
        - Include high fibre carbohydrate foods such as corn, brown rice, green bananas and ground provisions (sweet potatoes, cassava, yam, etc.)
        - Limit the intake of simple sugars. Approximately 5-10% of total calories may be included as simple sugars.
    - Total dietary fat intake should be less than 30%of total calories.
        - Recommend less foods that are fried, high in cholesterol and saturated fats.
    - Control intake of salt and sodium. Salt intake should be limited to no more than 6 g per day (1 tsp). In the presence of hypertension, more severe restriction may be necessary.
4. Help clients to time meals appropriately, keeping meal times constant from day today. Consider clients' daily schedule when creating plan. This will enhance compliance.
5. Schedule three main meals per day plus snacks as appropriate to balance the peak activity of insulin and exercise.
6. Teach clients how to use food exchange lists (See appendix) and measure portions with standard measuring equipment. Gradually, they will learn how to estimate portions.
7. Help clients to manage special situations such as when eating out.
8. Provide clients with appropriate diabetes/nutrition/health education. Topics should include:
    - Role of diet, medication and physical activity in controlling diabetes
    - Food demonstrations the using foods/food groups to formulate balanced meals
    - Reading food labels

Recommended Calorie Distribution for Diabetics

Carbohydrates *50-60%*
Added sugars *no more than 10%*
Protein *15-20%*
Total fat *<30%*
Saturated fat *<10%*
[41]

Added sugars no more than 10%

- Managing the diet in special circumstances e.g. travel, parties, eating out, and illnesses.
- Importance of exercise and when appropriate
- Self- care
- Blood glucose monitoring, using a glucometer, interpreting and using results.
- Detecting and managing complications
  - ~ Hypoglycaemia
  - ~ Hyperglycaemia
  - ~ Ketoacidosis
- Where and how to access information and resource persons in the community

The publication *"Meal Planning for Diabetes"* published by the CFNI (1994) can be added to your diabetes education toolbox as it offers helpful suggestions that will help clients manage their diabetes.

Recommendations for Special Groups

The Obese Client with Diabetes [6]

1. Conduct nutrition assessment to determine nutrition status (BMI, Diet history
2. diet prescription.
3. Develop a care plan outlining management procedure.
4. Determine level of weight loss necessary.
5. Set weight loss goals (short and long term), with input from client (see procedure for achieving weight loss and determining energy requirements in section on obesity).
6. Develop weight-reducing meal plan with input from client. Distribute calories across several small meals and snacks throughout the day
7. Counsel the client along with family members and or caregivers.
8. Suggest the adoption of lifestyle changes that will improve wellbeing.
9. Develop physical activity plan with input from client and consideration of doctor's recommendations.
10. Schedule follow-up appointments as indicated.
11. Monitor progress:
    - Review and re-assess achievement of treatment goals
    - Assess for compliance with nutritional management
    - Weight
    - Blood sugar levels

- Blood lipids – cholesterol, triglycerides
- Blood pressure
- Renal status Client's knowledge and understanding of disease and management objectives
- Additional needs

12. Document care in client's medical records.
13. If there is no progress with blood glucose control after three monthly visits, hypoglycaemic medications may be indicated
14. Refer for additional or specialized care as needed.

The Pregnant Diabetic

Clients who have diabetes and become pregnant will require some re-assessment and modification in their management. The aim of the diet is to achieve appropriate weight gain or control measures and match age needs, thus contributing to a healthy outcome. Usually a total weight gain of about 11.8 kg (26 pounds) is recommended. Approximately 0.9–1.8 kg (1-2 lbs) should be gained during the first trimester and not more than 1 kg (2.2 lbs) every fortnight thereafter. Monitor blood glucose levels, urine ketones, appetite and weight and adjust the meal plan throughout the pregnancy to achieve desired results. See Appendix X for recommendations on appropriate weight gain during pregnancy.

Blood Glucose Targets in Pregnancy

Fasting blood glucose	*<95 mg/dl (<5.3 mmol/L)*
1hr. pp.	*<140 mg/dl (< 7.8 mmol/L)*
2hr pp.	*<120 mg/dl (<6.7 mmol/L)*

Source:44

The Pregnant Mother with Gestational Diabetes

Factors relating to the pregnant diabetic will also apply to gestational diabetes.

Guidelines for Promoting Self-Management

The management of diabetes rests heavily with the individual and his/her ability to cope with the challenges of living with diabetes. Diabetes education will equip and empower diabetic clients to carry out effective self-management. Clients who understand what to do and why it should be done are more likely to be motivated to participate in achieving and maintaining good health outcomes. After providing diabetic clients with useful guidelines encourage them to:

1. Be determined to make the lifestyle changes necessary for improving prognosis and general health.

2. Find out about diabetes. What is diabetes, the type of diabetes they are diagnosed with, the signs and symptoms of poor management, types of complications their causes and management.

3. Self-monitor, record and use the information to improve management of diabetes.
   - Understand the importance of blood glucose monitoring
   - Acquire and use a glucometer to monitor blood glucose levels regularly.

4. Use knowledge about the role of diet, medication and physical activity in controlling diabetes
   - Use a variety of foods when preparing meals

Treating Hypoglycaemia

Owing to different factors it is normal for blood glucose levels to fluctuate throughout the day. If it falls below 70 mg/dl (3.9 mmol/L) the client will need to act as they would be in a hypoglycaemic state and will need to take steps to get glucose levels elevated. Symptoms might include:

- *Feeling shaky, sweaty and clamminess*
- *Confusion*
- *Feeling lightheaded or dizzy*
- *Hunger*
- *Nausea*
- *Color draining from the skin (pallor)*
- *Feeling sleepy, weak or tired*
- *Blurred/impaired vision*
- *Headaches*
- *Seizures*

The only way to be sure if blood sugar is low is to check (use personal glucometer). If unable to confirm, treat for hypoglycaemia.

Treatment - The "15 – 15 Rule"

Have 15 g of carbs to raise blood sugar and check it after 15 minutes. If it is still below 70 mg/dl (3.9 mmol/L) have another serving.

Repeat until it is back to normal then have a meal or snack.
The following should provide 15 g of carbohydrate:

- *4 ounces (1/2 cup) of juice or regular soda (not diet)*
- *1 tablespoon of sugar, honey, or corn syrup*

Other options include hard candies and glucose tablets. Read label to determine amount [43].

- Read food labels to identify ingredients that contain or refer to sugar or carbohydrate content
- Interpret nutrition fact labels (eg. 1 serving vs number of servings contained in the package)
- Reduce intake of saturated fat and cholesterol for overall cardiovascular health.
- Reduce intake of alcohol, if client drinks alcohol ($\leq$ 2 drinks for men; $\leq$ 1 for women)
- Limit consumption of fast foods and processed foods
- Be prepared to manage their diet in special circumstances e.g. travel, parties, eating out, and illnesses.

5. Adjust food intake and increase physical activity to achieve weight loss, maintain optimal blood glucose levels and for general health.
    - Aerobic exercise (90-150 min/week)
    - Resistance training (90-150 mins/week)
6. Cease smoking (if client smokes)
7. Know the how to detect and manage complications of diabetes
    - Hypoglycaemia
    - Hyperglycaemia
    - Ketoacidosis
8. Be patient and stick to nutrition plan as diabetes requires lifetime management and it might take time to see the results of nutrition intervention.
9. Maintain all appointments with health care team.
10. Access information and resource persons in the community

If the client has GDM or diabetes in pregnancy

11. Practice exclusive breastfeeding
12. Implement the guidelines above.

Recommendations for Physical Activity

Benefits of physical activity are greatest in the early progression of the disease. Nevertheless, regular physical activity is encouraged for all persons with diabetes. Recommend that clients living with diabetes:

- Undergo detailed medical evaluation before embarking on an exercise regime.
- Engage in aerobic physical activity daily.
- Pay careful attention to hydration status during and after exercise.

Protocol for the Nutritional Management of Hypertension

Protocol for the Nutritional Management of Hypertension

Background

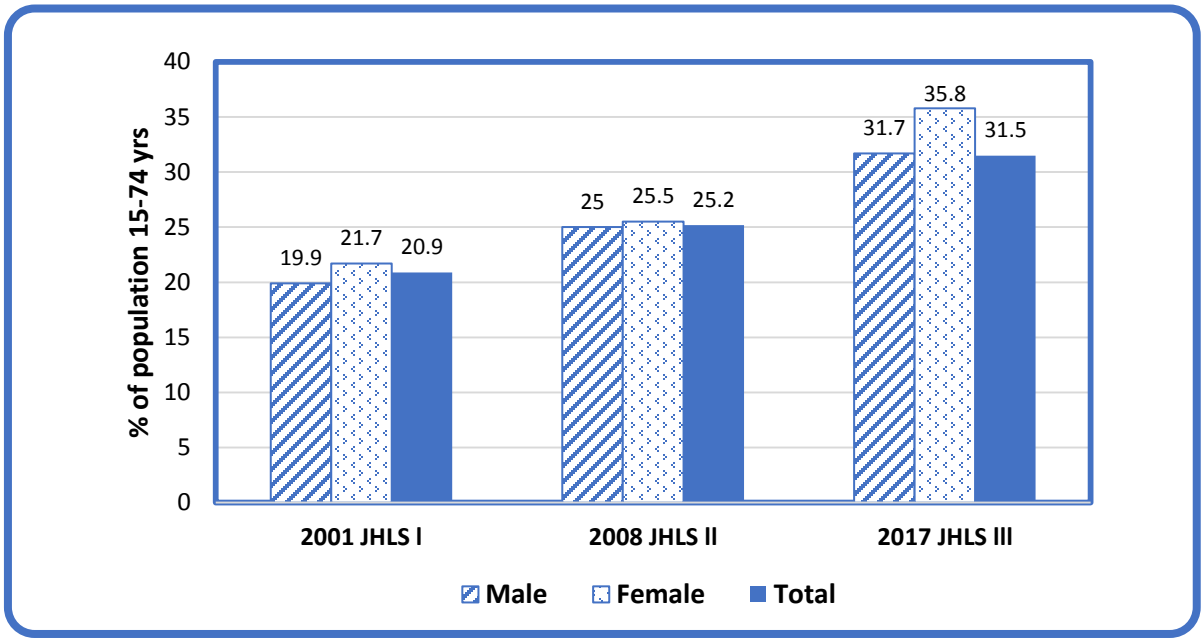
Hypertension (HTN) also called high blood pressure is a condition in which blood vessels (arteries) have persistently elevated blood pressure (BP) indicated by systolic BP readings of 130 mmHg and above and diastolic BP readings of 80 mmHg and above*. Worldwide prevalence of hypertension increased from 594 million in 1975 to 1.13 billion in 2015. This increase was mainly seen in low- and middle-income countries. The African region had the highest prevalence of 27% while the lowest prevalence (18%) was recorded in the region of the Americas. Men had a slightly higher prevalence as it was estimated that 1 in 4 men compared to 1 in 5 women were affected. Management of the condition is also problematic as less than 1 in 5 persons affected, had it under control. Hypertension has also proven to be a major cause of premature death as worldwide, an estimated 12.8% of deaths were attributed to this disease [29].

2014 CARICOM countries had an average prevalence of 23.9%. St. Lucia reported the highest prevalence of 24.8%. The country with the lowest prevalence was Guyana (22.6%). The prevalence was higher among men (26.2%) than women (21.6%) [25].

According to the Jamaica Health and Lifestyle Survey (III), conducted 2016-17, one in three Jamaicans were hypertensive but only 40% of these persons were aware of their condition. There was a significant difference in the level of awareness among men and women as only 40% of men knew they were hypertensive compared to 74% of women. Figure 13 shows the trend in prevalence among Jamaicans 15-74 years for the period 2001-2017. Prevalence in this age group has increased by over 10% in 16 years from 20.9% to 31.5%. The prevalence rate among genders differ from the worldwide trends. Over the period Jamaican females have carried a heavier burden of the disease than their male counterparts. In 2017 the rate among women was 35.8% and 31.7% among men [27].

* *JNC-8 guidelines define HTN as systolic BP 130 mmHg and above and diastolic BP 80mmHg and above. The JNC7 defined HTN as BP 140/90 mmHg. The statistics cited are based on the JNC-7.*

Figure 13 Prevalence of Hypertension Among Jamaicans 15-74 years, 2001, 2008, 2017



Genetic factors, childhood obesity, premature birth (associated with a 4 mm Hg higher systolic BP and 3 mm Hg higher diastolic BP in adulthood), low birth weight and paediatric hypertension increases the likelihood of hypertension in the adult years High blood pressure in the paediatric population is defined as persistent repeated readings at the 90th percentile or greater for height and age and gender.

It is urgent that the primary health care services are equipped to efficiently manage hypertension as it is a major risk factor for several life-threatening conditions. Left untreated it can result in heart disease and stroke. In some age groups, the risk of cardiovascular disease doubles for each increment of 20/10 mmHg of blood pressure. The risk of cardiovascular complications and organ damage is further increased when other risk factors such as smoking, obesity, elevated cholesterol and diabetes are also present. Other complications of hypertension include myocardial infarction, congestive heart failure, peripheral vascular disease, renal impairment, retinal hemorrhage and visual impairment.

Figures 14 and 15 shows blood pressure classifications and cut-offs in and children [32] [40].

Figure 14: Blood Pressure Classifications and Cut-offs in Adults

Blood Pressure Classifications (JNC-8)

Normal
Systolic BP: <120 mmHg ***and*** *Diastolic BP: <80 mmHg*
Elevated BP
Systolic BP: 120-129 mmHg ***and*** *Diastolic BP: <80 mmHg*
Hypertension Stage 1
Systolic BP: 130-139 mmHg ***or*** *Diastolic BP: 80-89 mmHg*
Hypertension Stage 2
Systolic BP: ≥140 mmHg ***or*** *Diastolic BP: ≥ 90 mmHg*
Hypertensive Crises (Urgency)
Systolic BP: >180 mmHg ***and/or*** *Diastolic BP: >120 mmHg*
Hypertensive Crises (Emergency)
Systolic BP: >180 mmHg + target organ damage ***and/or*** *Diastolic BP: >120 mmHg + target organ damage*

Based on JNC 8 Guidelines

BP Definitions

Blood pressure (BP): *is the force exerted by circulating blood against the walls of the arteries.*

Elevated BP: formerly called prehypertension.

Hypertension: any systolic BP measurement of 130 mmHg or higher or any diastolic measurement of 80mmHg or higher.

Hypertensive urgency: severe BP elevation in otherwise stable clients without acute target organ damage or dysfunction.

Hypertensive emergency: severe elevation in BP associated with new or worsening target organ damage.

Masked hypertension: higher BP readings at home but normal office readings.

White coat hypertension: higher BP readings in office but normal readings at home.

Figure 15: Blood Pressure Classification and Cut-offs in Children 1-18 years

Definitions of Hypertension (1-18 years)

Category	Children Aged 1-13yrs	Children Aged ≥ 13yrs
Normal BP	< 90th percentile	< 120/ <80 mmHg
Elevated Bp	≥ 90th percentile to <95th percentile or 120/80 mmHg to <95th percentile (whichever is lower)	120/ <80 to 129/ <80 mmHg
Stage 1 HTN	≥ 95th percentile to <95th percentile +12 mmHg or 130/80 to 139/89 mmHg (whichever is lower)	130/80 to 139/89 mmHg
Stage 2 HTN	≥ 95th percentile +12 mmHg or ≥140/90 mmHg (whichever is lower)	≥140/90 mmHg

***Source:*[42]**

Establishing the Diagnosis

To reduce errors in measurement and ensure the correct diagnosis engage the services of a doctor or nurse-practitioner.

1. If the initial systolic reading is between 120 and 129 mmHg and diastolic reading is <80 mmHg. Reassess within three to six months If these values persist the diagnosis is ***Elevated BP***.

2. If the initial systolic reading is between ≥130 -139 mm Hg or diastolic value ≥80-89 mm Hg. If clients are determined to be at risk of ASCVD or CVD reassess within one month. If they are not at risk, reassess in three to six months. If these values persist the diagnosis is ***Stage 1 Hypertension.***

3. If the initial systolic reading is between ≥140 -139 mm Hg or diastolic value ≥90-89 mm Hg. Reassess within one month. If these values persist the diagnosis is ***Stage 2 Hypertension. (JNC-8)*** [30]

See Appendix XIV – for summary of JNC 8 Hypertension Guidelines

Measuring BP Accurately

Clients should:

~ *Avoid smoking, caffeine, or exercise within 30 minutes before measurements;*
~ *Empty their bladder*
~ *Relax, and sit quietly for at least 5 minutes before measurements*
~ *Remain still during measurements.*

The Health Worker should:

~ *Use a properly calibrated instrument.*
~ *Support the limb used to measure BP (eg. resting on a desk)*
~ *Ensure that the BP cuff is at heart level*
~ *Use the correct cuff size*
~ *Not take the measurement over clothes.*
~ *Measure in both arms and use the higher reading; an average of 2 to 3 measurements taken on 2 to 3 separate occasions will minimize error and provide a more accurate estimate.*
~ *Inform clients (verbally and written) of BP readings.*

Source: **[30]**

Objectives of the Nutrition Management of Hypertension.

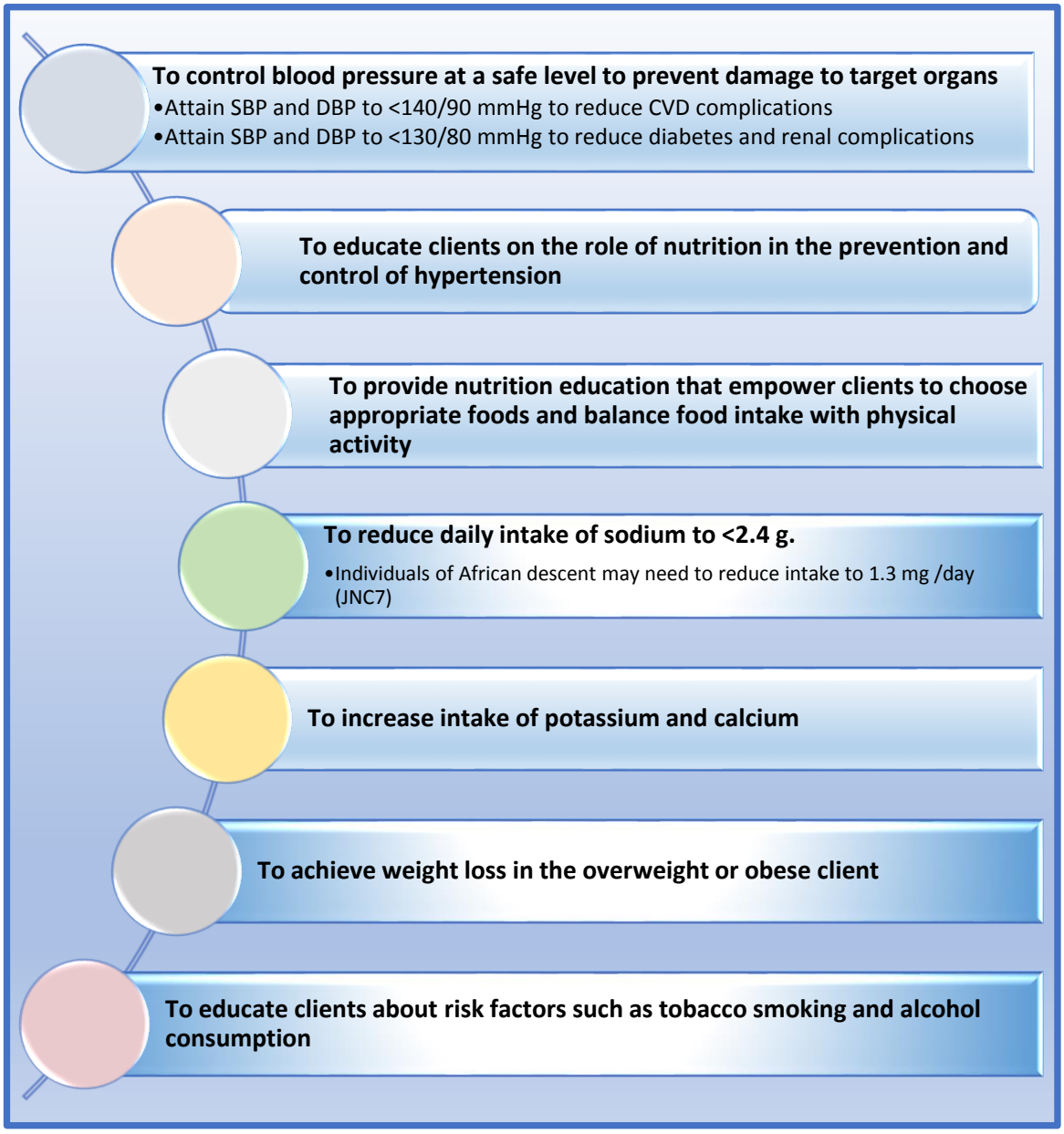
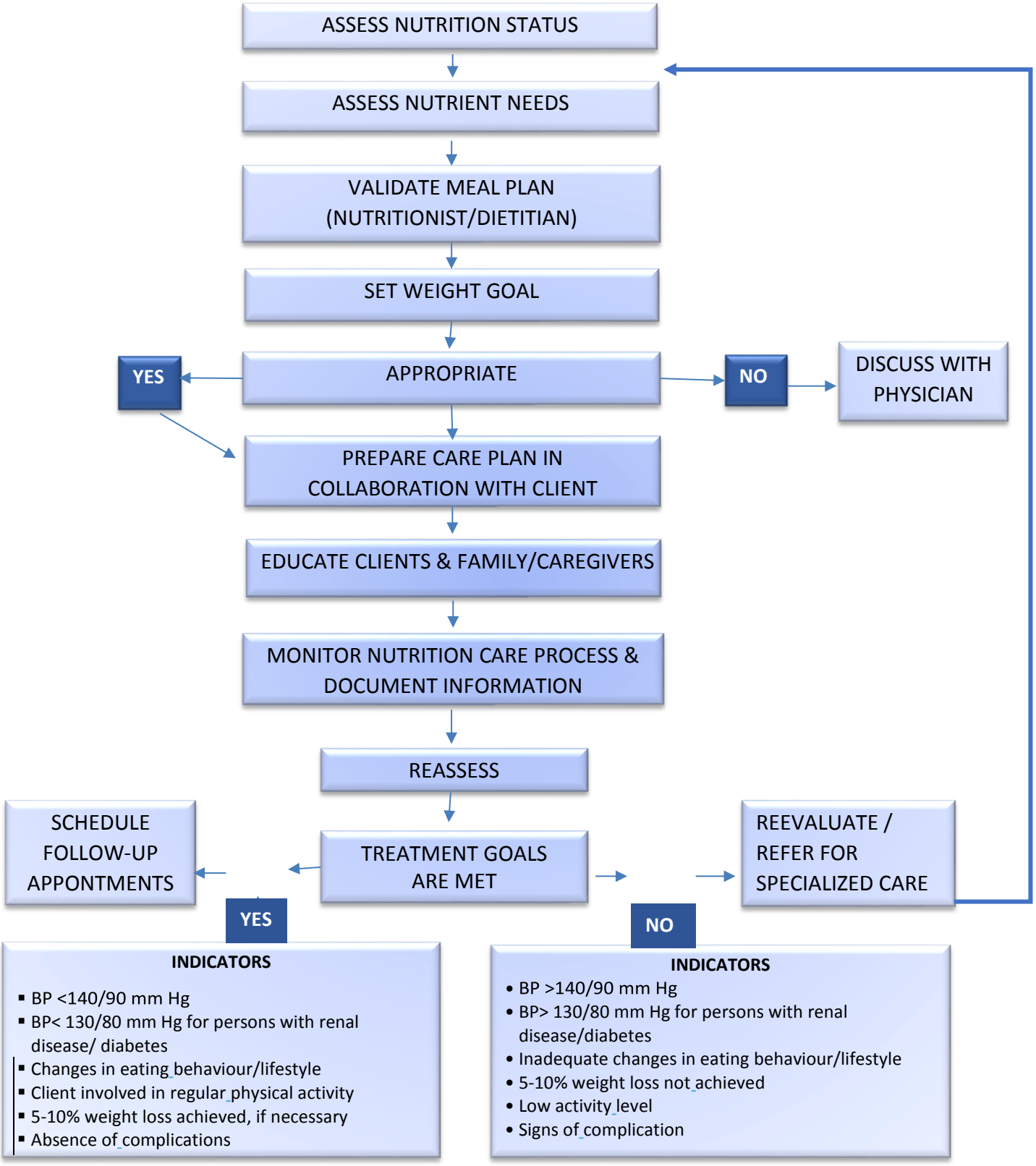


Figure 16: Pathway for the Nutritional Management of Hypertension



Nutrition Therapy and Hypertension

Pharmacological and non-pharmacological interventions are used in the treatment of hypertension. Medical experts recommend lifestyle modification along with BP-lowering medications for effective treatment. This document focuses on the use of medical nutrition therapy (MNT). A major component of MNT is lifestyle modification. Lifestyle changes such as improving food choices and increasing physical activity can significantly reduce systolic BP (by ~ 4 to 11 mm Hg). This type of intervention is also effective in reducing the modifiable risk factors of HTN and improves overall management of the condition. The information below outlines the MNT approach in treating hypertension (Figure 16).

1. Conduct a comprehensive nutrition assessment and review of historical and laboratory data. Recommend the testing of haemoglobin, serum sodium, potassium, creatinine, fasting blood glucose and lipid profile. Include microscopy and analysis for blood and protein for urine tests.
2. Initially, treat clients diagnosed with elevated BP, and Stage 1 HTN and not at risk of future cardiovascular events using life-style modifications strategies. These include nutrition therapy, weight loss in the overweight or obese, regular physical activity, reduction in dietary sodium and reduced consumption of caffeine and alcohol. If these modifications do not achieve treatment goals or if there are signs of target organ damage, add medication to the treatment regimen.
3. Intensify treatment intensifies as the clients BP and future risk of cardiovascular events increase. Provide pharmacological therapy to all clients who present with signs of target organ damage; are at risk of cardiovascular complications or diagnosed with Stage 2 HTN (BP 140mmHg and above). Complement the appropriate medication with lifestyle modifications.
4. Recommend MNT for clients with both hypertension and diabetes as it helps to control blood pressure, blood glucose and prevent or delay multiple organ damage.
5. Recommend MNT for women who were hypertensive before pregnancy and those who become hypertensive after pregnancy. Preeclampsia and eclampsia are life-threatening forms of hypertension that some women develop. Managing BP during pregnancy is complicated because many medications could harm the fetus [30].

   See Appendix XVI: Recommendations for Treatment of Patients with Comorbidities.

Recommendations for the Nutritional Management of Hypertension

1. Risk factors for hypertension include obesity, lack of physical activity, sodium intake, and alcohol consumption. Conduct thorough review of histories and do a physical examination to identify factors which may be impacting on blood pressure levels.
2. Determine severity of hypertension and specific intervention needs of patients e.g. reducing sodium intake, weight loss, increasing potassium intake and lowering blood lipids.
3. Determine caloric and nutrient needs and develop diet prescription. It should facilitate weight loss if necessary.
   - Achieving the client's ideal body weight is a long-term goal that should be encouraged. Blood pressure readings will improve with weight reduction (for every 1 kg lost there should be a 1 mmHg BP reduction).
4. Provide a nutritionally balanced diet with a variety of foods from all the food groups to meet the individual diet prescription.
   - Adopting the DASH diet, (diet rich in fruits, vegetables, whole grains, and low-fat dairy products) is highly recommended.
   - Reducing sodium intake and increasing potassium intake are among the dietary changes that will help to reduce BP. Clients with kidney disease or those on some medications might experience complications due to excess potassium.
   - Monitor sodium intake. For all clients on diuretics, a diet containing 2g of sodium per day is usually sufficient. A normal diet of 2-4 g sodium daily is usually a practical guide but must be monitored closely and modified to meet the needs of the individual client.
   - Limit consumption of caffeine. Consider decaffeinated beverages as a substitute.
   - If clients drink alcohol, males should be encouraged to reduce their daily consumption to 2 drinks or less while females should limit it to 1 or less.
     - ~ While alcohol consumption is linked with hypertension, it is also associated with higher levels of high-density lipoprotein (HDL) cholesterol and compared with abstinence, a modest consumption is linked to a lower level of coronary heart disease.
   - Many substances—over the counter, prescription, or even food substances—affect BP, so it's important to always ask patients about the substances they are taking and their dietary patterns.

5. Include a regular physical activity programme agreed on with the doctor. See recommendations in the section that follows.
6. Schedule follow-up as needed. Monitor BP, weight and laboratory values.
7. Provide ongoing nutrition and health education. Include topics such as:

   - Benefits of lifestyle changes to general health.
   - Importance of self-monitoring (correct use of electronic BP monitor)
   - Causes, risk factors and complications of hypertension.
   - Role of nutrition in helping to control hypertension
   - The DASH diet, components and benefits
   - Effects of sodium on blood pressure and ways of reducing it.
   - Ways to reduce sodium, fat, caffeine and alcohol
   - Ways to increase potassium, calcium and magnesium
   - Food preparation (include demonstrations)
   - Benefits of physical activity and recommendations

See Appendix XVII: for JNC-8 recommendations for lifestyle modifications in the treatment of hypertension.

DASH Diet

Dietary Approaches to Stop Hypertension (DASH) *was designed to prevent and treat hypertension.*

It Promotes consumption of *fruits, vegetables, grains, legumes and lean meats and* ***restricts*** *red meat, salt, added sugars and fat.*

Food	***Servings/day***
Grains	*6-8*
Vegetables	*4-5*
Fruit	*4-5*
Legumes, nuts & seeds	*4-5(/wk)*
Lean meat, fish & poultry	*6 or less*
Low fat/fat free dairy	*2-3*
Fats and oils	*2-3*
Sodium	*2,300mg*
Sweets/added sugar	*5 or less (/wk)*

When following DASH- *choose foods: low in saturated and trans fats; rich in potassium, calcium, magnesium, fibre and protein; low in sodium*

Complement the DASH *with PA, weight & stress management, reduction in alcohol and plenty of sleep.*

It has been effective in reducing BP, cholesterol levels, and helping with weight loss,

It could reduce the risk of some cancers, diabetes and heart disease and metabolic syndrome. Source: [45]

Recommendations for Physical Activity

Physical activity is beneficial for weight loss or maintenance, lowering blood pressure, is protective against developing a stroke and good for general health. Inactive persons are 30% to 50% more likely to develop hypertension than their active counterparts. Walking can potentially reduce BP by 2% and aerobic exercises could reduce systolic and diastolic BP by 4 and 2 mmHg respectively.

Recommend that clients engage in low to moderate intensity exercise for 30-45 minutes on most days of the week or aerobic exercise (90-150 min/week) and resistance training (90-150 mins/week) [5] [30].

Guidelines for Self-management

Encourage clients with hypertension to:

1. Make the lifestyle changes necessary for improving prognosis and general health.
2. Be informed about the causes, risk factors and complications of hypertension.
3. Use knowledge obtained about the role of nutrition in helping to control hypertension.
   - Be familiar with the components and effectiveness of the DASH diet and consider adopting the eating plan.
   - Always be conscious of the possible effects of sodium on blood pressure and use tips on how to limit or eliminate salt/sodium from the diet.
     - ~ Limit consumption of fast foods and processed foods (battered and breaded or canned meats, cup soups and noodles, etc.)
     - ~ Be aware of hidden sources of sodium (baking powder, flavoured water, etc.)

Self-Monitoring of BP

Encourage clients to monitor their own BP to aid hypertension diagnosis, treatment and management using these steps.

Step 1: To get accurate results when measuring at home, use the same validated instrument at the same of day.

Step 2: Position self correctly, with the bottom of the cuff directly above the bend of the elbow.

Step 3: Take at least 2 readings, 1 minute apart each morning before medication and each evening before supper.

Step 4: Record all readings accurately; use a monitor with built-in memory and bring it to the next clinic appointment. For clinical decision-making, base the patient's BP on an average from readings on 2 or more occasions. *Source: [30]*

- ~ Read food labels to identify ingredients that contain sodium and avoid excessive intake.
- ~ Use alternatives such as herbs and spices to flavour foods; taste food before adding salt and gradually reduce salt used in cooking, then aim towards eliminating its use.
- ~ Avoid adding salt after food has been cooked.

- Identify sources of caffeine (e.g. coffee, cola beverages, tea and chocolate) and reduce intake.
- Identify and consume adequate dietary sources of potassium, calcium and magnesium
- Reduce intake of saturated fat and cholesterol for overall cardiovascular health.
- Reduce intake of alcohol, if client drinks alcohol (≤ 2 drinks for men; ≤ 1 for women)

4. Adjust food intake and increase physical activity to achieve weight loss, lower blood pressure and for general health.
   - Aerobic exercise (90-150 min/week)
   - Resistance training (90-150 mins/week)
5. Self-monitor, record and use the information to improve management of hypertension.
   - Obtain electronic BP monitor, learn how to operate it and use regularly.
6. Cease smoking (if client smokes)
7. Understand that it might take time to see the results of nutrition intervention so be patient and stick to nutrition plan.
8. Maintain all appointments with health care team.

Protocol for the Nutritional Management of Cancer

Protocol for the Nutritional Management of Cancers

Background

Cancer is the name given to a collection of related diseases characterized by a mutation within cells that cause the production and proliferation of abnormal cells. Cancer can also occur when normal healthy cells are damaged and undergo uncontrolled replication. Most cancers, however, occur overtime as a result of diet, lifestyle and environmental factors. There are more than 100 types of cancers and they are usually named for the organs or tissues in which the abnormal cells form. For example, lung cancer starts in cells of the lung. Cancers may also be described by the type of cell that formed them, such as an epithelial cell or a squamous cells Cancers spread by invading surrounding tissues until they reach a blood or lymph vessel.

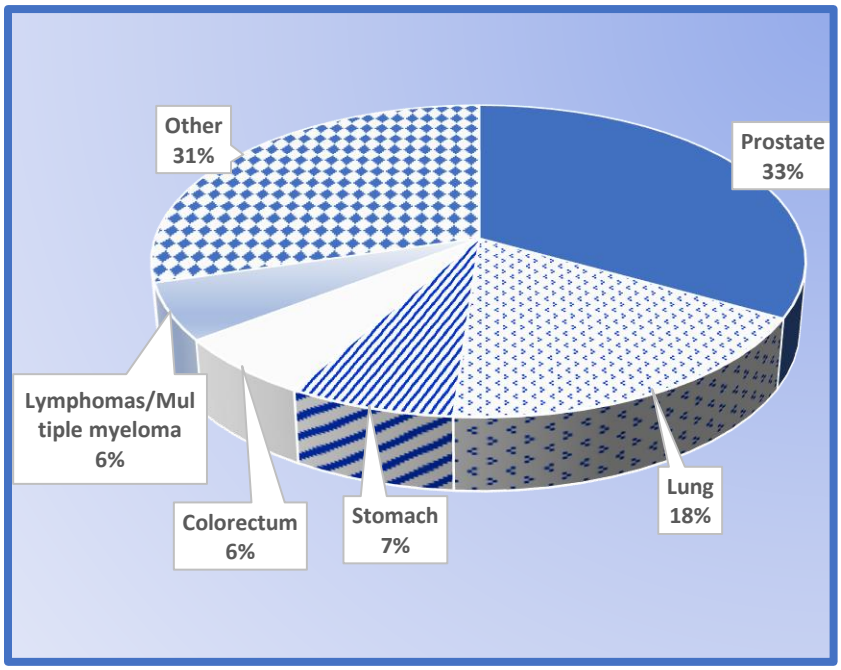
Estimates of the global cancer burden released in 2018 by the Global Cancer Observatory (GLOBOCAN) revealed that new cases rose to 18.1 million and there were 9.6 million cancer deaths in that year. It is also estimated that one in five men and one in six women will develop cancer during their lifetime and one in 8 men and one in eleven women are expected to die from the disease. Five-year prevalence, that is, the number of people alive within five years of diagnosis was estimated at 43.8 million. Cancers of the lung, breast and colorectal are the top three cancer types. They accounted for one third of worldwide cancer incidence and mortality. In men the most commonly diagnosed cancers were lung (14.5%), prostate (13.5%) and colorectal. In women breast cancer is most commonly diagnosed (24.2%). It accounts for one in four of all new cancer cases in women and it was the most common cancer in 154 of the 185 countries surveyed in 2018. Lung cancer is the leading cause of death in both men and women [31].

The region of the Americas which has 13.3% of the world's population recorded 21% of cancer incidence and 14.4% of worldwide mortality. In the Caribbean 111,933 new cases were reported while there were 63,075 deaths. Five-year prevalence in the region was 253,569 and it was projected that 10.4% of persons in the Caribbean will die from cancer before the age of 75. The five most commonly diagnosed cancers were prostate (15.7%), breast (12.6%), lung (9.8%), colorectal (9.7%) and cervical (3.8%). Among men the top three cancers were prostate (30.4%), lung (11.3%) and colorectal (8.7%), while women had a high incidence of breast (26%), colorectal (10.8%) and lung cancer (8.2%) [32].

In 2014 the most common forms of cancers in Jamaica were prostate cancer in men (33% of 2,000 cancer deaths) and breast cancer in female (20% of 1,400 deaths). There were 1,230 new cases

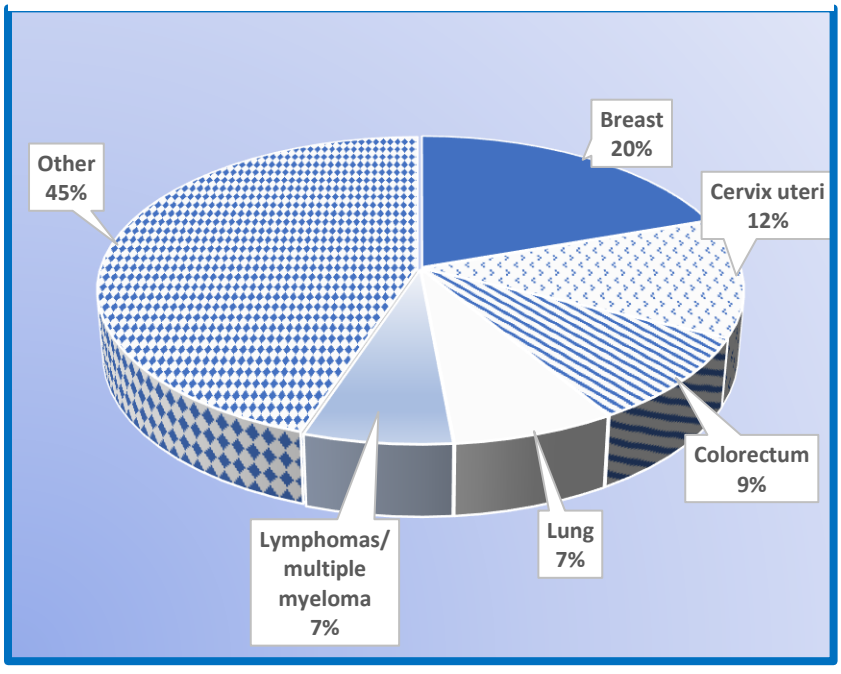
of prostate cancer diagnosed in men that year and 843 new cases of breast cancer. Cervical (12%), colorectal (9%), lung (7%) and lymphomas (7%) were included among the top five cancers causing mortality in women. Lung (18%), stomach (7%), colorectal (6%) and lymphomas (6%) were the top five cancers causing death in men. Prostate and lung cancers account for 50% of cancer deaths among men. (See Figures 17 and 18).

Figure 17: Cancer Deaths in Jamaican Males, by Type, (2014)



Considering the extent of the worldwide cancer burden individual territories must develop programmes to reduce the number of cancer cases and deaths and improve quality of life of cancer patients. Since most cancers occur as a result of diet, lifestyle and environmental factors the first line of defence against prevention. This involves identifying the risk factors and creating an environment that reduces them. The modifiable risk factors that have been associated with the development of cancers include obesity, physical activity, diet, use of tobacco products/smoking and alcohol consumption [33].

Figure 18: Cancer Deaths ion Jamaican Females, by Type (2014)



Territories should have a National Cancer Control Plan/programme created by implementing systematic, equitable and evidence-based strategies for prevention, early detection, diagnosis, treatment and palliation using available resources. A well-managed programme will help to reduce the cancer burden and improve services for cancer patients and their families. National cancer control plans should be goal-oriented, realistic, carefully prepared and appropriately funded through a participatory process

in order to be effectively implemented. Cancer control planning requires accurate data, including reliable cancer registries and monitoring and evaluation programmes to ensure programmes are appropriately prioritized and to assure quality [33].

The development of cancer can be summarized as:

Initiation: exposure to substances or influences (mutagens) that can initiate genetic mutations. Any DNA damage caused may or may not lead to cancer.

Promotion: under the influence of promoters, damaged DNA begins to be expressed, resulting in cellular changes. Promoters thus enhance tumour development following exposure to mutagens

Progression: a complex process leading to the development of malignant cells that have the capacity to invade other tissues.

Today many types of cancers are treatable if caught early as such many persons are living with cancer. As a result, cancer is now recognized as one of the chronic diseases.

Multiple treatment modalities can be used in the treatment of cancer include surgery, radiotherapy and chemotherapy. The selection should be based on evidence of the best existing treatment given the resources available. Whatever the treatment modality is selected it is likely to impact clients' nutrition status. Nutrition and other lifestyle modifications may also help to modify cancer development at any stage. This section outlines the nutritional management of cancers and the side effects of treatment in the hospitals, health centres and risk reduction in community settings [5].

Diagnosis of Cancers

Methods of diagnosing cancers include:

- Physical examination
- Blood tests (nonspecific tests and specific markers such as PSA levels)
- Cytology studies and tumor biopsy
- Imaging (x-rays, CT, MRI, PET scans)
- Staging (radiographic, pathologic, surgical or TNM staging for tumor size, nodes, metastasis). It is important to know the stage of the disease in order to plan the best treatment.

Screening for Diagnosis of Cancers

Prostate Cancer
Rectal examination ***and*** *Prostate specific antigen (PSA) test*
Breast Cancer
Clinical breast exam/Mammogram/Ultrasound/ Magnetic Resonance Imaging (MRI) ***and*** *Biopsy of breast tissue*
Lung Cancer
Low-dose DT scan (if there is history of smoking) *and* *Staging*
Cervical Cancer
Pap smear-identify pre-cancer cells on cervix ***and/or*** *HPV test – looks for evidence of HPV cells on cervix*
Colorectal Cancer
Stool tests – detect blood in stool *Flexible sigmoidoscopy/Colonoscopy- check for polyps* *CT Colonography – X-ray of colon; Biopsy*

Source: **[46]**

Cancer Related Terms

Adjunct therapy*: Additional cancer treatment given after the primary treatment to lower the risk that the cancer will come back. Adjuvant therapy may include chemotherapy, radiation therapy, hormone therapy, targeted therapy, or biological therapy.*

Biopsy: *Removal of cells or tissues for examination by a pathologist. Tissues may be studied under a microscope or other tests may be performed on the cells or tissue.*

Metastasis: *The spread of cancer cells from the place where they first formed to another part of the body.*

PSA: *A protein made by the prostate gland and found in the blood*

Staging: *Performing exams and tests to learn the extent of the cancer within the body.*

TNM staging system*: Describes the amount and spread of the cancer.* ***T -*** *the size and any spread into nearby tissue;* ***N -*** *spread to nearby lymph nodes; and* ***M*** *- metastasis.*

Tumor: *An abnormal mass of tissue that results when cells divide more than they should or do not die when they should [47].*

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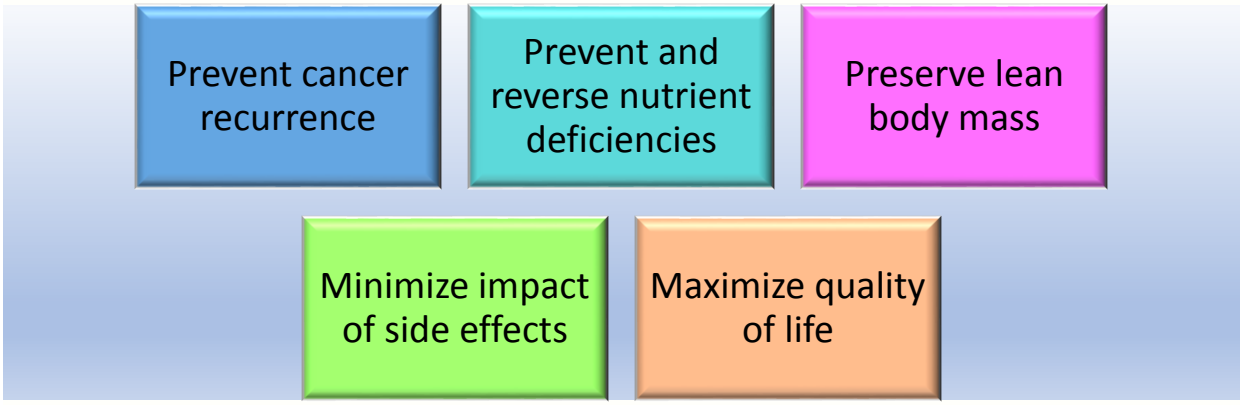
Goals of Nutrition Management in the Treatment of Cancers

Good nutrition is especially important in cancer because both the illness and its treatment can affect appetite. Cancer and cancer treatments can also affect the body's ability to tolerate certain foods and use nutrients. Table 11 gives a summary of possible effects of Medical Cancer Treatment on dietary intake, other effects are shown in Appendix: XVIII

***Table 11*: Effects of Medical Cancer Treatment on Dietary Intake**

Types of Cancer Treatment	Effects of Cancer Treatment on Dietary intake
Chemotherapy	Issues pertaining to mouth and digestive tract
Hormone therapy	Weight gain may occur
Radiation therapy	Tiredness which may lead to deceased appetite
Surgery	May affect the ability to eat and digest foods
Immunotherapy	Higher risk of infection
Stem Cell Transplant	May affect the ability to eat and absorb nutrients from food

The goals of the nutrition care team are to help to:



These goals will be achieved with the appropriate nutrition therapy, nutrition education, complemented by psychosocial support.

Objectives of Nutrition in Cancer Management

To manage the nutrition related complications of cancer (nausea, vomiting, dysphagia and malabsorption; wasting; cachexia; drug nutrient interactions among others) Nutrition/Dietetics personnel in primary care facilities will plan nutrition interventions that achieve the following objectives:

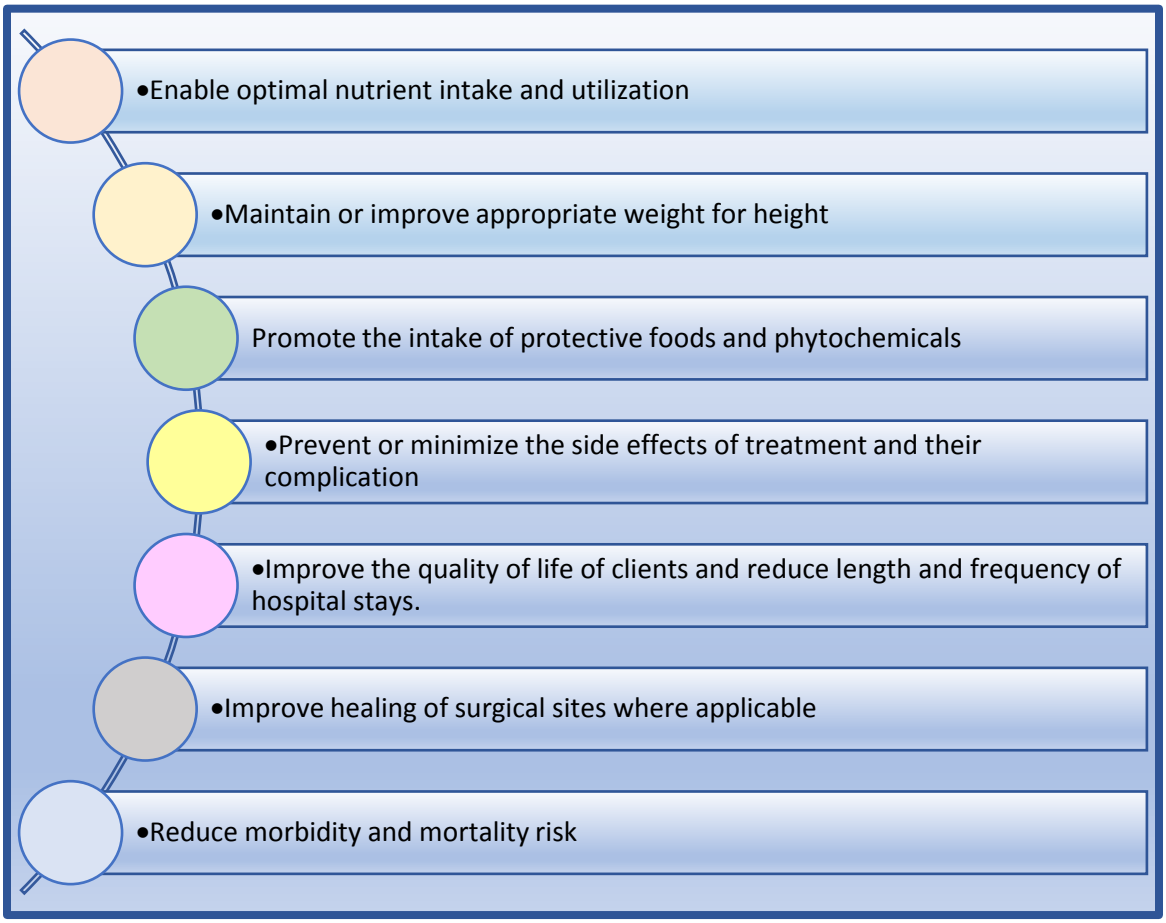
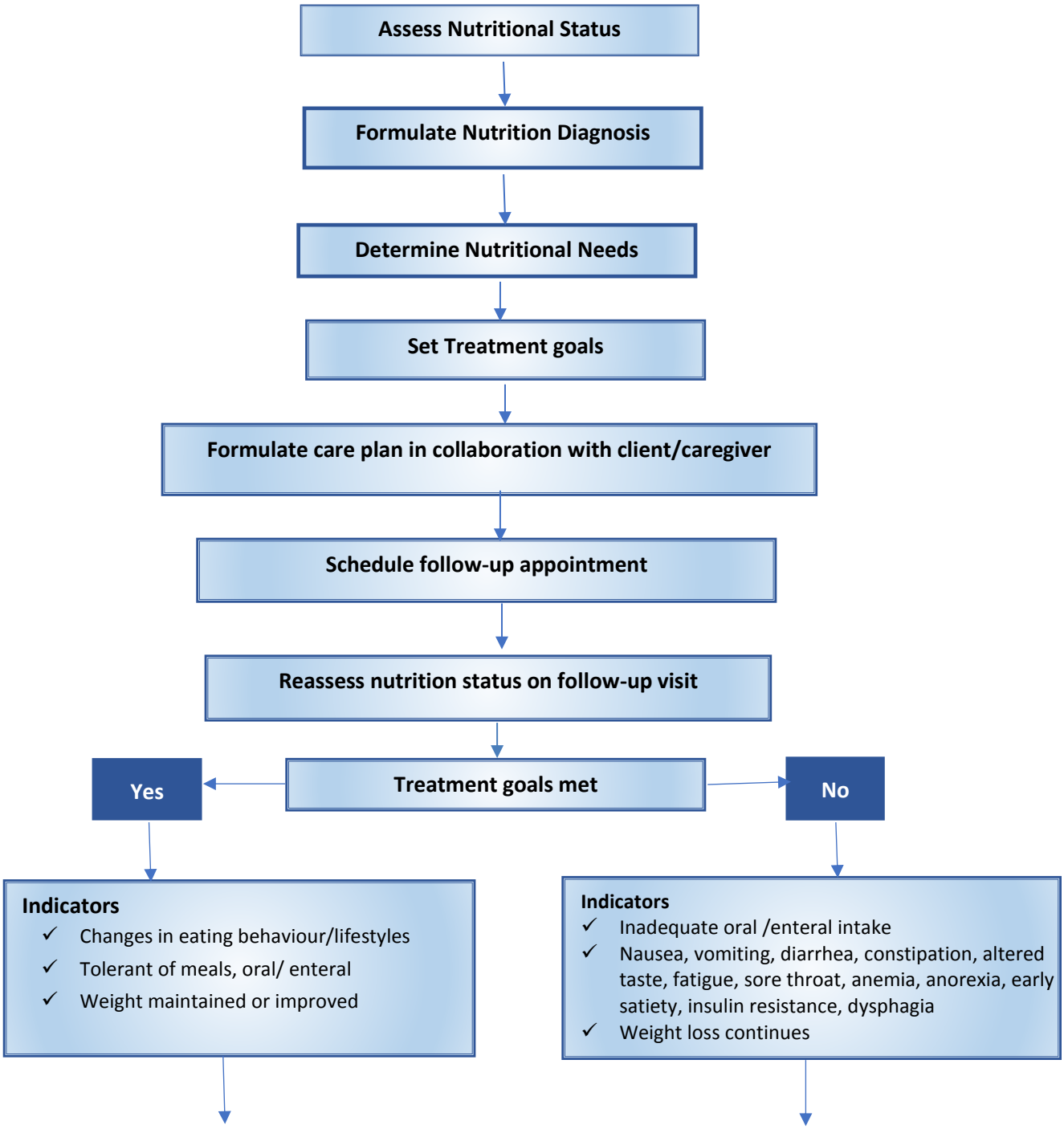


Figure 20 shows the critical pathway for the nutritional management of cancer that will facilitate the achievement of nutritional goals and objectives.

Figure 20: Critical Pathway for the Nutritional Management of Cancers



If met:
1. Commend
2. Reassess goals
3. Continue to target goals

If not met:
1. Reassess and set new goals
2. Refer for specialized care
3. Reschedule as appropriate

Recommendations for the Nutritional Management of Cancers

When developing a nutrition intervention, consider the psychosocial and financial impact cancers and their treatments can have on clients and their families. Include clients/family in decision making and consider their individual preferences where possible.

1. Conduct thorough review of histories and do a physical examination to identify factors which may be impacting nutrition status.
2. Determine severity of condition (dependent on stage of cancer) and specific intervention needs of patients
3. Determine caloric and nutrient needs and feeding modality then develop diet prescription.
   - Oral diet
   - Enteral nutrition (EN)
   - Total parenteral nutrition (TPN)
4. Cancers put the body into a catabolic state. To maintain or improve clients' nutritional status
   - Prescribe foods and beverages that provide adequate nutrients to repair and heal the body.
     - Maintenance 30 kcal/kg with 1-1.5 g protein/kg to maintain lean body mass
     - Repletion 35-45 kcal/kg with 1.5-2 g protein/kg to replete lean body mass to correct malnutrition, wasting and cachexia
   - Ensure adequate hydration (30 ml/kcal)
   - Ensure adequate micronutrient supplementation while avoiding excesses

     ~ Small frequent meals.

     ~ Divide meals into 5-6 small meals daily, larger meals may be better tolerated earlier in the day.

     ~ Liquid nutritional supplements maybe used to augment caloric intake and or tube feeding for persons who are unable to or unwilling to eat orally.

- Modify diet (bland, soft, grounded, blended) to allow for ease of chewing or tolerance as necessary
- Use parenteral nutrition carefully especially in cases of non-responsiveness to treatment or for patients with advanced cancer. Parenteral nutrition maybe used in cases where enteral nutrition is contraindicated however where sepsis exists it should be used cautiously

5. Monitor common side effects of chemotherapeutic agents such as mucositis, vomiting, altered food intake, increased nutrient losses, impaired digestion, and absorption, diarrhea and constipation) as well as other medications prescribed/administered
6. Control or manage side effects of treatment such as (dumping syndrome, anemia, lactose intolerance, diabetes)
7. Educate patient and family
   - Dietary restrictions due to side effects of surgical procedures or drug-nutrient interactions.
   - How to handle complications of treatment (See Appendix XIX)
   - Meal preparation
   - Importance of food hygiene in preventing infections. Client is susceptible due to weakened immune system (See Appendix (XX)
   - The use of complementary or alternative therapies, use of herbs, spices and botanical supplements should be discussed with primary care physician before (See Appendix XXI)
   - Physical activity and its role in restoring or preventing loss of lean body mass
8. Document at every stage of treatment in Medical Records within 24-48 hours of being referred using the ADIME. (See Appendix XXII)
9. If clients are in recovery, reduce the risk of cancer recurrence and development of other chronic diseases. (See recommendations from previous sections of protocol).

Nutrition Recommendations for Children with Cancer

Children have increased nutritional requirements for growth and development that must be met even as they undergo treatment.

Factors that might compound nutrition therapy include, refusal of food, fear, unpleasant hospital routines and food, food aversions and pain.

1. Use favourite nutrient-dense foods when intake is possible or best
2. Use nutritional supplements when tolerated

3. Use enteral support with cooperative children if digestive tract is functional but take measures to avoid aspiration
4. Use TPN for severe cases or for children at risk of becoming undernourished.

Nutrition Recommendations for Clients Receiving Palliative Care

1. Palliative care is provided for clients with advance cancer. It is provided when other curative methods are no longer considered an option. Focus on
   - Maintaining strength and energy to enhance quality of life and independence for daily living.
   - Managing factors such as pain, loss of appetite, early satiety, weakness, dry mouth, and constipation.
   - Emphasize the pleasurable aspects of eating
2. Assess nutritional status (Figure 20)
3. Provide
   - Diet as tolerated
   - Oral nutritional supplement to augment dietary intake
   - Nutrient dense meals
   - Enteral nutrition (tube feeding) if oral route is compromised
     - Assess residuals and withhold formula if residuals 50-100 ml
   - Adequate hydration
4. Prevent aspiration

Recommendations for Physical Activity

Recovery from cancer treatment will require physical activity to rebuild muscle strength.

- Recommend appropriate exercises as this will help to fight fatigue, improve immune system, self-esteem and mood; reduce anxiety and depression.
- Evaluate clients before recommending that they engage in physical activity.
- Design an individual physical activity plan for each client.

Guidelines for Promoting Self-Management

Encourage the client with cancer to:

1. Make the lifestyle changes necessary for improving prognosis and general health.
2. Be informed about the causes, risk factors and complications of cancer
3. Use knowledge obtained about the role of nutrition in helping prevent remission.
   - Be familiar with the recommended eating plan prescribed
   - Reduce intake of saturated fat and cholesterol for overall cardiovascular health.
   - Be familiar with strategies used to manage side effects of treatment
4. Maintain personal and food hygiene to avoid infections
5. Include physical activity in daily routine, as prescribed by health care team.
6. Cease smoking (if client smokes)
7. Avoid alcohol consumption
8. To be patient and stick to nutrition plan as it might take time to see the results of nutrition intervention.
9. Maintain all appointments with health care team.

Table 12 summarizes the nutritional care to be provided for the prevention and management of cancer. Appropriate and timely nutrition education and other interventions are necessary to reduce risk and improve outcome.

Table 12: Summary of Practice in the Nutritional Management of Cancer

Indicators	Hospital	Health Center	Community Setting
Nutrition Screening	Screen for nutrition risk on diagnosis (MST)	Screen for nutrition risk on diagnosis (MST)	Conduct as appropriate / Refer for nutrition screen at health facility
Subjective Global Assessment	Conduct SGA (detailed)	Conduct SGA (detailed)	N/A
Nutrition Assessment:	Conduct within 24-48 hours of referral	Conduct at next scheduled clinic	
• **Anthropometry**	Weight, BMI, MAC, TSF, MUAC, WC, proxy measurements	Weight, BMI, MAC, TSF, MUAC, WC, proxy measurements	BMI (overweight /obesity), WC, proxy measurements
• **Biochemical**	Total Protein, Albumin, CBC, Electrolytes	Total Protein, Albumin, CBC, Electrolytes	N/A
• **Clinical**	Nutrition focused, physical findings	Nutrition focused, physical findings	N/A
• **Dietary**	Food intake, adequacy, diet history	Food intake, adequacy, diet history	Education on food intake: fibre, fat, processed food, phytonutrients etc.

• **Lifestyle**	Smoking, alcohol consumption, physical activity, sleep	Smoking, alcohol consumption, physical activity, sleep	Promote health seeking behavior; smoking cessation; Minimal alcohol consumption; increase physical activity; adequate sleep; minimize stress
• **Socio economic status (SES)**	Employment, food safety and food security, social support	Employment, food safety and food security, social support	Food safety and food security
• **Medication: traditional (chemotherapy, radiotherapy, etc.), alternative medicine and home remedies**	Drug-Nutrient Interaction, Drug-Food Interaction and Drug-Drug Interaction; OTC drugs and herbal use	Drug-Nutrient Interaction, Drug-Food Interaction and Drug-Drug Interaction, OTC drugs and herbal use	N/A
• **Nutrition requirements**	Macro and micro-nutrient and caloric needs as per disease state	Macro and micro-nutrient and caloric needs as per disease state	Application of Food Based Dietary Guidelines and RDAs
Nutrition Diagnosis	Identify nutrition related problems	Identify nutrition related problems	N/A
Intervention:			N/A
• **Nutrition Counseling / Education**	• Nutrition care plan	• Nutrition care plan	N/A
• **Refer as necessary**	• Relevant Health Care team member (e.g. Social worker, mental health • Social support • Spiritual support (Faith Based support)	• Relevant Health Care team member (e.g. Social worker, mental health • Social support	N/A
Monitoring	• Review as required • Refer to community as appropriate	• Review as required • Refer to Medical Officer as necessary	N/A

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Appendix I: Diet History

Diet History

Obtaining an accurate diet history is an important component of the assessment process and is part of the overall nutrition history. The diet history provides valuable information about the client's past and/or current food behaviour.

Diet – is what the person usually eats or drinks. The health worker must be skilled at collecting data, as often clients will omit important information and may reveal what they eat but not what they drink. Beverages can be significant sources of calories and nutrients.

History – Recording, analyzing, correlating and explaining past events.

- How many meals the individual eats
- Food groups represented
- Quantity eaten
- Meal preparation methods
- Who prepares the meals
- Where meals are eaten
- Snacks eaten
- Social and family history

Taking a diet history involves interviewing the client. The interview serves two important purposes:

- It helps to build a relationship between the client and the health worker so that he/she can express his/her feelings honestly without judgment.
- It generates the information needed to develop a realistic meal plan.

Components of the diet history are:

- Collecting data
- Recording data
- Analyzing data
- Integrating the information to develop client profile

Preparing for the interview:

- Obtain client profile by reviewing medical records.
- Schedule the interview.

- Find a location that is conducive to confidentiality, concentration, care and comfort. If the client thinks that confidentiality is compromised, he/she will be less likely to tell the truth.
- Avoid distractions.
- Both the interviewer and the client need to be comfortable.

Ideally, the interviewer should be seated at a level similar to the client so that eye contact can be established.

The interviewer should demonstrate a caring personality and should avoid reacting to information given by the client. Both verbal and non-verbal communication can influence the client's reaction.

INTERVIEWING SKILLS

Several interviewing skills have been developed and tested by experts in communication and counselling:

Verbal skills

These include listening and sharing.

- Listening reassures the client that he/she is being heard. Listening responses include exploratory clarification and empathy. Exploratory responses are passive and are regarded as information sharing, while empathy and clarification seek to inform the client that he/she is heard and understood.
- Sharing responses allow the counsellor to share his/her thoughts and feelings with the clients.

Non-verbal skills

- Silent eye contact
- Gentle touch

Silence on the part of the caregiver can allow the client time to gather his/ her thoughts. Be careful about invading the client's space.

The gentle touch conveys empathy.

Roadblocks to communication

- Ordering rather than discussing
- Moralizing
- Lecturing
- Judging or ridiculing

Initiating the interview

- Introduce yourself
- Inform the client about the purpose and benefits of the interview.
- Start the interview – use open-ended questions which allows the client to express him/herself without prejudice

Closing the Interview

Nearing the end of the interview, inform the client of the available time left for the session and ask him/her for any additional information. At this time, pointed/ probing questions may be asked to obtain missing information. Make plans for follow-up.

METHODS OF OBTAINING A DIET HISTORY

1. 24 - hour recall

This provides information on food and beverage intake of the previous 24 hours.

Advantages

- A quick and easy method
- Writing and reading skills are not required by the client
- Does not influence the usual eating pattern of the client

Limitations

- Client may not tell the truth
- Requires the client to recall foods (memory dependent)
- May not represent usual intake
- Requires a skilled interviewer

2. Typical or usual intake

Advantages

- More representative of the usual intake than the 24 hour recall quick and easy method

Limitations

- Requires client to recall the usual pattern (memory dependent) requires a skilled interviewer

3. Food frequency

Is a check list of foods or beverages or food groups in which the client selects the frequency with which the foods are eaten.

Advantages

- Easily standardized
- Beneficial when used with the 24- hour recall
- Provides a picture of food consumption over a period of time with an overall picture of key nutrients
- Does not influence the usual diet

Limitations

- Reading and writing skills are required unless the client is interviewed
- Does not provide specific information on quantities consumed or on meal pattern
- Food list may not be representative of all the foods in the client's diet
- Knowledge of portion sizes may be required

4. Food Record/Diaries

Provide 3 to 7 day records of actual food intake.

Advantages

- Eliminates errors of recall
- A record of the type and amount of food eaten and the time of consumption

Limitations

- Reading and writing skills are required
- Requires the client to be knowledgeable about portion sizes
- Food intake may be influenced and therefore changes during the period of recording
- Requires a recording period of at least 3 days (one weekend day should be included)

5. Additional data

Data about an individual's general health, food habits and eating patterns include:

- Living conditions
- Food purchasing capabilities
- Meal planning and preparation
- Usual meal pattern
- Snack consumption
- Place in which meals are eaten
- Likes/dislikes
- Allergies
- Previous dietary restriction
- Use of vitamin, herbal, nutritional and or mineral supplements
- Taste changes/aversions
- Use of non-prescription drugs
- Weight changes
- Diet information (diet history)
- Bowel habits
- Level of activity/exercise

Appendix II: Data Collection for Nutritional Assessment

Data Collection for Nutritional Assessment

Personal Data			
Date:			
Name:			
Date of Birth:			
	Day	Month	Year
Age:		**Sex:**	
Health Centre:			
Marital Status	M☐ W☐ D☐ CL☐		
Record No.:			
Diagnosis:			
Modified Diet:	No☐ Yes☐		
Meal Plan			
Height:	cm	**Waist Circumference:**	cm
Weight:	kg	kg	kg
	Present	Usual	Desirable
IBW%:		**BMI:**	kg/m²
Recent weight change?	No☐ Yes☐		
	By how much? kg	Time span:	
	Was weight change planned?	No ☐ Yes☐	

Social History			
Occupation:			
Education:	Primary ☐ Secondary ☐ Post-Secondary ☐		
Literacy:	Good ☐ Fair ☐ Poor ☐		
Comments:			
Lifestyle:	Work hours:	Sleep/Rest hours:	
	Smoking:	Alcohol:	
Exercise:			
Leisure Activities:			
Housing:	Lives alone ☐ Lives with family ☐		
	Room ☐ Apartment ☐ Single Family home ☐		
Number in household:	Adults	Children	Infants/Toddlers

Nutrition History		
Food Source:	Purchases ☐ Home Garden ☐ Donations ☐	
Food obtained by:	Self ☐ Other ☐	
Approximate average amount spent food:	$ Weekly/ monthly	
Who does the shopping?		
Cooking Facilities:		
Who does most of the cooking?		
# Persons in household:		
Meals are eaten:	Alone ☐ With family ☐ With friends ☐	
Food storage facilities:		
Previous Diets:	1.	
	Duration:	
	Home remedy☐ OTC☐ Own prescription ☐ Doctor's prescription☐	
	2.	
	Duration:	
	Home remedy☐ OTC☐ Own prescription ☐ Doctor's prescription☐	
Meals:	Meals per day:	
	Where:	
Food dislikes:		
Food intolerances:		
Food allergies:		
Meals eaten at home:		
Meals eaten away from home:		
Appetite:	Good ☐ Fair ☐ Poor ☐	
Supplements/ tonics:	Type	Frequency
Recent illnesses:		
Laxatives:	Type	Frequency

Nutrition History cont'd	
Bowel movements:	Regularity:
	Consistency:
Fluid Intake:	
Dental Condition:	
Sight:	
Laboratory data (to be retrieved from dockets)	Blood Glucose☐ BUN☐ Cholesterol ☐ TG☐ Calcium ☐ Sodium☐ Total Protein Albumin☐ HCT☐

Evaluation Plan:

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Interviewed by: …….. Title: …….. Date: ……..

Reviewed by: …….. Title: …….. Date: ……..

Appendix III: Subjective Global Assessment Form

Subjective Global Assessment Form

MEDICAL HISTORY

Patient name: _____ Date: _____ /_____ /_____

NUTRIENT INTAKE

1. ☐ No change; adequate
2. Inadequate; duration of inadequate intake _____
   ☐ Suboptimal solid diet ☐ Full fluids or only oral nutrition supplements ☐ Minimal intake, clear fluids or starvation
3. **Nutrient Intake in past 2 weeks***
   ☐ Adequate _____ ☐ Improved but not adequate _____ ☐ No improvement or inadequate _____

WEIGHT

Usual weight _____ Current weight _____

1. **Non fluid weight change past 6 months** Weight loss (kg) _____
   ☐ <5% loss or weight stability ☐ 5-10% loss without stabilization or increase ☐ >10% loss and ongoing
   If above not known, has there been a subjective loss of weight during the past six months?
   ☐ None or mild ☐ Moderate ☐ Severe
2. **Weight change past 2 weeks*** Amount (if known) _____
   ☐ Increased ☐ No change ☐ Decreased

SYMPTOMS (Experiencing symptoms affecting oral intake)

1. ☐ Pain on eating ☐ Anorexia ☐ Vomiting ☐ Nausea ☐ Dysphagia ☐ Diarrhea
   ☐ Dental problems ☐ Feels full quickly ☐ Constipation
2. ☐ None ☐ Intermittent/mild/few ☐ Constant/severe/multiple
3. **Symptoms in the past 2 weeks***
   ☐ Resolution of symptoms ☐ Improving ☐ No change or worsened

FUNCTIONAL CAPACITY (Fatigue and progressive loss of function)

1. No dysfunction
2. Reduced capacity; duration of change _____
   ☐ Difficulty with ambulation/normal activities ☐ Bed/chair-ridden
3. **Functional Capacity in the past 2 weeks***
   ☐ Improved ☐ No change ☐ Decrease

METABOLIC REQUIREMENT

High metabolic requirement ☐ No ☐ Yes

PHYSICAL EXAMINATION

Loss of body fat	☐ No	☐ Mild/Moderate	☐ Severe
Loss of muscle mass	☐ No	☐ Mild/Moderate	☐ Severe
Presence of edema/ascites	☐ No	☐ Mild/Moderate	☐ Severe

SGA RATING

☐ A Well-nourished Normal

☐ B Mildly/moderately malnourished Some progressive nutritional loss

☐ C Severely malnourished Evidence of wasting and progressive symptoms

CONTRIBUTING FACTOR

☐ **CACHEXIA** - (fat and muscle wasting due to disease and inflammation) ☐ **SARCOPENIA** - (reduced muscle mass and strength)

*See page 2 SGA Rating for more description.

April 2017

Canadian Malnutrition Task Force* | le Groupe de travail canadien sur la malnutrition*

Advancing Nutrition Care in Canada / Améliorer les soins nutritionnels au Canada

Subjective Global Assessment Guidance For Body Composition

SUBCUTANEOUS FAT

Physical examination	Normal	Mild/Moderate	Severe
Under the eyes	Slightly bulging area	Somewhat hollow look, Slightly dark circles,	Hollowed look, depression, dark circles
Triceps	Large space between fingers	Some depth to fat tissue, but not ample. Loose fitting skin.	Very little space between fingers, or fingers touch
Ribs, lower back, sides of trunk	Chest is full; ribs do not show. Slight to no protrusion of the iliac crest	Ribs obvious, but indentations are not marked. Iliac Crest somewhat prominent	Indentation between ribs very obvious. Iliac crest very prominent

MUSCLE WASTING

Physical examination	Normal	Mild/Moderate	Severe
Temple	Well-defined muscle	Slight depression	Hollowing, depression
Clavicle	Not visible in males; may be visible but not prominent in females	Some protrusion; may not be all the way along	Protruding/prominent bone
Shoulder	Rounded	No square look; acromion process may protrude slightly	Square look; bones prominent
Scapula/ribs	Bones not prominent; no significant depressions	Mild depressions or bone may show slightly; not all areas	Bones prominent; significant depressions
Quadriceps	Well defined	Depression/atrophy medially	Prominent knee, Severe depression medially
Interosseous muscle between thumb and forefinger (back of hand)**	Muscle protrudes; could be flat in females	Slightly depressed	Flat or depressed area

FLUID RETENTION

Physical examination	Normal	Mild/Moderate	Severe
Edema	None	Pitting edema of extremities / pitting to knees, possible sacral edema if bedridden	Pitting beyond knees, sacral edema if bedridden, may also have generalized edema
Ascites	Absent	Present (may only be present on imaging)	

A - Well-nourished no decrease in food/nutrient intake; < 5% weight loss; no/minimal symptoms affecting food intake; no deficit in function; no deficit in fat or muscle mass **OR** *an individual with criteria for SGA B or C but with recent adequate food intake; non-fluid weight gain; significant recent improvement in symptoms allowing adequate oral intake; significant recent improvement in function; and chronic deficit in fat and muscle mass but with recent clinical improvement in function.

B - Mildly/moderately malnourished definite decrease in food/nutrient intake; 5% - 10% weight loss without stabilization or gain; mild/some symptoms affecting food intake; moderate functional deficit or recent deterioration; mild/moderate loss of fat and/or muscle mass **OR** *an individual meeting criteria for SGA C but with improvement (but not adequate) of oral intake, recent stabilization of weight, decrease in symptoms affecting oral intake, and stabilization of functional status.

C - Severely malnourished severe deficit in food/nutrient intake; > 10% weight loss which is ongoing; significant symptoms affecting food/nutrient intake;severe functional deficit **OR** *recent significant deterioration obvious signs of fat and/or muscle loss.

Cachexia – If there is an underlying predisposing disorder (e.g. malignancy) and there is evidence of reduced muscle and fat and no or limited improvement with optimal nutrient intake, this is consistent with cachexia.

Sarcopenia – If there is an underlying disorder (e.g. aging) and there is evidence of reduced muscle and strength and no or limited improvement with optimal nutrient intake.

**In the elderly prominent tendons and hollowing is the result of aging and may not reflect malnutrition.

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Appendix IV: STEP: The WHO STEPwise Approach to NCD Risk-factor Surveillance

STEP: The WHO STEPwise Approach to NCD Risk-factor Surveillance

STEP: The WHO STEPwise Approach to NCD Risk-factor Surveillance

Background

The global burden of chronic, non- communicable diseases (NCDs)—largely heart disease, stroke, cancer, chronic respiratory disease, and diabetes—is increasing rapidly and will have significant social, economic, and health consequences unless urgently addressed. To address this global health problem, in 2013, the World Health Assembly—the decision-making body of the World Health Organization (WHO)—adopted a Global Monitoring Framework for NCDs with 25 key indicators to track progress in prevention and control of NCDs. The World Health Assembly also agreed on a set of global voluntary targets linked to the Global Monitoring Framework to prevent and control NCDs by 2025, including a target to reduce premature mortality from the 4 main NCDs by 25%, and targets for the main behavioral and metabolic NCD risk factors and 2 health systems targets.

Risk-Factors Monitored

A few common and preventable risk factors underlie most NCDs. These NCD risk factors are the leading cause of the death and disability burden in all countries, regardless of their economic development status. The leading behavioral risk factors for NCDs are tobacco use, harmful alcohol consumption, unhealthy diet including high salt and sodium intake, physical inactivity, and overweight and obesity, and the leading physiological risk factors are raised blood pressure, raised blood glucose, and abnormal blood lipids.

Methods

Recognizing a global need for risk-factor data on these key NCD risk factors, WHO initiated the STEPwise approach to surveillance (STEPS) in 2002. STEPS is a WHO-developed, standardized but flexible framework for countries to monitor the main NCD risk factors through questionnaire assessment and physical and biochemical measurements. It is coordinated by national authorities of the implementing country. The STEPS surveys are generally household-based and interviewer-administered, with scientifically selected samples of around 5000 participants.

Goals

The key goals of STEPS are to guide the establishment of risk-factor surveillance systems in countries by providing a framework and approach; to strengthen the availability of data to help countries inform, monitor, and evaluate their policies and programs; to facilitate the development of population profiles of NCD risk-factor exposures; to enable comparability across populations and across time frames; and to build human and institutional capacity for NCD surveillance [34].

Appendix V: Responsibilities of the Health Care Team

Responsibilities of the Health Care Team

TEAM MEMBERS IN NUTRITIONAL CARE

The importance of a team approach to health care has been magnified, in view of the multi-faceted nature of many diseases. The combined efforts, knowledge, attitudes and skills of the team can help to ensure safe and effective Nutritional Care, particularly in the Caribbean where the availability of nutritionists and dietitians is limited. Team members also learn about the contribution of other team members and learn how to delegate and/or refer responsibilities to the most appropriate members of the team. The fact that the client is a very important team member should not be overlooked.

The following are responsibilities of different members of the health care team in the nutritional management of persons with chronic diseases. The list should not be considered exhaustive.

The Physician

- Diagnoses medical problems
- Performs medical procedures
- Co-ordinates and prescribes therapy
- Assumes overall supervision of the team
- Reviews/approves guidelines and clients' management protocol
- Refers clients for specialized Nutritional Care.

Nurse Practitioner

- Diagnoses medical problems
- Co-ordinates client management
- Refers clients for specialized Nutritional Care

Nutrition Personnel

- Takes responsibility for Nutritional Care
- Assesses nutrition status
- Determines nutrient needs
- Recommends appropriate diet therapy
- Prepares care plan in collaboration with client
- Instructs client on the diet and care plan
- Monitors Nutritional Care process
- Evaluates effectiveness of nutrition intervention

TEAM MEMBERS IN NUTRITIONAL CARE

Nutrition Personnel

- Takes responsibility for Nutritional Care
- Assesses nutrition status
- Determines nutrient needs
- Recommends appropriate diet therapy
- Prepares care plan in collaboration with client
- Instructs client on the diet and care plan
- Monitors Nutritional Care process
- Evaluates effectiveness of nutrition intervention
- Provides training and nutrition intervention for the other members of the health care team
- Refers clients to other members of the health care team as indicated
- Documents all relevant details in client's medical records.

The Nurse

- Assumes a central role in overall care and communicates with relevant members of the health care team
- Ensures documentation of all relevant information

The Pharmacist

- Recommends appropriate drug therapy
- Acts as a liaison to identify and inform the team, as well as the client and significant others, about possible drug-nutrient interactions and side effects of medications
- Educates the client on appropriate procedures for taking certain drugs e.g. before or after meals, or avoiding certain foods while taking the medication

The Community Health Aide

- Visits Clients at home
- Monitors client's self-care
- Refers client from community to health centre

Appendix VI: The Caribbean Food Groups

The Caribbean Food Groups

1. STAPLES	2. FOODS FROM ANIMALS	3. LEGUMES & NUTS
Bread	Chicken	Almonds
Bammy	Ham	Dried Peas and Beans
Biscuits	Liver	Green peas
Noodles Cornmeal	Fish	Baked Beans
Breakfast Cereals	Shrimps	Peanuts
Breadfruit	Cheese	Textured vegetable Protein
Sweet Potato	Goat	
Irish Potato	Beef	
Green bananas	Pork Egg	
Yams	Milk	
Rice	Yogurt	
Pasta		

4. VEGETABLES	5. FRUITS	6. FATS & OILS
Cabbage	Grapefruit	Margarine
Cucumber	Orange	Avocado
Lettuce Okra	Banana	Ackee (Jamaican)
Tomato	Guava	Peanuts
Carrot	Mango	Olives
Pumpkin	Papaya	Butter
Onion	Watermelon	Oil
StringBeans	Apple	Salad Dressing
	Peaches	Lard Shortening
		Coconut

Appendix VII: Food Exchange List

Food Exchange Lists

The basic premise of the exchange system is that foods are grouped together with other foods of similar nutrient composition so that foods on each list can be substituted or "exchanged" with other foods on the same list. Within each food list, one exchange in the serving size described (measure) is approximately equal to another in calories, carbohydrate, protein or fat.

The exchange list should be used in consultation with a nutrition professional who would individualize the treatment plan after reviewing the nutrition and health history and calculate the appropriate amount of calories and carbohydrate required.

The list in this appendix is divided into:

1. The Carbohydrate Group which includes the staples foods, vegetables and fruits. Foods from this list can be interchanged in the meal plan since each group contains roughly equal amounts of calories and carbohydrate.
2. The Meat and Meat Substitute Group which includes sources of protein from legumes and nuts as well as foods from animals.
3. The Fat Group which includes familiar fat sources and is divided into list of unsaturated and saturated fats.

STAPLE FOODS	MEASURE/EXCHANGE
Bread, Rice and Cereal Substitutes	
Bread/toast, shop, sliced	½ slice (10 cm x 10 cm x 2 cm)
Bread/toast, shop, sliced	1 slice (10 cm x 8½ cm x 1 cm)
Bread/toast, homemade	1 thin slice
Bread, hard dough	1 thin slice
Bammy	¼ small (15 cm diameter, 1½ cm thick)
Hamburger bun	½ medium
Hot dog roll	1 small
Biscuits, small, round, water type	6 only (3 cm diameter)
Biscuits, cream cracker type	3 only (5 cm diameter or square)
Biscuits, saltines	6 only (5 cm squares)

STAPLE FOODS	MEASURE/EXCHANGE
Roti, Sadha type	¼ (20½ cm diameter) made from 1 cup flour
Roti, Dhalpuri (very thin)	¼ (23 cm diameter) made from 1 cup flour)
Ryvita/Vita Wheat	2-2½ biscuits
Bake/Johnny Cake (baked only)	¼ bake (made from 1 cup flour) 1 small (round)
Rice, cooked	½ cup
Rice and Peas, cooked	½ cup
Noodles, boiled	½ cup
Macaroni, boiled	½ cup
Spaghetti, boiled	½ cup
Cornmeal porridge, medium consistency	½ cup (cooked with water)
Oatmeal porridge, medium consistency	½ cup (cooked with water)
Cream of Wheat porridge, medium consistency	½ cup (cooked with water)
Arrowroot, medium consistency	½ cup (cooked with water)
Arrowroot/Cornflour/Cornstarch	2 tbsp
Flour (dry, uncooked): wheat/plantain/yam, etc.	2 tbsp
Dumpling made from 2 tbsp flour/cornmeal	1 only
Corn-on-cob (15 cm long)	½ only
Canned Corn, Whole kernel	½ only
Cornflakes	¾ cup
Weetabix	1 only
Bran cereals such as All Bran	1/3 cup
Starchy Fruits, Roots and Tubers	
Breadfruit	2 pieces (5 cm x 2½ cm wedge) or 60 g
Cassava	1 piece (5 cm x 3 ½ cm) or 60 g
Dasheen	1 slice (5 cm x 6½ cm x 1½ cm) or 60 g
Coco/Eddoe	1 medium or 60 g
Green Banana	1 medium
Irish Potato, boiled or baked	1 medium or 90 g
Irish Potato, mashed	½ cup

STAPLE FOODS	MEASURE/EXCHANGE
Plantain (ripe)	1 piece (5 cm)
Sweet Potato	1 slice (5 cm x 6½ cm x 1½ cm) or 60 g
Yam/Yampie	1 slice (5 cm x 6½ cm x 1½ cm) or 60 g

LEGUMES AND NUTS	MEASURE/EXCHANGE
Almonds (shelled)	10
Channa/Chickpea	¼ cup
Breadnut	2-3 seeds
Dahl, medium consistency	½ cup
Dried peas and beans (1 tbsp. dry) cooked	¼ cup
Green peas, canned	½ cup
Gungo Peas /Green Pigeon/broad beans	¼ cup
Stewed Peas	¼ cup
Baked Beans (canned without molasses and pork)	2 tbsp
Peanuts (salted or unsalted, roasted and shelled)	16
Cashew nuts (salted or unsalted, roasted and shelled)	7

DARK GREEN LEAFY, YELLOW AND OTHER STARCHY VEGETABLES	MEASURE/EXCHANGE
Green Leafy and other Low- Calorie Vegetables	
Baghi	Vegetables such as those listed in this group may be used as desired if raw, as they do not have much energy. When cooked use only 1 cup. You may use these vegetables at each meal in **addition** to your other vegetable allowance.
Bamboo shoots	
Cabbage	
Callaloo bush (Dasheen leaves, Aramanthus)	
Carailli	
Cauliflower	
Celery	
Chives/green seasoning	
Cho-cho/Christophene	

DARK GREEN LEAFY, YELLOW AND OTHER STARCHY VEGETABLES	MEASURE/EXCHANGE
Cress	Vegetables such as those listed in this group may be used as desired if raw, as they do not have much energy. When cooked use only 1 cup. You may use these vegetables at each meal in **addition** to your other vegetable allowance.
Cucumber	
Kale	
Lettuce	
Egg Plant/Aubergine	
Mustard greens	
Okra	
Pak Choy/Patchoi/Chinese Cabbage	
Pawpaw, green	
Spinach	
Squash (Cucumber type)	
Tomato	
Yellow and Other Vegetables	
Beetroot	½ cup
Bodi	¾ cup
Carrot	½ cup
Chow Mein (Chinese vegetables)	½ cup
Mixed vegetables, canned	½ cup
Onions	1 medium or 2 small or ½ cup
Pumpkin	½ cup
String beans, salad beans (immature pod)	¾ cup
Turnip	½ cup

FRUITS	MEASURE/EXCHANGE
Citrus Fruits and Juices	
Grapefruit	½ (9 cm diameter)
Grapefruit juice, fresh	½ cup
Grapefruit juice, canned, unsweetened	½ cup
Orange/Ortanique	1 small (5 cm diameter), 1 medium; ½ large
Orange juice, canned, unsweetened	½ cup
Tangerine	1 medium
Other Fresh Fruits	

FRUITS	MEASURE/EXCHANGE
Banana, ripe	½ medium (15 cm banana) or 1 small
Cashew, fruit	1 large
Cherries (West Indian)	20
Coconut water	¾ cup
Coolie Plum	12
Guava	1 medium
Guineps	10
Mammie Apple	½ cup
Mango, ripe	1 small
Pawpaw/Papaya	½ cup cubed or ½ small (solo)
Pineapple, raw	1 slice (1½ - 2 cm) thick
Pineapple, juice, unsweetened	1/3 cup
Pineapple and Orange juice, mixed, unsweetened	1/3 cup
Plums	10 small or 6 medium
June Plum/Jew Plum	1 medium (7½ cm x 5 cm)
Pommegranate	1 small
Otaheite Apple	1 medium
Naseberry	1 medium
Soursop, pulp	½ - ¾ cup
Soursop, juice (unsweetened)	1/3 cup
Star Apple	1 medium/small
Sweet sop	1 small
Watermelon	1 cup cubed
Imported Fresh Fruits	
Apple	½ medium or 1 small
Grapes	14 medium
Pear	1 small
Canned Fruits	
Apricot	2 halves
Fruit cocktail	1/3 cup
Grapefruit segments	5

FRUITS	MEASURE/EXCHANGE
Pears	2 halves
Peaches	2 halves
Pineapple	1 ring or 1/3 cup pieces
Dried Fruits	
Dates	2 only
Figs, dried	1 only
Prunes	2 medium only
Raisins, Currants	1½ tbsp

FOODS FROM ANIMALS	MEASURE/EXCHANGE
Lean Meats – and Poultry with skin removed	
Chicken	1 small drumstick
Chicken breast sliced	2 slices (3½ cm x 7½ cm)
Chicken wing	1 small
Chicken necks	2 small
Chicken backs	½
Ham, lean, thin slice**	5 cm x 7½ cm
Rabbit, thin slices, game meat	4 small cubes or 30 g cooked
Liver	3½ cm x 5 cm x 1½ cm, match box size
Kidney (stewed)	1 tbsp
Heart, ox, slices	5 cm x 7½ cm
Heart, sheep/calf	½ small
Fresh Fish	1 small piece (6½ cm x 5 cm x 1½ cm)
Flying Fish	1
Lean Meats – Fish	
Salted Fish**	1 small piece (6½ cm x 7½ cm) or ¼ cup flaked)
Shrimps, Prawns	5 medium
Oysters	3 medium

FOODS FROM ANIMALS	MEASURE/EXCHANGE
Lean Meats – Cheese	
Cottage	2 tbsp
Grated Parmesan	2 tbsp
Medium Fat – Meat and Poultry	
Goat (boneless)	1 tbsp or 4 small cubes (30 g)
Beef (trimmed) regular, sliced thin (1/8" thin)	6½ cm x 7½ cm (30 g)
Beef, stew (boneless)	4 small cubes/1 tbsp (30 g)
Pork chops (fat trimmed)	½ small
Medium Fat – Fish: Canned and Drained	
Tuna fish, salmon, mackerel**	¼ cup
Sardine (oil drained)	1 large or 2 small
Medium Fat – Eggs	
Egg (whole)	1 medium
High Fat	
Mutton or lamb (trimmed)	1 tbsp or 4 small cubes (30 g)
Chicken wing	1 small
Pork, regular, sliced (trimmed)	6½ cm x 7½ cm or 30 g (1 ounce)
Pork spare ribs	30 g (1 ounce)
Beef ribs	30 g (1 ounce)
Minced meat (regular)	2 tbsp
Sausages**	1 small or ½ large
Luncheon meats**	1 slice 6 cm, diameter, ½ cm thick
Bologna	1 slice
Salt meat (fat trimmed)**	5 cm x 7½ cm
Salami	2 thin slices
Oxtail (fat trimmed)	1 piece 5 cm x 1½ cm
Corned beef**	30 g (1 ounce)
Pig tail**	1 small piece
Pig trotters**	2 pieces 5 cm x 2½ cm

FOODS FROM ANIMALS	MEASURE/EXCHANGE
Lamb chop (trimmed)**	1 small
Lamb, sliced thin	6½ cm x 7½ cm
High Fat – Cheese	
Cheddar and American type**	1.25cm cube(15g)
Skim and very low fat milk	
Milk, liquid, skim	½ cup
Milk, powered skim (before adding liquid)	2 tbsp
Yogurt (plain low fat)	60 g (2 ounces)
Low Fat Milk	
2% Milk	½ cup
Yogurt made with 2 % milk	60 g (2 ounces)
Whole Milk	
Milk, fresh cow's	½ cup
Milk, evaporated whole (before adding liquid)	¼ cup
Milk, powered whole (before adding liquid)	2 tbsp
Yogurt, plain (whole milk)	60 g (2 ounces)

FATS AND OILS	MEASURE/EXCHANGE
Margarine	1 tsp
Avocado	1/8 (10 cm diameter)
Ackee (Jamaican)	2 seeds
Peanut butter	1 tsp
Peanuts	10 only
Cashew Nuts	4 only shelled
Olives, green**	5 small
Almonds (dry roasted)	6 whole
Oil (corn, cottonseed, safflower, sunflower, olive, soybean, peanut)	1 tsp
Salad dressing, mayonnaise type	1 tsp
Salad dressing (all varieties)**	1 tbsp
Salad dressing (reduced-calorie)***	2 tbsp
Saturated Fats	
Butter	1 tsp
Lard	1 tsp
Shortening	1 tsp
Ghee	1 tsp
Saturated Fats	
Bacon, streaky without rind	Small rasher
Bacon fat**	1 tsp
Chicken fat	1 tsp
Pork salted**	2½ cm cube
Cream cheese	1 tbsp
Coffee whitener powder	4 tsp
Oil (coconut and palm)	1 tsp
Coconut (dried, grated)	2 tbsp

**If two or more portions are eaten, these foods would contribute significant quantities of sodium and should be restricted for those on low sodium diets.

***Two tablespoons of low-calorie salad dressing is a free food.

Appendix VIII: Determining Energy Needs

Determining Energy Needs

DETERMINING ENERGY NEEDS

There are several methods used to determine energy needs.

1. The Harris Benedict Equation for Basal Energy Expenditure (BEE) which is often used to estimate the minimum amount of energy needed by the body at rest (basal energy), uses age, height and weight.

   For men: BEE (kcals/day) = 66.5 + (13.8 x W) + (5.0 x H) – (6.8 x A)

   For women: BEE (kcals/day) = 655.1 + (9.6 x W) + (1.8 x H) – (4.7 x A)

   W = weight in kilograms H = height in centimeters A = age in years

2. Another method for estimating energy needs is calculation of Resting Energy Expenditure (REE).

   For men: REE (kcals/day) = 1.0 x W x 24

   For women: REE (kcals/day) = 0.95 x W x 24

BEE and REE are multiplied by an activity factor to estimate total energy expenditure.

ENERGY NEEDS BASED ON WEIGHT AND ACTIVITY LEVEL (kcal/kg)

	Sedentary	Moderate	Active
Overweight	20 -25	30	35
Normal weight	30	35	40
Underweight	30	40	45 -50

Appendix IX: Guidelines for Documentation

Guidelines for Documentation

- Client records are legal documents; therefore, all entries should be written in ink.
- All entries should be accurate, complete, clear and concise.
- If the information is not documented or if it cannot be read, it can be argued that the service was not provided.
- Entries should be made immediately after the service is provided or as soon as possible thereafter. Any late entry should be identified as such.
- Each page of the medical record should be identified by the client's name and record number. The type of service, e.g. nutrition, date and time should be documented.
- Only standard abbreviations should be used.
    - All entries should be signed at the end. Signature should include first name initial, complete surname and status, e.g. J. Brown, RN
- Entries made by interns should be co-signed by the clinical instructor, thereby sharing responsibility and authenticity of the information.
- Information in the record should follow agreed-on standards for documentation.
- The record should never be used to argue personal positions or cast doubt on the professionalism of others.
- The ADIME method will be used for documentation in the medical records

Appendix X: Determinants of Client Visits

Determinants of Client Visits

WEEKLY	MONTHLY	QUARTERLY	SEMI ANNUALLY	ANNUALLY
Clients beginning treatment with nutrition therapy and not yet competent to undertake self-management programme	Clients with multiple risks e.g. any combination of diabetes, obesity, hypertension, coronary heart disease, dyslipidaemia. Renal impairment or signs of complications. • Clients on intensive insulin therapy. • Pregnant women • Obese clients • Clients recently discharged from hospital for diabetes, hypertension, obesity or related illnesses. • Clients referred to other team members for problems if necessary. Clients with BP systolic 160-179, diastolic 100-109 mmHg.	• All clients who have not yet achieved treatment goals. • Clients in whom any abnormalities have been identified who may need to have nutritional or disease study re-assessed for intervention children with diabetes, obesity or hypertension. Clients with blood pressure reading: systolic 140-159, diastolic 90-99 mm Hg.	• Re-evaluation of client's understanding of the disease process. • Review of self-management. • Review and update of clients support system. Re-assessment of nutritional status for children and clients with onset of complications.	• All clients: comprehensive nutritional assessment. All clients: re- evaluation of Nutritional Care Plan.
N.B. Children newly diagnosed with diabetes and adults requiring insulin are usually hospitalized for initial care.				

Appendix XI: NICE and IOM Guidelines for Nutrition, Physical Activity and Weight Management During Pregnancy.

NICE and IOM** Guidelines for Nutrition, Physical Activity and Weight Management During Pregnancy.*

NICE guidelines for nutrition and activity recommendations for pre-conception and intrapartum time period based on BMI.

	Pre-pregnancy BMI	
	18.5–24.9	**≥25**
Nutrition	Maintain a healthy weight by eating healthy starches, fiber, ≥5 servings of fruit and vegetables, low fat. Limit fried and sugary foods (fast foods)	Try to lose weight before becoming pregnant by losing at most 0.5–1 kg per week
	Eat breakfast	Eat a balanced and healthy diet
Exercise	Do some activity every day	
	Minimize sedentary activities	
	Build activity into the work day	
	Walk or bike as an alternate mode of transportation	
	Encourage regular activity and start slowly with 15 minutes 3 times weekly, gradually increasing to 30 minutes of daily activity	
	Encourage aerobic and strengthening exercise	

	Intrapartum BMI	
	18.5–24.9	**≥25**
Nutrition	Providers to discuss eating habits and address concerns	Do not lose weight during pregnancy
	Increase fruit and vegetable intake to ≥5 per day	Refer to a dietician for assistance
	Discuss myths about how much and what to eat during pregnancy	Discuss same nutrition recommendations as for pregnant women with BMI<25
	Educate that energy needs do not change much for first 6 months and then increase in last trimester by approximately 200 calories per day	
Exercise	Encourage moderate activity and reassure that activity will not harm the infant	
	Do aerobic and strengthening activities with the goal of staying fit rather than reaching maximum fitness	
	Start slowly and gradually increase amount of exercise to goal of 30 minutes daily	
	Women should be able to exercise at the same intensity as prior to pregnancy without any harmful effects on the mother or infant	

***NICE- National Institute for Health and Clinical Excellence; ** Institute of Medicine**

Institute of Medicine guidelines for total and rate of weight gain during pregnancy, based on pre-pregnancy BMI,*

Pre-pregnancy BMI	Total weight gain		Rates of weight gain during second and third trimesters	
	Range (kg)	Range, (lb)	Mean (range) (kg/wk)	Mean (range) (lb/wk)
Underweight (<18.5)	12.5–18	28–40	0.51 (0.44–0.58)	1 (1–1.3)
Normal Weight (18.5–24.9)	11.5–16	25–35	0.42 (0.35–0.5)	1 (0.8–1)
Overweight (25–29.9)	7–11.5	15–25	0.28 (0.23–0.33)	0.6 (0.5–0.7)
Obese (≥30)	5–9	11–20	0.22 (0.17–0.27)	0.5 (0.4–0.6)

- **Calculations assume 0.5–2 kg (1.1–4.4 lb) of weight gain during the first trimester[16].**

Appendix XII: WHO Global Recommendations on Physical Activity and Health

WHO Global Recommendations on Physical Activity and Health

WHO Global Recommendations on Physical Activity and Health

Physical Activity Recommendations: Aged 5 - 17 years

For children and young people, physical activity includes play, games, sports, transportation, chores, recreation, physical education, or planned exercise, in the context of family, school, and community activities. The recommendations to improve cardiorespiratory and muscular fitness, bone health, and cardiovascular and metabolic health biomarkers are:
Children and youth aged 5-17 should accumulate at least 60 minutes of moderate - to vigorous-intensity physical activity daily.
Amounts of physical activity greater than 60 minutes provide additional health benefits.
Most of the daily physical activity should be aerobic. Vigorous-intensity activities should be incorporated, including those that strengthen muscle and bone, at least 3 times per week.
These recommendations are relevant to all healthy children aged 5–17 years, unless specific medical conditions indicate to the contrary, irrespective of gender, race, ethnicity, or income level. Whenever possible, children and youth with disabilities should meet these recommendations. However, they should work with their health care provider to understand the types and amounts of physical activity appropriate for them considering their disability.

If children are currently doing no physical activity, doing amounts below the recommended levels will bring more benefits than doing none at all. They should start with small amounts of physical activity and gradually increase duration, frequency and intensity over time.

The concept of accumulation refers to meeting the goal of 60 minutes per day by performing activities in multiple shorter bouts spread throughout the day (e.g. 2 bouts of 30 minutes), then adding together the time spent during each of these bouts.

Physical Activity Recommendations: Age 18-64 years

In adults aged 18-64, physical activity includes leisure time physical activity, transportation (e.g. walking or cycling), occupational (i.e. work), household chores, play, games, sports or planned exercise, in the context of daily, family, and community activities.

The recommendations in order to improve cardiorespiratory and muscular fitness, bone health, reduce the risk of NCDs and depression are:
Adults aged 18–64 should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or do at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week or an equivalent combination of moderate - and vigorous-intensity activity.
Aerobic activity should be performed in bouts of at least 10 minutes duration.

WHO Global Recommendations on Physical Activity and Health

For additional health benefits, adults should increase their moderate intensity aerobic physical activity to 300 minutes per week, or engage in 150 minutes of vigorous-intensity aerobic physical activity per week, or an equivalent combination of moderate - and vigorous-intensity activity.
Muscle-strengthening activities should be done involving major muscle groups on 2 or more days a week.

Inactive people should start with small amounts of physical activity and gradually increase duration, frequency and intensity over time. Inactive adults and those with disease limitations will have added health benefits when they become more active.

Physical Activity Recommendations: Age 65 years and Older

In older adults of the 65 years and above age group, physical activity includes leisure time physical activity, transportation (e.g. walking or cycling), occupational (if the individual is still engaged in work), household chores, play, games, sports or planned exercise, in the context of daily, family, and community activities. The recommendations in order to improve cardiorespiratory and muscular
fitness, bone and functional health, reduce the risk of NCDs, depression and cognitive decline are:

1. Older adults should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or do at least 75 minutes of vigorous intensity aerobic physical activity throughout the week or an equivalent combination of moderate- and vigorous-intensity activity.
2. Aerobic activity should be performed in bouts of at least 10 minutes duration.
3. For additional health benefits, older adults should increase their moderate intensity aerobic physical activity to 300 minutes per week or engage in 150 minutes of vigorous-intensity aerobic physical activity per week, or an equivalent combination of moderate-and vigorous-intensity activity.
4. Older adults, with poor mobility, should perform physical activity to enhance balance and prevent falls on 3 or more days per week.
5. Muscle-strengthening activities, involving major muscle groups, should be done on 2 or more days a week.
6. When older adults cannot do the recommended amounts of physical activity due to health conditions, they should be as physically active as their abilities and conditions allow.

Inactive people should start with small amounts of physical activity and gradually increase duration, frequency and intensity over time. Inactive adults and those with disease limitations will have added health benefits when they become more active.

Appendix XIII: Guide to the Management of the Obese Adolescent

Guide to the Management of the Obese Adolescent

	Phase 1	Phase 2	Phase 3
Clinical objective	Stop gaining	Reduce weight	Maintain weight
Assessment tasks	Family history Dieting history Intake and activity Measurements of height, weight, WC Physical examination	Compliance history Regimen review Measurements of height, weight, WC	Anticipate crises Review lifestyle Measurements of height, weight, WC
Management plan	Calculate BMI Prescribe initial diet and exercise	Set weight goals Increase activity gradually Decrease caloric intake gradually	Set weight range Discuss binges and relapse Reinforce principles of FBDGs.
Monitoring	Regular weigh-ins Weekly diary of intake/activity/mood Provide simple rules Write contract Provide written information (FBDGs) Suggest books or videos	Regular weigh-ins Consider prescription options - medication if an underlying cause was discovered - behaviour modification – support group Consider referrals (if practical) - Private Nutritionist for individualized counselling. – exercise trainer	De-emphasize weigh-ins Work with family Build size acceptance Teach binge control
Office visit frequency	Weekly	Fortnightly	Quarterly

Source: [21]

Appendix XIV: JNC-8 Hypertension Guidelines

: JNC 8 Hypertension Guidelines

The JNC 8 Hypertension Guidelines: An In-Depth Guide

Michael R. Page, PharmD, RPh

The American Journal of Managed Care (AJMC) Jan 2014

Compared with previous hypertension treatment guidelines, the Joint National Committee (JNC 8) guidelines advise higher blood pressure goals and less use of several types of antihypertensive medications. The new guidelines emphasize control of systolic blood pressure (SBP) and diastolic blood pressure (DBP) with age- and comorbidity-specific treatment cutoffs. The new guidelines also introduce new recommendations designed to promote safer use of angiotensin converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs).

Important changes from the JNC 7 guidelines2 include the following:

- In patients 60 years or older who do not have diabetes or chronic kidney disease, the goal blood pressure level is now <150/90 mm Hg.
- In patients 18 to 59 years of age without major comorbidities, and in patients 60 years or older who have diabetes, chronic kidney disease (CKD), or both conditions, the new goal blood pressure level is <140/90 mm Hg.
- First-line and later-line treatments should now be limited to 4 classes of medications: thiazide-type diuretics, calcium channel blockers (CCBs), ACE inhibitors, and ARBs.
- Second- and third-line alternatives included higher doses or combinations of ACE inhibitors, ARBs, thiazide-type diuretics, and CCBs. Several medications are now designated as later-line alternatives, including the following: beta-blockers, alphablockers, alpha1/beta-blockers (eg, carvedilo), vasodilating beta-blockers (eg, nebivolol), central alpha2/-adrenergic agonists (eg, clonidine), direct vasodilators (eg, hydralazine), loop diruretics (eg, furosemide), aldosterone antagoinsts (eg, spironolactone), and peripherally acting adrenergic antagonists (eg, reserpine).
- When initiating therapy, patients of African descent without CKD should use CCBs and thiazides instead of ACE inhibitors.
- Use of ACE inhibitors and ARBs is recommended in all patients with CKD regardless of ethnic background, either as first-line therapy or in addition to first-line therapy.
- ACE inhibitors and ARBs should not be used in the same patient simultaneously.
- CCBs and thiazide-type diuretics should be used instead of ACE inhibitors and ARBs in patients over the age of 75 years with impaired kidney function due to the risk of hyperkalemia, increased creatinine, and further renal impairment.

The change to a more lenient systolic blood pressure goal may be confusing to many patients who are accustomed to the lower goals of JNC 7, including the <140/90 mm Hg goal for most patients and <130/80 mm Hg goal for patients with hypertension and major comorbidities.

The guidelines were informed by results of 5 key trials: the Hypertension Detection and Follow-up Program (HDFP), the Hypertension-Stroke Cooperative, the Medical Research Council (MRC) trial, the Australian National Blood Pressure (ANBP) trial, and the Veterans' Administration (VA) Cooperative. In these trials, patients between the ages of 30 and 69 years received medication to lower DBP to a level <90 mm Hg. Results showed a reduction in cerebrovascular events, heart failure, and overall mortality

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in patients treated to the DBP target level. The data were so compelling that some members of the JNC 8 panel wanted to keep DBP <90 mm Hg as the only goal among younger patients, citing insufficient evidence for benefits of an SBP goal lower than 140 mm Hg in patients under the age of 60 years. However, more conservative panelists pushed to keep the target SBP goal as well as the DBP goal.

In younger patients without major comorbidities, elevated DBP is a more important cardiovascular risk factor than is elevated SBP. The JNC 8 panelists are not the first guideline authors to recognize this relationship. The JNC 7 guideline authors also acknowledged that DBP control was more important than SBP control for reducing cardiovascular risk in patients <60 years of age. However, in patients 60 years and older SBP control remains the most important factor.

Other recent evidence suggests that the SBP goal <140 mm Hg recommended by the JNC 7 guidelines for most patients may have been unnecessarily low. The JNC 8 guideline authors cite 2 trials that found no improvement in cardiovascular outcomes with an SBP target <140 mm Hg compared with a target SBP level <160 mm Hg or <150 mm Hg. Despite this finding, the new guidelines do not disallow treatment to a target SBP <140 mm Hg, but recommend caution to ensure that low SBP levels do not affect quality of life or lead to adverse events.

The shift to a DBP-based goal may mean younger patients will be prescribed fewer medications if diagnosed with hypertension; this may improve adherence and minimize adverse events associated with low SBP, such as sexual dysfunction.

Patients with Kidney Disease

Although 1 post hoc analysis showed a possible advantage in kidney outcomes with the lower target of 130/80 mm Hg recommended by JNC 7, 2 other primary analyses did not support this finding. Additionally, another 3 trials did not show an advantage with the <130/80 mm Hg goal over the <140/90 mm Hg goal level for patients with chronic kidney disease.

As a result, the new guidelines recommend that patients with chronic kidney disease receive medication sufficient to achieve the higher <140/90 mm Hg goal level. However, in an exception to this goal level, the guidelines suggest that patients with chronic kidney disease or albuminuria 70 years or older should receive treatment based on comorbidities, frailty, and other patient-specific factors.

Evidence was insufficient to support a goal blood pressure of <140/90 mm Hg in patients over the age of 70 years with CKD or albuminuria.

Patients with Diabetes

Adults with diabetes and hypertension have reduced mortality as well as improved cardiovascular and cerebrovascular outcomes with treatment to a goal SBP <150 mm Hg, but no randomized controlled trials support a goal <140/90 mm Hg. Despite this, the panel opted for a conservative recommendation in patients with diabetes and hypertension, opting for a goal level of <140/90 mm Hg in adult patients with diabetes and hypertension rather than the evidence-based goal of <150/90 mm Hg.

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Follow-up

The JNC 8 guideline authors simplified a complicated recommendation for follow-up in patients with hypertension. The JNC 7 panel recommended that after an initial high blood pressure reading, follow-up with a confirmatory blood pressure reading should occur within 7 days to 2 months, depending on how high the initial reading was and whether or not the patient had kidney disease or end-organ damage as a result of hypertension. Under JNC 8, in all cases, goal blood pressure targets should be reached within a month of starting treatment either by increasing the dose of an initial drug or by using a combination of medications.

Treatments

Like the JNC 7 panel, the JNC 8 panel recommended thiazide-type diuretics as initial therapy for most patients. Although ACE inhibitors, ARBs, and calcium channel blockers (CCBs) are acceptable alternatives, thiazide-type diuretics still have the best evidence of efficacy.

The JNC 8 panel does not recommend first-line therapy with beta-blockers and alpha-blockers due to 1 trial that showed a higher rate of cardiovascular events with use of beta-blockers compared with use of an ARB, and another trial in which alpha-blockers resulted in inferior cardiovascular outcomes compared with use of a diuretic. In addition, a lack of evidence comparing the 4 first-line therapies with carvedilol, nebivolol, clonidine, hydralazine, reserpine, furosemide, spironolactone, and other similar medications precludes use of any medications other than ACE inhibitors, ARBs, CCBs, and thiazide-type diuretics in the vast majority of patients.

Before receiving alpha-blockers, betablockers, or any of several miscellaneous agents, under the JNC 8 guidelines, patients would receive a dosage adjustment and combinations of the 4 first-line therapies. Triple therapy with an ACE inhibitor/ARB, CCB, and thiazide-type diuretic would precede use of alpha-blockers, beta-blockers, or any of several other agents.

These new guidelines all but eliminate use of beta-blockers (including nebivolol), alpha-blockers, loop diuretics, alpha 1/beta-blockers, central alpha2/adrenergic agonists, direct vasodilators, aldosterone antagonists, and peripherally acting adrenergic antagonists in patients with newly diagnosed hypertension. Caution is warranted in patients who are already stable on these therapies.

Special Therapeutic Considerations

ACE inhibitors and ARBs may not be an ideal choice in patients of African descent. Results of a subgroup analysis in the Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) found that ACE inhibitors led to worse cardiovascular outcomes than thiazide-type diuretics or CCBs in patients with African ancestry. Despite the subgroup analysis of ALLHAT, results of the African American Study of Kidney Disease and Hypertension (AASK) support use of first-line or add-on ACEIs to improve kidney-related outcomes in patients of African descent with hypertension, CKD, and proteinuria.

The JNC 8 Hypertension Guidelines: An In-Depth Guide

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As a result, the JNC 8 panelists recommend that all patients with chronic kidney disease and hypertension, regardless of ethnic background, should receive treatment with an ACE inhibitor or ARB to protect kidney function, either as initial therapy or add-on therapy.

One exception to the use of ACE inhibitors or ARBs in protection of kidney function applies to patients over the age of 75 years. The panel cited the potential for ACE inhibitors and ARBs to increase serum creatinine and produce hyperkalemia. As a result, for patients over the age of 75 years with decreased renal function, thiazide-type diuretics or CCBs are an acceptable alternative to ACEIs or ARBs. In addition, the panel expressly prohibits simultaneous use of an ACE inhibitor and an ARB in the same patient. This combination has not been shown to improve outcomes. Despite the fact that the 2 medications work at different points in the renin-angiotensin-aldosterone system, other combinations of medications are better options, and the simultaneous use of ACEIs and ARBs is not supported by evidence.

Lifestyle Changes

As in JNC 7, the JNC 8 guidelines also recommend lifestyle changes as an important component of therapy. Lifestyle interventions include use of the Dietary Approaches to Stop Hypertension (DASH) eating plan, weight loss, reduction in sodium intake to less than 2.4 grams per day, and at least 30 minutes of aerobic activity most days of the week.

In addition, to delay development of hypertension, improve the blood pressure–lowering effect of existing medication, and decrease cardiovascular risk, alcohol intake should be limited to 2 drinks daily in men and 1 drink daily in women. Note that 1 drink constitutes 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80-proof liquor. Quitting smoking also reduces cardiovascular risk.

Conclusion

The JNC 8 guidelines move away from the assumption that lower blood pressure levels will improve outcomes regardless of the type of agent used to achieve the lower level. Instead, the JNC 8 guidelines encourage use of agents with the best evidence of reducing cardiovascular risk. In addition, the guidelines may lead to less use of antihypertensive medications in younger patients, which will produce equivalent outcomes in terms of cardiovascular events with less potential for adverse events that limit adherence.

References

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Appendix XV: JNC-8 Treatment of Hypertensives with Comorbidities

JNC-8 Treatment of Hypertensives with Comorbidities

Recommendations for Treatment of Hypertension in Patients with Comorbidities JNC-8	
Recommendation: Use BP-lowering medications in patients with clinical CVD (coronary heart disease, heart failure, and stroke) who have an average BP of 130/80 mm Hg or higher. For most patients with comorbidities, the BP treatment goal should be less than 130/80 mm Hg. For patients who are 65 years of age or older, or for those with heart failure and persistent high BP, a target systolic BP goal of less than 130 mm Hg is recommended. For some patients with comorbidities, the threshold is a BP level of 140/90 mm Hg (see Table 23 in the 2017 Hypertension Guideline).	
Comorbidity	Guidelines
ASCVD:	Patients are already at risk and need to have their BP controlled at 130/80 mm Hg (previously 140/90 mm Hg). The treatment includes an assessment of ASCVD risk.
Stable ischemic heart disease:	Prescribe guideline-directed management and therapy. β-Blockers and/or calcium channel blockers are effective antihypertensive and antianginal agents.
Chronic heart failure:	Antecedent hypertension is present in 75% of patients
High risk for CVD:	Strong evidence supports treatment with antihypertensive medications and more-intensive intervention
Heart failure with reduced ejection fraction:	Prescribe guideline-directed management and therapy to hypertensive patients with heart failure with reduced ejection fraction. Nondihydropyridine calcium channel blockers are not recommended
Heart failure with preserved ejection fraction:	For patients with heart failure and persistent hypertension after management of volume overload, prescribe ACE inhibitors or ARBs and β-blockers.6
Chronic kidney disease:	An ACE inhibitor (or an ARB if ACE inhibitor is not tolerated) is a preferred drug for treatment of hypertension for those with chronic kidney disease stage 3, or for stage 1 or 2 with albuminuria (300 mg/d or higher, or 300 mg/g albumin-to creatinine ratio or higher or the equivalent in the first morning void). Combining an ARB with a direct renin inhibitor is contraindicated because of a greater risk for hyperkalemia and hypotension and lack of demonstrated benefit.
Kidney transplantation:	Hypertension is common in patients who have received a transplant because of preexisting kidney disease, the effects of immunosuppressive medications, and allograft pathology

Recommendations for Treatment of Hypertension in Patients with Comorbidities JNC-8	
Comorbidity	Guidelines
Stroke:	Treatment recommendations require recognition of stroke acuity, stroke type, and therapeutic objectives – Intracerebral hemorrhage: Because of the data linking high BP with poor clinical outcomes and some suggestive data for treatment in patients with modestly high initial systolic BP levels, early comprehensive lowering of systolic BP in patients with markedly high systolic BP levels (>220 mm Hg) might be sensible. – Acute ischemic stroke: Early initiation or resumption of antihypertensive treatment is indicated only for patients who received a tissue-type plasminogen activator or patients with a systolic BP higher than 220 mm Hg or diastolic BP higher than 120 mm Hg. ▪ Rapidly reducing BP, even to lower levels within the hypertensive range, can be detrimental. ▪ Restarting antihypertensive therapy to improve long-term BP control is reasonable after the first 24 hours for neurologically stable patients who have preexisting hypertension.
Recurrent stroke:	Elevated BP increases the risk of a recurrent stroke, and guideline-recommended antihypertensive drug treatment to lower BP has been linked to a reduction in 1-year recurrent stroke risk
Peripheral artery disease (PAD):	Hypertension is a major risk factor for PAD, and patients with hypertension and PAD should be treated similarly to patients with hypertension without PAD
Diabetes mellitus:	Combined with hypertension, diabetes mellitus greatly increases the risk of damage from CVD, resulting in a higher incidence of coronary heart disease, heart failure, peripheral artery disease, stroke, and CVD mortality.
Metabolic syndrome:	Lifestyle changes that focus on dietary modification, weight reduction, and exercise form the foundation of treatment. The optimal antihypertensive drug therapy for patients with hypertension and metabolic syndrome has not been clearly defined. Although caution is recommended with thiazide diuretics in these patients because of their increased insulin resistance, dyslipidemia, and hyperuricemia and the increased risk of conversion to overt diabetes mellitus, no data are currently available that show a deterioration in cardiovascular or renal outcomes in patients treated with these agents
Atrial fibrillation:	Hypertension is a risk factor for atrial fibrillation and is present in more than 80% of patients with atrial fibrillation, making it by far the most common comorbid condition, regardless of age. Control of hypertension is critical and may prevent new-onset atrial fibrillation.

Appendix XVI: Best Non-pharmacological Interventions for Prevention and Treatment of Hypertension (JNC-8)

Best Non-pharmacological interventions for Prevention and Treatment of Hypertension (JNC-8)

Non-pharmacological Intervention	Dose
Healthy diet: Use the Dietary Approaches to Stop Hypertension (DASH) dietary pattern	Diet rich in fruits, vegetables, whole grains, and low-fat dairy products with reduced content of saturated and total fat
Weight loss: Focus on losing excess weight/body fat	• Ideal body weight is best goal but aim for at least 1 kg body weight reduction for most overweight adults. • Expect about 1 mm Hg for every 1 kg reduction in body weight.
Sodium: Reduce intake of dietary sodium	<1500 mg/day is optimal goal but aim for at least 1000 mg/day reduction in most adults.
Potassium: Increase intake of dietary potassium	3500-5000 mg/day, preferably by consumption of a diet rich in potassium
Physical activity: Add aerobic exercises to weekly routine	• 90-150 min/week • 65%-75% heart rate reserve
Physical activity: Add dynamic resistance training to weekly routine	• 90-150 min/week • 50%-80% heart rate reserve, 1 rep maximum • 6 exercises, 3 sets/exercise, 10 repetitions/set
Physical activity: Add isometric resistance training to weekly routine	• 4 × 2 min (hand grip), 1 minute of rest between exercises, 30%-40% maximum voluntary contraction, 3 sessions/week • 8-10/week
Alcohol: Reduce consumption of alcohol	For those who drink alcohol, the recommended daily consumption is no more than 2 drinks for men and 1 drink for women.

Source: [30]

Appendix XVII: Nutrition Related Side Effects/ Symptoms on Medical Cancer Treatments

Nutrition Related Side effects/Symptoms on Medical Cancer Treatments

Side Effect/ Symptom	Type of Treatment				
	Chemotherapy	Radiation therapy (brain, head or neck)	Radiation therapy (chest)	Radiation therapy (abdomen, pelvis, rectum)	Surgery
Poor appetite/ anorexia	x	x	x	x	X
Nausea	x	x	x	x	x
Vomiting	x	x	x	x	
Diarrhea	x			x	
Constipation	x				
Sore throat	x	x	X (trouble to swallow)	X	
Sore mouth or thrush	x	x			
Dry mouth	x		x		
Altered taste or smell	x	X			
Thickened saliva		x			
Early satiety	x				x
Bowel obstruction				x	
Colitis				x	

Appendix XVIII: Nutrition Intervention Strategies for Self-Management of Side Effects/ Symptoms of Medical Treatment for Cancers

Nutrition Intervention Strategies for Self-Management of Side Effects/Symptoms of Medical Treatment for Cancers

SIDE EFFECT OR SYMPTOM	STRATEGIES
WEIGHT LOSS	• Eat small, more frequent nutrient dense meals and snacks • Add protein and calories to favourite foods • Use protein and calorie-containing supplements (e.g. whey or soy powder, nutritional supplements) • Keep nutrient dense foods close at hand and snack frequently
Poor appetite or anorexia	• Capitalize on time when feeling the best • Eat meals and snacks in a pleasant atmosphere, such as around friends and family • Keep nutrient dense foods close at hand and snack frequently • Be physically active as permitted
Nausea and Vomiting	• Sip on cool or room temperature clear liquids in small amounts • Avoid high fat, greasy, spicy, or overly sweet foods • Avoid foods with strong odors • Eat bland, soft, easy-to-digest foods on scheduled treatment days
Diarrhea	• Consume plenty of clear liquids such as water, clear juices, broth, gelatin popsicles, sports drink • Decrease intake of high fiber foods such as nuts, raw fruits and vegetables, and whole grain breads and cereals. • Avoid sugar alcohol-containing foods such as sugar free candies and gums (e.g. mannitol, xylitol, sorbitol) • Eat e.g. pureed apples, bananas, white rice or pasta which are easy to digest and can firm up the stool
Constipation	• Increase intake of high fiber such as whole grains, fresh or cooked fruits or vegetables, especially those with skins and seeds, dried fruits, beans and nuts • Drink plenty of healthy fluids to keep the digestive system moving • Try to eat a snack at the same time each day • Try to increase physical activity as permitted or able
Sore throat	• Eat soft, moist foods with extra sauces, dressings or gravies • Avoid dry, coarse or rough foods • Avoid alcohol, citrus, caffeine, tomatoes, vinegar and hot peppers. • Experiment with food temperatures (e.g. warm, cool or icy) to find which temperature is most soothing. •
Sore mouth, mucositis, or thrush	• Maintain good oral hygiene (e.g rinse mouth frequently, keep mouth clean) • Eat soft moist foods with extra sauces, dressings and gravies

SIDE EFFECT OR SYMPTOM	STRATEGIES
	• Avoid alcohol, citrus, caffeine, tomatoes, vinegar and hot peppers and dry coarse or rough foods. • Try foods at room temperature or chilled
Fatigue	• Consume easy-to-prepare, easy-to-eat foods • Keep nutrient dense snacks close at hand and snack frequently • Drink plenty of healthy fluids to keep the digestive system moving • Be physically active as permitted or able
Neutropenia	• Wash hands frequently and keep kitchen surfaces and utensils clean • Do not eat raw or undercooked animal products including; meat, pork, poultry, eggs and fish • Wash all fruits and vegetables • Avoid old or moldy foods
Altered tastes or smell	• Maintain good oral hygiene (e.g rinse mouth frequently, keep mouth clean) • Try marinades and spices to mask strange tastes • Use plastic utensils if metallic tastes are a problem • Try cooler foods rather than warmer foods
Thickened saliva	• Sip on liquids throughout the day to keep oral cavity moist.
Xerostomia	• Sip on liquids throughout the day to keep oral cavity moist. • Try tart foods to stimulate saliva if open sores are not present • Eat soft, moist foods with extra sauces, dressings or gravies • Maintain good oral hygiene (e.g rinse mouth frequently, keep mouth clean) •

Source: Grant BL et al Clinical guide to oncology nutrition 2edition., Chicago 2006 American Dietetic association

Appendix XIX: Food Safety

Food Safety

A side effect of cancer treatment is a weaken immune system hence clients receiving treatment must practice food safety:

- Wash hands before eating or preparing food items
    - Wash fruits and vegetables before using
- Clean counter tops, pots, pans, cutting boards, dishes and utensils
- Use separate cutting boards for raw foods and cooked foods/ready to eat foods
- Sanitize counter tops and cutting boards with 1tablespoon bleach to 1 gallon water
- Prevent cross contamination by keeping uncooked and cooked foods separate
- Wash cans or clean boxes before opening them
- Cook meat kind thoroughly or until well done
- Refrigerate or freeze foods or perishables promptly
- Avoid the following food items
    - Soft Cheese: Feta, Brie, Camembert, Blue veined
    - Luncheon or deli meats unless they are properly reheated
    - Raw or undercooked seafood or shellfish
    - Softly cooked eggs
    - Unpasteurized milk and foods prepared with unpasteurized milk

Source: https//www.fda.gov/food/people-risk-foodborne-illness/food-safety-people with Cancer

Appendix XX: Herbs and Botanical Supplements

Herbs and botanical supplements

Herbs and botanical supplements maybe taken by persons living with cancer for the following reasons

- Hoping to halt the cancer
- As recommended by family, friends and or healthcare providers
- To improve and strengthen their immune system
- To aid in managing the symptoms and side effects of cancer and its treatment

Research investigating the effect of these supplements on cancer treatment are inconclusive.

Herbs & Botanicals

Dietary Supplements	Potential Event
Echinaea	May cause inflammation of the liver if used in conjunction with other medications such as anabolic steroids, methrotrexate (chemotherapy) or others
St John,sWort	May decrease effectiveness of all currently marketed medications using cytochromeP450 pathway in the liver irinotecan (Camptosar)
Garlic	May increase bleeding in patients with cancer who are on anticoagulants
Ascorbic Acid	Results of animal studies show that use ascorbic acid reduces bioactivity of bortezomib
Black Cohash	May lower blood lipids and increase the absorption and toxicity of tamoxifen
CoQ10	May interfere with effectiveness of chemotherapy

Reliable sources for evaluating dietary supplements and possible benefits and concerns are available at:

- Natural Medicines Comprehensive Database: Available at http://naturaldatabase.therapeuticresearch.com/home
- National Institutes of Health: Available at http://www.nlm.nih.gov/medlineplus/dietarysupplements
- Memorial Sloan-Kettering Cancer Center: About Herbs, Botanicals, and Other Products available at http://www.mskcc.org/cancer-care/integrative-medicine/about-herbs-botanicals-other-products

Appendix XXI: ADIME Documentation

ADIME Documentation

ADIME Documentation

A: Assessment

D: Nutrition Diagnosis

→ Problem-high risk code assigned

→ Etiology-the cause of the problem or risk code

→ Signs/Symptoms-the evidence collected that trigger the high-risk code to be assigned

I: Intervention – Specific behavior change identified to address the Nutrition Diagnosis

M/E: Monitoring/Evaluation - next steps, follow-up information and referrals

ADIME Note: Example 1

Assessment (A)

Referral appreciated for this 4/52 old male infant admitted with complaints of vomiting, diarrhea and fever. Now diagnosed with AGE. His mother reported that he is exclusively breastfed four to five times daily when he is awake as he is often "sleepy," for fifteen minutes duration each feeding. She complains that her breasts are often engorged and painful. She stated the infant produces one soiled diaper and three to four wet diapers daily. O/E, he is alert and lively; breathes freely on room air, and appears to be underweight. Weight gain since birth noted at 7.4%. His skin turgor is adequate, however there is visual evidence of generalized wasting. No edema is present. Evaluation of anthropometric data on admission confirms he is underweight (z-score WFA below -2), with wasting (z-score WFL below -2), but is not stunted (z-score WFL below -1). He currently receives and tolerates a milk-based formula (20 kcal/oz.) with 440 mL fed over 24 hours, providing 293 Kcal daily. Calculated nutritional needs as follows: 435 Kcal/day (150 Kcal/kg) with 9 grams of protein daily (3 g. Protein/kg).

Nutrition Diagnosis (D)

Suboptimal growth rate related to inadequate energy intake secondary to breastfeeding difficulty as evidenced by poor weight gain since birth with evident wasting.

Intervention (I)

Goal: Optimize nutritional intake to promote a positive growth velocity.

1. Increase volume of milk-based formula as tolerated to 80 mL X 8 (640 mL) daily. At target, feeds will provide 427 Kcal daily with 8.53 g protein daily.
2. Continue breast feeding infant on demand.
3. Counsel mother regarding proper feeding regimen for newborn infants, in addition to techniques related to breastfeeding which prevent or reduce the incidence of engorgement and discomfort, including manual expression of breast milk.

ADIME Documentation

4. Referral to Diet Clinic post discharge for continued nutrition counselling and monitoring.

Monitoring & Evaluation (M/E)

1. Weigh infant (nude) alternate days to assess weight gain, with goal to increase body weight by 20 – 30 grams daily.
2. Measure infant's length weekly to assess linear growth rate (target: ≥ 0.9 cm/week).
3. Strict documentation of feeds daily to assess adequacy of nutritional intake, with anticipated tolerance of ≥ 85% or more prepared volume.

ADIME Note: Example 2

Assessment (A)

Elderly male with H/O HTN and DM. Admitted to medicine approximately two weeks; S/P CVA with right hemiparesis. IVF with additives (2.5 L/24 hr) in progress. The nasogastric feeding tube was removed on day six of admission, and patient is fed with assist a regular consistency (1800 Kcal), Low-sodium Diabetic diet. Diet is tolerated, but his oral intake is documented at less than 50%. He is alert but with minimal verbal responses. Nurse on duty stated he is able to chew his food, but "holds it in his mouth and takes a while to swallow it," and occasionally will cough during feeding, suggesting a compromised gag-reflex. Current labs (LFTs) indicates good visceral protein status and CBC R/O nutrition-related anaemia. O/E there is no wasting or edema to extremities, however, he has a stage II sacral decubitus ulcer.

Nutrition Diagnosis (D)

Swallowing difficulty, related to complications of recent stroke, as evidenced by inadequate oral diet intake.

Intervention (I)

Goal: Increase oral intake without aspiration risk.

1. Change diet consistency to Pureed (1800 Kcal, low-sodium, diabetic).
2. Supplement diet with 2 bottles Ensure Plus po daily (provides 700 Kcal & 26g protein).
3. Recommend MVI with minerals (optimal Ascorbic Acid and Zinc) to promote wound healing.
4. Continue feeding assistance with HOB at 30 degrees or greater to reduce aspiration risk.

Monitoring & Evaluation (M/E)

1. Strict documentation of portion of diet and supplement consumed daily to assess nutritional adequacy.
2. Monitor wound healing for granulating tissue and decrease in size or until completely healed.
3. Repeat LFTs and CBC weekly to assess visceral protein status and developing anemia.

https://azdhs.gov/documents/prevention/azwic/agencies/trainers/new-employee-training/new-employee-training-plan-adime.pdf

Glossary

Adjunct therapy*: Additional cancer treatment given after the primary treatment to lower the risk that the cancer will come back. Adjuvant therapy may include chemotherapy, radiation therapy, hormone therapy, targeted therapy, or biological therapy.*

Biopsy: *The removal of cells or tissues for examination by a pathologist. The pathologist may study the tissue under a microscope or perform other tests on the cells or tissue. There are many different types of biopsy procedures. The most common types include: (1) incisional biopsy, in which only a sample of tissue is removed; (2) excisional biopsy, in which an entire lump or suspicious area is removed; and (3) needle biopsy, in which a sample of tissue or fluid is removed with a needle. When a wide needle is used, the procedure is called a core biopsy. When a thin needle is used, the procedure is called a fine-needle aspiration biopsy.*

Diabetic ketoacidosis: *is a complication that occurs because of inadequate insulin for glucose utilization. The body uses fat for energy and forms ketones*

Eclampsia *is the development of seizures in a woman with severe preeclampsia. It is a rare but serious condition where high blood pressure results in seizures during pregnancy. Seizures are periods of disturbed brain activity that can cause episodes of staring, decreased alertness, and convulsions (violent shaking).*

Enteral nutrition *is the provision of nutrients into the gastrointestinal tract through a tube when oral intake is inadequate.*

Gestational diabetes: is hyperglycaemia first detected at any time during pregnancy.

Hyperglycaemia: *a complication of diabetes, characterized by high blood sugar levels cause by no insulin or insulin resistance.*

Hypoglycaemia: *a complication of diabetes, characterized by abnormally low blood sugar levels, which can lead to cognitive impairment, seizures, loss of consciousness, coma and even death.*

Impaired Fasting Glucose (IFG): *is a risk factor for future diabetes associated with impaired glucose secretion and impaired suppression of hepatic glucose output. It is the zone between the upper limit of a normal fasting blood glucose and the lower limit of the diabetic fasting blood glucose.*

Impaired Glucose Tolerance (IGT): *is a risk factor for future diabetes associated with muscle insulin resistance and defective insulin secretion, resulting in less efficient disposal of glucose during an OGTT.*

Insulin Resistance: *impaired sensitivity to either exogenous or endogenous insulin*

Intermediate Hyperglycaemia/ Prediabetes: *blood glucose levels higher than normal, but not high enough to be diagnosed as diabetes; sometimes referred to as IGT or IFG depending on the* test used to detect it.

Macrosomia: *is the term used to describe neonates who are significantly larger than average, having a birthweight more than 4kg (8lbs 13oz) regardless of gestational weight.*

Metastasis: *The spread of cancer cells from the place where they first formed to another part of the body. In metastasis, cancer cells break away from the original (primary) tumor, travel through the blood or lymph system, and form a new tumor in other organs or tissues of the body. The new, metastatic tumor is the same type of cancer as the primary tumor. For example, if breast cancer spreads to the lung, the cancer cells in the lung are breast cancer cells, not lung cancer cells. The plural form of metastasis is metastases*

Palliation: *Relief of symptoms and suffering caused by cancer and other life-threatening diseases. Palliation helps a patient feel more comfortable and improves the quality of life, but does not cure the disease*

Palliative care*: care given to improve the quality of life of patients who have a serious or life-threatening disease. The goal of palliative care is to prevent or treat as early as possible the symptoms of a disease, side effects caused by treatment of a disease, and psychological, social, and spiritual problems related to a disease or its treatment. Also called comfort care, supportive care, and symptom management.*

Parenteral nutrition *is the provision of nutrients directly into the blood stream intravenously*

Polydipsia: *an initial symptom of diabetes characterized by excessive thirst and is usually accompanied by prolonged dryness of the mouth.*

Polyphagia: *an initial symptom of diabetes characterized by excessive hunger or increased appetite.*

Polyuria: *an initial symptom of diabetes characterized by frequent urination*

Preeclampsia *is a condition of pregnancy characterized by high blood pressure (hypertension) and protein in the urine (proteinuria).*

PSA: *A protein made by the prostate gland and found in the blood. PSA blood levels may be higher than normal in men who have prostate cancer, benign prostatic hyperplasia (BPH), or infection or inflammation of the prostate gland. Also called prostate*

PSA test: *A laboratory test that measures the amount of prostate-specific antigen (PSA) found in the blood. PSA is a protein made by the prostate gland. The amount of PSA may be higher in men who have prostate cancer, benign prostatic hyperplasia (BPH), or infection or inflammation of the prostate. Also called prostate-specific antigen test.*

Shoulder dystocia: *a complication of labour/delivery. It occurs during vaginal birth when a baby's head passes through the birth canal and the shoulders become stuck in the mother's pelvis*

Staging: *Performing exams and tests to learn the extent of the cancer within the body, especially whether the disease has spread from where it first formed to other parts of the body*

Staging system: *A system that is used to describe the extent of cancer in the body. Staging is usually based on the size of the tumor and whether the cancer has spread from where it started to nearby areas, lymph nodes, or other parts of the body.*

Stunting*: the impaired growth and development that children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation.*

TNM staging system*: A system to describe the amount and spread of cancer in a patient's body, using TNM. T describes the size of the tumor and any spread of cancer into nearby tissue; N describes spread of cancer to nearby lymph nodes; and M describes metastasis (spread of cancer to other parts of the body). This system was created and is updated by the American Joint Committee on Cancer (AJCC) and the International Union Against Cancer (UICC). The TNM staging system is used to describe most types of cancer. Also called AJCC staging system.*

Total parenteral nutrition (TPN) *is the delivery of nutrients into a large central vein, using the superior vena cava.*

Tumor: *An abnormal mass of tissue that results when cells divide more than they should or do not die when they should. Tumors may be benign (not cancer), or malignant (cancer). Also called neoplasm.*

Wasting *indicates in most cases a recent and severe process of weight loss, often associated with acute starvation and/or severe disease. However, it could also be the result of a chronic unfavourable condition.*