



HYPERTENSION, CARDIOVASCULAR, DIABETES AND OBESITY PREVENTION AND MANAGEMENT GUIDELINES

First Printed 2001, Revised 2010, 2013

Guideline Review team

Gratitude is expressed to the following for their contribution to the first (2010) review of these guidelines.

Dr Tim Cundy, General Physician, Auckland City Hospital
Dr Tikaka Henry, Director Hospital Services, Cook Islands Ministry of Health
Dr Zaw Aung, Consultant Physician, Cook Islands Ministry of Health
Dr Tekaa Nelesone, Medical Doctor, Atiu, Cook Islands Ministry of Health
Dr Rangi Fariu, Director Community Health Services, Cook Islands Ministry of Health
Dr Ni Ni Wynn, Medical Doctor, NCD clinic, Cook Islands Ministry of Health
Ms Jeanie McKenzie, SPC Healthy Lifestyle Advisor, SPC, New Caledonia
Dr Temo Waqanivalu, Diet and Physical Activity Advisor, WHO, Suva, Fiji
Ms Karen Tairea, Nutritionist/NCD Co-ordinator, Cook Islands Ministry of Health
Biribo Tekanene, Chief Pharmacist, Cook Islands Ministry of Health
Ms Maina Mataio, Health Promotion Tobacco Officer, Cook Islands Ministry of Health
Ministry of Health Doctors
Professor RFW Moulds, Emeritus Professor of Medicine, Fiji National University
(Risk Factor Assessment and Management guidelines)

2013 Review team:

Professor RFW Moulds, Emeritus Professor of Medicine, Fiji National University
(Risk Factor Assessment and Management guidelines)
Dr Mareta Jacob, OPD Manager, Cook Islands Ministry of Health
Dr Voi Solomon, Clinical Chief Medical Officer, Cook Islands Ministry of Health
Dr Tikaka Henry, Director Hospital Services, Cook Islands Ministry of Health
Dr Zaw Aung, Consultant Physician, Cook Islands Ministry of Health
Ms Ngakiri Teaea, Chief Nursing Officer, Cook Islands Ministry of Health
Ms Karen Tairea, Nutritionist/NCD Co-ordinator, Cook Islands Ministry of Health
Biribo Tekanene, Chief Pharmacist, Cook Islands Ministry of Health
Ms Maina Mataio, Health Promotion Tobacco Officer, Cook Islands Ministry of Health
Ministry of Health Doctors

Gratitude to World Health Organization for Technical and Financial Assistance to review and reprint these Guidelines

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INITIAL CLINICAL ASSESSMENT

History

Ask about:

- Ⓢ Diagnosed heart disease, stroke, TIA, diabetes, hypertension, hyperlipidaemia, kidney disease.
- Ⓢ Angina, breathlessness on exertion and lying flat, numbness or weakness of limbs, loss of weight, increased thirst, polyuria, puffiness of face, swelling of feet, passing blood in the urine etc.
- Ⓢ Medicines that the patient is taking.
- Ⓢ Family history of premature heart disease or stroke, particularly in first degree relatives.
- Ⓢ Occupation (sedentary or active).
- Ⓢ Current (within the last 12 months) tobacco use - if yes, amount and how often.
- Ⓢ Current alcohol use – if yes, amount and how often.
- Ⓢ Current eating pattern (diet)

Physical Examination:

In addition to a full cardiovascular examination, the following should be documented.

Measurement of Obesity

a) Body Mass Index (BMI)

A patient's height should be measured in metres. To measure height:

- Ⓢ The person should be barefooted.
- Ⓢ Ask the person to stand up straight with heels, bottom and their upper back touching the height measure or wall.
- Ⓢ Check that feet are together.
- Ⓢ Ask the person to look straight forward (Check the ear is in line with the corner of the eye).
- Ⓢ Slide the measure down until it rests on the top of the head. Remove hair ties or undo buns if they are in the way and flatten big hair before taking measurements
- Ⓢ Read the height in centimeters to the exact point e.g. 158.7cm

If the person is under 18 years update the height annually. For most people over the age of 18 the height does not change.

The weight should then be measured in kilograms. To measure weight:

- Ⓢ The person should be barefooted and in light clothing (no heavy jackets, jumpers, or large belts)
- Ⓢ Remove other heavy objects such as keys, mobiles, wallet and coins in pockets
- Ⓢ Ask the person to step onto the scales, look straight ahead and remain steady until the scale ready stops changing
- Ⓢ Read and record weight to one decimal place e.g 91.3 kg

Calculate BMI as using the following formula:

$$\text{BMI} = \text{Weight} \div [\text{Height}]^2$$

(where weight is in Kg and height is in Metres)

Catergory	BMI (SPC)	Risk of Morbidities
Underweight	<22	Increased
Healthy weight	22 – 26.9	Low
Overweight	27 - 32	Increased
Obese (very overweight)	>32	Severe/very severe

Patients with a BMI of >32 should be on a weight control program.

b) Waist

This is a measure of the amount of fat around the abdomen (central adiposity), which is related to the development of diseases such as diabetes and hypertension. It is simple to do and requires no calculations. It should be recorded in centimetres.

To measure the waist:

- ⓐ Ask the person to remove belts, wallets and any other bulky items around the waist and hip area
- ⓐ Ask the person to stand straight, feet together
- ⓐ Find the mid point between the bottom of the ribcage and the top of the hip bone on the person's side. Measure the waist at this level. Avoid pulling the tape measure too tight
- ⓐ Ask the person to hang their arms down at their side and read the waist measurement when the person is breathing out gently

Avoid pulling the tape measure too tightly

In adult Polynesians:

Males:	waist measurement should be less than 102cm.
Females:	waist measurement should be less than 95 cm.

Measuring Blood Pressure

The patients' blood pressure should be measured with the patient sitting down and using the right hand. The cuff should fit well, use a large cuff if necessary. Check the sphygmomanometer against another one every 6 months. (add page 12 of original blue book)

- Ⓢ A blood pressure of **below 120/80** (ie both systolic is below 120 and the diastolic is below 80) is **normal**. Explain to the patient that the blood pressure is normal at present but they should still live a healthy lifestyle and have it checked in 2 years.
- Ⓢ A blood pressure of **between 120/80 and 139/89** is **high normal**. Explain to the patient that the blood pressure is normal but leaning towards high at present. They should live a healthy lifestyle and have it checked in 1 year.
- Ⓢ **Above 140/90 is abnormal** If the patient has not had hypertension diagnosed previously, it should be checked 30 minutes later. If the blood pressure is still high they should be advised to lose weight, stop smoking, drink only moderate alcohol, do moderate physical activity (such as walking) and restrict the amount of salt in their diet. Recheck the blood pressure on two more occasions about a month apart. If still high. they should be referred to the doctor in the NCD or hospital clinic. If the blood pressure is between 160/100 and 179/109 this should be done within the week and if the blood pressure is *above 179/109 the patient should be referred immediately to the hospital.*

Classification and follow-up Action of blood pressure level in Adults

(Blood pressure to be measured on 3 separate occasions)

Category	Systolic	Diastolic	Action
Normal	<120	<80	Recheck in 2 years (or earlier guided by patients cardiovascular risk). Advise lifestyle changes
High - Normal	120-139	80-89	Recheck in 1 year (or as guided by patients cardiovascular risk). Advise lifestyle changes
Mild Hypertension	140-159	90-99	Confirm within 2 months. Action as outlined on page 21
Moderate Hypertension	160-179	100-109	Recheck within 1 week. Refer to hospital. Action as outlined on page 21
Severe Hypertension	≥180	≥110	Refer to hospital. Start drug treatment immediately

Measuring the blood sugar

Use a finger prick (capillary blood) and the glucometer for screening purposes. Confirm diagnosis of diabetes by performing a venous blood test where available.

Random (non-fasting)

- Ⓢ If the random (non-fasting) blood sugar is below 8.9mmol/l then this is *normal*. The person should be advised that their blood sugar is good today but that they still could develop diabetes in the future. They should follow a healthy diet, control their weight, not smoke, drink moderate alcohol and do regular physical activity. They should have another blood sugar check in 2 years.
- Ⓢ If the random blood sugar is Greater than or equal to 11.1mmol/l then diabetes is likely. If they have symptoms, diagnose diabetes. If they don't have symptoms repeat in one week. If it is again >11.1, diagnose diabetes.
- Ⓢ If the random blood sugar is between 8.9 and 11.1mmol/l The person should be asked to repeat the test after at least 6 *hours fasting*.

Fasting

- Ⓢ If the fasting blood sugar is less than 6.1mmol/l then this is *normal* (ideal is

<5.6mmol/l).

- Ⓢ If the fasting blood sugar is greater than or equal to 7.0mmol/l then this is abnormal (*diabetes*). If the patient has no symptoms of diabetes, repeat the fasting blood sugar in one week. If it is still above 7.0mmol/l diagnose diabetes.
- Ⓢ If the fasting blood sugar is between 6.1mmol/l and 6.9mmol/l repeat the fasting blood test in a month. Advise the patient to follow a healthy diet, reduce weight, not to smoke and drink alcohol in moderation.

Diabetes Diagnostic criteria*

Venous or capillary Sample	
Normal	Fasting BG <6.1 Random <8.9
Diabetes	Fasting BG ≥ 7.0 Random ≥ 11.1

* WHO Criteria: Type 2 Diabetes, Practical Targets and Treatments, 3rd Edition 2002 & WHO/IDF consultation 2006 and updated by Cook Islands MOH doctors

Note: Patients with FBG ≥7.0 and with symptoms (polyuria, polydipsia, weight loss, malaise, tiredness, blurred vision, poor wound healing, repeated infections, etc) is diagnostic of diabetes. Patients who are asymptomatic but have a blood sugar suggestive of diabetes (fasting ≥7.0) should have a second test to confirm the diagnosis a week later. Two readings on different days of ≥7.0 is diagnostic of diabetes

Diagnostic criteria are the same for both adults and children. The diagnostic criteria is also the same for venous and capillary samples.

Diagnostic criteria: (Based on glycated haemoglobin – HbA1c*)

	HbA1c – mmol/mol	HbA1c – %
Normal	≤ 38	≤ 5.6
Impaired	39 - 47	5.7 - 6.4
Diabetes	≥ 48	≥ 6.5

(*WHO 2010)

Measuring Cholesterol

Elevated cholesterol levels can increase the risk of a cardiovascular event. Measurement of non fasting Total Cholesterol (TC) can be done either by using a finger prick (capillary blood) and the Accucheck cholesterol meter or by venous sample analysed by the laboratory. Measurement of other blood lipids needs to be done by the laboratory.

Criteria for Urgent Referral

Patients should be referred urgently to the hospital if they have:

- Ⓢ Very severe hypertension (BP> 180/110)
- Ⓢ Cholesterol >8mmol/L fasting by Laboratory
- Ⓢ Very high blood sugar (BSL>20) with or without symptoms
- Ⓢ High blood sugar (BSL>15) accompanied by significant symptoms (dizziness, nausea, vomiting, shortness of breath) or ketoacidosis
- Ⓢ Visual loss or other significant new visual disturbance
- Ⓢ Infection not responding to treatment within a few days or getting worse
- Ⓢ Blue or gangrenous toe, foot or leg.

- Ⓢ Proteinuria (albumin/creatinine ratio >50) – unless previously detected and assessed
- Ⓢ Chest pain or signs of a stroke (such as numbness or weakness down one side of the body)

CARDIOVASCULAR RISK ASSESSMENT

Patients With Established Cardiovascular Disease

Patients with established cardiovascular disease are at high risk of further cardiovascular events, and should be managed in the same manner as patients with a >30% 10 year risk (see below).

Patients with established cardiovascular disease should also be treated with aspirin 100 mg daily (unless contraindicated) in addition to treatment given for their individual risk factors.

NOTE: Aspirin is not recommended for patients without established cardiovascular disease even if their 10 year risk is >30%.

Patients Without Established Cardiovascular Disease

Patients without established cardiovascular disease and who do not meet any of the criteria for urgent referral should have their cardiovascular risk assessed according to the WHO cardiovascular risk assessment chart for the Western Pacific region (see below)

Calculating Cardiovascular Risk

Before applying the chart to estimate the 10 year cardiovascular risk of an individual, the following information is necessary:

- Ⓢ Presence or absence of diabetes¹
- Ⓢ Gender
- Ⓢ Smoker or non-smoker²
- Ⓢ Age
- Ⓢ Systolic blood pressure (SBP)³
- Ⓢ Total blood cholesterol⁴ (if in mg/dl divide by 38 to convert to mmol/l).

Once the above information is available proceed to estimate the 10-year cardiovascular risk as follows:

Step 1 Select the appropriate chart depending on the presence or absence of diabetes

Step 2 Select male or female tables

Step 3 Select smoker or non smoker boxes

Step 4 Select age group box (if age is 50-59 years select 50, if 60-69 years select 60 etc)

Step 5 Within this box find the nearest cell where the individuals systolic blood pressure (mmHg) and total blood cholesterol level (mmol/l) cross. The color of this cell determines the 10 year cardiovascular risk.

¹ A person who has diabetes is defined as someone taking insulin or oral hypoglycaemic drugs, or with a fasting plasma glucose concentration ≥ 7.0 mmol/l (126 mg/dl) or random blood glucose ≥ 11.1 mmol/l (200mg/l) on two separate occasions). For very low resource settings urine sugar test may be used to screen for diabetes if blood glucose assay is not feasible. If urine sugar test is positive a confirmatory blood glucose test need to be arranged to diagnose diabetes mellitus.

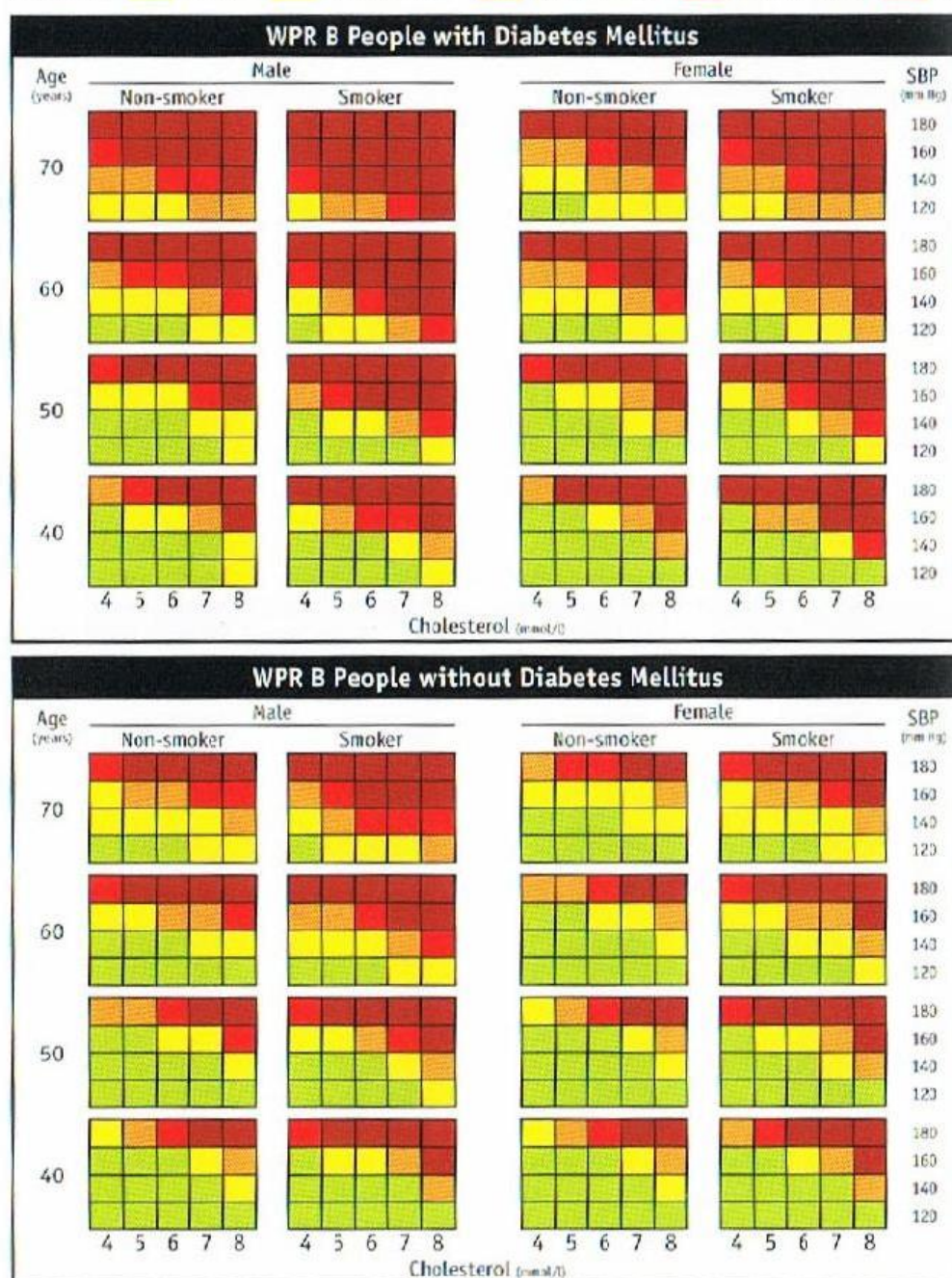
- ² All current smokers and those who quit smoking less than 1 year before the assessment are considered smokers for assessing cardiovascular risk.
- ³ Systolic blood pressure, taken as the mean of two readings on each of two occasions, is sufficient for assessing risk but not for establishing a pretreatment baseline.
- ⁴ The mean of two non-fasting measurements of serum cholesterol by dry chemistry, or one nonfasting laboratory measurement, is sufficient for assessing risk.

WHO Cardiovascular Risk Assessment Chart 1

Chart for Western Pacific Region where total cholesterol CAN be measured

Figure 2. WHO/ISH risk prediction chart for WPR B. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, total blood cholesterol, smoking status and presence or absence of diabetes mellitus.

Risk Level ■ <10% ■ 10% to <20% ■ 20% to <30% ■ 30% to <40% ■ ≥40%



This chart can only be used for countries of the WHO Region of Western Pacific, sub-region B, in settings where blood cholesterol can be measured (see Table 1)

Practice points

Please note that CVD risk may be higher than indicated by the charts in the presence of the following:

- Ⓜ already on antihypertensive therapy
- Ⓜ premature menopause
- Ⓜ approaching the next age category or systolic blood pressure category
- Ⓜ obesity (including central obesity)
- Ⓜ sedentary lifestyle
- Ⓜ family history of premature CHD or stroke in first degree relative (male <55 years, female < 65 years)
- Ⓜ raised triglyceride level (>2.0 mmol/l or 180 mg/dl)
- Ⓜ low HDL cholesterol level (< 1 mmol/l or 40mg/dl in males, < 1.3 mmol/l or 50 mg/dl in females)
- Ⓜ raised levels of C-reactive protein, or fasting glycaemia.
- Ⓜ microalbuminuria (increases the 10 year risk of diabetics by about 5%)
- Ⓜ raised pulse rate
- Ⓜ socioeconomic deprivation.

1. A person is defined as having Diabetes if they are taking insulin or oral hypoglycemia drugs or have a blood glucose measurement at the initial clinical assessment that meets the criteria for the diagnosis of diabetes(see earlier)
2. If the patient has been diagnosed with Diabetes for more than a year and has been poorly controlled e.g. CBG frequently more than 10 or if they have known complications of Diabetes e.g. retinopathy, proteinuria they should be classified as high risk CVR>40% and referred to Rarotonga NCD clinic and for outer islands medical consultant Rarotonga Hospital be informed and monitoring of Creatinine monthly and referral for eye specialist and visiting physician when opportunity arises.
3. The blood pressure measurement used to assess risk should be the reading obtained at the initial clinical assessment(see earlier). If the patient is already on antihypertensive treatment the reading used should be the last reading before treatment was commenced. If this is unavailable use the current BP reading, but increase the risk assessment by 1 row depending on the adequacy of their preceding control. Eg. If the BP reading is 140, used the 160 row.
4. The cholesterol measurement used to assess risk should be that obtained at the initial clinical assessment(see earlier). If the patient is already on treatment with simvastatin, the cholesterol reading used should be the last reading before treatment was commenced. If this is unavailable, use the current cholesterol reading but increase the risk assessment by one column depending on their preceding control. E.g. if the cholesterol reading is 5, use the 6 column.
5. Adjust the risk assessment for obese patients and patients who have a strong family history of premature cardiovascular disease as follows;

Obese

- Add 3 years on the patients age if they are obese(BMI>35) e.g. assess a 44 year old as though they were 47 years old

Family History

- Add 5 years on the patients age if they have a strong family history of premature cardiovascular disease(defined as father or brother having a proven cardiovascular

event at age <55 or mother or sister having a proven cardiovascular event at age <65)
e.g. assess a 42year old as though they were 47 years old.

Points are additive, i.e if they are obese and have a strong family history add 8 years on patients age.

Intervention according to cardiovascular risk assessment

Cardiovascular Risk assessment should be estimated for all patients 40 to 80years of age.

Cardiovascular Risk	Lifestyle	Drug Therapy	Treatment Goals	Follow-up
10 year CVD risk clinically Determined* more than 30% - ie secondary prevention	Intensive lifestyle advice on a cardioprotective dietary pattern, physical activity and <u>smoking cessation</u> interventions. Lifestyle advice should be given simultaneously with drug treatment	Aspirin, a beta blocker, statin and an ACE-inhibitor (after MI) or aspirin, statin and a new or increase dose of a blood pressure lowering agent (after stroke) Treat diabetes energetically if present	Efforts should be made to reach optimal risk factor levels	Full clinical assessment and cardiovascular risk assessments at least annually. Risk factor monitoring every 3 months
10 year CVD risk calculated more than 30%	Intensive lifestyle advice on a cardio protective dietary pattern, physical activity and <u>smoking cessation</u> interventions. Lifestyle advice should be given simultaneously with drug treatment	Drug treatment of all modifiable risk factors (blood pressure lowering, lipid modification and glycaemic control)	Risk factors reduced to a level that will lower 10-year cardiovascular risk to less than 20% (by recalculating risk)	Cardiovascular risk assessments at least annually. Risk factor monitoring every 3 months
10 year CVD risk calculated 20 - 30%	Specified individualized lifestyle advice on a cardio-protective dietary pattern, physical activity and <u>smoking cessation</u> . This lifestyle advice should be given by the primary health care team for 3-6 months prior to initiating drug treatment	Drug therapy only indicated for people with individual extreme risk factor levels# BP >170/100, cholesterol >8mmol/l	Risk factors reduced to a level that will lower 10-year cardiovascular risk to less than 20% (by recalculating risk)	Cardiovascular risk assessments at least annually. Risk factor monitoring every 3-6 months
10 year CVD risk calculated 10 – 20%	Specified individualized lifestyle advice on a cardioprotective dietary pattern, physical activity and <u>smoking cessation</u> . This lifestyle advice should be given by the primary health care team	Non-pharmacological approach to treating multiple risk factors. Drug therapy seldom required, but occasionally indicated for extreme individual risk factor levels unresponsive to non-pharmacological measures	Lifestyle advice aimed at reducing cardiovascular risk	Further cardiovascular risk assessment in 5 years
10 year CVD risk calculated Less than 10%	General lifestyle advice on a cardioprotective dietary pattern,	Non-pharmacological approach to treating multiple risk factors	Lifestyle advice aimed at reducing cardiovascular	Further cardiovascular risk

	physical activity and smoking cessation		risk	assessment in 5 years
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* People who have had a previous cardiovascular event (angina, myocardial infarction, angioplasty, coronary artery bypass grafts, transient ischaemic attacks, ischaemic stroke or peripheral vascular disease) **OR** people with certain genetic lipid disorders (FH, FDB, FCH) **OR** people with diabetes and over diabetic nephropathy **OR** people with diabetes and renal disease

People with isolated high risk factor levels either total cholesterol greater than 8mmol/l or blood pressure greater than 170/100 mm Hg should have these risk factors treated regardless of their calculated cardiovascular risk

HOW TO MANAGE OBESITY, HYPERTENSION, DIABETES, HYPERCHOLESTEROLAEMIA, AND SMOKING

OBESITY

Goals

The management of obesity requires both a population health approach, and attention to the factors influencing the body fatness of individuals. These management guidelines are aimed at the *individual* with an obesity problem.

NOTE: Obesity is included in risk factor management because, even though it is not independently one of the determinants of cardiovascular risk, it is a major risk factor for diabetes and hypertension, and is also a major problem in the Cook Islands in its own right.

The aims of obesity management are:

- Ⓢ Prevention of further weight gain, i.e maintenance of current weight
- Ⓢ Weight loss of any magnitude
- Ⓢ Increase in daily physical activity levels

Please note:

Achievement of even one of the above is beneficial and should be regarded as a success for both the health worker and the individual with obesity. Whilst achievement of weight loss or the ideal body weight is the ultimate long-term outcome, the success of any obesity management program should *not* be judged on these factors alone.

Promotion of healthy diet

This may include

- Ⓢ Raising *awareness of the problems* associated with being overweight and having an unhealthy diet, eg diabetes, hypertension, osteoarthritis of knees, hips, and back, difficulty in conceiving.
- Ⓢ *Counseling and education* regarding healthy eating patterns, including advice on how to grow healthy foods, fishing, shopping, how to cook healthy, how to structure meals, how to structure eating during the day
- Ⓢ Working with the individual to identify the *advantages* for them of improving the diet and having a body weight in the healthy range (health, financial, body image, family). The perceived advantages will vary from person to person.
- Ⓢ Assisting the individual to set *realistic goals* of weight management. For example: setting a goal of losing 0.5-1 kg per week, which would be a loss of 6-12kg over 3 months.

- ☞ *Assessing eating patterns* using a questionnaire or food diary initially, and then following the patient's progress using a food diary if appropriate.
- ☞ Assisting individuals to make improvements in their dietary habits. The advice given needs to be specific and practical. (refer to Dietician if applicable)
- ☞ Identifying *barriers* to dietary improvement, such as individual, family, cultural and societal factors. For example, family eating habits, community feasting, the easy availability of unhealthy food choices, such as high fat take-away foods.
- ☞ Assisting individuals to *deal with those barriers* which inhibit a healthy change in eating patterns. For example, asking family and friends to support you in your efforts to lose weight, and encouraging them to make the same changes.
- ☞ Ensuring availability of a *healthy food supply*. For example: home vegetable gardens, substituting frozen vegetables when fresh is not readily available, using local vegetables such as rukau viti or rukau taro.
- ☞ Involving the *family* of the individual in the lifestyle change. These dietary and lifestyle changes should apply to the whole family, not just the person who is currently overweight.
- ☞ Providing *regular follow-up, encouragement and support* by the Health or community health worker. Brief but frequent contact is preferable. It is important for the health worker to remain positive in their attitude towards clients who need to lose weight, even if weight loss is not easily achieved. Never give up!

Pamphlets, if available are useful to reinforce and remind individuals of all of the above messages.

Promotion of Physical Activity

This should emphasize that being active needs to be integrated into daily life, and is not a special or a short-term activity. Activity should be promoted as:

- ☞ *Enjoyable* for that individual eg swimming, walking, cycling, gardening, sport
- ☞ A *regular* part of a day's routine
- ☞ *Not strenuous*, but rather *sustained and moderate*
- ☞ *Including* walking or cycling, instead of driving or riding
- ☞ *Sociable* eg a walking partner or group, a gardening or church group, etc. This provides companionship and support, incorporating the activity into family and community life.
- ☞ *Culturally* acceptable

HYPERTENSION

Goals

All patients with systolic blood pressures >160mm Hg will need drug treatment, and ideally all patients with a 10 year cardiovascular risk of >30% should also have their blood pressure lowered.

In practice, most patients with an absolute risk of >30% will need antihypertensive drug treatment, but the intensity of their treatment will depend on the severity of the

hypertension.

Apart from effective blood pressure control, other important goals are:

- Ⓢ Controlling the other major risk factors – smoking, lipids, and diabetes
- Ⓢ Controlling other important contributing factors such as excessive alcohol drinking, poor nutrition, high salt intake of (>5g per day) and lack of physical activity
- Ⓢ Controlling weight, aiming to achieve a BMI of <30 and no weight gain.

The management of all patients with hypertension should commence with diet (particularly reduction in salt intake), weight reduction, and increased physical activity. However if the initial blood pressure is >160/100, or if ideal blood pressure control is not achieved after 3 – 6 months of non-pharmacological management, then drug treatment should also be commenced. However it is important that non-pharmacological measures are continued after drug therapy is introduced.

Choice of Drug

There is a uniform agreement as to which antihypertensive drugs should be given for initial therapy. The major options are:

- Bendrofluazide (Thiazide – type diuretics)
- Enalapril (Angiotensin – converting enzyme (ACE) inhibitors)
- Nifedipine CR and Felodipine ER (Calcium channel blockers)

Each of these classes of drugs has been equally effective in monotherapy trials if the attained blood pressure is similar.

Atenolol and Metoprolol CR (Beta blockers) are NOT commonly used for initial monotherapy in the absence of a specific indication, since they may have an adverse effect on some cardiovascular outcomes, particularly in older patients.

The goal of antihypertensive therapy in most patients below the age of 80 years with uncomplicated combined systolic and diastolic hypertension is a blood pressure of less than 140/90mmHg.

After the initial dose, going to higher doses produced on average relatively small further reductions in blood pressure at the price of an increasing rate of adverse effects. As a result, we generally limit dose titration to one step with a given antihypertensive drug.

Two or even three drugs at half standard doses might have greater antihypertensive efficacy and less toxicity than one drug at standard or twice standard doses and might produce better patient outcomes.

All patients with systolic blood pressures >160mm Hg will need drug treatment, and ideally all patients with a 10 year cardiovascular risk of >30% should also have their blood pressure lowered.

In practice, most patients with an absolute risk of >30% will need antihypertensive drug treatment, but the intensity of their treatment will depend on the severity of the hypertension.

- Ⓢ Bendrofluazide 2.5mg – 5mg once daily orally

OR

- Ⓢ Enalapril 2.5mg – 40mg once daily orally

OR

- Ⓢ Nifedipine Retard 20mg twice daily orally or
Felodipine ER 2.5mg – 10mg once daily orally
- OR

- Ⓢ Atenolol 50mg – 100mg once daily orally or
Metoprolol CR 47.5mg – 95mg once daily

The angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB) can be used as monotherapy or in combination with other drugs

Indications for use of ACEI and ARB

- Ⓢ Complicated by heart failure
- Ⓢ Requiring treatment after a myocardial infarction
- Ⓢ Associated with left ventricular systolic dysfunction
- Ⓢ Occurring in diabetic patients

Combination of drugs – if blood pressure is not satisfactorily controlled by single drug.

- Ⓢ Atenolol 100mg once daily orally

OR

- Ⓢ Metoprolol CR 95mg once daily orally

WITH

- Ⓢ Bendrofluazide 2.5mg once daily orally

Combination of drugs

- Ⓢ Enalapril 20mg twice daily orally

WITH

- Ⓢ Bendrofluazide 2.5mg once daily orally

- Ⓢ Enalapril 20mg twice daily orally

WITH

- Ⓢ Atenolol 100mg once daily orally

OR

Metoprolol CR 95mg once daily orally

- Ⓢ Nifedipine retard 20mg twice daily orally

OR

Felodipine ER 10mg once daily orally

WITH

Ⓢ Atenolol 100mg once daily orally

OR

Metoprolol CR 95mg once daily orally

Advice to accompany drug therapy for Hypertension

It is important to *explain the treatment* to the patients and their family. This should include why the medicine is being used and what to do if there are any side effects. Explain to the patient that it is important not to stop taking their medication even though they are taking Maori, traditional or herbal medicine. Encourage the patient to bring their medicine bottle with them so you can get some idea of how they are taking them. (Also refer to Cook Islands Ministry of Health Standard Treatment Guidelines for Cardiovascular Diseases)

DIABETES

Goals

The principle goal of management is to prevent specific complications of diabetes such as gangrene, kidney disease, and blindness. However good diabetes control also probably reduces the risk of stroke and myocardial infarction.

Good diabetes control can be achieved by:

- Ⓢ Controlling risk factors such as zero smoking and reducing excessive alcohol drinking, improve nutrition and regular physical inactivity
- Ⓢ Controlling the blood sugar. Targets for control of the HbA1c and pre- and post-prandial blood glucose (BG) are given below. HbA1c measures how well controlled the blood sugar is over the previous 6-12 weeks.
- Ⓢ Detecting complications early and provide treatment for them -especially for foot problems, infections, eye complications and kidney disease.

When to start treatment

All patients with type 2 diabetes should be advised about diet, weight reduction and increased physical activity.

If the initial fasting blood glucose is >12 , or if after 6 weeks the blood glucose is still elevated (fasting blood sugar of 7 or more, or random above 11.1), in addition to the above non-pharmacological measures, the patient should be started on oral hypoglycaemic drugs.

Medication is always in addition to, and not a substitute for, healthy eating and regular physical activity

For obese type 2 diabetic patients, start on

- ☞ *Metformin 500 mg orally 2-3 times daily up to a maximum of 2 g daily with meals.*

Note that metformin can cause nausea and vomiting, so should be started in a low dose, increased as necessary to the maximum. It should also not be prescribed for patients with significant renal impairment (estimated creatinine clearance <30 ml/min) as it can occasionally cause lactic acidosis.

If blood sugar levels are uncontrolled, add a sulphonylurea (see below).

For non-obese type 2 diabetic patients, start on

- ☞ *Glibenclamide 2.5 to 10 mg as a single dose or twice daily up to a maximum of 20 mg daily with meals or after meals. This drug is preferred in younger patients.*

OR

- ☞ *Gliclazide 40mg orally once or twice daily to a maximum daily dose of 320mg*

The main adverse effect of sulphonylureas is hypoglycaemia. Patients must be warned about this possibility and advised what to do if it occurs.

If blood sugar is not adequately controlled with a single oral agent, give

- ☞ *Metformin + glibenclamide/gliclazide (doses as above).*

Insulin treatment in type 2 diabetes

The indications to start insulin in type 2 diabetes are:-

- ☞ failure of oral hypoglycaemic agents (eg HbA1c persistently >7%),
- ☞ patients undergoing major surgery,
- ☞ critically ill patients, pregnancy

Do not stop oral hypoglycaemic agents when commencing insulin treatment. The simplest regimen is to add a single dose of intermediate acting insulin at night.

- ☞ *Intermediate-acting isophane 10 units subcutaneously at bedtime and adjust dose according to blood sugar levels*

If blood sugars are not controlled, increase the dose of insulin by 2 units per week until fasting levels are between 5 and 7.

If the above regimen does not produce satisfactory control, a twice daily regimen can be used:

- ☞ *Intermediate-acting isophane insulin 10 units in the morning and 5 units in the evening subcutaneously.*

In principle, two-thirds of the insulin dose should be administered in the morning and one-third in the evening. However, insulin doses should be adjusted based on the blood sugar levels and increments of 5 units per dose are recommended.

Practical tips on how to start insulin

1. **Pre-warn the patient** - can usually do so many months (or years) in advance.
Give positive messages e.g. they will feel better; everyone finds it much easier than they expected. Acknowledge and discuss patient inhibitions to injecting themselves daily.
2. **Self-testing** - Patients need to know how to test their own glucose at home with a glucometer.
3. **Provide a prescription** – Protaphane insulin and syringes (or Novopen + needles if available).
4. **Bring patient in** - at end of day - to see you or practice nurse (PN). Tell patient he/she will give first injection. Demonstrate dialling up 10U of insulin and injecting into air. Then get patient to do it - pulls up shirt/ blouse, takes pinch of skin between thumb and forefinger, pushes needle vertically into top of raised skin, pushes plunger, withdraws. *Usual starting dose at home 0.2u/kg body weight, taken in the evening.*
5. **Continue oral medications**, if metformin preferably as a b.d. dose.
6. **Patient checks and records fasting glucose** (FBG) each morning.
7. **Bring patient back to clinic** at same time each afternoon until you (the doctor, Registered Nurse or Nurse Practitioner) and patient are happy with injection technique, and that patient can continue unsupervised at home. People are usually confident after the initial visit or after one or two more visits. Shift injection time at home **to bedtime** (*anytime from 2100-0100*). Educate about hypos, though in practice unlikely unless they are thin.
8. **Patient phones in** fasting glucose reading, initially daily. You (the doctor, Registered Nurse or Nurse Practitioner) instruct to increase insulin dose, initially in **2U increments every 3-5 days** if average FBG over 6, later may **increase by 4U if average fasting glucose still over 10**. Works remarkably simply – often initial dose and early increases make no difference until hit a level at which FBG starts to come down then as insulin steadily goes up, glucose steadily comes down. Aim for an average fasting glucose of 4.5 to 6.
9. **As fasting glucose comes down**, ask patient to check glucose before evening meal.
10. **If the fasting sugar is good, but the evening sugar high** despite taking oral drugs in the daytime, then stop the sulphonylurea, and add in a morning injection of Protaphane insulin 0.2u/kg.
11. **Do NOT reduce/withdraw metformin** as the combination with insulin gives better control, weight and lipid profile – better to reduce insulin doses if needed.
12. Increase morning insulin dose, initially in **2U increments every 3-5 days** if average blood glucose (BG) before the evening meal is over 7. Later may **increase by 4U if average glucose still over 10**.

- 13. Recheck HbA1c** after about 2 months on stable insulin dose(s), also lipids and microalbumin if previously raised – they will often improve too. Appropriate target HbA1c needs to be considered on an individual basis, especially in elderly.
- 14. Recheck HbA1c every 3-4 months** – if on a single nocturnal dose the patient is likely to need twice daily insulin sooner or later within the next 5 years. Explain that at this stage.

Sick days

Any additional sickness may cause problems in diabetes. Most illnesses make diabetes control worse especially infections like bladder or kidney infections or boils. Diabetes control will also be worse after a severe injury, heart attack or stroke. For patients on tablets, this may mean that the patient needs to go on insulin temporarily to control the blood sugar. After the illness is over they can usually stop. Patients on insulin will require careful control not only to avoid high sugars (insulin requirements are commonly increased in illness) but also low sugars, because the patient is eating less.

Monitoring of diabetes

Because diabetes has specific complications (eg retinopathy, neuropathy, and nephropathy), extra monitoring for these is required, and patients should be referred for further assessment if they are detected for the first time.

Recommended monitoring for specific diabetes complications are given below.

What to check	When	Comment
Blood sugar	Every visit	Ask patient to test sometimes before and sometimes after meals Target RBG 4-11mmols and FBG 4.6-6.9mmols if unable to do HbA1c
HbA1c	Every 6 months	Especially after starting therapy. Target <7.1%
Feet	Every 6 months	Check for loss of sensation and loss of pulses. At every visit look for ulcers or infections, corns or calluses. If foot infection is identified commence treatment with antibiotics immediately and review daily. Refer if not improving
Vision	Every 12 months	Check using Snellens chart. If visual loss identified refer immediately to eye clinic or hospital
	Every 2 years	Refer to ophthalmologist for screening, even if there is no visual impairment
Urine	Every 12 months	Check albumin/creatinine ratio. This should be done

on a first morning urine sample. If proteinuria detected (Ratio >30 or 2+ on a dipstick – refer or treat appropriately.

Goals

The principle goal of management is to prevent complications such as gangrene, kidney disease, blindness, stroke and myocardial infarction. This can be achieved by:

- ④ Controlling risk factors such as zero smoking and reducing excessive alcohol drinking, improve nutrition and regular physical inactivity
- ④ Controlling the blood sugar. Targets for control of the HbA1c and pre- and post-prandial blood glucose (BG) are given below. HbA1c measures how well controlled the blood sugar is over the previous 6-12 weeks.
- ④ Detecting complications early and provide treatment for them -especially for foot problems, infections, eye complications and kidney disease.
- ④ Maintaining quality of life by minimizing complications and side effects of treatment.

<i>Targets for Treatment</i>	
<i>HbA1c</i>	<7.1% (<54mmol/L)
<i>Fasting Blood Glucose (FBG)</i>	4.6 – 6.9 mmol/L
<i>Random Blood Glucose (RBG)</i>	4.0 – 11.0 mmol/L
<i>Blood Pressure</i>	<130/80 <125/75 if proteinuria present
<i>Weight</i>	BMI <27 or no weight gain
<i>Lipids</i>	Total Cholesterol: <4.0 mmol/L LDL: <2.0 mmol/L HDL: >1.0 mmol/L Triglycerides: <1.7 mmol/L
<i>Smoking</i>	Zero smoking
<i>Alcohol</i>	Reduce excessive drinking, limit alcohol intake

<i>Diet</i>	Reduce fat intake, control carbohydrates and eat more vegetables
<i>Physical Activity</i>	Regular physical activity. At least 30 minutes on 5 days of the week

HYPERCHOLESTEROLAEMIA

The target for patients with an absolute 10 year cardiovascular risk of >30% is to keep the total cholesterol below 4.0 mmol/L. Two measurements should be taken prior to initiating treatment.

The first step of treatment is to make lifestyle changes: reduce the amount of saturated fat in the diet; ensure regular exercise, encourage weight loss (if overweight); quitting smoking and limit sugar and alcohol intake (especially if the triglycerides are elevated). To decrease LDL cut down on saturated and trans fats in diet, To reduce TG's reduce alcohol intake and sugar intake.

If diet fails after 3-6 months, or if the initial total cholesterol level is the main contributing factor to the patient's high cardiovascular risk, the patient should be started on a statin.

The statin available in the Cook Islands is simvastatin. It should be commenced in a dose of 10 mg daily, and the patient reviewed at monthly intervals and monitored for musculoskeletal symptoms. If there are no adverse effects, but the target cholesterol level is not reached, the dose should be increased incrementally (20, 40, 80) to a maximum of 80 mg daily nocte. However note that significant numbers of patients will develop musculoskeletal symptoms and/or raised CK levels at the higher doses. If simvastatin is not tolerated bisafibrate can be given at 400mg oral daily.

Note also that lipid abnormalities are sometimes secondary to other conditions:

Secondary causes of lipid abnormalities include:

- ② diet and alcohol influences,
- ② hypothyroidism, diabetes, liver disease, nephrotic syndrome and steroid treatment.

A rise in triglycerides is seen:

- ② In people with diabetes or people who are obese, or
- ② In people who have excessive alcohol consumption.

Any identifiable cause should be treated before initiating lipid lowering treatment.

SMOKING

Smoking is a major risk for many diseases, including cardiovascular diseases, so all patients should be advised to stop smoking regardless of their cardiovascular risk.

However because smoking makes such a major contribution to overall cardiovascular risk, it is particularly important that high risk patients cease smoking – indeed it will be difficult to reduce their overall risk satisfactorily without quitting smoking.

Assess how ready the patient is to change. Tailor your advice to the stage they are at. When they are ready to act they may be helped by:

- 🌀 Setting a quit date
- 🌀 Trying to avoid situations where they will be tempted to smoke
- 🌀 Providing help with craving. This may involve using nicotine gum or patches.

Protocol for counseling on cessation of tobacco use

The **ABC** Smoking Cessation Protocol

ASK

1. Ask ALL people at every visit if they smoke and document their smoking status in the clinical record.
 - Current smoker
 - Long-term former smoker (stopped more than 12 months ago)
 - Recent former smoker (stopped less than 12 months ago)
 - Never smoked
 - Exposed to second hand smoke

BRIEF ADVICE

1. Personalized the advice
 - What is important to the person?
 - Is there a health conditions that may be attributed to using tobacco?
2. Acknowledge that quitting is hard, but that it is possible
 - Ensure that the resources you will provide has helped others and that he/she just needs to find out what works for him/her.
3. Encourage them and offer support to help quit

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CESSATION RESOURCES

1. For those not ready to quit, provide basic information about:
 - The dangers of tobacco use to themselves and their families
 - The benefits of quitting tobacco use
2. For those ready to quit, provide information such as:
 - Tips on what to do before quitting
 - Tips on how to recognize and avoid 'triggers'
 - Identifying withdrawal and how to deal with symptoms
 - Set a quit date and develop a personal quit plan
 - Arrange for follow-up(link with next medical appointment)

3. For household members wanting to help their loved ones quit, provide information about:

- How to be supportive of a person trying to quit using tobacco

Note: the use of ABC is a memory aid for smoking cessation interventions

SCREENING FOR HYPERTENSION, DIABETES AND OBESITY

The earlier people with hypertension, diabetes or obesity are diagnosed and treated, the less likely they are to develop complications. Only about half of the people with diabetes or high blood pressure in the community have been diagnosed. This is partly because people don't recognize that they have these conditions, they don't want to admit that they have these conditions or health workers are not looking hard enough. Obesity is related to both diabetes and hypertension, and has health problems in and of itself such as osteoarthritis, joint problems, sleep apnoea and fertility problems.

Screening for these conditions can be carried out:

- ☞ In the community as part of a wide screening
- ☞ As a wellness program in a village, church or workplace
- ☞ As patients present to the hospital or clinic with other problems

The purpose of the screening is to:

- ☞ Identify health problems that may lead to disease, e.g smoking ,overweight
- ☞ Detect diseases early to prevent complications
- ☞ Provide people with information about their health, about health risks and assist people in changing unhealthy behaviours (brief interventions)
- ☞ Provide a non threatening way for people to engage with the health service about concerns they may have about their health

WHO SHOULD BE SCREENED

Screening should be considered for all adults (≥ 15 years) who are overweight or obese (Body Mass Index >25 (WHO) or >27 SPC) and have any of the following:

- ☞ Women who have had a baby weighing $>9\text{lb}$ or 4kg or were diagnosed with Gestational Diabetes Mellitus (GDM)
- ☞ Those who had previous borderline tests (Impaired Glucose Tolerance or Impaired Fasting Glucose)
- ☞ Those with existing heart disease, diabetes or hypertension (for example those with diabetes should be tested for hypertension and vice versa).
- ☞ Those who drink to excess or smoke
- ☞ Those with someone in their close family (mother, father, brother, sister, grandmother or grandfather) with high blood pressure, diabetes or heart disease
- ☞ Those who are inactive

HOW SCREENING SHOULD BE CARRIED OUT

History

Patients should be asked about

- Ⓢ Previous diabetes
- Ⓢ Previous hypertension
- Ⓢ If they are pregnant
- Ⓢ If they smoke
- Ⓢ If they drink alcohol
- Ⓢ If they do regular physical activity,
- Ⓢ Their diet especially how much fruit and vegetables they eat

(The MiniSTEPS form can be used and is attached in *Appendix 1*).

Measurements

The following measurements should be taken:

- Ⓢ Weight (kg)
- Ⓢ Height (cm)
- Ⓢ Blood sugar
- Ⓢ Cholesterol
- Ⓢ Blood pressure
- Ⓢ Waist (cm)
- Ⓢ Calculate Cardiovascular Risk

Always give people immediate feedback about their results and include brief interventions where appropriate e.g healthy eating, smoking cessation, etc.

For screening within the community, results outside the normal range need to be followed up and where necessary referral to NCD or hospital clinic arranged.

TESTING FOR DIABETES

Testing for Type 2 Diabetes should be carried out for adults with no symptoms if they are overweight or obese or have additional risk factors such as:

- Physical inactivity
- Close relative with diabetes
- Women who have delivered a baby $\geq 4\text{kg}$ or 9lbs
- Hypertension ($\geq 140/90$)
- HDL cholesterol $< 0.90\text{mmol/l}$, triglyceride level > 2.82
- Women with polycystic ovary syndrome
- HBA1c $\geq 5.7\%$, IGT or IFG on previous testing
- History of CVD
- Other clinical conditions associated with insulin resistance

PATIENT COUNSELLING AND PATIENT EDUCATION

PATIENT COUNSELLING

Counseling is an essential but separate aspect of patient care in the management of many medical problems. Counseling is different from advising or educating. It aims to find out how a person feels and thinks about their situation, not just to tell a person what they should do.

The principles of counseling are important for all health staff to understand and adhere to, especially in the area of the lifestyle changes necessary for the management of obesity, hypertension and diabetes. These principles are:

Confidentiality

Each person has the right to complete privacy when they interact with health personnel. Health staff also needs to comply with the Ministry of Health Confidentiality Policy.

Respect and unconditional high regard

Each person has the right to their personal choices and decisions, so long as they do not harm others or break the law. Health staff should understand this autonomy. They must be very careful not to be judgmental or disapproving when interacting with patients who, do not adhere to advice given. Not complying with health advice is *not* sinful or criminal or negligent. To imply this only serves to alienate the patient and reduces the chance of establishing an effective therapeutic relationship.

Understanding and support

Patients need our understanding of their personal, family and community context. They need encouragement to set and achieve goals which are realistic for *them*. They need health staff to be positive and encouraging, *especially* when goals are not met.

PATIENT EDUCATION

Patients with obesity, hypertension or diabetes need to develop their own understanding of the problem and what can be done about it.

Explaining obesity, hypertension, diabetes and hypercholesterolaemia

Obesity is defined as having a BMI greater than 32. Being obese puts you at greater risk of developing diabetes, high blood pressure, heart disease and some cancers. It can also lead to other problems such as fatty liver, joint pain, skin infections, sleep apnoea and difficulty conceiving.

Hypertension means that the pressure in the blood vessels (arteries) is high. Too much pressure weakens the wall of the vessel making it easy to break or a clot may block the artery causing a stroke.

Type 2 (or adult) diabetes is when there is too much sugar in the blood which then leads to thickening and damage to blood vessel walls. It results from altered action of insulin, which is a hormone which normally carries the sugar from the blood into the liver, fat, and muscles. In Type 2 Diabetes the muscle and fat resists the insulin, preventing the sugar moving from the blood into the tissues. In type 2 diabetes the body cannot make enough insulin or the insulin it makes cannot work properly. This type of diabetes occurs

more frequently in overweight people, although it can also occur in people of normal weight. It also runs in families, and is the main type of diabetes in the Cook Islands.

Type 1 (or childhood) diabetes is a disease of the pancreas, where the pancreas stops producing any insulin. This type of diabetes is rare in the Cook Islands.

Gestational diabetes is diabetes in pregnancy that often disappears after birth. It may appear again in another pregnancy or later in life if overweight or obesity continues.

Smoking is not a cause of hypertension or diabetes but it makes complications such as heart attack or stroke much more likely to occur.

How big is the problem

Patients need to understand how high their blood pressure is or how high their blood sugar is. They also need to understand what their risk factors are — how overweight they are, what needs to be changed in their diet, how physically active or inactive they are and how their smoking increases the chances of complications.

Managing the Problem

Patients need to understand what they can do about their obesity, diabetes or hypertension. This involves explaining:

- ② What they should be eating and how to prepare food.
- ② What physical activity they should be doing and how often
- ② How they can stop smoking or reduce their alcohol intake
- ② How they can reduce stress levels
- ② What treatment they need to take and what to do if they have any side effects.

It is important that they understand what medication(s) they are taking, the purpose of the medication and to take the medication every day. They should not stop taking the medication without talking to their doctor first.

Consequences of following or not following the management plan

Patients need to understand the benefits of changing their lifestyle and following the management and treatment plan. For hypertension it means that they can reduce their risk of heart attack or stroke. For diabetes it can reduce their risk of gangrene of the feet & amputations, blindness, kidney failure, heart attack or stroke.

If they do not follow the management plan they may not feel ill straight away. However over the next few years they can expect to suffer some of these complications. For example it may mean that they have a one in three risk of a stroke in the next five years, or increase risk of developing kidney failure.

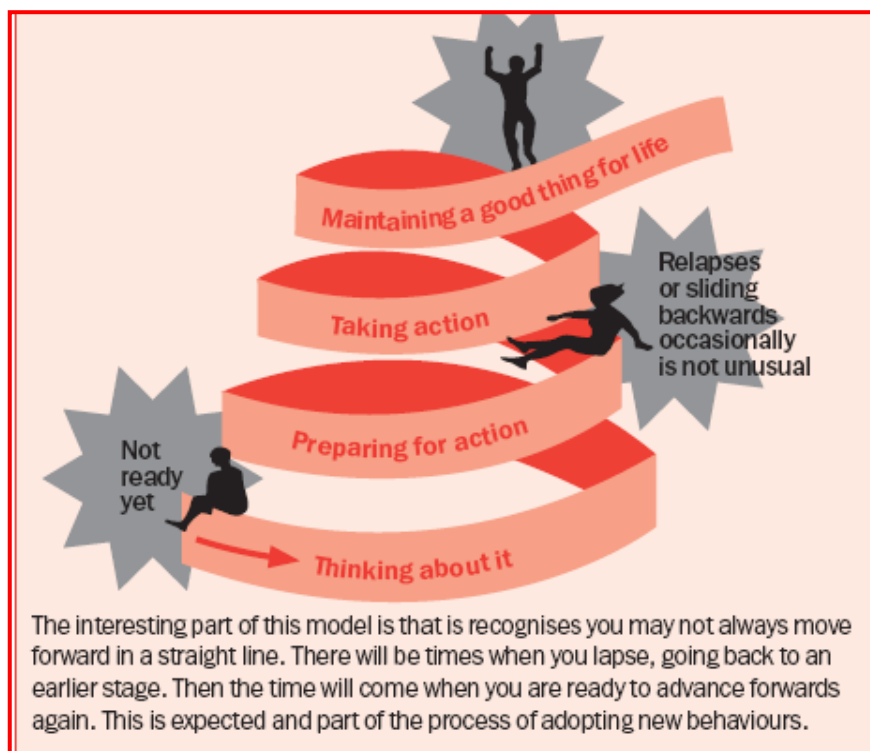
This information is important not only when people are seen in the clinic but also if they are being followed up for not attending a clinic appointment.

Helping people to change their diet, stop smoking, reducing their alcohol intake or increase physical activity is difficult. The patient may be at a different stage of readiness to make the change. The health professional should recognize at what stage the person is and develop their education to the stage (See table below).

Stages of Behavioral Change

STAGE	DESCRIPTION	HOW TO HELP
<u>Stage 1:</u> <i>Not Thinking About Change</i>	Stage during which a person does not consider the need for changing their lifestyle	<i>Give simple information about obesity, hypertension or diabetes and risks associated with them.</i> <i>Ask the patient to come back with family members to discuss it further.</i>
<u>Stage 2:</u> <i>Thinking of change</i>	In this stage, a person considers changing their lifestyle	Give information about how obesity, diabetes or hypertension can be controlled and the benefits of management
<u>Stage 3:</u> <i>Ready for Change</i>	The stage where a person is ready to take action in the next month.	<i>Give detailed information about how obesity, diabetes and hypertension can be controlled and what the patient has to do.</i> <i>Help the patient to set goals for their diet, weight and physical activity</i>
<u>Stage 4:</u> <i>Action</i>	Change begins (this can be large or small changes)	<i>Give practical advice on what to do. For example</i> <i>Suggest, diary for diet and physical activity.</i> <i>Involve the family. Provide encouragement.</i>
<u>Stage 5:</u> <i>Maintaining Change</i>	Change is sustained over a period of time	<i>Follow up regularly with Support. Warn patient not to lose confidence if they relapse — relapses are common and can be expected.</i> <i>Encourage patient to continue with changes as soon as possible after the relapse</i>

Stages of Behavioural Change



MANAGING NUTRITION, ALCOHOL AND PHYSICAL ACTIVITY

An important part of the management of obesity, hypertension and diabetes is the control of nutrition, alcohol and physical activity.

Alcohol

Advise the patient to limit their alcohol intake to 1 drink a day for women, and 2 for men with 1-2 alcohol free days a week. Pregnant women and young people should be encouraged to not drink alcohol. Binge drinking (drinking a lot of alcohol at one time or session) should be avoided. The patient should be warned of the risk of stroke if they go on drinking binges. Patients with elevated triglycerides should be advised to reduce their alcohol intake

STANDARD DRINKS

A Standard Drinks measure is a simple way to work out how much alcohol you are drinking. It measures the **amount of pure alcohol in a drink**

1 standard drink = 10g of pure alcohol



330ml can of
beer @ 4%
alcohol



100ml glass
of table wine



30ml straight
spirits e.g rum



All alcohol containers now have Standard drinks content on the Label. Always check the label as the number of standard drinks will differ depending on the alcohol percentage.

Nutrition

Weight reduction is an important goal for both hypertension and diabetes management. Losing at least 5kg or 10% of their total body weight can reduce cholesterol, blood pressure and blood sugar. Weight loss should be gradual — enough to give the patient a sense that they are achieving something but not too quickly as it will be difficult to maintain.

The aim for healthy eating should be to make changes in the eating habits of the patient and their family. The patient and their family need to make changes to the types of food eaten, the way they are prepared and the amounts eaten. The aim should be to reduce the amount of fat (especially saturated fat), oil and sugars, while increasing the amount of carbohydrates such as taro or sweet potato, brown bread, cereals, fruit and vegetables. Regular eating of fish is also beneficial but the patient should avoid fried foods or foods with added oils or fats (such as coconut cream, mayonnaise etc).

Patients should reduce their salt intake by avoiding salty foods and not adding salt to food whilst cooking or at the table. Many takeaway foods are high in salt. Sugar intake should also be reduced (but not necessarily eliminated). Patients should use low sugar

soft-drinks or cordials. Cakes, ice cream, sweets and chocolate should be avoided or taken as occasional treats.

Physical Activity

Physical activity should be regular — almost every day. Mild to moderate physical activity such as walking, swimming (or walking in the water), cycling and gardening is safe and will help control diabetes and hypertension.

Healthy Eating Guidelines

1. Eat more fruits and vegetables
2. Choose whole grains e.g bread, porridge etc, and starchy vegetables e.g. taro, kumara, kuru, etc
3. Choose low fat milk products
4. Choose lean meat and chicken, remove fat and skin from chicken and melt fat from corned beef. Eat more fish. Aim for at least 2 fish meals a week
5. Eat less fat and fatty foods such as coconut cream, cream, mayonnaise, doughnuts, cakes, icecream etc. Use products or oils from canola, soyabean, olives
6. Eat less sugar or sweet foods and drinks such as biscuits, soft drinks, cordials etc
7. Use less salt and limit salty foods. Use only small amounts of salt in cooking and do not add salt at the table.
8. Eat at least 3 meals every day
9. Reduce portion sizes, aim for half a plate of vegetables, quarter plate meat and quarter plate starch e.g kinaki.



Physical Activity Guidelines for Adults

1. If you are not physically active, it's not too late to **START NOW!** Do regular physical activity and reduce sedentary activities
2. Be active everyday in as many ways as you can, your way
3. Do at least 30 minutes of moderate-intensity (*hard enough to make you breathe faster but still being able to talk*) physical activity on five or more days a week
4. If you can, enjoy some regular vigorous-intensity activity for extra health and fitness benefits

REFERRAL

Referral can be done by providing person with a referral form and advising to see an outpatient doctor or by making appointments with NCD clinic and notifying person. Always attach relevant results.

The criteria for urgent referral have been listed earlier under the initial clinical assessment. However any of the criteria for urgent referral might occur at any time, and are the same even if the patient is not being seen for the first time.

In addition to the criteria for urgent referral, patients should be referred non-urgently for further assessment if:

- Ⓜ The BP remains above 160/100 despite compliance with therapy with two different drugs
- Ⓜ Cholesterol remains above 6.0 mmol/L despite compliance with treatment with simvastatin
- Ⓜ Fasting blood sugar remains above 8.00 mmol/l, or HbA1c remains above 8%, despite compliance with antidiabetic treatment
- Ⓜ The patient develops any new complications of diabetes, eg numb feet, reduced pinprick sensation in the feet, shooting pain in the legs
- Ⓜ Any person under 40years with BP of >140/90
- Ⓜ Cardiovascular risk (CVR) of > 30%

Contact details:

NCD clinic:	Hospital:	22664
	Tupapa Community Clinic	20066
	Outer Island Health Clinic/Hospital:	Check Telecom Directory

Hospital admissions:

Rarotonga: Refer to Hospital Outpatient Doctor (22664)
Outer Islands: Outer Island Health Clinic/Hospital

Re-Referral

Patients who have been referred urgently or non-urgently for further assessment are likely to be referred back to you when they are stable and their targets are being met. However they should be re-referred again if any of the criteria for urgent or non-urgent referral are again met.

Hospital Health Services notify Public Health Nurses of patients that require follow up in the community.

ORGANISATION

Good care of patients with hypertension or diabetes requires organization. There are a lot of things to do and remember - too many to rely on memory. The following are the essentials of a good NCD clinic or system.

RECORDS

Patients should have their own record of their treatment and progress. This improves self- management and compliance with treatment protocols.

The *clinic record* should be structured to remind the doctors what needs to be checked and when. Use of recall in Medtech system can be used to remind of routine tests e.g HbA1c, creatinine, foot checks etc. All NCD patient records should contain a caution so that when seen outside of clinic hours, their condition is easily identified.

Ideally, persons undergoing screening in the community should have their results recorded in Medtech using the appropriate screening template.

ASSESSMENT

NCDs are too complicated for one health professional to manage alone. The Public Health Nurse or health promotion staff should be involved in giving advice for primary prevention (those without disease but at risk), and in identifying those with diabetes or hypertension (case detection). The clinic nurse also has an important role in checking the diet, weight, blood pressure and blood sugar and providing advice. The clinic doctor can then review this, check for complications and order any tests and manage the drug therapy. The dietician can provide assistance with regards to diet. The Public Health nurse or Men's Health Co-ordinator has an important role in following people up in the community especially patients who don't attend for routine check ups.

SUPPLIES AND EQUIPMENT

The clinic and public health nurses need to check that their equipment is working properly. This applies especially to sphygmomanometers, glucometers and cholesterol meters. As many patients are obese it is important that large and extra-large size cuffs are available. Weighing scales should also be checked for accuracy. There needs to be adequate supplies of needles and syringes, sharps containers, lancets, blood glucose and cholesterol strips. There also need to be enough drugs available.

PATIENT EDUCATION AND EDUCATION MATERIALS

Everyone should play a role in patient education and there should be available patient education leaflets and IEC materials on hypertension, diabetes, obesity, smoking etc. The clinic nurse and dietician should provide patient education one to one or in group sessions for patients and their families. The public health nurse and nutritionist can also provide this in addition to providing food preparation and cooking demonstrations.

REGISTER FOR RECALL AND COLLECTION OF DATA FOR QUALITY

Assurance and evaluation.

A register (preferably on computer) of patients with hypertension and diabetes is very useful in providing lists of patients for follow up either in the clinic or the community (especially those who are overdue for a check up). The register can also collect data for looking at the quality of care provided in the clinic and evaluation of what other services or programs may be needed.

A good system for referral and communication

There needs to be good system for communication and referral between hospital and community health services and between the various health professionals involved. This is not only for emergencies but also follow up of patients who have been to hospital or who have not attended clinic appointments. It is also important to maintain good communication between various health professional regarding community screenings to ensure adequate supplies e.g laboratory and pharmaceuticals) and pre-warning of possible referrals.

Non compliance policy

Refer *appendix 2*

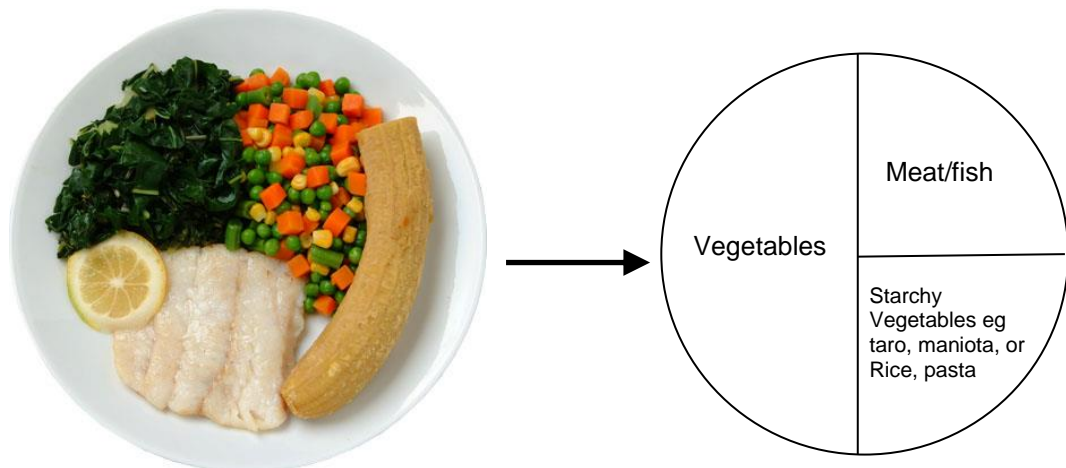
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APPENDIX 1: HEALTHY EATING – EXTRA POINTS

Points to consider

- 🕒 Emphasize traditional and local foods such as taro, yams, breadfruit, maniotia, kumara and vegetables and fruit are healthy. This is empowering.
- 🕒 Pork, chicken, seafood and beef are also healthy if prepared appropriately.
- 🕒 Discuss the quantity of food consumed by the individual. Stress the importance of reducing the amount of food eaten. This is usually the problem rather than the food content. Take a detailed history from the patient of what they are eating, and in what quantity. Identify the frequency of consumption of foods such as takeaways, coconut cream or soft drinks. Point out that you can eat too much healthy foods. Questions to ask include:
 - How many portions of food (eg, meat, taro) are consumed in each meal or occasion?
 - How big is each portion?
- 🕒 Ideal portions to aim for are – as a rough guide are: Palm size portions of meat, Hand size portions of fish, fist size portions of starchy vegetables. Encourage large portions of other vegetables e.g salad, mixed vegetables, pinapi, etc. Showing the healthy food plate may also be helpful.



- 🕒 Food preparation – traditional dishes should be adapted, rather than being replaced. Encourage boiling, steaming and grilling of food rather than frying and baking. The use of coconut cream can be modified by the gradual dilution with water over time so that the family's palate adjusts. Foods such as pokoroto Miti can be boiled to reduce the salt content, and the fat can be removed before serving. Drain the fat off canned corned beef, by heating in a microwave or on a flame or by placing in a bowl and pouring hot water over and throwing water away. Fat should be removed from meats such as pork, beef, mutton, lamb flaps and chicken.
- 🕒 Cooking and food preparation practical demonstrations should be made available to the individual and family members. Ideally this should be offered in the home or community setting. This should include menu planning, offering realistic alternatives and modifications to regular dishes. What does a person do when attending a large feast? How often does a person attend a feast? Is the family fed with a healthy snack before attending a gathering that is expected to run over time? At the buffet, is the plate piled up high? How many plates of food are consumed? What ratio of meat to vegetables is eaten? Does he/she drink water or soft drink? Which desserts are usually eaten? Realistic alternatives and options should be offered, for example, suggest eating one plateful of food instead of two or taking along some water.
- 🕒 How does a person respond when offered food? This can be difficult as it is culturally polite to eat food that is offered. Role plays can be a useful way to learn polite ways to eat in moderation in social settings. Advise that consuming a small portion or part of the meal offered should politely display their gratitude. If possible, choose to eat the healthier foods on the plate or meal offered. For example, the person could be encouraged to remove the skin or fat on meat or chicken presented, choose the boiled food choices over fried dishes,

and choose to eat fruit for dessert instead of ice cream.

- ☞ The practice of eating only one meal a day in the evening with only a cup of tea and a piece of bread or taro for breakfast and lunch is common. Encourage the practice of having at least three meals. If leftovers are preferred for breakfast, this is acceptable discuss eating smaller portions – adapt eating plan to include this.
- ☞ Fasting is commonly practiced. They usually fast for one or more days each week. Realistic alternatives should be offered with explanations as to why regular meal consumption is important. It is important to advise people with diabetes or hypertension what medications to withhold until they have eaten to avoid hypoglycaemic attacks or postural hypotension (eg, sulphonylureas, antihypertensives). Discuss healthy options when they do eat.
- ☞ Teach reading of food labels and encourage people to look for foods that are low in sugar, fat and high in fibre. Some of these will be foods with the National Heart Foundation heart tick – point out that some foods with tick could be high in sugar or salt
- ☞ A plan of healthy eating should be devised for each person tailored to their environment and needs. This should be reinforced with ongoing support and encouragement.

Reading Labels

Labels provide important information about nutrition content of packaged foods, helping us to make healthier choices. All packaged and canned foods have a nutrition information panel that provides information on total energy, fat, sugar and salt content of the food. When reading labels always look at the 100g column – this allows us to compare different products. Avoid the per serve column as serving size differs from product to product.

As a rough guide choose foods that contain

- *less than 10g fat* per 100g and less than 2g saturated fat
- *less than 10g sugar* per 100g. But if the product contains fruit less than 20g sugar is acceptable
- *more than 6g fibre* per 100g
- *less than 400mg sodium* per 100g

Sometimes the product has values higher than those above – in this case it is best if you choose the one with the least amount.

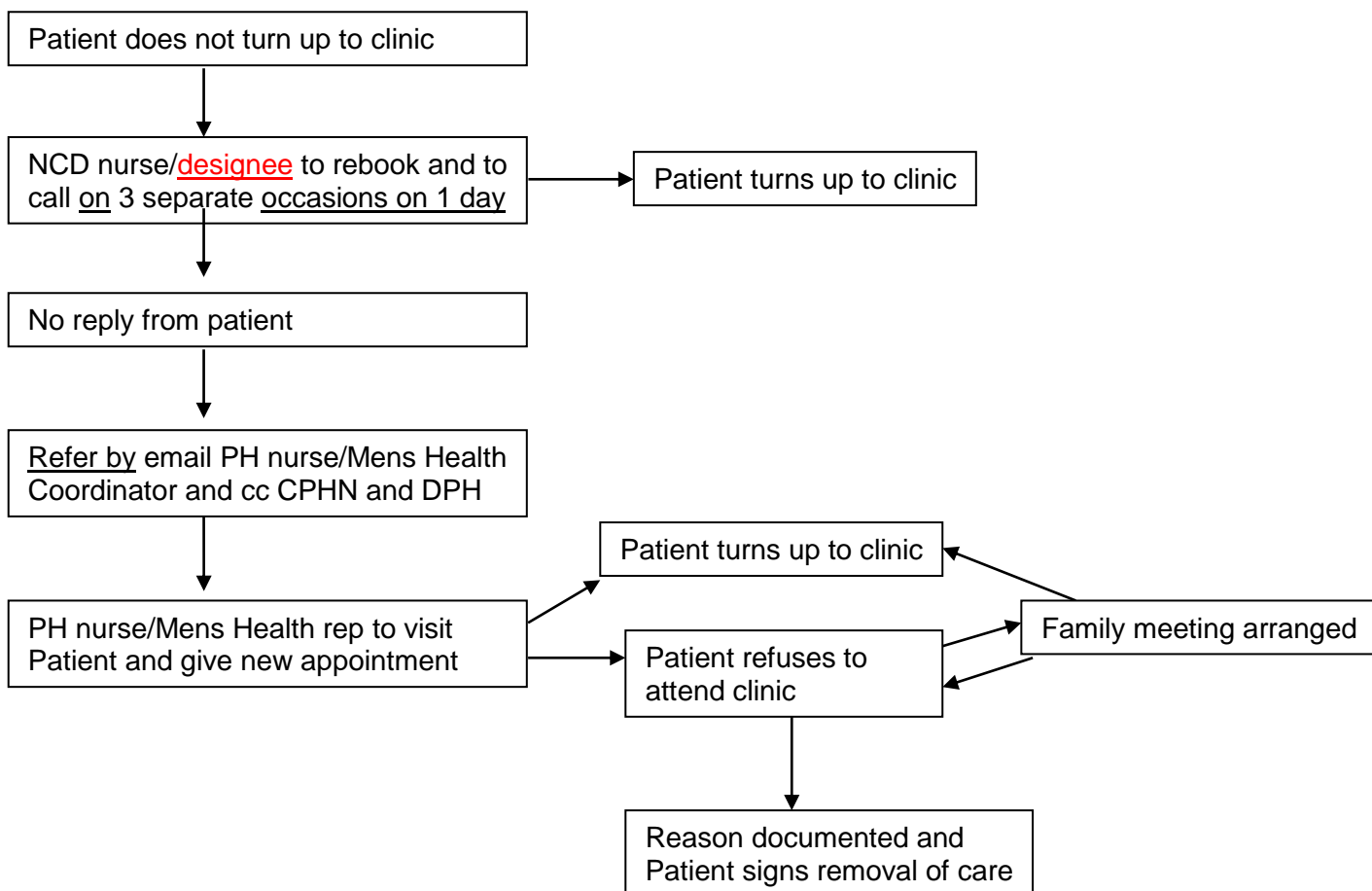
APPENDIX 2: NON COMPLIANCE POLICY

This policy is for non compliant NCD patients for Tupapa NCD Clinic, Rarotonga Hospital NCD Clinic and the CVRA Clinic.

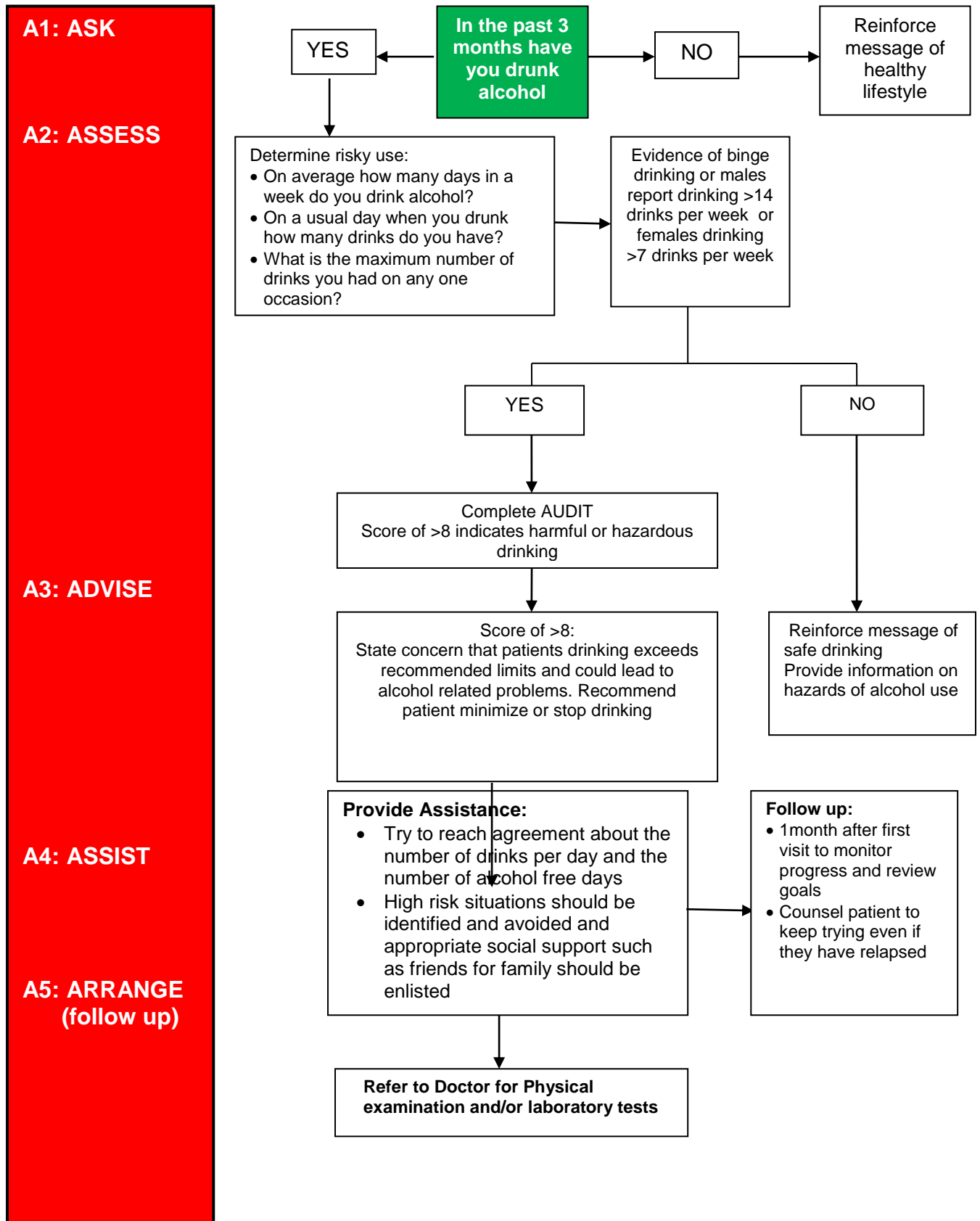
If a patient does not turn up to his/her appointment as scheduled.

1. The NCD nurse or designee will follow up by calling the patient or caregiver to rebook for another date.
2. The calls will be made on 3 occasions on the same day and if no reply, a request to follow up via email to the public health nurse /Mens Health Coordinator of that village to be made. New appointment date to be given.(Public Health Nurse/Mens Health Coordinator to reply via email and record on medtech response from patient)
Chief Public Health Nurse and Director of Community Health Services should be copied in on all correspondence
3. If the patient refuses to attend his/her appointment then the reason for refusing will be documented on patients medtech file and a family meeting will be arranged by the community liason officer to discuss issue and means of overcoming barriers. If patient still refuses, he/she then signs the "Removal of Care" form.
4. All the above to be documented on medtech.

FLOW CHART OF SUMMARY OF NON COMPLIANCE POLICY



APPENDIX 3: PPROTOCOL FOR COUNSELING ON ALCOHOL USE



APPENDIX 4: ALCOHOL AUDIT TOOL – INTERVIEW VERSION

THE ALCOHOL USE DISORDERS IDENTIFICATION TESTS (AUDIT): Interview Version

Read the questions as written. Record answers carefully. Begin the AUDIT by saying “Now I am going to ask

you some questions about your use of alcoholic beverages during the past year'. Explain what is meant by "alcoholic beverages" by using local examples of beer, wine, vodka, etc. Code answers in terms of "standard drinks". Place the correct answer number in the box at the right.

<p>1. How often do you have a drink containing alcohol?</p> <p>(0) Never [skip to Q9-10] (1) Monthly or less (2) 2 to 4 times a month (3) 2 – 3 times a week (4) 4 or more times a week</p> <div style="text-align: right;"><input type="text"/></div>	<p>1. How often during the past year have you needed a first drink in the morning to get yourself going after a heavy drinking session?</p> <p>(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <div style="text-align: right;"><input type="text"/></div>
<p>2. How many drinks containing alcohol do you have on a typical day when you are drinking</p> <p>(0) 1 or 2 (1) 3 or 4 (2) 5 or 6 (3) 7, 8 or 9 (4) 10 or more</p> <div style="text-align: right;"><input type="text"/></div>	<p>2. How often during the last year have you had a feeling of guilt or remorse after drinking?</p> <p>(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <div style="text-align: right;"><input type="text"/></div>
<p>3. How often do you have six or more drinks on one occasion?</p> <p>(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <div style="text-align: right;"><input type="text"/></div> <p><i>(skip to Q9 and 10 if Total Score for Q2 & 3 = 0)</i></p>	<p>3. How often during the last year have you been unable to remember what happened the night before you had been drinking?</p> <p>(5) Never (6) Less than monthly (7) Monthly (8) Weekly (9) Daily or almost daily</p> <div style="text-align: right;"><input type="text"/></div>
<p>4. How often during the last year have you found that you were not able to stop drinking once you had started?</p> <p>(5) Never (6) Less than monthly (7) Monthly (8) Weekly (9) Daily or almost daily</p> <div style="text-align: right;"><input type="text"/></div>	<p>4. Have you or someone else been injured as a result of your drinking?</p> <p>(0) No (1) Yes, but not in the last year (4) Yes, during the last year</p> <div style="text-align: right;"><input type="text"/></div>
<p>5. How often during the last year have you failed to do what was normally expected from you because of drinking?</p> <p>(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <div style="text-align: right;"><input type="text"/></div>	<p>5. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?</p> <p>(0) No (2) Yes, but not in the last year (5) Yes, during the last year</p> <div style="text-align: right;"><input type="text"/></div>
<p style="text-align: right;">Record total of specific items here: <input type="text"/></p>	

APPENDIX 5: USE OF A 10 GRAM MONOFILAMENT

1. Show the monofilament to the patient. Place the end of the monofilament on his/her hand or arm to show that the testing procedure will not hurt.

2. Ask the patient to turn his/her head and close his/her eyes or look at the ceiling.
3. Ask the patient to say 'yes' when he/she feels you touching his/her foot with the monofilament. DO NOT ASK THE PATIENT 'did you feel that?'
4. Hold the monofilament perpendicular to the skin and use a smooth motion when testing. Try a 3 second sequence that includes:
 - placing the end of the monofilament on the sole of the foot
 - pushing the monofilament until it bends, then
 - lifting the monofilament from the skin.

Repeat the sequence at another testing site on the foot (see below). DO NOT use a rapid or tapping movement.

If the monofilament accidentally slides along the skin, retest that area later in the testing sequence.

5. Use the monofilament in a random sequence, NOT moving from right to left.
6. If the patient does not say 'yes' when you touch a given testing site, continue on to another site. When you have completed the sequence RETEST the area(s) where the patient did not feel the monofilament.
7. Apply the filament along the perimeter of, and not on, an ulcer site, necrotic tissue, callus or scar.

Loss of protective sensation = absent sensation at one or more sites

The 5.07 monofilament will last indefinitely if you ALWAYS place it back in the case after use. This will keep you from accidentally bending or breaking the monofilament. To clean the monofilament, sodium hypochlorite (household bleach) 1:10 solution is recommended.

Sites on the sole of the foot for monofilament testing



(Source: The Group Health Cooperative Seattle Diabetes Foot Screening Guideline)

APPENDIX 6: COMMUNITY WELLNESS ASSESSMENT FORM

Location: _____

Date: _____

Name: _____

Date of Birth: _____

Gender: Male ☐ Female ☐

Weight: _____ kg

Height: _____ cm

Waist: _____ cm

BP 1: ____/____mmHg

Pulse: _____

BP 2: ____/____mmHg

BS: _____ mmol/l Fasting ☐ Random ☐ Cholesterol: _____ mmol/l

CVRA: _____%

MEDICAL HISTORY

Have you had/do you have?

☐ Diabetes

☐ Cancer (any)

☐ Rheumatic Fever

☐ Stroke

☐ TB

☐ Heart problems

☐ High blood pressure

☐ Gout

Are you taking medication for your condition Yes ☐ No ☐

SMOKING

Do you currently smoke: Yes ☐ No ☐ How many per day: _____

Ex Smoker: Yes ☐ No ☐ Give up date: _____

ALCOHOL

Are you currently drinking alcohol: Yes ☐ No ☐ Days per week: _____

On a drinking day, how many standard drinks do you have? _____ standard drinks

(1 standard drink = 1 can beer, 1 small bottle beer, 1 small glass wine, 1 nip spirits)

FRUIT & VEGETABLES

How many days in a week do you eat fruit? _____ How many serves per day: _____

(1 serve fruit = 1 fruit)

How many days in a week do you eat vegetables? _____

How many serves per day: _____

(1 serve vegetable = $\frac{1}{2}$ cup cooked or 1 cup raw vegetables)

PHYSICAL ACTIVITY

How many days in a week do you do Physical Activity (walking, sports, zumba etc)? _____

How much time to you spend daily doing physical activity? _____ hours _____ minutes

Intensity: ☐ Light (easy)

☐ Moderate (breathing a bit harder)

☐ Vigorous (breathing hard)

APPENDIX 7: COMMUNITY WELLNESS RESULT FORM

Community Wellness Result Form

Date: ____/____/____ Name: _____

Age: ____ yrs Gender: ☐ M ☐ F Are you currently pregnant: ☐ Yes ☐ No

Weight: ____ kg Height: ____ cm Waist: ____ cm

BP 1: ____/____ mmHg Pulse: ____ BP 2: ____/____ mmHg
(normal below 140/90)

Blood Sugar: ____ mmol/l ☐ Fasting ☐ Random (normal fasting below 7; Random below 8.9)

Cholesterol: ____ mmol/l (normal below 5.0) Body Mass Index (BMI): ____ (Ideal: 22-27)

Comments:

Community Wellness Result Form

Date: ____/____/____ Name: _____

Age: ____ yrs Gender: ☐ M ☐ F Are you currently pregnant: ☐ Yes ☐ No

Weight: ____ kg Height: ____ cm Waist: ____ cm

BP 1: ____/____ mmHg Pulse: ____ BP 2: ____/____ mmHg
(normal below 140/90)

Blood Sugar: ____ mmol/l ☐ Fasting ☐ Random (normal fasting below 7; Random below 8.9)

Cholesterol: ____ mmol/l (normal below 5.0) Body Mass Index (BMI): ____ (Ideal: 22-27)

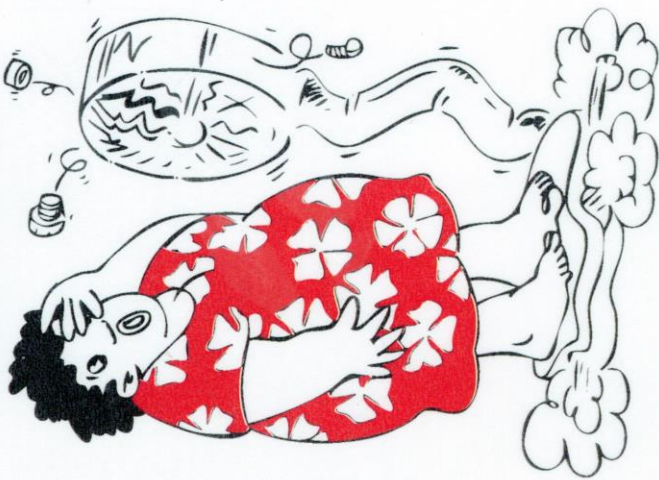
Comments:

APPENDIX 8: REFERRAL FORM

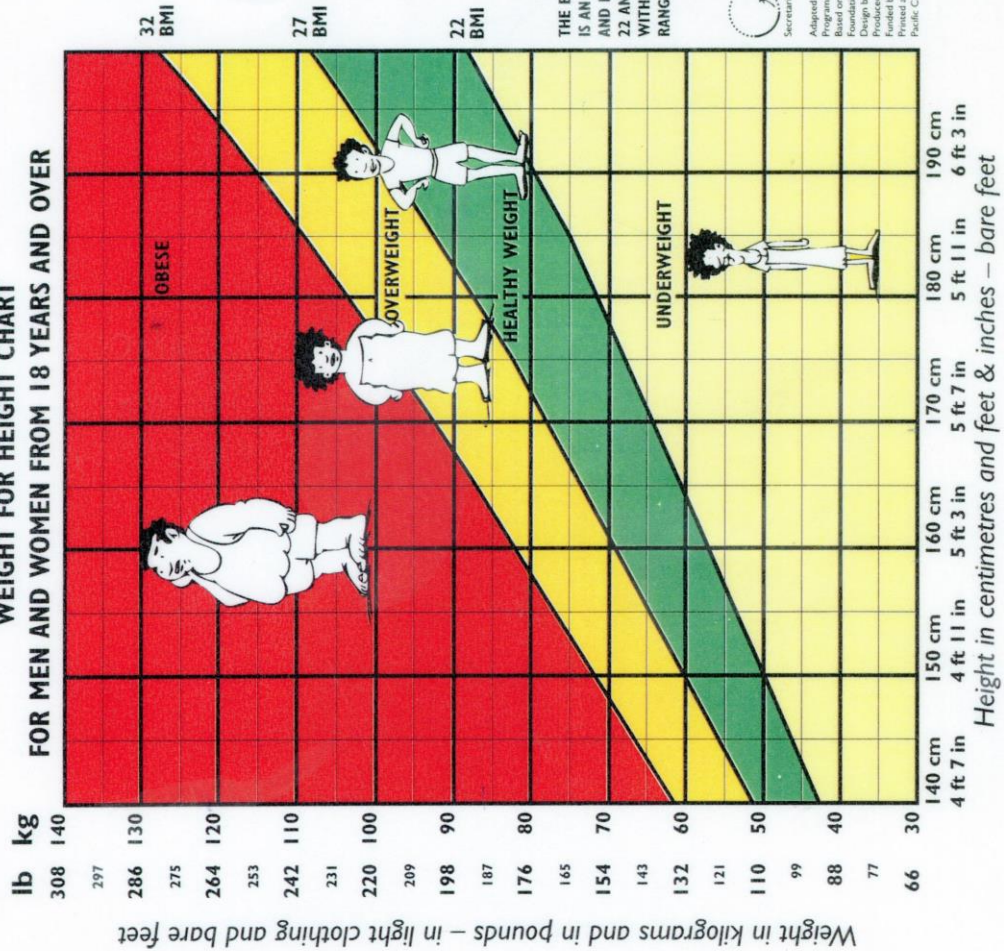
APPENDIX 9: SPC BMI Chart

LOOK FIT, BE HEALTHY!

**AIM FOR
A HEALTHY
WEIGHT**



**WEIGHT FOR HEIGHT CHART
FOR MEN AND WOMEN FROM 18 YEARS AND OVER**



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