Hypertension Cardiovascular Diabetes and Obesity Management Guidelines

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Guideline Review team

Gratitude is expressed to the following for their contribution to the review of this guideline.

2012 First Review team:

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 Tekaai 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

2020 Review team:

Dr Josephine Aumea Herman Public Health and GP specialist, Secretary of Health TMO
Dr Tereapii Uka Director Public Health TMO
Dr Tim Cundy Diabetes specialist, Ministry of Health New Zealand
Dr Bob Eason Physician, ADHB, Ministry of Health New Zealand
Dr Zaw Aung Consultant Physician TMO
Dr Ko Ko Lwin Registrar, Medical Department
Teina Ringi Office assistance
Ministry of Health Doctors

2022 Review Team

Dr Zaw Aung Consultant Physician TMO
Dr Ko Ko Lwin Registrar, Medical Department, Chief Medical Officer
Dr TeAriki Faireka Director of Primary Health Care
Dr Mareta Jacob WHO PEN Consultant
Dr Tim Cundy Diabetes specialist, Ministry of Health New Zealand
Dr Yin Yin May Director of Hospital Health Services
TMO doctors
Dr Nuhisifa Williams, Phd, editional edits and formatting.

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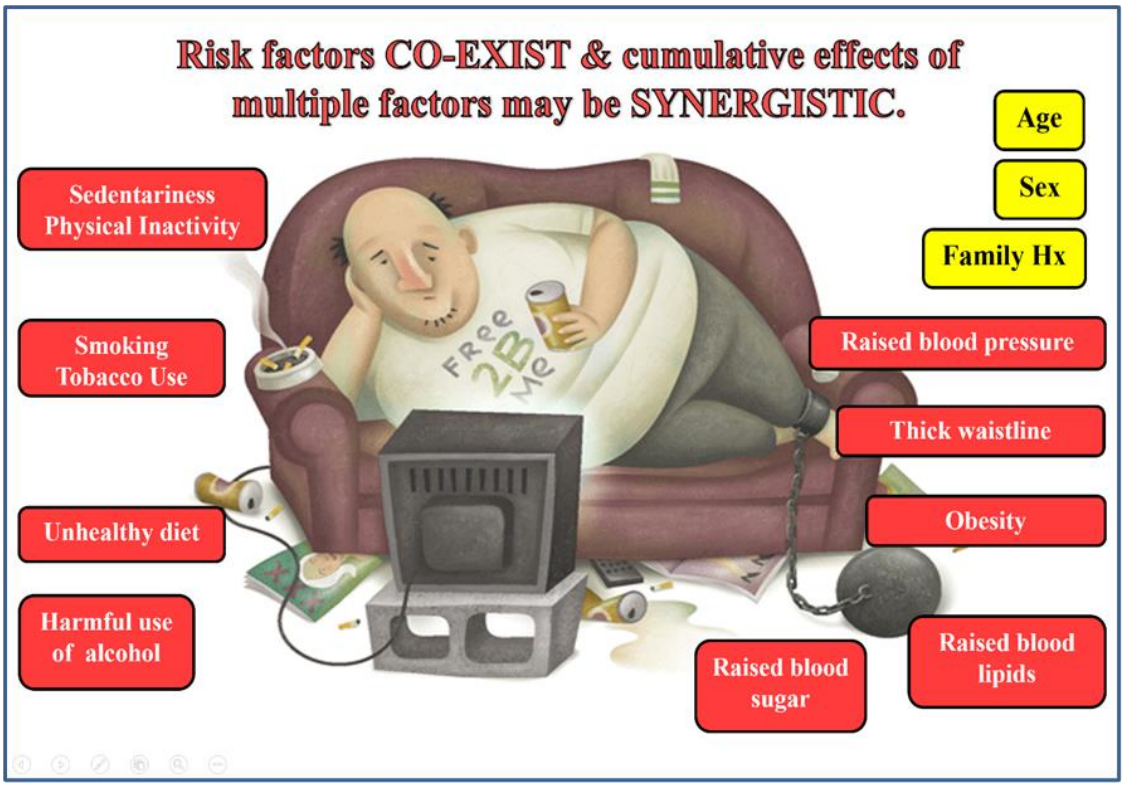
Contents

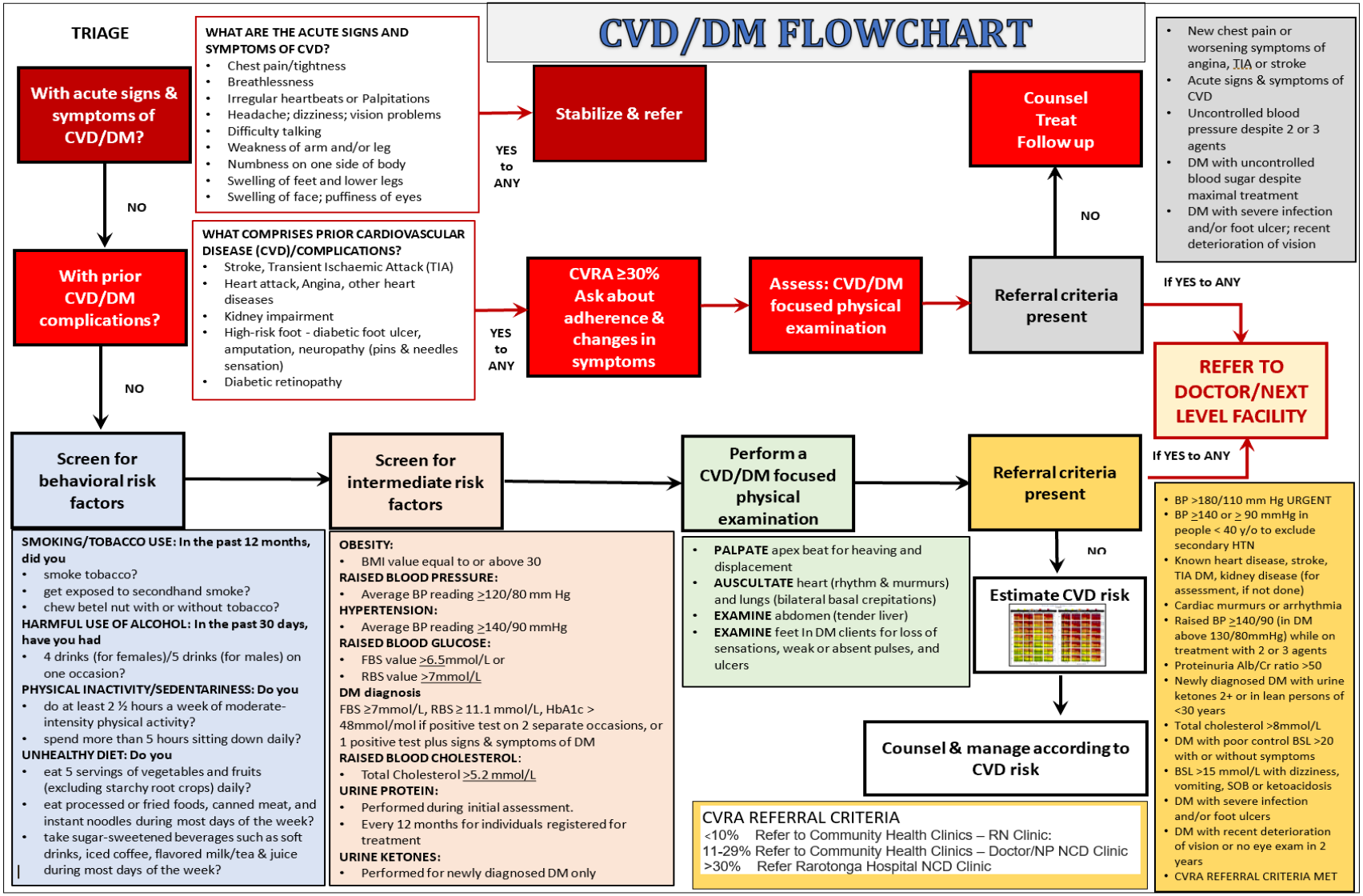
Initial clinical assessment

Multiple causal factors contribute to cardiovascular disease (CVD), most of which are modifiable. The numerical probability that an individual will develop CVD within a given period (absolute risk) depends on the cumulative effects of multiple synergistic factors.

By knowing the absolute risk, decisions can be made on prevention and treatment of cardiovascular disease (CVD). These include choices about lifestyle change, lipid and blood pressure lowering medication, diabetes care, and secondary preventative medication after myocardial infarction (MI), stroke and other cardiovascular disease.



Cardio Vascular Disease/DM Flowchart at Health Facility



History

Ask about:

- Diagnosed heart disease, stroke, TIA, diabetes, hypertension, hyperlipidaemia, kidney disease
- Acute signs and symptoms of CVD/DM: Angina, breathlessness on exertion and lying flat, numbness or weakness of limbs, palpitations, headache, vision problems, loss of weight, increased thirst, polyuria, puffiness of face, swelling of feet, etc.
- Check on patient's adherence to medication.
- Family history of premature heart disease or stroke, particularly 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

1. Body Mass Index (BMI)

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 (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.

To measure weight:

- The person should be barefooted and in light clothing
- 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 example, 91.3 kg

Calculate BMI – MedTech can do this or use the following formula:

BMI = Weight ÷ [Height]^2
(Weight in Kg, height in Metres)

Category	BMI (SPC)	Risk of Morbidities
Underweight	<22	Increased
Healthy weight	22 – 26.9	Low
Overweight	27 - 32	Increased
Obese (very overweight)	32 - 40	Severe
Morbid obesity	>40	Very severe

Patients with a BMI >32 kg/m^2 should be on a weight control programme.

2. 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 may be difficult to measure reliably in very overweight people. Record in centimetres.

To measure the waist:

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

In adult Cook Islanders and Polynesians:

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

Measuring Blood Pressure

The patient's 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. 2 readings should be taken 2 minutes apart and the average reading recorded. **Report to the nearest 2 mmmHg**.

- **Above 140/90 is abnormal** if the patient has not had hypertension diagnosed previously. It should be checked 30 minutes later. If the BP 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 BP on two more occasions about a month apart. If still high, refer to the doctor in the NCD or hospital clinic. If the BP is between 160/100 and 179/109 this should be done within the week. If the BP is 180/110 or higher the patient should be started on treatment and referred to the hospital.
- **Above 200/120** – please refer immediately to hospital

Classification and follow-up action of blood pressure level in adults

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 patient's cardiovascular risk). Advise lifestyle changes
Mild Hypertension	140-159	90-99	Confirm within 2 months. Action as outlined on p 19 (How to manage Hypertension)
Moderate	160-179	100-109	Recheck within 1 week. Refer to hospital. Action as outlined on p 19
Severe	**≥180**	**≥110**	Start treatment immediately. Refer

			to hospital.
Very severe	**≥200**	**≥120**	Refer to hospital immediately

Measuring Blood Glucose

Use a finger prick (capillary blood) and the glucometer for screening purposes. Confirm diagnosis of diabetes by performing a venous blood test where available. Blood glucose tests may be either fasting or at random. Diabetes can also be diagnosed by an elevated glycated haemoglobin (HbA1c).

Diabetes diagnostic criteria

Category	Venous or capillary glucose (mmol/l)		HbA1c mmol/mol *
	Fasting	Random	
Normal	**≤6.0**	**≤7.7**	**≤39**
Prediabetes	**6.1-6.9**	**7.8-11.0**	**40-49**
Diabetes	**≥ 7.0**	**≥ 11.1**	**≥ 50**

* These HbA1c criteria are used in New Zealand. WHO criteria are a little lower: Normal ≤38, Prediabetes 39-47; Diabetes ≥48 mmol/mol:

Note: Patients with symptoms (polyuria, polydipsia, weight loss, malaise, tiredness, blurred vision, poor wound healing, repeated infections) are considered to have diabetes if anyone of the above criteria are reached.

Patients who are asymptomatic but have a blood glucose suggestive of diabetes should have a second test to confirm the diagnosis a week later.

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

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 Accu-chek cholesterol meter or by venous sample analyzed by the laboratory. Measurement of other blood lipids needs to be done by the laboratory.

Criteria for Referral

Criteria for urgent referral

- High blood glucose (>15 mmol/l) 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.
- Chest pain or signs of a stroke (such as numbness or weakness down one side of the body)
- BP of 200/120 mmHg and higher with:

- Signs of retinal haemorrhage or papilloedema (accelerated hypertension) or
- Life-threatening symptoms such as new onset confusion, chest pain, signs of heart failure, or acute kidney injury.

Criteria for non-urgent referral:

- Hypertension (BP> 180/110) without symptoms and end-organ damage.
- Cholesterol >8mmol/L
- Very high blood glucose (>20 mmol/l) without symptoms
- Proteinuria (albumin/creatinine ratio >50) – unless previously detected

Cardiovascular clinical assessment

Patients with established Cardiovascular Disease

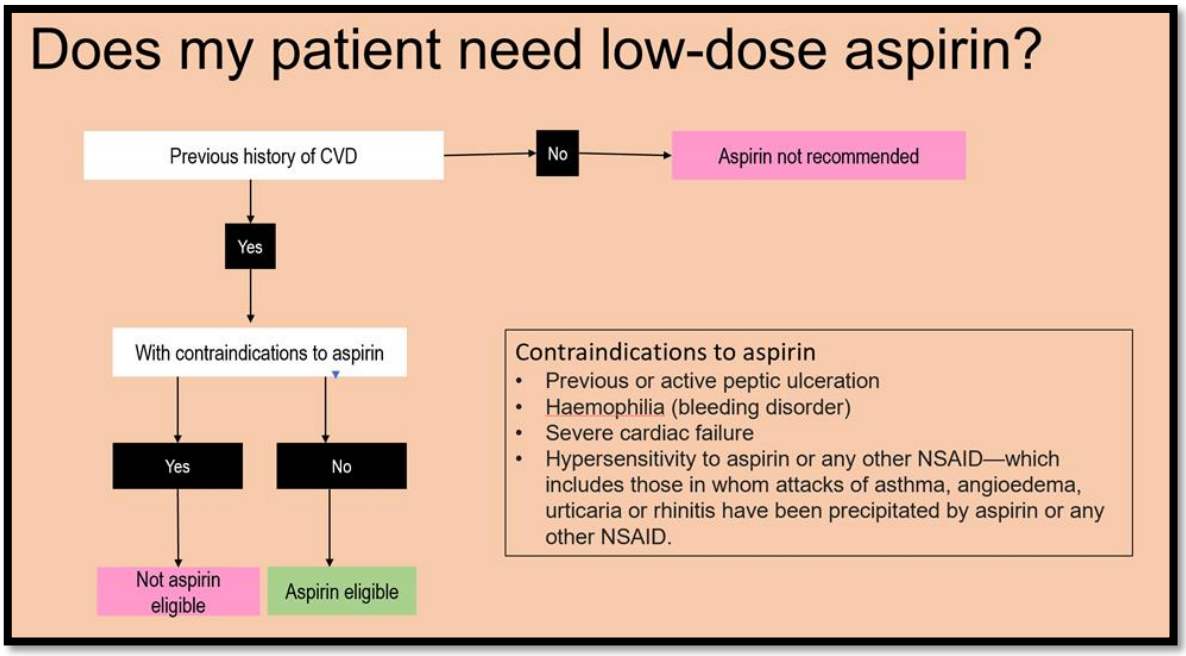
Patients with established cardiovascular disease are at high risk of further cardiovascular events and should be managed in the same manner as patients with a >20% 10-year risk (see below).

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 (secondary prevention).

Patients without established Cardiovascular Disease

Patients without established cardiovascular disease who do not meet the criteria for urgent referral should have their cardiovascular risk assessed according to the WHO Oceania CV risk assessment chart (see below).

Note: Aspirin is not recommended for patients without established cardiovascular disease (primary prevention) even if the 10-year risk is >20%.



Calculating Cardiovascular risk

Cardiovascular Risk assessment should be estimated for all 30 to 75 years of age.
This can be calculated manually or using an electronic app.
Calculation of cardiovascular risk using the HEARTCARE Lite App
Download via play store or via this link
https://play.google.com/store/apps/details?id=com.ncdhearts.heartcarelite

Calculation of cardiovascular risk for people with diabetes using the New Zealand Society for the Study of Diabetes calculator
https://www.nzssd.org.nz/cvd/

World Health Organization (WHO) Cardiovascular Risk Assessment Charts

There are two types of charts.

1. Laboratory Based Chart: In settings where blood cholesterol can be measured. The following information is required:
   - Presence or absence of diabetes[1]
   - Gender, Smoking status,[2] Age
   - Systolic blood pressure (SBP)[3]
   - Total blood cholesterol[4]
2. Non-laboratory Based Chart: In settings where blood cholesterol cannot be measured. The following information is required:
   - Gender, Smoking status
   - Age, BMI

Manual Calculation of cardiovascular risk using the Lab-based chart

This chart can be used when blood sugar level and cholesterol **can** be measured.
Estimate the 10-year cardiovascular risk as follows

[1] A person who has diabetes is defined as someone taking insulin or oral hypoglycaemic drugs, or meets the criteria for the diagnosis of diabetes. 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 needs to be arranged to diagnose diabetes mellitus. 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>30% and referred to Rarotonga NCD clinic while for outer islands medical consultant Rarotonga Hospital be informed, monitoring of Creatinine every 3-6month, referral for eye specialist and visiting physician when opportunity arises.

[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. 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

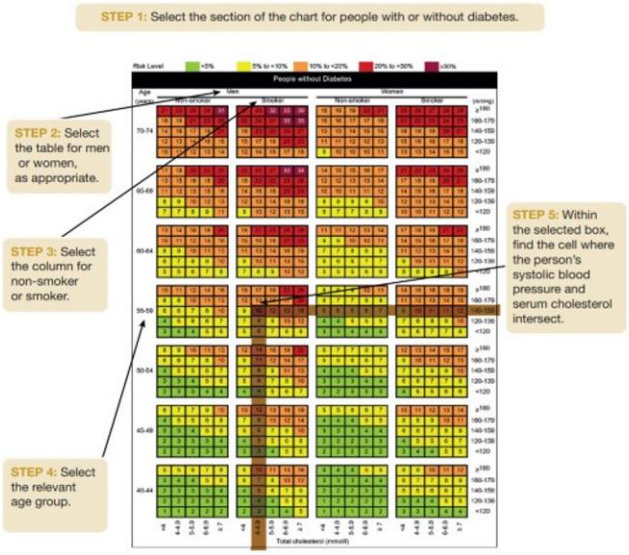
[4] The mean of two non-fasting measurements of serum cholesterol by dry chemistry, or one non-fasting laboratory measurement, is sufficient for assessing risk. The cholesterol measurement used to assess risk should be that obtained at the initial clinical assessment (see earlier). If the patient is already on treatment with a statin, the cholesterol reading used should be the last reading before treatment was commenced. If this is unavailable, use the current cholesterol reading.

Using the CVD Risk Lab based chart

Step 1 Select the appropriate chart depending on the presence or absence of diabetes
Step 2 Select men or women tables
Step 3 Select smoker or non-smoker boxes
Step 4 Select age group box (if age is 42 years, select 40 to 45 box, if 50 years, select 50 to 54 box, if 60 select 60 -64 years etc.)
Step 5 Within this box find the cell where the the individual's systolic blood pressure (mmHg) and total blood cholesterol level (mmol/l) cross.
The color of this cell determines the 10 year cardiovascular risk.(risk of fatal and non -fatal cardiovascular event)
The value within the cell is the risk percentage.
Colour coding is based on the grouping as indicated below:

Cell Color	Risk Percentage	Risk Interpretation
Green	<5%	Low risk
Yellow	5% to <10%	Medium risk
Orange	10% to <20%	High risk
Red	20% to <30%	Very high risk
Dark red	≥30%	Extremely high risk

Step 6 Counsel, treat and refer according to risk level



Manual Calculation of cardiovascular risk using the non-Lab based chart

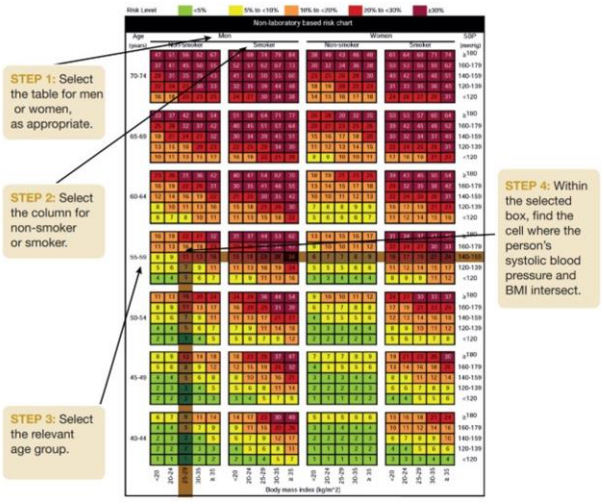
This chart can be used when blood sugar level and cholesterol **cannot** be measured. They are to be used to identify people at high risk who can be taken up for further investigations.

Using the CVD Risk Non-Lab Based Chart

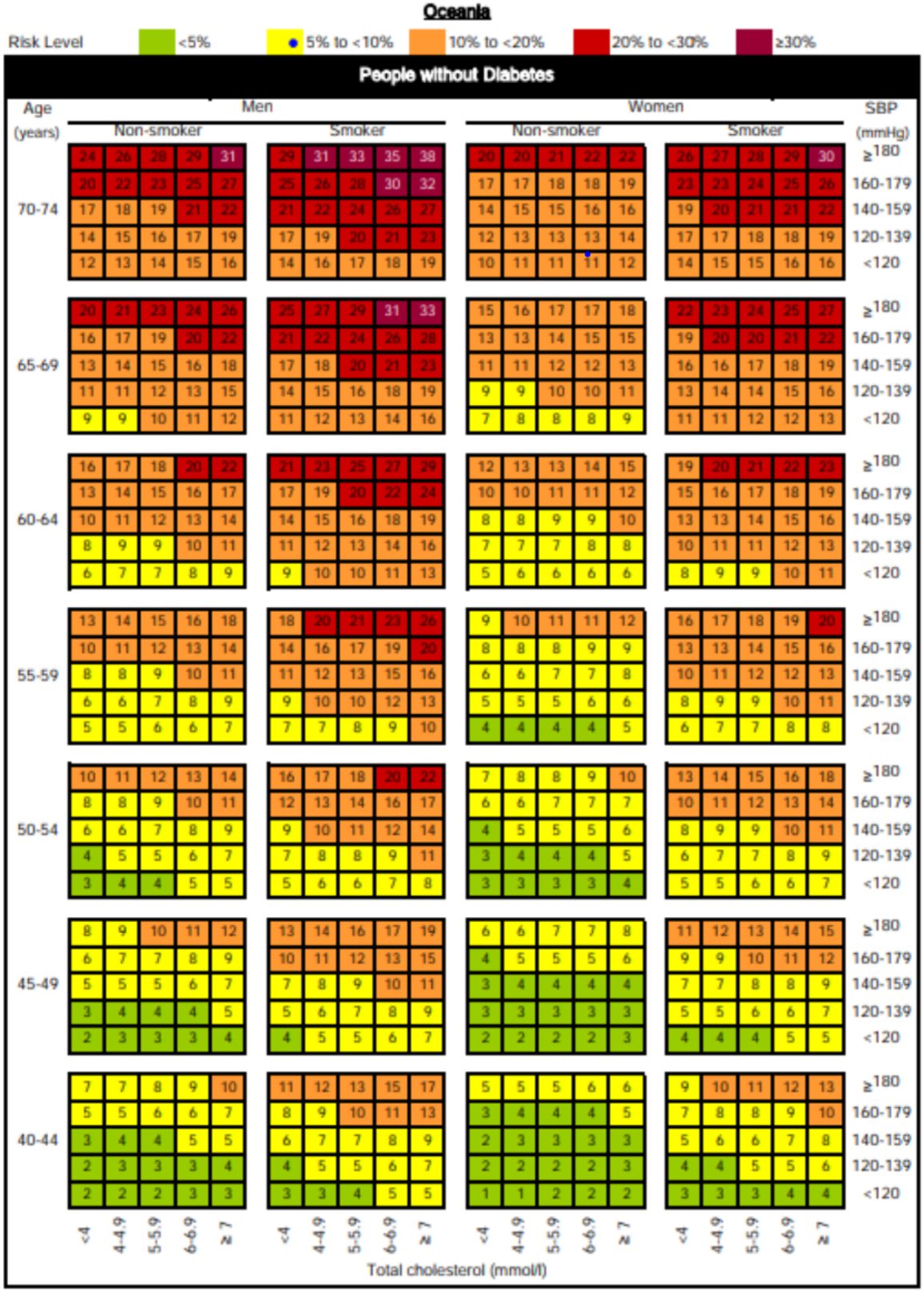
Step 1 Select men or women tables
Step 2 Select smoker or non-smoker boxes
Step 3 Select age group box (if age is 42 years, select 40 to 45 box, if 50 years, select 50 to 54 box, if 60 select 60 -64 years etc.)
Step 4 Within this box find the cell where the the individual's systolic blood pressure (mmHg) and BMI cross.
The color of this cell determines the 10 year cardiovascular risk.(risk of fatal and non -fatal cardiovascular event)
The value within the cell is the risk percentage.
Colour coding is based on the grouping as indicated below:

Cell Color	Risk Percentage	Risk Interpretation
Green	<5%	Low risk
Yellow	5% to <10%	Medium risk
Orange	10% to <20%	High risk
Red	20% to <30%	Very high risk
Dark red	≥30%	Extremely high risk

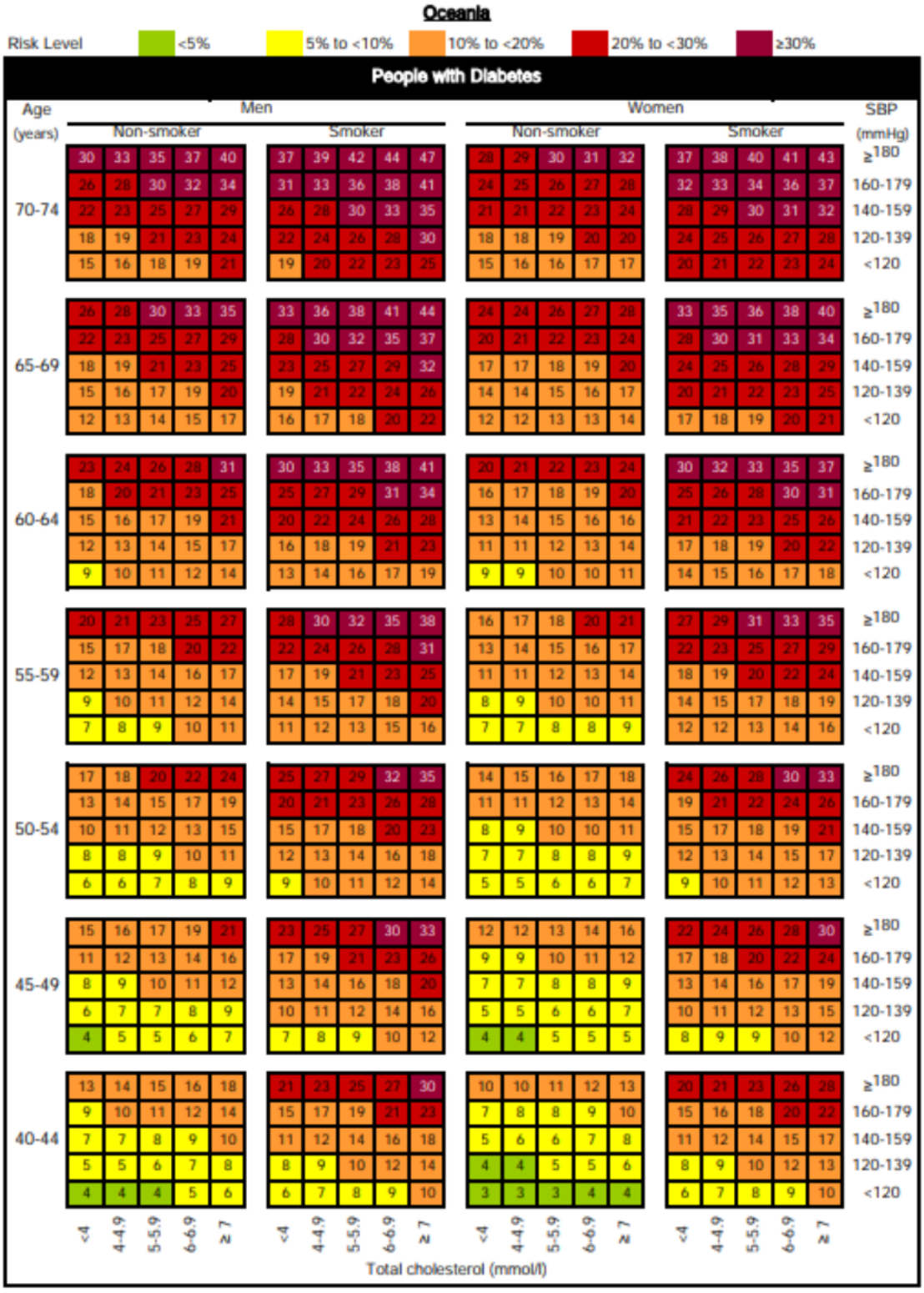
Step 5 Counsel, treat and refer according to risk level



WHO Cardiovascular Risk Assessment Chart (laboratory-based) for people without Diabetes

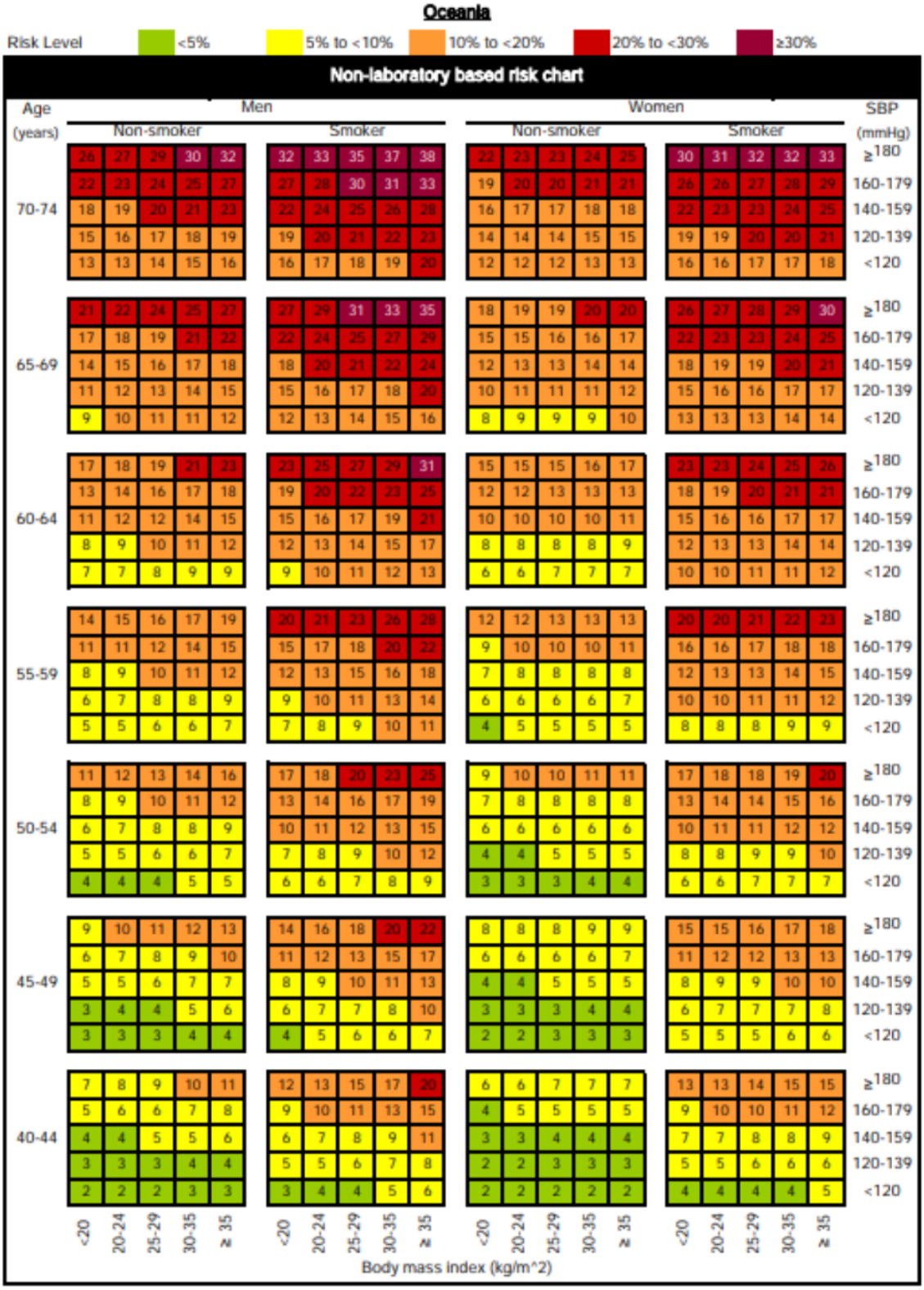


WHO Cardiovascular Risk Assessment Chart (laboratory-based) for People with Diabetes



WHO Cardiovascular Risk Assessment Chart (non-laboratory based)

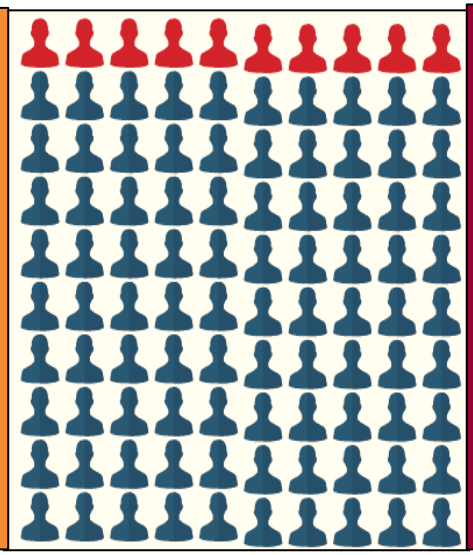
Oceania chart where total cholesterol CANNOT be measured to calculate the 10-year risk of a fatal or non-fatal cardiovascular event by age, systolic BP, smoking status, and BMI



How to explain a cardiovascular risk score

<5%	Individuals in this category are at **LOW** risk. Low risk does not mean "no" risk.	CVD risk scores are a measure of the probability of having a fatal or non-fatal cardiovascular event (such as a heart attack or stroke) within the next 10 years.
5 to <10%	Individuals in this category are at **MODERATE** risk of fatal or non-fatal vascular events.	
10% to <20%	Individuals in this category are at **HIGH** risk of fatal or non-fatal vascular events.	
20% to <30%	Individuals in this category are at **VERY HIGH** risk of fatal or non-fatal vascular events.	
≥30%	Individuals in this category are at **EXTREMELY HIGH** risk of fatal or non-fatal vascular events.	

A CVD risk of 10% means that in a crowd of 100 people with the same risk factors as you have, 10 persons are likely to have a fatal or non-fatal heart attack or stroke within the next 10 years.



A CVD risk of 30% means that in a crowd of 100 people with the same risk factors as you have, 30 persons are likely to have a fatal or non-fatal heart attack or stroke within the next 10 years.

Intervention according to cardiovascular risk assessment

The purpose of management is to motivate and assist individuals with high risk levels to lower their total CVD risk.
If risk is <5%, follow up in 12 months. If risk is 5%–10%, follow up every 3 months, then 6–9 months thereafter. For patients who are not at high enough risk for medical therapy, CVD risk should be reassessed every 12 months, or earlier if clinical symptoms develop. At follow-up visits:

- Ask about: new symptoms, adherence to advice on tobacco and alcohol use, physical activity, healthy diet, medications
- Assess (physical exam).
- Estimate cardiovascular risk
- Refer if necessary
- Counsel all and treat as shown in protocol.

Risk stratification is NOT necessary for making treatment decisions for individuals already known to be at high-risk. All of these individuals need intensive lifestyle interventions and appropriate drug therapy:

1. Very high-risk groups, such as those with:
   - Previous CVD event: angina, MI, percutaneous coronary intervention (PCI), coronary artery bypass grafting (CABG), transient ischaemic attack (TIA), ischaemic stroke, peripheral vascular disease (signs of peripheral vascular disease include non-healing sores, ulcers, gangrene or infections in the extremities that may necessitate amputation)
   - Diabetes with overt nephropathy or other significant renal disease (ACR ≥30 mg/mmol)
   - Renal failure or renal impairment GFR < 45 ml/min for at least 3 months

Note - All the above cases are classified at **Brick-Red Risk (≥30%) for life**

2. Without established CVD but with very high levels of single risk factor:
   - Total cholesterol ≥8.0 mmol/l, Low-density lipoprotein (LDL) cholesterol ≥6 mmol/l
   - TC/HDL-C (total cholesterol/high density lipoprotein cholesterol) ratio >8
   - Persistent raised blood pressure >160/100 mmHg)

Intervention according to cardiovascular risk assessment

Cardiovascular Risk	Lifestyle	Drug Therapy	Treatment Goals	Follow-up
10-year CVD risk >20% - and known cardiovascular disease (secondary prevention)	Intensive lifestyle advice on a cardio protective dietary pattern, physical activity and smoking cessation. Lifestyle advice given simultaneously with drug treatment	Aspirin, beta blocker, statin and an ACE-inhibitor (after MI) or aspirin, statin and intensification of BP control (after stroke) Treat diabetes intensively if present	Efforts should be made to reach optimal risk factor levels	Full clinical assessment, cardiovascular risk assessments and risk factor monitoring every 3 months

10-year CVD risk calculated more than 20%	Intensive lifestyle advice on a cardio protective dietary pattern, physical activity and smoking cessation	Drug treatment of all modifiable risk factors (BP lowering, lipid modification and glycaemic control)	Reduce 10-year CV risk to <20% (recalculating risk)	Cardiovascular risk assessments and risk factor monitoring every 3 months
10-year CVD risk calculated 10-<20%	Individualized lifestyle advice on a cardio-protective dietary pattern, physical activity and smoking cessation 3-6 months prior to drug treatment	Drug therapy indicated for people with individual extreme risk factor levels[#] e.g., cholesterol >8mmol/l	Reduce 10-year CV risk to <20% (recalculating risk)	Cardiovascular risk assessment and risk factor monitoring every 3-6 months
10-year CVD risk calculated 5 - <10%	Individualized lifestyle advice on a cardio protective dietary pattern, physical activity and smoking cessation. From the primary health care team	Non-pharmacological approach to addressing multiple risk factors. Drug therapy seldom required, but occasionally indicated for extreme individual risk factor	Lifestyle advice aimed at reducing cardiovascular risk	Further cardiovascular risk assessment and follow up every 3 months till targets are met then 6 to 9 months thereafter
10-year CVD risk calculated Less than <5%	Lifestyle advice on a cardio protective dietary pattern, physical activity and smoking cessation	Non-pharmacological approach to treating multiple risk factors	Lifestyle advice aimed at keeping cardiovascular risk low	Cardiovascular risk assessment and follow up in 1 year

[*]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 140/90 mm Hg should have these risk factors treated regardless of their calculated cardiovascular risk

How to manage Obesity, Hypertension, Diabetes, Hypercholesterolemia 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 an independent determinant of cardiovascular risk, it is a major risk factor for diabetes, dyslipidemia 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 (maintenance of current weight)
- Weight loss of any magnitude
- Increase in daily physical activity levels

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 an ideal body weight is the ultimate long-term outcome, this is rarely achieved and the success of any obesity management programme should *not* be judged on this basis alone.

Promotion of healthy diet
This may include:
1. Raising *awareness of the problems* associated with being overweight and having an unhealthy diet, example diabetes, hypertension, obstructive sleep apnoea, fatty liver, renal disease, polycystic ovarian disease and osteoarthritis
    - *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*. For example: setting a goal of losing

0.5-1 kg per week, could amount to 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' readiness to improve dietary habits. The advice given needs to be specific and practical (refer to Dietician if applicable)
- Identifying *barriers* to 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 are useful to reinforce and remind individuals of these messages.

Promotion of Physical Activity

2. 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 e.g., 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 example a walking partner or group, a gardening or church group. This provides companionship and support, incorporating activity into family and community life
   - Culturally acceptable
   - Beneficial in that physical activity is good for hearts, bodies and minds. Regular physical activity can prevent and help manage heart disease, type 2 diabetes, and cancer which cause nearly three quarters of deaths worldwide. Physical activity can also reduce symptoms of depression and anxiety, and enhance thinking, learning, and overall well-being.
   - Any amount of physical activity is better than none, and more is better. For health and wellbeing, WHO recommends at least 150 to 300 minutes of moderate aerobic activity per week (or the equivalent vigorous activity) for all adults, and an average of 60 minutes of moderate aerobic physical activity per day for children and adolescents?
   - All physical activity counts. Physical activity can be done as part of work, sport and leisure or transport (walking, wheeling and cycling), as well as every day and household tasks.
   - Muscle strengthening benefits everyone. Older adults (aged 65 years and older) should add physical activities which emphasize balance and coordination, as well as muscle strengthening, to help prevent falls and improve health.

- Too much sedentary behaviour can be unhealthy. It can increase the risk of heart disease, cancer, and type 2 diabetes. Limiting sedentary time and being physically active is good for health.
- Everyone can benefit from increasing physical activity and reducing sedentary behaviour, including pregnant and postpartum women and people living with chronic conditions or disability.

Hypertension

Goals

- 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
- In diabetic patients, systolic BP target should be 130 mmHg
- For patients with albuminuria (albumin-creatinine ratio > 30 mg/mol), with or without diabetes, a target systolic BP 125 mmHg is recommended.

Who needs treatment?

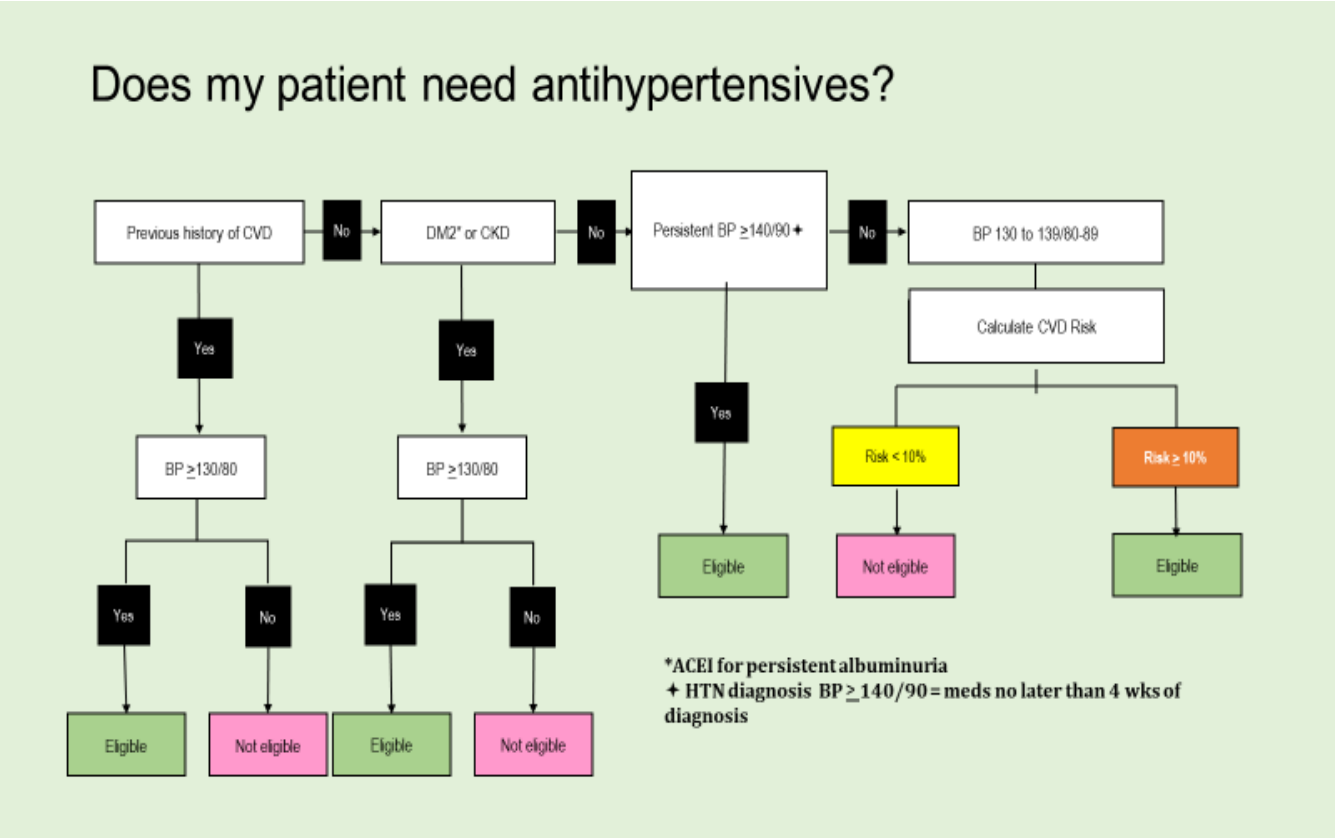
All patients with systolic blood pressures >160mm Hg will need drug treatment, and ideally all patients with a 10-year cardiovascular risk of >20% should also have their blood pressure lowered.

In practice, most patients with an absolute risk of >20% will need antihypertensive drug treatment, with the intensity of treatment depending 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 intake, 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 inhibitors - ACEi)
- Candesartan (Angiotensin *receptor blocker* - *ARB*) should be used if a patient has an adverse reaction to an ACEi.
  - ACEi and ARB can be used as monotherapy or in combination with other drugs (especially thiazides), but **not** in combination with each other.
- Nifedipine CR or Felodipine ER (*Calcium channel blockers*)

Each of these classes of drugs are equally effective in monotherapy 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 (such as previous angina or myocardial infarction.

How to start anti-hypertensive medications

Organise pre-treatment baseline FBC, UECr, Liver enzymes, Lipid profile, Chest X-Ray and ECG if available prior to treatment.

Step 1

- Offer an ACE inhibitor to adults who:
  - Have type 2 diabetes
  - Have heart failure
  - Require treatment after a myocardial infarction
  - Are associated with left ventricular systolic dysfunction
  - Have increased albuminuria

- If an ACE inhibitor is not tolerated, for example because of cough, offer an ARB.
- Offer a calcium-channel blocker (CCB) to adults who:
  - Are aged 55 or over and do not have type 2 diabetes
  - If CCB is not tolerated, for example because of oedema, offer a thiazide diuretic (Bendrofluazide).

Step 2 treatment

- Before considering next step treatment for hypertension discuss with the person if they are taking their medicine as prescribed.
- If hypertension is not controlled with an ACE inhibitor or ARB, offer addition of 1 of the following drugs
  - A thiazide diuretic **or**
  - A CCB
- If hypertension is not controlled with CCB, offer addition of one of the following drugs
  - An ACE inhibitor **or** an ARB **or** a thiazide diuretic.

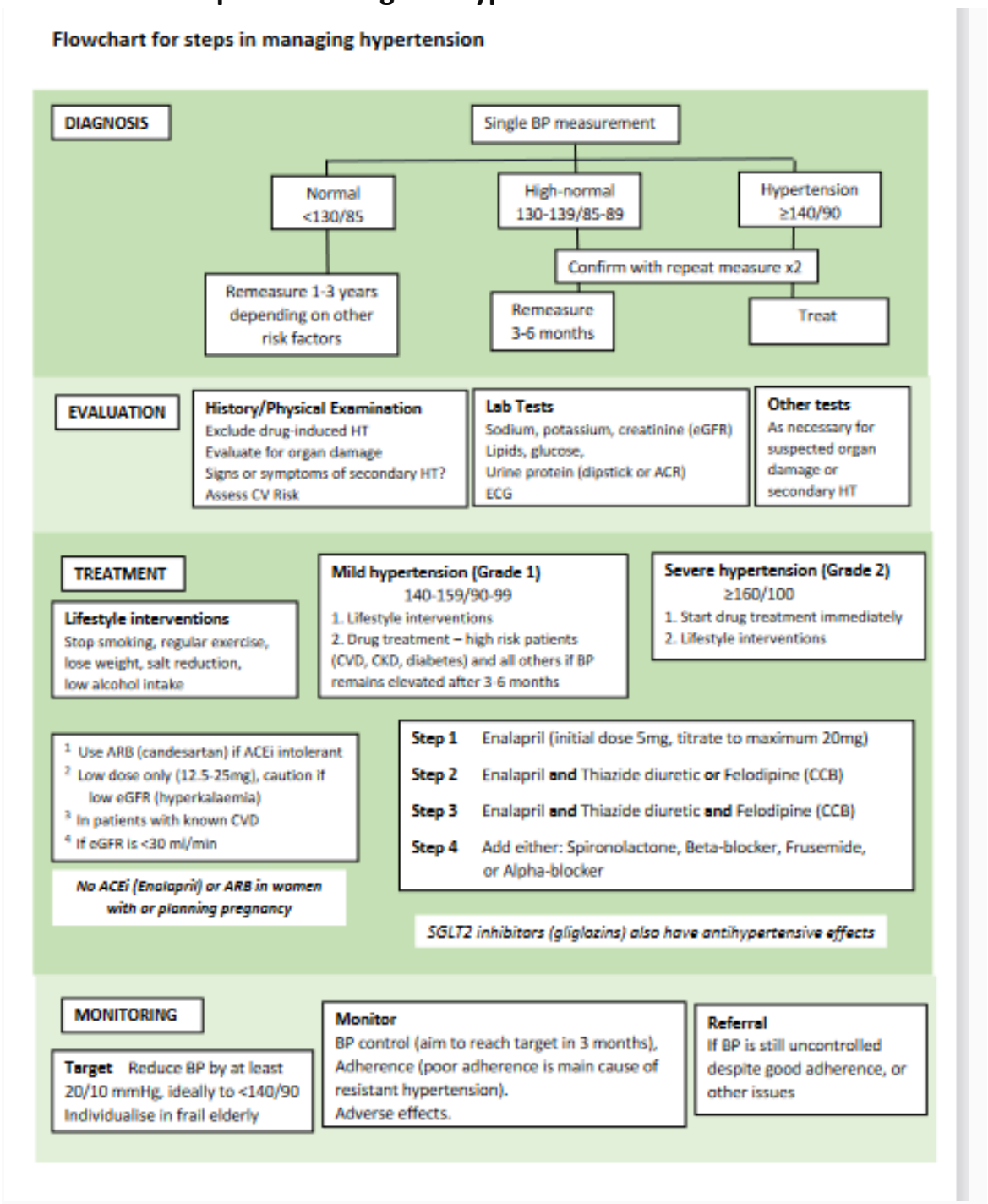
Step 3 treatment

- Before considering next step treatment, discuss adherence.
- If hypertension is not controlled with Step 2 treatment, offer combination of:
  - An ACE inhibitor or ARB **and**
  - A thiazide-like diuretic **and**
  - A CCB.

Step 4 treatment (for resistant hypertension)

- If hypertension is not controlled with optimal tolerated doses of an ACE inhibitor or an ARB + a CCB + a thiazide diuretic,
- Discuss adherence and examine prescribing record. **Non-adherence is the commonest cause of resistant hypertension.**
- Consider adding a fourth antihypertensive drug (step 4)
- Consider further diuretic therapy with low-dose Spironolactone for adults who have a blood potassium < 4.5 mmol/l. (Caution in people with a reduced estimated glomerular filtration rate - monitor blood sodium and potassium and renal function within 1 month of starting treatment and repeat as needed thereafter).
- Consider an alpha-blocker or beta-blocker for adults who have a blood potassium level of more than 4.5 mmol/l

Flowchart of steps on starting Antihypertensive medications



Drugs and doses

Class	Medication	Dose	Comments
Diuretic (Thiazide type) (Potassium sparing diuretic)	Bendrofluazide Spironolactone	2.5mg to 5mg once orally daily 25mg once daily	 For resistant hypertension
ACEi (Angiotensin-converting-enzyme inhibitor)	Enalapril	5mg to 40mg once daily orally **ACEi synergistic with diuretics**	For patients that: • have type 2 diabetes • have heart failure • after a myocardial infarction • have left ventricular systolic dysfunction • increased albuminuria • if possible, check serum creatinine, potassium before starting ACE inhibitor. Contraindications: • pregnancy • advanced CKD • aortic stenosis Common adverse effects: • cough • angioedema
ARB *(Angiotensin receptor blocker)*	Candesartan	8mg to 32mg daily ARB synergistic with diuretics	-Use if there is an adverse reaction to an ACEi.
CCB (Calcium channel blocker)	Nifedipine CR Felodipine ER	10 to 20mg twice daily orally 5 to 10mg daily in the morning orally	Side effects: peripheral oedema.
Alpha-blocker	Doxazosin	1mg to 4 mg daily orally	Side effects: peripheral oedema.
Beta-blocker	Atenolol Metoprolol CR	25- 50mg once daily orally 47.5mg to 190 mg once daily orally	Higher dose not usually necessary Use in patients with established ischaemic heart disease.
SGLT2 inhibitors *Not currently available in Cook Islands*	Empagliflozin	10 to 25 mg once daily ***Synergistic with ACEi and ARB***	Also, lower blood glucose, protect against heart failure and slows progression of renal disease

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),*

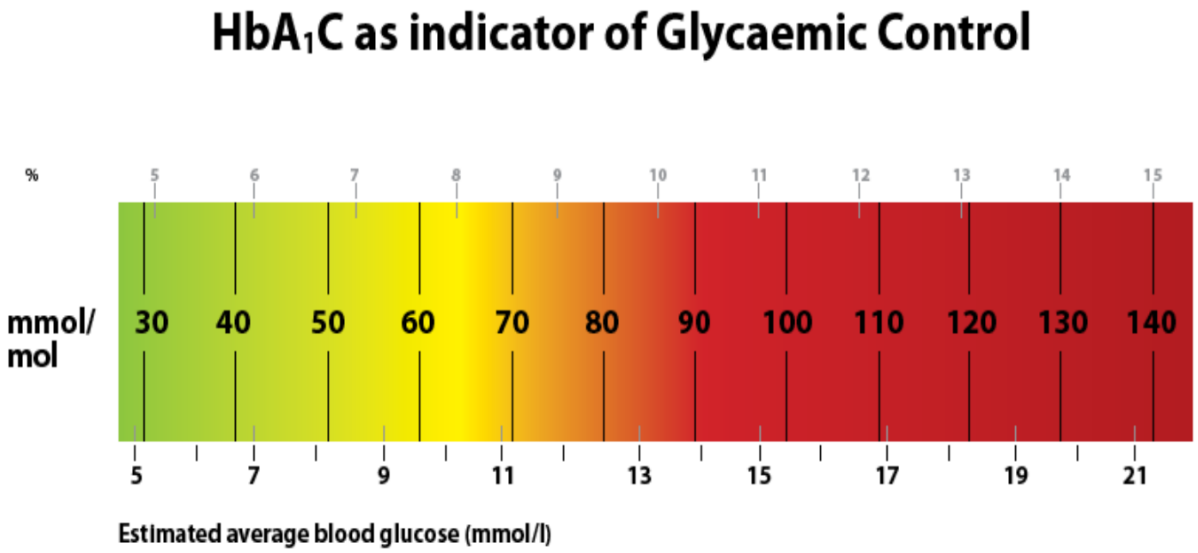
Diabetes

Goals

The principal goal is to prevent specific complications of diabetes such as neuropathy, kidney disease, and blindness. Good diabetes control also reduces the risk of stroke, myocardial infarction and peripheral vascular disease.

Good diabetes management consists of:

- Controlling risk factors such as smoking and excessive alcohol drinking, improving nutrition and regular physical activity
- Controlling the blood glucose – this can be assessed by measuring pre- and post-prandial blood glucose (BG) and by measuring HbA1c which reflects the average blood glucose over the previous 2 – 3 months. **The relationship between HbA1c and average blood glucose is illustrated below.**
- 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.
Pretreatment investigations e.g. FBC, UECr, Liver enzymes, lipid profile, ECG is needed for any case if available.

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. Pretreatment investigations can include FBC, Creatinine, Liver enzymes, Lipid profile, albuminuria assessment and ECG.

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

For obese patients with type 2 diabetes, start on:

- *Metformin 500 mg orally 2-3 times daily up to a maximum of 3- 3.4 g daily with meals, in patients with normal renal function.*

Note: Metformin can cause nausea, abdominal pain and diarrhoea, 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 either:

- *Glibenclamide 2.5 to 10 mg as a single dose up to a maximum of 20 mg daily. This drug is preferred in younger patients*
- *Gliclazide 40mg orally once or twice daily to a maximum of 320mg*

The main adverse effect of sulfonylureas 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).*

SGLT2 inhibitors

This is a new class of antidiabetic drugs that may soon be available in the Cook Islands. Because they work by an insulin-independent action (increasing urinary glucose loss), do not cause hypoglycaemia and have beneficial effects on cardiovascular disease (particularly heart failure) and renal disease it is probable that they will become the major 'second line' drug after metformin.

Insulin treatment in type 2 diabetes

The indications to start insulin in type 2 diabetes are:

- Failure of oral hypoglycaemic agents (e.g., HbA1C persistently >60 mmol/L once poor adherence has been excluded.)
- patients undergoing major surgery,
- critically ill patients,
- pregnancy

Do not stop oral hypoglycaemic agents when commencing evening insulin treatment. The simplest regimen is to add a single dose of intermediate acting insulin at night with the aim of normalising the fasting blood glucose.

- *Intermediate-acting isophane 0.1 to 0.2 units/kg body weight, subcutaneously at bedtime, adjust dose according to fasting blood glucose levels*

If the fasting blood glucose is not controlled, increase the dose of insulin by 2-5 units per week until fasting levels are between 5 and 7 mmol/l.

If the above regimen does not produce satisfactory control of blood glucose in the evening, a twice daily regimen can be used by adding:

- *Intermediate-acting isophane insulin in the morning, in a similar dose to that being used in the evening.*

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. **Discuss with the patient** - can usually do so many months (or years) in advance. Give positive messages example they will feel better; everyone finds it much easier than they expected; reduced risk of complications. 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 dialing 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 0.1 to 0.2 u/kg body weight, taken in the evening.*
5. **Continue oral medications** (but discontinue sulphonylurea if twice daily insulin is instituted).
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 5U 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 mmol/l
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. 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 5U if average glucose still >10 mmol/l***.
12. **Recheck HbA1c** after 2-3 months on stable insulin dose(s), also lipids and microalbumin (ACR) if previously raised – they will often improve too. Appropriate target HbA1c needs to be considered on an individual basis, especially in elderly.
13. **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.

- Patients using insulin should be issued with their own glucometer to help them manage their diabetes.
- It is important that patients bring their meter to each clinic visit.
- Staff should ask to see the meter, know how to interrogate the meter to meet maximal information from it, and know how to set the correct date and time on the meter.

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. If steroids are prescribed, glycaemic control commonly deteriorates with particularly high readings in the afternoon and evening
- Patients on tablets may need 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 glucose monitoring not only to avoid hyperglycaemia (insulin requirements are commonly increased in illness) but also hypoglycaemia, because the patient is eating less.

Monitoring of diabetes

Because diabetes has specific complications (example 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.

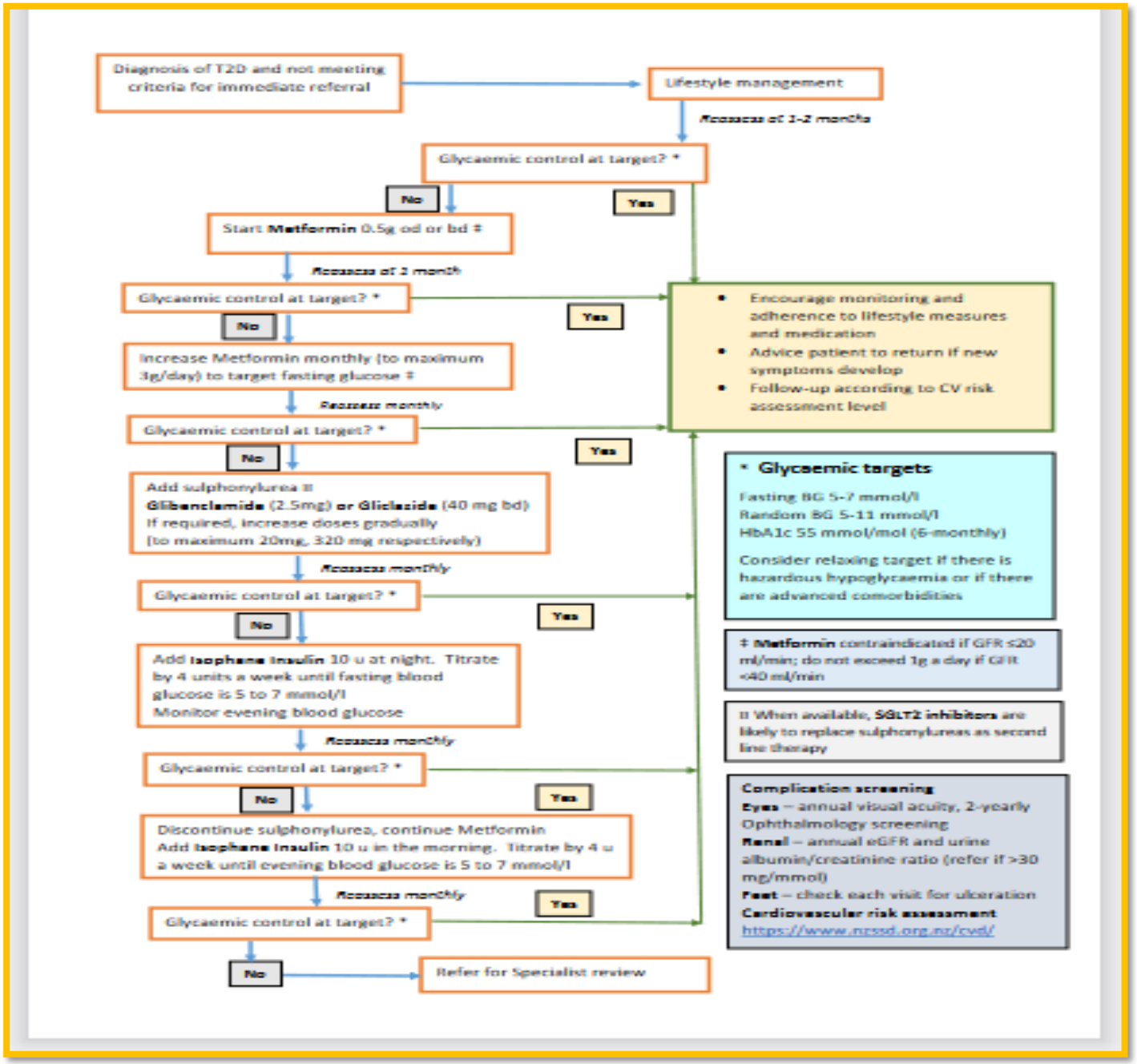
What to check	*When*	*Comment*
Blood glucose	**Every visit**	Ask patient to test sometimes before and sometimes after meals Target RBG 4-11mmol/l and FBG 5-7 mmol/l if unable to do HbA1c
HbA1c	**Every 6 months**	Especially after starting therapy. Target <60 mmol/mol
Feet	**Every 6 months**	Check for loss of sensation and loss of pulses. At every visit look for ulcers or infections, corns or calluses. If foot infection is identified begin treatment with antibiotics immediately and review daily. Refer if not improving
Vision	**Every 12 months** **Every 2 years**	Check using Snellen chart. If visual loss identified refer immediately to eye clinic or hospital Refer to ophthalmologist for screening, even if there is no visual impairment
Urine	**Every 12 months**	Check urine albumin/creatinine ratio (ACR). If abnormal albuminuria is detected (ACR >30 mg/mmol or 2+ on a dipstick) refer or treat appropriately.

Goals for managing diabetes

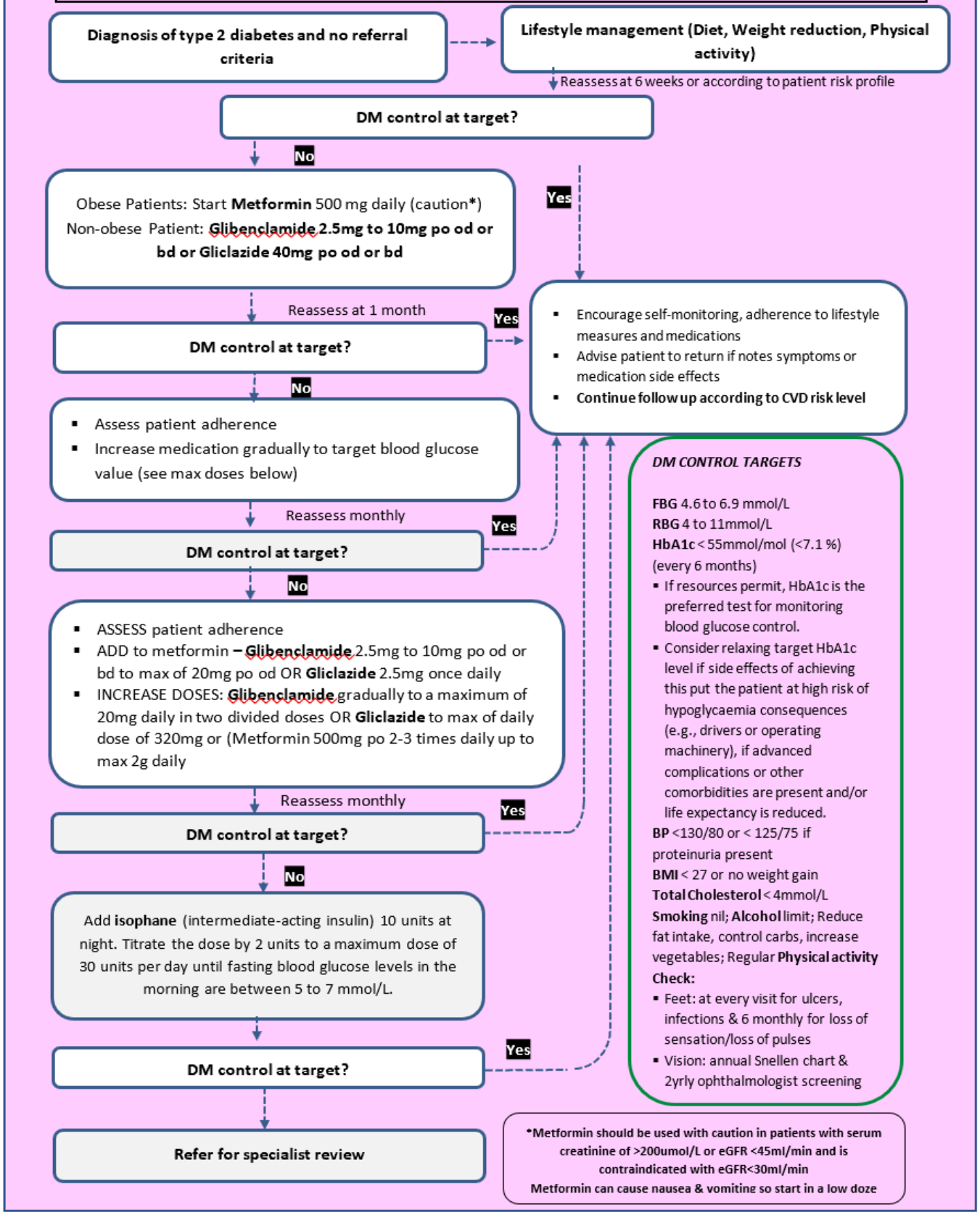
The principal goal of management is to prevent complications such as gangrene, kidney disease, blindness, stroke and myocardial infarction. This can be achieved by:

- Controlling risk factors: stop (or reduce) smoking, improve nutrition, take regular physical inactivity
- Controlling the blood glucose. Targets for control of the HbA1c and pre- and post-prandial blood glucose (BG) are given below. HbA1c measures the average blood glucose over the previous 8-12 weeks
- Detecting complications early and provide treatment for them -especially for foot problems, infections, eye complications and kidney disease
- Maintaining quality of life by minimizing complications and side effects of treatment.

Targets for Treatment	
HbA1c	**<55 mmol/L**
Fasting Blood Glucose (FBG)	**4.6 – 6.9 mmol/L**
Random Blood Glucose (RBG)	**4.0 – 11.0 mmol/L**
Blood Pressure	**<130/80** **<125/75 if proteinuria present**
Weight	**BMI <27 or no weight gain**
Lipids	**Total Cholesterol: <4.0 mmol/L** **LDL: <2.0 mmol/L** **HDL: >1.0 mmol/L** **Triglycerides: <1.7 mmol/L**
Smoking	**Zero smoking**
Alcohol	**Reduce excessive drinking, limit alcohol intake**
Diet	**Reduce fat intake, control carbohydrates and eat more vegetables**
Physical Activity	**Regular physical activity. At least 30 minutes on 5 days of the week**


Diagnosis of T2D and not meeting criteria for immediate referral
Lifestyle management
Reassess at 1-2 months
Glycaemic control at target? *
No
Yes
Start Metformin 0.5g od or bd ‡
Reassess at 1 month
Glycaemic control at target? *
Yes
No
Increase Metformin monthly (to maximum 3g/day) to target fasting glucose ‡
Reassess monthly
Glycaemic control at target? *
Yes
No
Add sulphonylurea ||
Glibenclamide (2.5mg) or Gliclazide (40 mg bd)
If required, increase doses gradually
(to maximum 20mg, 320 mg respectively)
Reassess monthly
Glycaemic control at target? *
Yes
No
Add Isophane Insulin 10 u at night. Titrate by 4 units a week until fasting blood glucose is 5 to 7 mmol/l
Monitor evening blood glucose
Reassess monthly
Glycaemic control at target? *
Yes
No
Discontinue sulphonylurea, continue Metformin
Add Isophane Insulin 10 u in the morning. Titrate by 4 u a week until evening blood glucose is 5 to 7 mmol/l
Reassess monthly
Glycaemic control at target? *
Yes
No
Refer for Specialist review
Encourage monitoring and adherence to lifestyle measures and medication
Advice patient to return if new symptoms develop
Follow-up according to CV risk assessment level
* Glycaemic targets
Fasting BG 5-7 mmol/l
Random BG 5-11 mmol/l
HbA1c 55 mmol/mol (6-monthly)
Consider relaxing target if there is hazardous hypoglycaemia or if there are advanced comorbidities
‡ Metformin contraindicated if GFR ≤20 ml/min; do not exceed 1g a day if GFR <40 ml/min
|| When available, SGLT2 inhibitors are likely to replace sulphonylureas as second line therapy
Complication screening
Eyes – annual visual acuity, 2-yearly Ophthalmology screening
Renal – annual eGFR and urine albumin/creatinine ratio (refer if >30 mg/mmol)
Feet – check each visit for ulceration
Cardiovascular risk assessment
https://www.nzssd.org.nz/cvd/

MANAGEMENT & MONITORING SUMMARY FOR PATIENTS WITH DIABETES



Hypercholesterolaemia

The target for patients with an absolute 10-year cardiovascular risk of >20% 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 statins available in the Cook Islands are simvastatin and atorvastatin. Simvastatin should be commenced in a dose of 10 mg, preferably in the evening. Review the patient at monthly intervals and enquire about musculoskeletal symptoms. If there are no adverse effects, but the target cholesterol level is not reached, the dose should be increased incrementally to a maximum of 80 mg daily nocte. If this dose of Simvastatin is still not controlling the serum cholesterol Atorvastatin can be substituted. Some patients develop musculoskeletal symptoms and raised CK levels at the higher doses.

If statins are not tolerated bezafibrate can be given at 400mg oral daily.

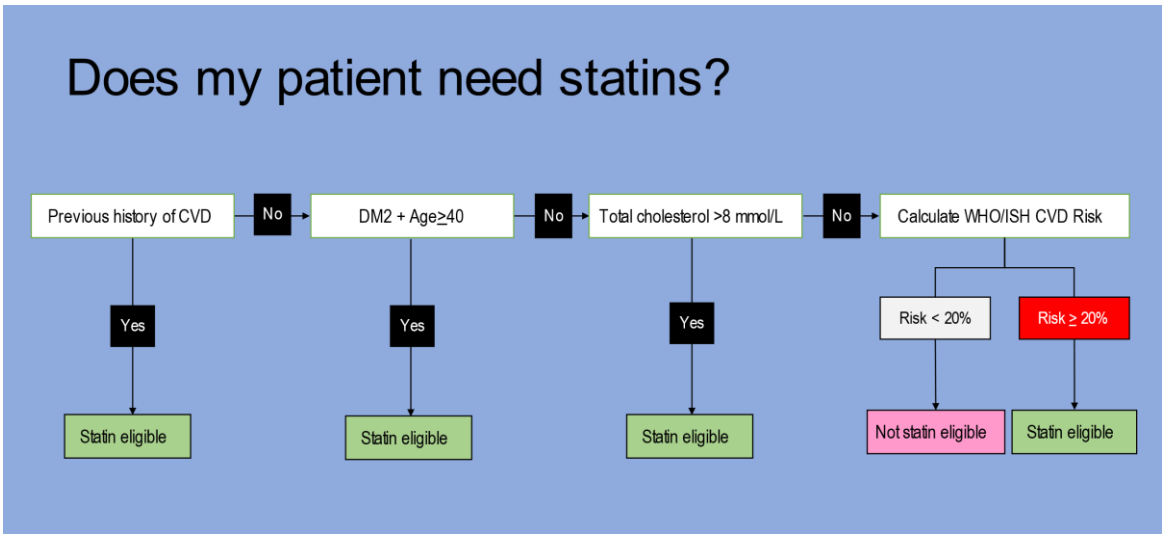
Note also that lipid abnormalities are sometimes secondary to other conditions:
Secondary causes of lipid abnormalities include:

- Diet and alcohol influences,
- Hypothyroidism, diabetes, liver disease, nephrotic syndrome, steroid treatment.

Increased triglycerides are seen:

- In people with diabetes or people who are obese, or
- 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 or vaping devices.

Protocol for counselling on cessation of tobacco use

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 than12 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

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 effectively, the less likely they are to develop complications. Only about half 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 other health problems including osteoarthritis, sleep apnea, fatty liver and fertility problems.

Screening for these conditions can be carried out:

- In the community as part of a wide screening (See community screening guide)
- As a wellness programme in a village, church or workplace (See community screening guide)
- 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 >9lb or 4kg or were diagnosed with gestational diabetes (GDM)
- Those who had previous borderline tests (in the 'prediabetes' range)
- 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 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 (including gestational 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 6).

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 and smoking cessation.
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 ≥4kg
- Hypertension (≥140/90)
- HDL cholesterol <0.90mmol/l, triglyceride >2.82 mmol/l
- Women with polycystic ovary syndrome
- Prediabetes on previous testing
- History of CVD
- Conditions with insulin resistance (example steroid use)
- Fatty liver

Patient counselling and Patient education

Patient counselling
Counselling is an essential but separate aspect of patient care in the management of many medical problems. Counselling 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 counselling are important for all health staff to understand and adhere to, especially in 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 Te Marae Ora Ministry of Health Confidentiality Policy.

Respect and unconditional high regard
Each person has the right to their personal choices and decisions, as 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 will only alienate the patient and reduce 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 hypercholesterolemia

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, chronic kidney disease and difficulty conceiving (polycystic ovarian syndrome).

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 glucose 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 resist 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 has until recently been rare in the Cook Islands, but cases are increasingly being detected.

Gestational diabetes is diabetes discovered in pregnancy that often disappears after giving birth. It may appear again in another pregnancy or later in life if overweight or obesity continues. It is an indicator that a woman is at risk of developing type 2 diabetes.

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

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:

- What they should be eating and how to prepare food.
- What physical activity they should be doing and how often
- How they can stop smoking or reduce their alcohol intake
- How they can reduce stress levels
- 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 it every day, as prescribed. They should not stop taking 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 and 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 may 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. Kidney disease in people with diabetes is the leading cause of 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
Stage 1 Not thinking of change	Stage during which a person does not consider the need for changing their lifestyle	Give simple information about obesity, hypertension or diabetes and risks associated with them. Ask the patient to come back with family members to discuss it further.
Stage 2 Thinking of change	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
Stage 3 Ready for Change	The stage where a person is ready to take action in the next month.	Give detailed information about how obesity, diabetes and hypertension can be controlled and what the patient must do. Help the patient to set goats for their diet, weight, and physical activity
Stage 4: Action	Change begins (this can be large or small changes)	Give practical advice on what to do. For example, suggest, diary for diet and physical activity. Involve the family. Provide encouragement.
Stage 5: Maintaining change	Change is sustained over a period .	Follow up regularly with Support. Warn patient not to lose confidence if they lapse - lapses are common and can be expected. Encourage patient to continue with changes as soon as possible.

Ensuring patient adherence to the management plan

- Explain the diagnosis of the illness
- Inform patient of the complications of untreated illness
- Discuss the possible symptoms of the illness
- Show the patient the appropriate dose
- Prescribe once-daily medications, less expensive generics, and longer-lasting
- supplies of medicine whenever possible
- Explain potential adverse effects of the medications and what to do if the patient experiences them
- Explain how many times a day the patient should take the medication and at what time, and adopt the following simple steps to help adherence:
  - Label, date and package the tablets.
  - Check the patient's understanding before the patient leaves the clinic.
- Explain to patient how important it is to:
  - Keep an adequate supply of medications safely at home
  - Take the medicines regularly as advised, even if there are no symptoms
- Provide tools such as pill boxes and medication logs to help patients remember to take their medications
- Assess adherence and discuss barriers at every visit
- Reconcile clinician's medication list with patient's list, adjust dose, and eliminate Unneeded medications.

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 standard 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 should be avoided. Patients with elevated triglycerides should be advised to reduce their alcohol intake

330ml can of beer @ 4% alcohol

100ml glass of table wine

30ml straight spirits e.g., rum

Nutrition

Weight reduction is an important goal. Losing at little as 5 to 10kg 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 minimise fried foods or foods with added oils or fats (such as coconut cream, mayonnaise).

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.

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 every day 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 (Appendix 8) and advising to see an outpatient doctor or by making an appointment with the NCD clinic and notifying the person in-charge of the clinic. 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 glucose remains >8 mmol/l, or HbA1c >65 mmol/mol, despite compliance with antidiabetic treatment
- The patient develops any new complications of diabetes, e.g., numb feet, reduced pinprick sensation in the feet, shooting pain in the legs
- Any person under 40 years with BP of >140/90
- Cardiovascular risk (CVR) of > 30%

Contact details:

Hospital:	22664
Tupapa Community Clinic	20066

Community Clinic in the respective villages

Titikaveka	28190
Matavera	28189
Nikao	28286
Tupapa	28189
Blackrock	28185

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 via email 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 Diabetes booklet has a record of the patients' medications, the most recent consultation at the clinic and some education awareness material.

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 example, HbA1c, creatinine, foot checks. 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 Evolution using the appropriate screening template.

Assessment

Non communicable diseases 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 aid 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 checkups.

The role delineation chart (Appendix 12) clarifies this.

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.
A regular stock take of these is necessary and an annual capacity assessment of the health facility can be carried out for this record. (Appendix 10)

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, and smoking. 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 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 checkup). The register can also collect data for looking at the quality of care provided in the clinic and evaluation of what other services or programmes 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*

Monitoring

It is important to have a clinic with the basic necessary resources and a competent workforce in a fully functional clinic.

An annual capacity assessment of the health facility (Appendix 10) can be carried out to assess the functionality of the clinic.

Monitoring of competencies will be based on this guideline and will be done by using Audit Tools (Appendix 11) that mainly focuses on assessing how competent the health professionals are in working within the clinic, how they carry out the biophysical measurements (BP, BSL, cholesterol, waist circumference, BMI), stratify risks, timeliness of laboratory investigations, referrals and follow-ups and the other clinical best practice that is underlined in this guideline. It will assess whether patients are over or under

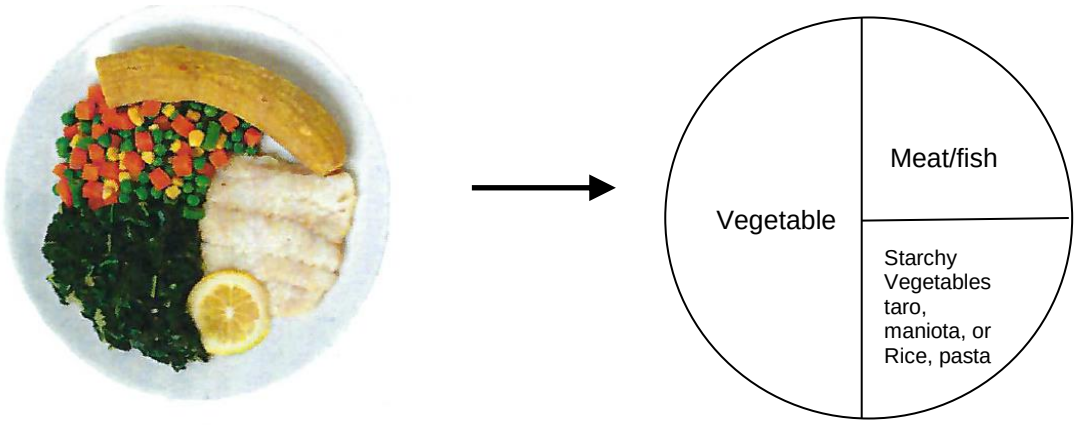
treated, patient's satisfaction with the service as well as patient's adherence to medications to identify gaps and solutions to improve the service. The auditing process shall be conducted by trained personal and can be carried out once or twice annually.

Appendices

Appendix 1: Healthy eating – Extra points

Points to consider

- Emphasize traditional and local foods such as taro, yams, breadfruit, maniota, 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 (example 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, and fist size portions of starchy vegetables. Encourage large portions of other vegetables e.g., salad, mixed vegetables, pinapi. 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. Advice 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 hypoglycemic attacks or postural hypotension (e.g., sulphonylurea, antihypertensive). 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 fiber. 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.

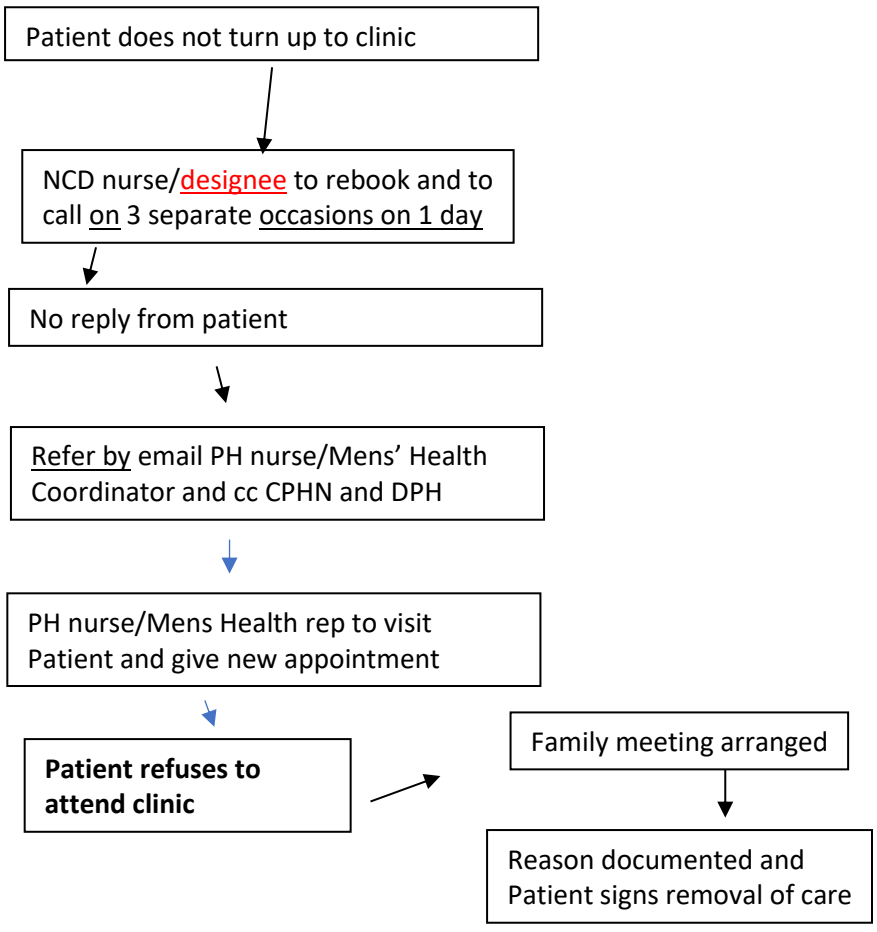
If a patient does not turn up to his/her appointment as scheduled.

- The NCD nurse or designee will follow up by calling the patient or caregiver to rebook for another date.
- 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/Men's Health Coordinator of that village to be made. New appointment date to be given. (Public Health Nurse/Men's Health Coordinator to reply via email and record on Medtech Evolution response from patient)

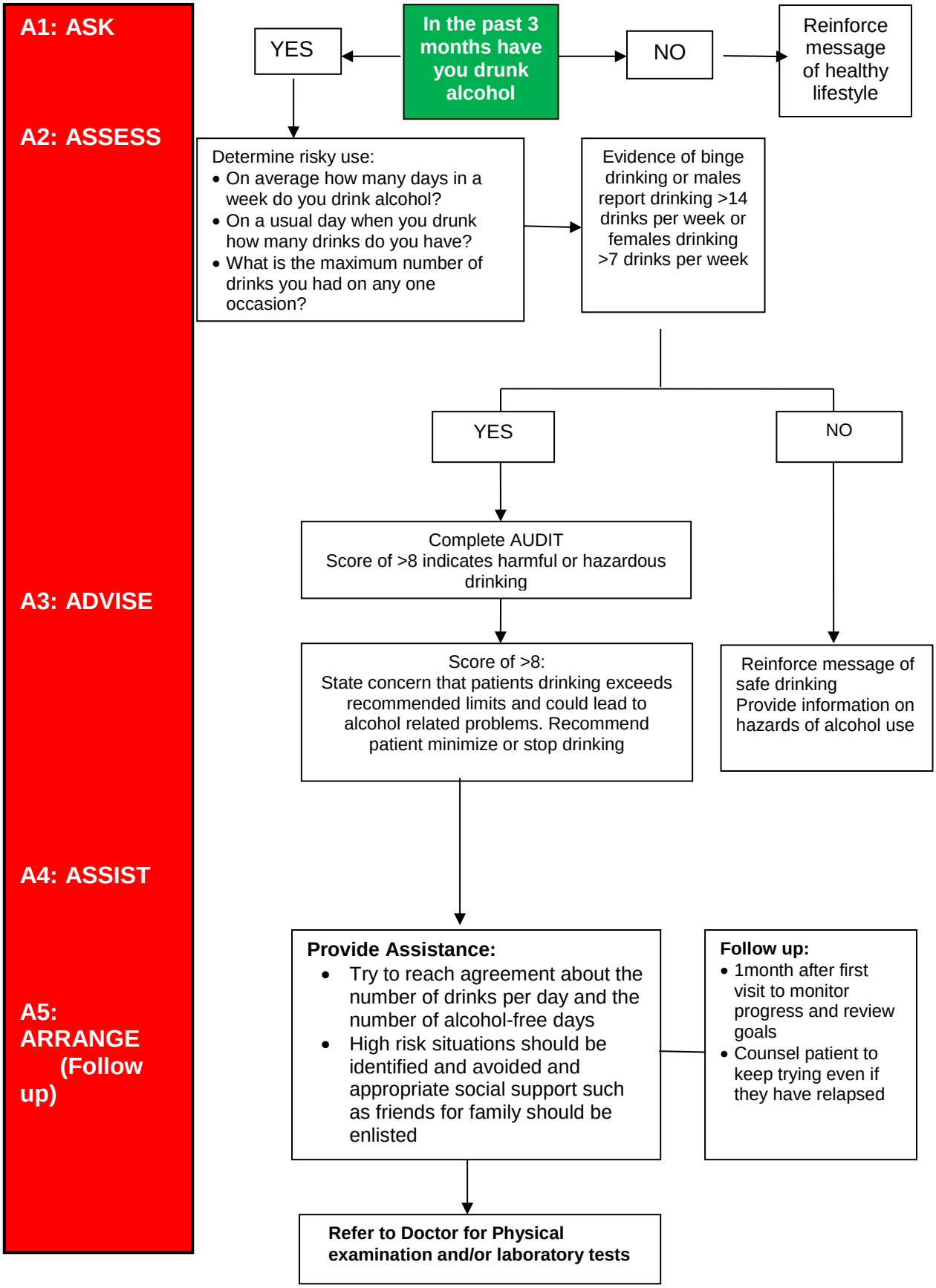
Chief Public Health Nurse and Director of Community Health Services should be copied in on all correspondence

- If the patient refuses to attend his/her appointment, then the reason for refusing will be documented on patients Medtech Evolution file and a family meeting will be arranged by the community liaison officer to discuss issue and means of overcoming barriers. If patient still refuses, he/she then signs the "Removal of Care" form.
- All the above to be documented on Medtech Evolution

Flow chart of summary of non-compliance policy



Appendix 3: Protocol for counselling 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. Code answers in terms of *standard drinks*. Place the correct answer number in the box at the right.

1. How often do you have a drink containing alcohol? (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 ☐	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? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily ☐
2. How many drinks containing alcohol do you have on a typical day when you are drinking? (0) 1 or 2 (1) 3 or 4 (2) 5 or 6 (3) 7, 8 or 9 (4) 10 or more ☐	2. How often during the last year have you had a feeling of guild or remorse after drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily ☐
3. How often do you have six or more drinks on one occasion? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily ☐ *(skip to Q9 and 10 if Total Score for Q2 & 3 = 0)*	3. How often during the last year have you been unable to remember what happened the night before you had been drinking? (5) Never (6) Less than monthly (7) Monthly (8) Weekly (9) Daily or almost daily ☐
4. How often during the last year have you found that you were not able to stop drinking once you had started? (5) Never (6) Less than monthly (7) Monthly (8) Weekly (9) Daily or almost daily ☐	4. Have you or someone else been injured as a result of your drinking? (0) No (1) Yes, but not in the last year (4) Yes, during the last year ☐
5. How often during the last year have you failed to do what was normally expected from you because of drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily ☐	5. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down? (0) No (2) Yes, but not in the last year (5) Yes, during the last year ☐
Record total of specific items here: ☐	

Appendix 5: Use of a 10 g 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? (Record year of first diagnosis)
☐ 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 and 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 = ½ 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 Currently pregnant: ○ Yes ○ No

Weight: _____ kg **Height:** _____ cm **Waist:** _____ cm

BP 1: _____/_____ mmHg **Pulse:** _____ **BP 2:** _____/_____ mmHg
(Normal below 140/90)

Blood glucose: _____ mmol/l ○ Fasting ○ Random *(normal fasting ≤6; random ≤7.7)*

Cholesterol: _____ mmol/l *(normal below 5.0)*

Body Mass Index (BMI): _____ (*Ideal: 22-27)*

Comments:

Appendix 8: Referral form

TE MARAE ORA
COOK ISLANDS Ministry of Health

REFERRAL FORM FOR SUSPECTED/NEW NCD CASES

Date: _____/_____/_____ Location: _____

Surname: _____ First Name(s): _____

Gender: ○ M ○ F Date of Birth: _____/_____/_____ Address: _____

THE ABOVE WAS SCREENED AND FOUND TO HAVE:

BP 1: _____/_____ mmHg *(normal below 140/90)* BP 2: _____/_____ mmHg BSL: _____ mmol/l ○ Fasting ○ Random *(Normal fasting ≤6; random ≤7.7)*

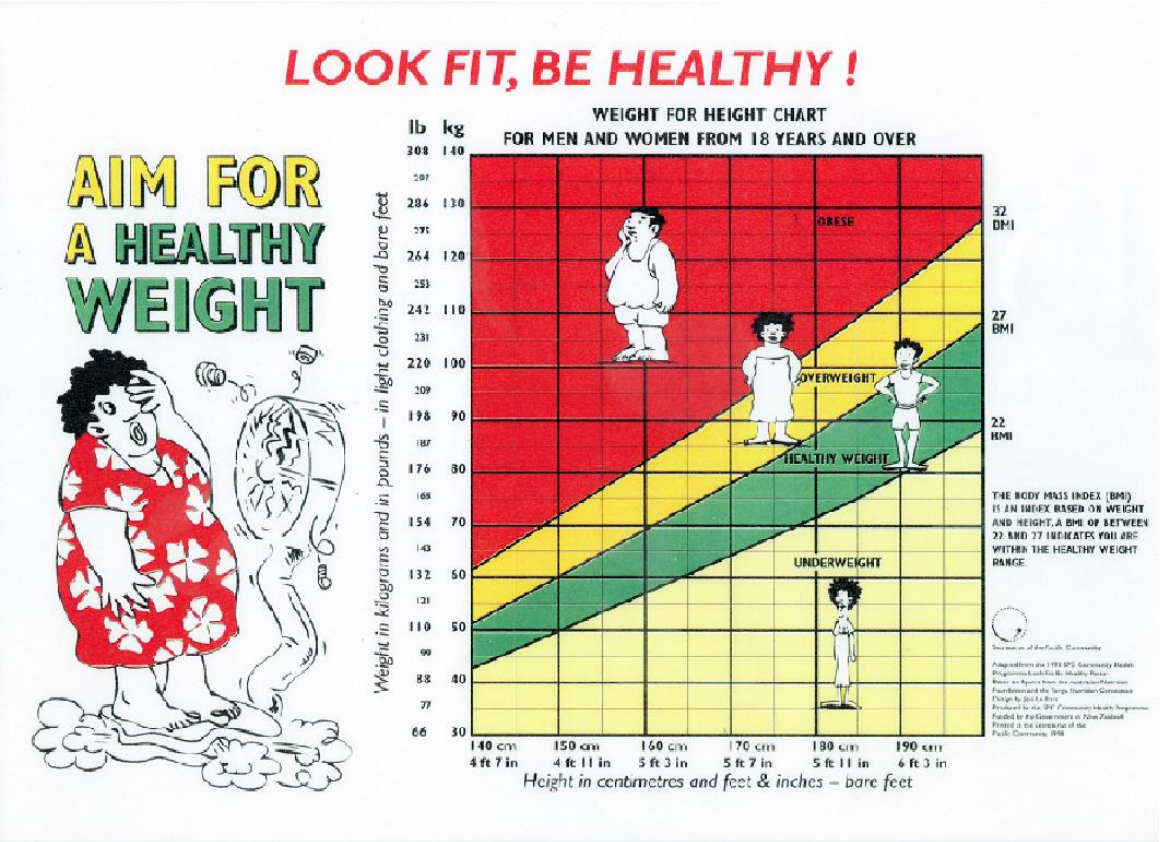
Chol: _____ mmol/l *(normal below 5.0)* CVRA: _____ Other: _____

PLEASE CONFIRM DIAGNOSIS OF:

Hypertension ○ Diabetes ○ Heart Disease ○ Other: _____

Referred by: _____

Appendix 9: South Pacific Community BMI Chart



Appendix 10: Capacity Assessment of Health Facilities

Capacity Assessment to prevent and manage major non-communicable diseases (NCDs) in primary health care facilities

G0 Date Today	G1 Name of person completing the questionnaire	G2 Designation of person completing the questionnaire
G3 Health Facility Name	G4 Health Facility Address	G5 Type of Health Facility ☐ Hospital ☐ Health Center ☐ Clinic
G6 Population size this health facility covers	G7 Geographical area/s this health facility covers	

Availability of *human resources* for managing major non-communicable diseases

Cadre	Number with training on NCD management	Number without training on NCD management
Specialist doctor	H1.1	H1.2
General doctor, full-time	H2.1	H2.2
General doctor, part-time	H3.1	H3.2
Nurse	H4.1	H4.2
Nurse Aide	H5.1	H5.2
Nutritionist-Dietitian	H6.1	H6.2
Physiotherapist	H7.1	H7.2
Health Educator	H8.1	H8.2
Pharmacist	H9.1	H9.2
Laboratory technician	H10.1	H10.2
Other clinical staff		

Availability of *basic equipment* for managing major non-communicable diseases

Basic equipment	Number of functional devices available
Manual blood pressure device	E.1
Digital blood pressure device	E.2
Weighing scale	E.3
Height scale	E.4
Measuring tape	E.5
Stethoscope	E.6
Thermometer	E.7
Glucometer	E.8
Cholesterol meter	E.9
ECG machine	E.10
Peak flow meter	E.11
Spacer	E.12
Nebulizer	E.13
Pulse oximeter	E.14
Oxygen cylinders (full)	E.15
Monofilament (for foot examination)	E.16

Availability of *medicines and medical supplies* for managing major non-communicable diseases (NCD)

	Drug/Supplies	Always available (D_1)	Stock out during the last 3 months (D_2)	Not available at all (D_3)		Drug/Supplies	Always available (D_1)	Stock out during the last 3 months (D_2)	Not available at all (D_3)
D1	Adrenaline injection				D20	Metformin			
D2	Amlodipine/Nifedipine SR				D21	Morphine injection			
D3	Aspirin				D22	Morphine tablet			
D4	Atenolol				D23	Paracetamol tablet			
D5	Beclomethasone inhaler				D24	Prednisolone tablet			
D6	Benzathine penicillin inj.				D25	Salbutamol inhaler			
D7	Enalapril				D26	Salbutamol injectable			
D8	Erythromycin				D27	Salbutamol nebule			
D9	Frusemide				D28	Salbutamol tablet			
D10	Glibenclamide				D29	Simvastatin/Atorvastatin			
D11	Glipizide				D30	Sodium chloride infusion			
D12	Hydrochlorothiazide				D31	Glucose solution 50% iv			
D13	Hydrocortisone inj.				D32	Heparin injection			
D14	Insulin soluble Actrapid				D33	Ibuprofen			
D15	Insulin long-acting Isophane				D34	Blood glucose strips			
D16	Insulin biphasic Mixtard				D35	Blood cholesterol strips			
D17	Ipratropium				D36	Urine strips for protein			
D18	Isosorbide dinitrate				D37	Urine strips for ketones			
D19	Lisinopril				D38	Health education materials			

	Are the following services/procedures being carried out?	Yes, at this facility S_.1	Yes, at the referral facility S_.2	No, why not? S_.3
S1	Screening on unhealthy lifestyle (smoking, unhealthy diet, physical inactivity)			
S2	Patient counselling and education on diet, alcohol and physical inactivity			
S3	Brief tobacco cessation intervention			
S4	Patient counselling for diabetes self-care			
S5	Cardiovascular risk screening using colored risk charts			
S6	Screening for overweight/obesity using BMI and/or waist circumference			
S7	Administration of oxygen			
S8	Administration of intravenous fluids			
S9	Eye examination (visual acuity)			
S10	Ophthalmoscopy			
S11	Comprehensive diabetic foot examination			
S12	Electrocardiography			
S13	Blood glucose test			
S14	Blood cholesterol test			
S15	Urine glucose test			
S16	Urine protein test			
S17	Urine ketone test			
S18	Serum creatinine test			
S19	Glycated hemoglobin test (HbA1c)			

Utilization of services		
U1	How do patients access this health facility? ☐ U1.1 Walk-in only ☐ U1.2 by appointment only ☐ U1.3 Combination of appointments and walk-ins	
U2	What is the estimated or actual total number of visits to this health facility for outpatient NCD services last month?	
U3	What is the total number of diabetics with or without hypertension registered/listed in this health facility till now?	
U4	What is the total number of patients with hypertension registered/listed in this health facility till now?	

Referral	
R1	What means of transport is most frequently used to transfer emergency patients from this health facility? ☐ R1.1 Ambulance ☐ R1.2 Public transport ☐ R1.3 Commercial vehicle ☐ R1.4 Private vehicle
R2	Are you able to refer remotely (by phone or radio) to the referral physician/facility? ☐ R2.1 Yes ☐ R2.2 No
R3	Can you refer patients with NCDs for a second opinion/specialist consultation? ☐ R3.1 Yes ☐ R3.2 No, why not?
R4	If yes, the patients will usually be: ☐ R4.1 Referred back to this health facility for follow-up ☐ R4.2 Followed up at the referral facility

Medical and Facility Records			
M1	Does the facility keep a record of patient visits?	☐ M1.1 Yes	☐ M1.2 No
M2	How are records kept? ☐ M2.1 Individual patient files	☐ M2.2 Patient registers	☐ M2.3 Both
M3	Are patient files retrieved and consulted each time they visit the facility? ☐ M3.1 Yes, patient files are retrieved and consulted	☐ M3.2 No, patient files are not always consulted	
M4	Does the facility have stock card or logbooks for **medicines?** ☐ M4.1 Yes, used routinely and currently ~~up-to-date~~	☐ M4.2 Yes, but not used routinely	☐ M4.3 No
M5	Does the facility have stock card or log books for **consumables/medical supplies**? ☐ M5.1 Yes, used routinely and currently ~~up-to-date~~	☐ M5.2 Yes, but not used routinely	☐ M5.3 No

Community Links	
C	Do any of the following community supports to NCDs happen in this health facility's community/ies? ☐ C1 Community-initiated NCD risk screening ☐ C.3 Patient support group ☐ C.5 No community support ☐ C2 Community-organized outreach ☐ C.4 Healthy lifestyle groups ☐ C.6 Others, specify

Cancer early detection

A1	Does your facility conduct screening for cervical cancer in asymptomatic people? A1.1 ☐ Yes, routinely A1.2 ☐ No, never A1.3 ☐ Only when outreach teams visit

	Are these services being carried out?	Yes, routinely at this facility [Mark below with ✓ if available and N/A if not available]	Yes, but only when outreach teams visit [Mark below with ✓ if available and N/A if not available]	How many women received this service in the last 12 months? [Write the number in the box below]	How long does it typically take for the patient to receive results of the test? [Write the average number of days in the box below]
A2	Visual inspection (unassisted)	A2.1	A2.2	A2.3	_____days A2.4
A3	Visual inspection with acetic acid (VIA)	A3.1	A3.2	A3.3	_____days A3.4
A4	Pap smear (cytology)	A4.1	A4.2	A4.3	_____days A4.4
A5	ThinPrep (Liquid-based cytology)	A5.1	A5.2	A5.3	_____days A5.4
A6	Human papillomavirus (HPV) testing	A6.1	A6.2	A6.3	_____days A6.4
A7	Colposcopy	A7.1	A7.2	A7.3	_____days A7.4
A8	Clinical breast examination	A8.1	A8.2	A8.3	_____days A8.4
A9	Breast ~~Self Examination~~ education	A9.1	A9.2	A9.3	_____days A9.4
A10	Thermal ablation	A10.1	A10.2	A10.3	_____days A10.4
A11	Cryotherapy	A11.1	A11.2	A11.3	_____days A11.4
A12	Large Loop Excision of the Transformation Zone (LLETZ) or Loop Electrosurgical Excisional Procedure (LEEP)	A12.1	A12.2	A12.3	_____days A12.4
A13	Endocervical curettage	A13.1	A13.2	A13.3	_____days A13.4
A14	None	If none, why ~~not?~~: _____ A14.1			

A15	Is *any* treatment available in the same visit, immediately after testing? A15.1 ☐ Yes, routinely A15.2 ☐ Yes, when resources are available A15.3 ☐ Only when outreach teams visit A15.4 ☐ No, never
A16	If not, why ~~not?~~: _____

	Availability of essential equipment for cancer screening [Write the current number of available devices in the box to the right]	Number of functional devices available
A17	Penlight or bright light source	
A18	Gooseneck lamp	
A19	Speculums	
A20	Ring forceps	
A21	Examination table with stirrups	
A22	Equipment for sterilization	

	Availability of essential supplies for cancer screening [Mark with ✓ in the corresponding column]	Always available (A_1)	Stock out during last 3 months (A_2)	Not available at all (A_3)
A23	Examination gloves			
A24	Soap and water			
A25	Disinfectant for equipment			
A26	Results recording forms			
A27	Cotton-tipped swabs or cotton balls			
A28	3-5% acetic acid solution or white vinegar			
A29	Cervical spatula, brush or brooms			
A30	Glass slides			
A31	Pap smear fixative spray/fixative solution			
A32	IEC materials on cervical cancer screening			
A33	IEC materials on breast cancer screening			

Appendix 11: Clinical audit tools

Clinical audit tools					
Data collector name:		Date of data collection:		Audit Form number:	
Facility name:		District:		File Number:	
Sex:	M F	Date first registered in this facility:			
Year of birth/Age: /		CVD/DM visit in last 12 months:	Yes Complete this	No Do not complete	
A.CVD history (Answer all CVD history questions; If Diabetic complete B1 to F: Complete B2 to F for the rest)					
Smoking (active/passive)	Yes		No	Not recorded	
Hypertension	Yes	Date diagnosed:	No	Not recorded	
Prior CVD	Yes	Date diagnosed:	No	Not recorded	
Heart attack or stroke	Yes	Date diagnosed:	No	Not recorded	
Chronic kidney disease	Yes	Date diagnosed:	No	Not recorded	
DM foot ulcer/Amputation	Yes	Date diagnosed:	No	Not recorded	
Neuropathy/Retinopathy	Yes	Date diagnosed:	No	Not recorded	
Diabetes	Yes	Date diagnosed	No	Not recorded	
B. CVD follow up					
B1. Diabetes patient: **N/A** Encircle, NA (not applicable) if non-	HbA1c recorded in the last 12 months	Yes (HbA1c value: _____)	No		
	Comprehensive foot examination recorded in the last 12	Yes	No		
	Dilated eye examination recorded in the last 24 months	Yes	No		
	COVID vaccination during the past 12 months	Yes	No		
	Tuberculosis screening recorded at least once after diagnosis	Yes	No		
	Depression screening recorded during the past 12 months	Yes	No		
	Urine test for protein recorded in the last 12 months	Yes	No		
B2. Blood	Recorded at last CVD visit	Yes	No		

pressure:	Reading at last CVD visit: (If 2nd BP not done, write: NR for not	Reading 1:	Reading 2:	Average BP
B3. BMI	Recorded at last CVD visit: Yes No	Weight:	Height:	BMI:
B4. Total cholesterol (date last available:		TC value:		Not available
C. CVD risk	**CVD risk recorded at least once in last 12 months**	Yes: CVD risk: _____%		No
	CVD risk estimated correctly (Last available in last 12 months)	Yes		No
	CVD risk % (record correct risk only)	**Baseline risk:** %	**Current risk:** % Date:	

D1. Statin prescribed (with prior CVD, CVD risk ≥20%, DM2 40 y/o & above, TC above	Yes	No	Not applicable
D2. Aspirin/Clopidogrel prescribed (with prior CVD, CVD risk ≥20% no	Yes	No	Not applicable
D3. Antidiabetics prescribed	Yes	No	Not applicable
D4. Antihypertensive prescribed	Yes	No	Not applicable
E. Counselling on healthy behaviors provided	Yes	No	
F. Date of return visit recorded at last visit	Yes	No	Not applicable

Indicator	Diagnosis		
	With CVD (MI/heart attack/angina, stroke/TIA)	**With CKD (stage 3b onwards)**	**With diabetic amputation, retinopathy or other DM chronic complication**
CVD risk classification	**Red to Brick Red (≥30% or very high risk)**		
CVD risk monitoring	**Same (Does not change)**		
Blood pressure target	below 130/80		
Eligible for statins and given statins	YES		
Eligible for low dose aspirin and given low dose aspirin (If no contraindications)	YES		
Eligible for antihypersensitive and given antihypersenitive	YES, if prior or latest BP is above 130/80		

Indicator	DIAGNOSIS	
	Diabetes CVD risk ≥30% (Red, brick red)	Diabetes CVD risk below 30% (Green, yellow, orange)
Blood pressure target	below 130/80	
Comprehensive foot examination	Done at least once during the past 6 months	
Eye examination	Done at time of diagnosis, every 12 months Snellen chart and every 2 yrs. opththalmologist screening or dilated eye examination	
HbA1c Test	Done at 3 monthly if complicated	Done at least 6 to 12 monthly
HbA1c Target	<7	
Urine for Proteinuria	12 monthly	
Eligible for statins and given statins	YES, regardless of Total Cholesterol level	YES, only if ≥40 years old or if Total Cholesterol level is ≥8mmol/L
Eligible for low dose aspirin and given low dose aspirin	YES	NO
Eligible for antihypersensitive and given antihypersenitive	YES, if prior or latest BP is above 130/80 or diagnosed with hypertension	
Eligible for anti-diabetic and given anti diabetic	YES	

Indicator	DIAGNOSIS	
	Hypertension only CVD risk ≥30% (Red, brick red)	Hypertension only CVD risk below 30% (Green, yellow, orange)
Blood Pressure target	below 130/80	Below 140/90
Eligible for statins and given statins	**YES**, regardless of Total Cholesterol level	**YES**, only if Total Cholesterol level is ≥8 mmol/L
Eligible for low dose aspirin and given low dose aspirin	YES, if prior CVD	**NO**
Eligible for antihypersensitive and given antihypersenitive	YES	YES
Eligible for anti-diabetic and given anti diabetic	NO	NO

Observation checklists to assess skills of service providers

Observe the service provider as he/she conducts the risk screening procedures. Listed under each procedure are the actions that should be observed from the service provider. For each action, put a checkmark under the appropriate column.

Processes	Yes	No	N/A
Measuring height			
□ Made sure the height board is on level ground			
□ Instructed the client to:			
□ remove shoes, socks & hair ornaments			
□ stand on the baseboard with feet slightly apart			
□ keep the back of the head, shoulder blades, & buttocks to touch the vertical board			
□ keep the legs straight & feet flat, with heels & calves touching the vertical board			
□ Positioned the person's head so that a horizontal line from the ear canal to the lower border of the eye socket runs parallel to the base board			
□ Read the measurement & recorded the height in centimeters to the last completed 0.1 cm			
Measuring weight			
□ Made sure the weighing scale is placed on a flat, hard, even surface			
□ Instructed the client to:			
□ remove shoes & outer clothing (If it is socially unacceptable to undress the person, remove as much clothing as possible.)			
□ stand still in the middle of the scale, feet slightly apart			
□ Recorded the person's weight to the nearest 0.1 kg			
Measuring waist circumference			
□ Made use of a non-extensible/ non-stretchable tape measure			
□ Determined the waist which is midway between the last rib & the top of the hipbone			
□ Placed the tape measure around this midpoint (waist) unclothed			
□ Instructed the client to:			
□ stand straight with the abdomen relaxed			
□ lift his/her top			
□ keep feet together & arms at the sides			
□ Took the person's waist circumference in centimeters			
Measuring blood pressure			
□ Made sure the client is relaxed & has rested for at least 5 minutes and should not have smoked or ingested caffeine within 30 minutes before BP measurement			
□ Made sure the client's back is supported by the chair & the feet are flat on the floor & the legs are not crossed			

□ Bared client's arm & apply cuff around the arm 2-3 cm above the brachial artery			
□ Applied the cuff snuggly with no creases			
□ Kept the client's arm level with his/her heart by placing it on a table or a chair arm or by supporting it with examiner's hand			
□ Kept the manometer at eye level			
□ Palpated brachial pulse correctly just below or slightly medial to the antecubital area			
□ Placed the earpieces of stethoscope on the ears & stethoscope head over the brachial pulse			
□ Used the bell (or diaphragm for obese persons) of the stethoscope to auscultate pulse			
□ While watching the manometer, inflated the cuff rapidly by pumping the bulb until the column or needle reaches 30 mmHg above the palpated SBP			
□ Deflated the cuff slowly at a rate of 2-3 mmHg/beat			
□ While the cuff was deflating, listened for pulse sounds			
□ Noted the appearance of the first clear tapping sound (Recorded this as systolic BP)			
□ Noted the diastolic BP which is the disappearance of sounds			
□ Recorded the first reading			
□ Fully deflated the cuff			
□ Took the second blood pressure reading 1 to 2 minutes after the first			
□ Recorded the second reading			
□ Computed for the average systolic and diastolic reading & recorded the average BP			
Measuring blood glucose			
□ Explained the procedure to the client			
□ Took one strip from the canister & closed the lid quickly and firmly			
□ Inserted the test strip into the slot on the meter			
□ Cleaned the tip of the client's ring or middle finger with alcohol swab and allowed to dry			
□ Loaded a fresh lancet in the fingerstick device & activated the barrel by sliding it			
□ Held the fingerstick perpendicularly & firmly against the puncture site & released the barrel			
□ Collected enough blood to cover the entire reaction zone of the test strip			
□ Recorded the glucose value that was displayed			
□ Removed the used lancet from the fingerstick device & put this in a sharp's container			
Measuring urine protein and/or urine glucose			
□ Explained the procedure to the client			
□ Made sure the test tube or test container is clean and dry			
□ Asked the client to fill the container with fresh urine			
□ Took one urine strip from the canister & closed the lid quickly & firmly			

▯ Completely immersed the reagent area of the strip in the urine specimen & removed the strip immediately			
▯ Ran the edge of the strip against the rim of the urine container to remove the excess urine			
▯ Held the strip in a horizontal position & brought the edge of the strip into contact with an absorbent material (toilet paper)			
▯ Compared the reagent areas to the corresponding color blocks on the canister label.			
▯ Read the results within the prescribed time after dipping & recorded the value/s			
▯ Disposed the urine & the container safely.			

Client satisfaction survey tool

Why conduct Client Satisfaction Assessments?

Conducting client satisfaction activities can help you to:

1. Identify opportunities for service improvements;
2. Identify what clients want as opposed to what you or your staff think they want
3. Provide feedback to service delivery staff, management, and others about programme effectiveness.

	Interview Questions:	Responses
1a	CVD risk score is a measure of an individual's chances of developing a heart attack or stroke over several years and is valuable in determining the intensity of managing your condition. Has anyone measured your CVD risk score?	
1 b	If yes, who?	
1c	Did the health worker explain the meaning of your CVD risk score?	
2a	Diabetes is a chronic disease that requires lifestyle adjustments. Has anyone adequately explained to you what diabetes is and what lifestyle changes are needed to control your blood sugar?	
2 b	If yes, who provided the counselling?	
3a	Did the health worker give you advice regarding limiting salt intake, and intake of 5 servings of fruit and vegetables?	
3 b	Did the health worker give you advice on taking 2 1/2 hours of moderate intensity physical activity per week and advice against too much sitting and sedentariness?	
3c	If you are a current or ex-smoker or tobacco user, did the health worker advise you on the harmfulness of smoking /tobacco use and the importance of quitting tobacco use?	
3 d	If you are taking alcoholic drinks, did the health worker advise you on the hazardous use of alcohol and against having more than 5 drinks on one occasion?	
4a	Are your feet checked for wounds and infection every time you visit?	
4 b	If yes, who checks your feet?	
4c	If you need foot care, who provides the care?	

5a	Did the health worker give you the date of your return visit? When is the date of your return visit?	
5 b	Did the health worker provide you with the opportunity to ask questions?	
6	Is this interview helpful to you?	

PATIENT ADHERENCE TO MEDICATION QUESTIONAIRE

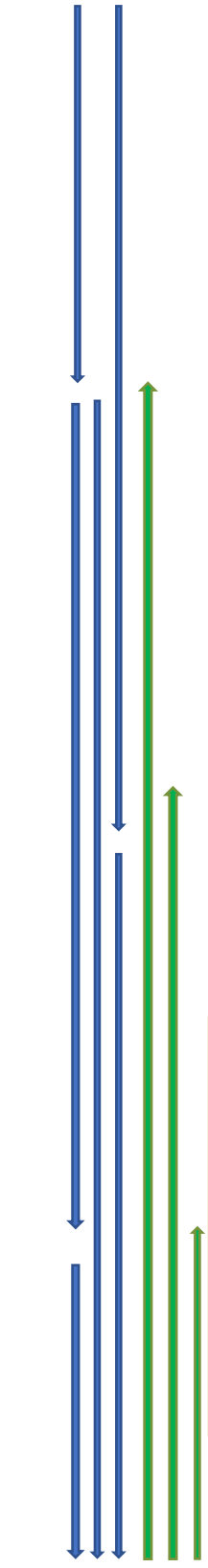
a. Why conduct Patient Adherence to Medication Questionnaire?

1. Identify why patients are not compliant to their medications
2. Identify opportunities for service improvements

b. This can be carried out by the clinic staff

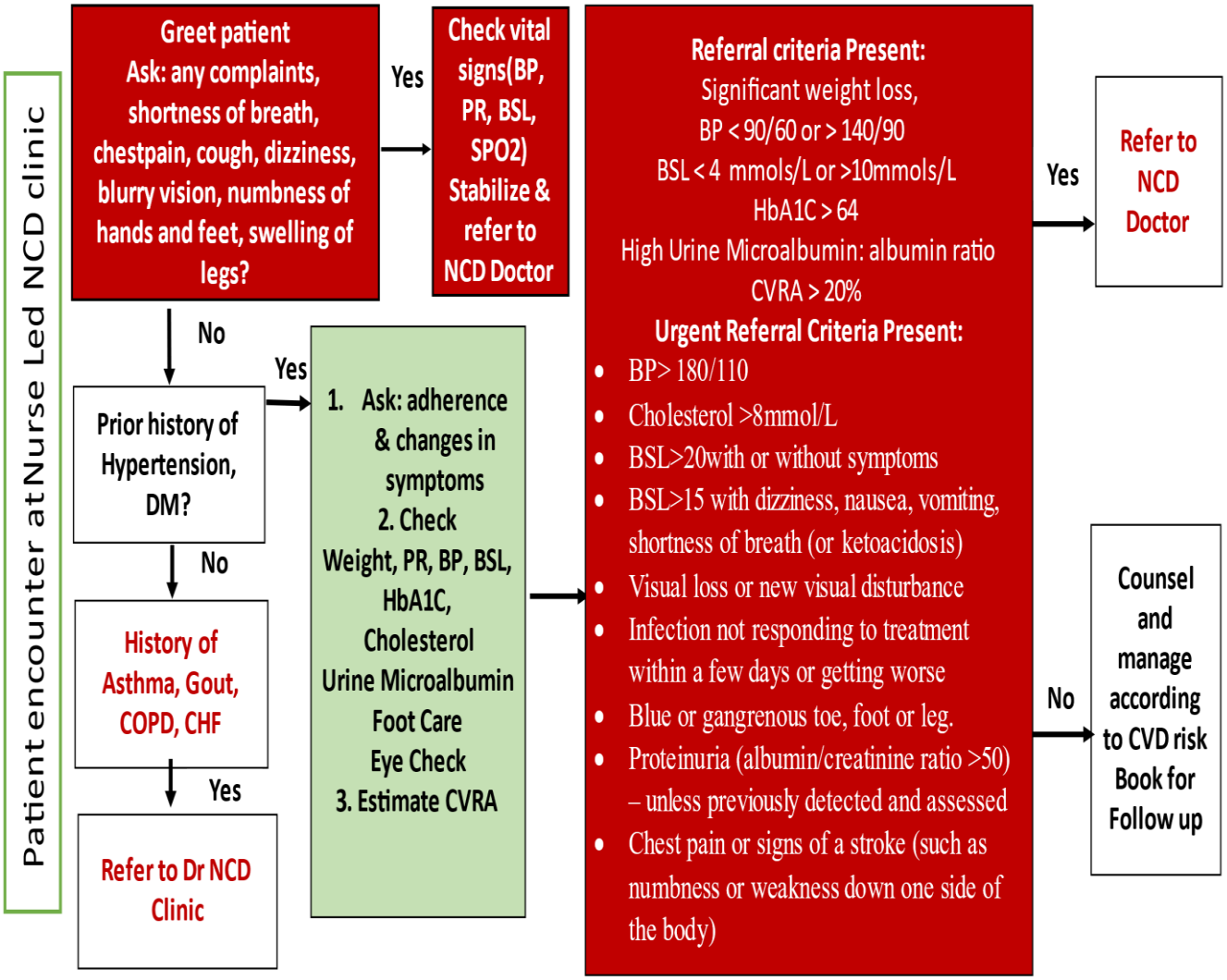
1. Were you given a medication during your previous visit?	Yes	No
2. If yes, what is your medicine called?		
3. What is your medicine for?		
4. How does your medicine work?		
5. How do you take your medication?		
6. How long do you need to be on your medication?		
7. When was the last time you took your medicine?		
8. What should you do if you forget to take a dose?		
9. What did your health provider tell you about unwanted side effects of your medication?		
10. Over the past 7 days, how many times did you miss a dose of your medicine?		
11. Why did you miss or not take your medication?		
12. Are you currently taking herbal or traditional remedy for hypertension or diabetes? If yes, are you taking this remedy together with the medicine prescribed by your doctor?		
13. Would you buy your medication from a private pharmacy if the government pharmacy could not provide the medication?		

Appendix 12: Role delineation chart



Patient	Leve	Package of NCD Services	Referral Criteria
	Community (Non health)	• Promotion of healthy lifestyle and self-care • Basic health care and psychosocial support • Screening for unhealthy lifestyle - smoking, sedentariness, physical inactivity, unhealthy diet and obesity and provision of health education/ information • Identification of NCDs and high-risk cases and referral to higher level facility for management • Defaulter retrieval	• BP >140/90 mm Hg, DM BP >130/80 • FBS > 6.1mmol/L or RBS >11.1mmol/L • BMI >30 • Possible angina/heart attack, transient ischemic attack or stroke • Foot ulcer, blurring of vision
	Nurse Led NCD Clinic (PHC)	• Promotion of self-care • Nutrition counselling and counselling on healthy lifestyle • Basic health care and psychosocial support • Provision of the package of essential NCD interventions – CVD risk screening and management • Screening of pregnant women for gestational diabetes and referral/management & Screening of diabetic patients for TB and appropriate referral/management • Basic foot examination and foot care/wound care • Visual acuity test • Refill of prescriptions for maintenance medications • HbA1c test for glycemic control monitoring • Follow-up of people discharged by facility-based services for people with chronic health conditions, disabilities and mental health problems. • Routine Vaccines	• BP >180/>100 mm Hg (URGENT REFERRAL) • Cardiac arrhythmia (URGENT REFERRAL) • BP >140 mmHg (Systolic) or > 90 mmHg (diastolic) in people < 40 yrs. (to exclude secondary hypertension) • Known heart disease, stroke, transient ischemic attack, DM, kidney disease (for assessment, if this has not been done) • New chest pain or change in severity of angina or symptoms of transient ischemic attack or stroke • Target organ damage (e.g., angina, claudication, heaving apex, cardiac failure) • Raised BP >140/90 (with diabetes >130/80) while on treatment with 2 or 3 agents • Cardiac murmurs or arrhythmia • Any proteinuria • Newly diagnosed DM with urine ketones 2+ or in lean persons of <30 years • DM with poor control despite maximal metformin with or without sulphonylurea • DM with severe infection and/or foot ulcer • DM with recent deterioration of vision or no eye exam in 2 years
	Doctor Led NCD Clinic (PHC)	• Promotion of self-care • Nutrition counselling and counselling on healthy lifestyle • Basic health care and psychosocial support • Provision of the package of essential NCD interventions – CVD risk screening and management • Screening of pregnant women for gestational diabetes and referral/management • Screening of diabetic patients for TB and appropriate referral/management • Comprehensive foot examination and foot care patients • Visual acuity test • Follow-up check-up of patients discharged from hospital • Refill of prescriptions for maintenance medications • Community-based rehabilitation/physiotherapy • Diagnostic tests – routine tests, HbA1c, urine, blood chemistries Albumin/Creatinine Ratio, troponin/cardiac enzymes, ECG	• BP >200/>110 mm Hg (URGENT REFERRAL), CVR >30% • New chest pain or change in severity of angina or symptoms of transient ischemic attack or stroke • DM with severe infection and/or foot ulcers • Target organ damage (e.g., angina, claudication, heaving apex, cardiac failure) • Acute episodes of NCD - heart attack, cerebrovascular disease, peripheral
	NCD Clinic (Hospital)	• Provision of the package of essential NCD interventions – CVD risk screening and management & Promotion of self-care • Counselling on nutrition, smoking, physical inactivity, harmful use of alcohol, obesity, etc. • Screening of pregnant women for gestational diabetes and referral/management • Screening of diabetic patients for TB and appropriate referral/management • Diagnostic tests – routine tests, HbA1c, urine Albumin/Creatinine Ratio, blood chemistries, troponin/cardiac enzymes, ECG • Monitoring of glycemic control (HbA1c) and renal complications (urine albumin-creatinine ratio - ACR) • Comprehensive foot examination and foot care; wound care • Follow-up check-up of patients discharged from hospital • Refill of prescriptions for maintenance medications • Visual acuity/Pinhole test & Referral for Oral Health	• DM with severe infections • Target organ damage (e.g., angina, claudication, heaving apex, cardiac failure, cardiac arrhythmias) • Acute episodes of NCD - heart attack, cerebrovascular disease, peripheral vascular disease • Oral health • Renal failure for dialysis
	Specialists	• Specialist care (Specialist Clinic and In-patient Care) • Management of acute episodes of NCD - heart attack, cerebrovascular disease, peripheral vascular disease • Surgical services - wound debridement, amputation, etc. • Diagnostic tests – routine tests, HbA1c, urine Albumin/Creatinine Ratio, blood chemistries, troponin/cardiac enzymes, ECG • Rehabilitation services, including retrofitting of footwear, prosthesis, cardiac rehab • Fundoscopy (dilated eye), retinoscopy, laser surgery	

Appendix 13: Summary Guideline for Nurse Led NCD Clinic



1. **Greet** the patient and ask for any complaint, such as shortness of breath, chest pain, coughing, dizziness, blurring of vision, numbness of hands and feet and swelling of legs.
2. **Check**:
   - Weight, pulse, BP,
   -Blood glucose, HbA1c, cholesterol
   -Urine microalbumin
   -Cardiovascular Risk Assessment
   - Up to date with footcare, eye-check, routine blood checks?
   Weight: Is there any change in weight compared to previous one?
   If increased in weight – discussed eating habit and exercise
   If decreased in weight is significant – refer to NCD Clinic, Rarotonga Hospital, for further investigations.
   Pulse: Is the pulse normal range, slow (<60 bpm) or fast (>100 bpm)?
   If pulse is slow or irregular or fast - refer to the doctor at NCD Clinic, Rarotonga

Hospital.

Blood Pressure: Is the BP normal, low (<90/60 mmHg) or High (>140/90 mmHg). If BP is low or high – medication for HTN needs to be reviewed and adjusted accordingly. Refer to NCD Clinic, Rarotonga Hospital.

Blood Glucose: Is the glucose low or high? If BSL <4.0 mmol/L, please check if the patients take regular meals to prevent hypoglycaemia. Consider reducing dose of sulphonylurea or insulin.

If glucose > 12 mmol/L refer to the doctor at NCD Clinic, Rarotonga Hospital for consideration of medication dosage adjustment.

HbA1c: Please check HbA1c every 3 to 6 months. If HbA1c is high >65 mmol/mol refer to the doctor at NCD Clinic, Rarotonga Hospital for consideration of dosage adjustment of treatment for diabetes.

Target HbA1C — Glycated hemoglobin (HbA1C) goals in patients with type 2 diabetes should be tailored to the individual, balancing the improvement in microvascular complications with the risk of hypoglycemia. A reasonable goal of therapy is 55 mmol/mol for most patients. Glycemic targets are generally higher (e.g., 65 mmol/mol) for older patients and those with comorbidities, a limited life expectancy and little likelihood of benefit from intensive therapy.

Urine microalbumin and albumin to creatinine ratio (ACR): Check urine microalbumin and albumin to creatinine ratio at least once a year. If the results are high (>30 mg/mmol) check every six months and refer to the doctor at NCD Clinic, Rarotonga Hospital.

Cholesterol (lipids): Check cholesterol / lipids once a year.

3. **Foot Care**: check feet for any alteration in sensation and ulcers.
4. **Eye check**: Ophthalmology referral once every 2 years if no diabetic retinopathy. Once a year if the patient has had diabetic retinopathy and has had laser treatment.
5. **Other abnormal findings**: Shortness of breath, chest pain, chronic coughing, swelling of legs – refer to NCD Clinic, Rarotonga Hospital.
6. **Other diseases** (e.g., gout, asthma, COPD, heart failure): refer to NCD Clinic, Rarotonga Hospital.
7. **Check Cardiovascular Risk Assessment** and update according to guideline.

Criteria for urgent referral

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

- Severe hypertension (BP> 180/110)
- Cholesterol >8mmol/L
- Very high blood glucose (>20) with or without symptoms
- High blood glucose (>15) accompanied by 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
- Blue or gangrenous toe, foot or leg.
- Proteinuria (albumin/creatinine ratio >30) – unless previously detected and assessed
- Chest pain or signs of a stroke (such as numbness or weakness down one side of the body)

Patient Care Check-up Points	
At each clinic visit	BP, blood glucose, weight
	Compliance with and side effects of medication
	CVRA if appropriate
	General Examination and foot check
	Update diagnosis
	Advise on lifestyle changes as appropriate
	Book next appointment
Every 3 months	HbA1c and foot examination for complicated DM
Every 6 to 12 months	HbA1c and foot examination for non-complicated DM
Every 12 months	ECG for patients above 60yrs
	Serum Creatinine
	Lipid Profile
	Urine Protein (albumin/creatinine ratio)
Every 2 years	Retinal examination (Ophthalmologist screening or dilated eye examination)

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