Improving Diabetes Care

A Training Program for the Health Workers in Nauru

Implemented as part of the
World Diabetes Foundation Project
2007

Contents

Introduction

This training program for Health workers is developed in collaboration with the In-country coordinator, Australian collaborators and Project team. Its purpose is to provide Health workers with:

- background information
- a framework for systematically learning information and skills for each competency
- assessment criteria for each competency
- other relevant information to assist Health workers during their training.

Overview of Diabetes

Background	Diabetes is affecting an increasing number of people every year. Diabetes can cause serious health problems. Diabetes cannot be cured but can be controlled with effective treatment. In order for people with diabetes to be involved in their management they require a basic understanding of the nature of diabetes. It is essential that Health Workers involved in diabetes care also understand the disease process, impact and treatment of diabetes to be able to give appropriate information and advice.
Purpose of this topic	To provide Health Workers with a broad knowledge of the pathophysiology of diabetes, types of diabetes and general principles of management.
Main points to cover	• Definition of diabetes • Prevalence of diabetes in the Pacific Islands & specifically in Nauru • How diabetes develops • Normal blood glucose range • Diagnostic criteria • The three major types of diabetes and their presentation • Aims of diabetes treatment • Framework for treatment and management
Teaching strategies	Using a small group of patients ask the Health Worker to discuss their understanding of: - what diabetes is - the causes of diabetes - what symptoms (if any) were present at diagnosis - why diabetes is increasing in Nauru - why treatment is necessary - basic management Ask the Health Worker to correct any myths/misinformation.
Assessment	The Health Worker demonstrates through a question and answer process with patients, a sound understanding of diabetes relating to Nauru.

Dietary Management

Background	Healthy eating is the basis of diabetes management. Health Workers need to give accurate information and practical advice to help people with diabetes develop skills and strategies to select and prepare appropriate food.
Purpose of this topic	To provide Health Workers with a general idea of dietary recommendations and develop strategies to help patients obtain realistic goals.
Main points to cover	• Identify major food groups • Effect of carbohydrate on blood glucose levels • Importance of reducing fat in diet • Practical approaches to weigh management • The effects of alcohol on diabetes management
Teaching strategies	At the beginning of the training program ask the Health Worker to complete his own 24 hour food history. Following dietary education ask him to develop an appropriate meal plan for himself then discuss the plan with him. Ask the Health Worker to: - take a 24 hour food history from a patient - develop an appropriate meal plan taking into consideration the patient's BMI, level of physical activity, food preferences and social situation - develop strategies for implementation of the meal plan - make an appropriate follow up appointment
Assessment	Assess the meal plan devised by the Health Worker and the strategies for on going care.

Exercise/Physical Activity

Background	Regular exercise/physical activity is recommended for everyone for general health and well being and is an important part of diabetes management. Health Workers need to recognise individual barriers to exercise in order to provide encouragement and motivation. Exercise goals should be safe, realistic and achievable.
Purpose of this topic	To give Health Workers an overview of the benefits of exercise and the recommendations for exercise.
Main points to cover	• The benefits of exercise in diabetes • Recommended type, frequency, intensity and duration of exercise • Precautions for exercising with diabetes
Teaching Strategies	Ask the Health Worker to discuss with a small group of patients their views about: - their exercise patterns - what types of exercise are considered acceptable for age and gender in the community - possible barriers to exercise and how to overcome them - ways that exercise might fir into their normal daily routine
Assessment	Based on the level of exercise of a patient over the last 6 months, the Health Worker develops an appropriate exercise plan for that person for the next 3 months taking into consideration: - age - current level of activity - social factors - other health issues

Competency 1 - The Foot and Diabetes (At risk feet)

Competency	Foot assessment including use of monofilament.
Background	Foot problems are the most common cause of hospitalisation in people with diabetes. About 50% of lower limb amputations occur because of diabetes. Foot care screening and education have a major impact on reducing foot ulcers and amputations.
Purpose of this topic	To ensure that Health Workers are aware of the principles of causes, identification, management and prevention of foot problems.
Main points to cover	• Description of commonly occurring foot problems and their causes • Description of a "high risk foot" and how to detect it. • Importance of foot care education • Prevention strategies • Health professional referral criteria
Teaching Strategies	Demonstrate: - how to assess the foot in order to identify an at risk foot - preventive measures through education and foot care practices Allow the Health Worker supervised practice on selected patients with normal and high risk feet.
Assessment	The Health Worker demonstrates, describes and documents a foot assessment to identify risk factors and active foot problems according to the foot assessment form.

Competency 1 - The Foot and Diabetes (Peripheral Vascular Disease - PVD)

Competency	Recognition of vascular changes to the foot.
Background	Diabetes can cause narrowing of the blood vessels, reducing blood flow and putting feet at high risk of infection, ischaemic ulcers and poor healing. Other factors such as smoking, high cholesterol, high blood pressure and obesity can exacerbate the problem.
Purpose of this topic	To ensure that Health Workers are able to identify risk factors for developing PVD and feet "at risk" for PVD, and are able to provide appropriate advise for preventing this problem.
Main points to cover	• Pathophysiology of PVD in diabetes • Identification of feet "at risk" of developing PVD • Assessment of PVD • Treatment of PVD
Teaching Strategies	Demonstrate palpation of the posterior tibial and dorsalis pedis pulses. Allow the Health Worker supervised practice on selected patients with and without PVD.
Assessment	The Health Worker demonstrates the ability to: - palpate the posterior tibial and dorsalis pedis pulses - identify the signs and symptoms of impaired peripheral blood flow

Competency 1 - The Foot and Diabetes (Peripheral Neuropathy)

Competency	Recognition of nerve damage to the foot.
Background	Diabetes can cause nerve damage, especially in the nerves to the legs and feet. Nerve damage can mask the body's natural protective warning signs that alert the person with diabetes when damage to their feet is occurring. People with peripheral neuropathy are at increased risk of developing areas of excess pressure and foot deformities that can lead to further problems.
Purpose of this topic	To ensure that Health Workers are able to identify risk factors for developing neuropathy and feet "at risk" for neuropathy, and are able to provide appropriate advise for preventing this problem.
Main points to cover	• Pathophysiology of neuropathy in diabetes • Types of neuropathy • Effects of neuropathy • Assessment of neuropathy using a monofilament • Treatment of peripheral neuropathy • Identification of feet "at risk" of developing neuropathy
Teaching Strategies	Demonstrate use of the monofilament to show differences in cutaneous perception in people with and without peripheral neuropathy. Allow the Health Worker supervised practice on selected patients with and without peripheral neuropathy.
Assessment	The Health Worker demonstrates the ability to: - Assess cutaneous perception using a monofilament - identify the signs and symptoms of peripheral neuropathy

Competency 1 - The Foot and Diabetes (Wound/Ulcer Care)

Competency	Knowledge and understanding of the basic principles of wound healing.
Background	Diligent and appropriate wounds/ulcer management in people with diabetes greatly reduces the risk of sepsis, osteomyelitis and amputation.
Purpose of this topic	To ensure that Health Workers are able to identify wounds/ulcers and manage them appropriately.
Main points to cover	• Pathophysiology of wound healing • Theory of moist wound healing • Types of wounds • Wound infection • Types of wound products • Importance of wound/ulcer debridement
Teaching Strategies	Demonstration and discussion about: - different types of wounds - signs of infection - appropriate dressing products for different wounds - debridement of wounds/ulcers - when and where to refer patients
Assessment	The Health Worker demonstrates the ability to: - identify different types of wounds - identify the appropriate dressing for the different wound types

Competency 1 - The Foot and Diabetes (Patient Education)

Competency	Knowledge and understanding of the importance of providing accurate foot care information and ongoing support to patients with foot problems and those with "at risk" feet.
Background	It has been shown that diabetes-related foot problems can be prevented if the Health Workers emphasise to people with diabetes that they can do something about it. Ulceration and amputations are not inevitable consequences.
Purpose of this topic	To ensure that Health Workers can provide basic diabetes management advice and foot care education.
Main points to cover	• Hygiene • Foot examination • Nail cutting • Basic first aid • When to seek professional medical help • Footwear
Teaching Strategies	Demonstrate how to run individual and group education sessions.
Assessment	The Health Worker demonstrates the ability to: - teach daily foot care routine to a patient - give basic first aid advice

Diabetic Foot Problems

Background
Foot problems account for much of the morbidity, hospitalisation and amputations in people with diabetes. Most foot problems are preventable with education, early detection and treatment.

Aim
- To determine the risk category of feet of people with diabetes
- To identify significant active foot problems
- To prevent amputations due to diabetes.

Assessment
1. Ask about previous foot problems, neuropathic symptoms, rest pain and intermittent claudication
2. Inspect the feet (including nails, between the toes) to identify active foot problems
3. Examine for neuropathy by testing for protective sensation using the 10g monofilament
4. Check peripheral pulses
5. Assess footwear

Interpretation of Assessment
- **Low risk foot -** normal sensation, normal pulses, no other abnormality
- **At risk foot -** neuropathy or absent pulses or other foot abnormality (except ulcer)
- **High risk foot -** past history of ulcer or amputation, or 'at risk foot' with skin changes
- **Ulcerated foot -** current ulcer
- **Active foot problem -** infection, corns, calluses, fissures, nail dystrophy, or interdigital maceration.

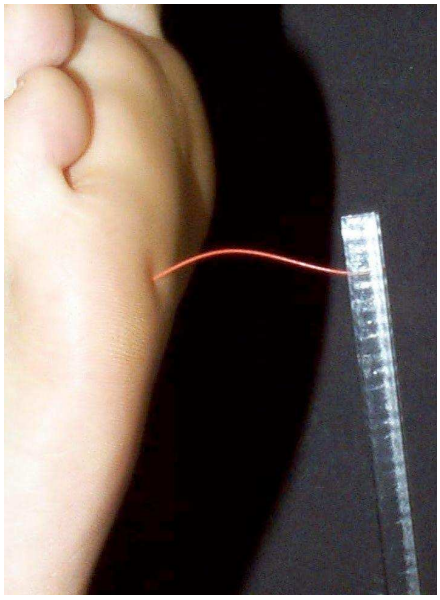
How often
- Perform routine foot examination every year in all people with diabetes
- Examine feet at more regular intervals (see below) in all people except those in low risk category

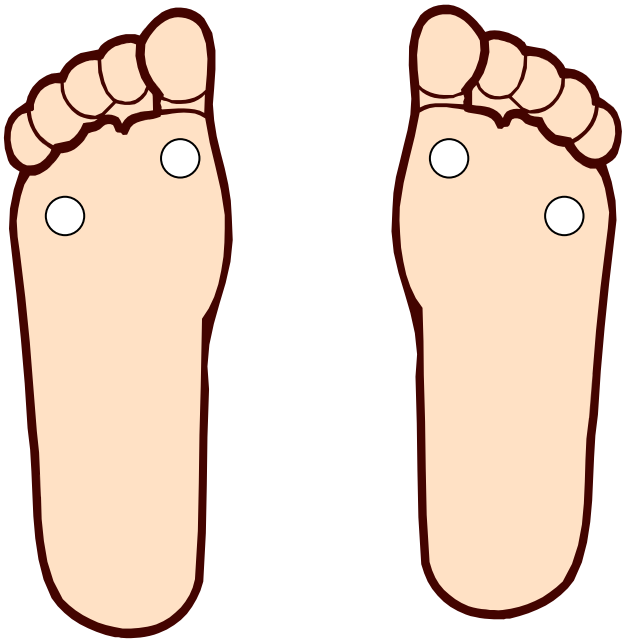
What to do
All people with diabetes require foot care education and regular review

- **Low risk foot -** provide foot care education and review annually
- **At risk foot -** provide foot care education, advise on appropriate footwear, consider therapy for symptomatic neuropathy, consider further vascular assessment if indicated; examine feet every 3-6 months
- **High risk foot -** as above and review by specialist foot service every 3 months
- **Ulcerated foot -** requires urgent foot care by specialist foot care service
- **Active foot problem -** treat problem and provide education and regular follow up

Foot Assessment

Testing with 10gmonofilament





Dorsalis Pedis Pulse

Posterior Tibialis Pulse

Foot Assessment Form

History

Name		
1. Previous Foot Ulceration Date Site	Yes	No
2. Ulcer Healed Was the ulcer	Yes Chronic	No Acute
3. Previous Amputation Cause	Yes	No
4. Admitted to hospital in the past 12months for foot sepsis	Yes	No
5. Past Footcare Education	Yes	No
6. Comments		

Foot Assessment

1. Foot Deformity:

Claw Digit	Yes	No
Bunion	Yes	No
Reduced Joint Mobility	Yes	No

2. Nail / Skin Abnormalities:

Corns / Callus	Yes	No
Dry Skin	Yes	No
Infection	Yes	No
Other	Yes	No

3. Current Foot Ulcer Yes No

4. Neuropathy Assessment

Signs and Symptoms	Present	Absent	Comment
Numbness			
Burning pain			
Pins and needles			
5.07 Monofilament (10g)	Abnormal	Normal	

5. Vascular Assessment

Signs and Symptoms	Abnormal		Normal		Comment
Skin temperature					
Skin colour					
Claudication	Present		Absent		
Hair loss	Present		Absent		
Pulses	Present		Absent		
Dorsalis pedis pulse	L	R	L	R	
Posterior tibialis pulse	L	R	L	R	

6. Risk Category High risk Low risk

Assessed By Date

What people with diabetes need to know about their feet

It is well established that education and daily foot care for people with diabetes can prevent amputations. It is therefore essential that all people with diabetes or their carers be given the following basic information about potential foot problems and routine foot care.

- Foot problems are the most common and costly complication of diabetes
- Diabetes is the most common cause of non-traumatic amputation
- Older people with diabetes may be prone to foot problems due to other reasons such as arthritis or foot deformities
- The impact of lower limb amputation is devastating not only to the person having the amputation but affects the family, friends and the community in general
- The early identification and treatment of diabetic foot problems has a vital role in reducing foot ulceration and lower limb amputation
- Looking after the feet is not difficult or expensive and serious foot problems can be avoided by good foot care
- Getting into the habit of looking at, feeling and applying cream to the feet will help to keep feet healthy and to make sure problems are noticed early
- Feet should be washed every day and dried well especially between the toes
- Don't walk barefoot outside the house
- Inspect and feel all surfaces of the feet including the back of the heels and between the toes. Look for:
    - blisters or cuts
    - cracks, especially on the heels
    - moist skin between toes
    - redness or swelling
    - localised hot spots or discharge
    - corns or callus
    - ingrown toenails
- The doctor or health worker should be seen immediately if any of these problems are present
- Feet should be checked every year by a doctor or health worker even if problems are not present

Competency 2 - The Eye and Diabetes

Competency	Knowledge and understanding of the basic principles of diabetic retinopathy, vision testing and when to refer. To be able to perform vision screening and appropriately refer for a full eye examination
Background	Diabetic retinopathy can affect the eyes. Careful management of diabetes can reduce the risk of becoming blind from diabetic retinopathy.
Purpose of this topic	To ensure that Health Workers are able to monitor a person's vision and refer patients as appropriate.
Main points to cover	• Importance of regular eye examination • Vision screening technique • Referral criteria
Teaching Strategies	Demonstration and discussion about: - the importance of monitoring vision in Diabetics - how to measure vision - when and where to refer patients
Assessment	The Health Worker demonstrates the ability to: - measure visual acuity and pinhole visual acuity correctly - list the referral criteria for a full eye examination - explain the importance of regular eye examinations to a patient

Diabetic Eye Problems

Background
All people with diabetes may get diabetic retinopathy. Diabetic retinopathy is a disease of the retina inside the eye due to diabetes. Diabetic retinopathy is a major cause of blindness in the 20 to 60 year old group.

Aim
- To understand what diabetic retinopathy is and to know how the damage from retinopathy can be lessened so that you can tell people how to look after their vision if they have diabetes
- To understand how diabetes can cause blindness and how blindness from diabetes can be prevented.

Eye Assessment
When diabetic retinopathy first starts the person will not know because their vision will be the same.

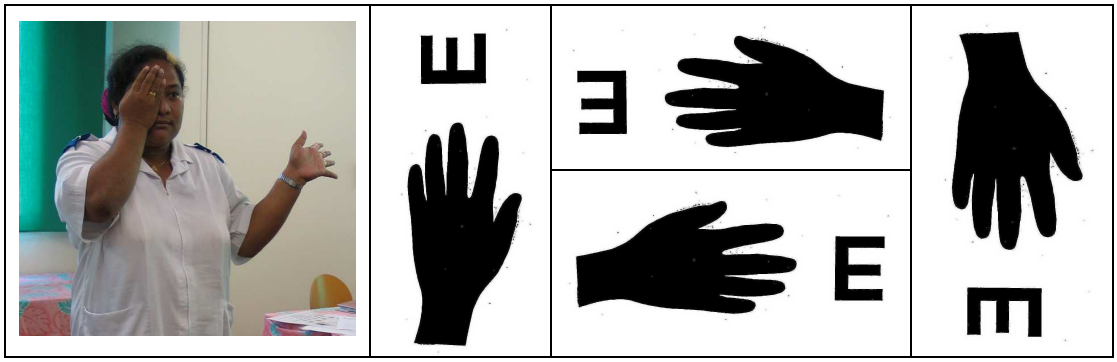
To look for diabetic retinopathy the retina inside the eye needs to be checked when their diabetes is diagnosed and then every year or at least every two years.

Checking eyes also involves assessing their vision by measuring visual acuity. Visual Acuity (VA) is a measurement of how well a person can see. Diabetes can affect the eyes so it is important to measure the visual acuity in people who have diabetes or are suspected of having diabetes.

Measuring Visual Acuity
Make sure the chart is in good light
Check that the chart is at the correct distance (3m) from the person
Equipment required: Visual acuity chart, occluder, pinhole occluder

Measure VA unaided (vision without spectacles) or aided (vision with distance spectacles if used).

1. Explain to the person that this test is to find out how well they see
2. Ask the person to stand or sit in the correct position (3m from the chart)
3. Using the VA chart provided in the Diabetes Kit measure the vision in the right eye first. As shown in the picture on the next page, ask the person to cover their left eye and ask them to read the lowest line of letters or to show you which way the arms of the E point holding their fingers the same way as the arms of the E
4. Encourage the person to try as hard as they can to read more letters. Always check that the person
    - is looking at the chart with the eyes open normally and blink normally
    - is covering the correct eye
    - is not pressing on the covered eye
    - is not looking through their fingers or around the occluder



5. Record vision for the right eye,
    - If the person gets all of a line correct but none of the next, record the vision as the number (fraction) that is written on the chart next to the fully correct line. Eg 6/12
    - If the person gets some letters of a line correct, record the vision as the number (fraction) of the line above, plus the number of correct answers on this line. Eg $6/12^{+3}$
    - Record if spectacles were used
      Eg Right eye – VA R $6/12^{+3}$ with spectacles or VA R $6/12^{+3}$ unaided
6. Repeat steps 2-5 for the left eye.

Pinhole VA Test

- If VA is less than 6/18, the pinhole test should always be used
- Repeat VA measurement with the pinhole occluder in front of each eye, cover the eye not being tested
- The pinhole test tells us if vision is poor because of a refractive error
- If VA is worse than 6/12 with pinhole, the person should be referred urgently
- If VA is better than 6/12 with pinhole, the person should be referred as spectacles may help them see better

Patient referral

Patients should be referred to an Ophthalmologist or Eye Nurse Practitioner if:

- their visual acuity becomes worse (i.e. change in vision)
- their vision is not improved with pinhole or is worse than 6/12 with pinhole
- their visual acuity is better than 6/12 with pinhole as spectacles may help them to see better

All patients with diabetes should be referred to an Ophthalmologist or Eye Nurse Practitioner upon diagnosis with diabetes and then they should have their vision checked at least every year or as soon as the patient reports a change in how well they can see or if their diabetes has become worse.

Treatment of Diabetic Retinopathy
If someone has diabetic retinopathy this can be treated, but this has to be done as soon as possible because treatment will work the best before vision gets bad.

The main treatment of Diabetic Retinopathy is by laser (photocoagulation).

It is important for people with diabetic retinopathy to have laser treatment before it is too late because laser treatment can stop the loss of more vision.

Laser works best before the sight gets too bad. Some people leave it too late to get the best from laser treatment and think that it has not helped them. These people do not see better after laser treatment because laser usually cannot bring back sight that has been lost. It is important that these people understand that if they do not have laser treatment they would lose more and more sight and become blind.

Laser treatment can only stop more damage from happening, it cannot bring vision back, so it should be done before it is too late.

Prevention of Diabetic Retinopathy
People with diabetes have a higher chance of getting diabetic retinopathy the longer they have had diabetes and if they do not look after their blood sugar or their blood pressure.

In order to prevent diabetic retinopathy people with diabetes need to:

- Control their blood sugar
- Control their blood pressure
- Have checks for diabetic retinopathy at diagnosis and then every year or at least every two years
- Have treatment for diabetic retinopathy before it is too late, because treatment can stop more damage occurring but it cannot bring back vision that is lost

Competency 3 - Blood Glucose Monitoring

Competency	Blood glucose monitoring technique, accuracy, and precision and infection control.
Background	Regular blood glucose monitoring is recommended for people with diabetes as it provides information about their diabetes status, which helps them, make informed choices regarding their management.
Purpose of this topic	To inform Health Workers of the various monitoring systems and how to interpret results.
Essential points to cover	• Rationale for blood glucose monitoring • Various methods of testing • Appropriate monitoring schedules • Interpretation of results
Teaching Strategies	Demonstrate: - the correct blood glucose monitoring technique - correct infection control procedure including cleaning of the monitor - safe disposal of sharps Ask the Health Worker to use 3 or 4 patient histories to: - review blood glucose readings over a 12 month period - interpret the blood glucose results - outline appropriate management strategies
Assessment	The Health Worker demonstrates the ability to accurately and competently: - monitor blood glucose levels - assess the relevance of the readings - develop management strategies based on the glycaemic history

Blood Glucose Control

Background
The occurrence and progression of retinopathy, nephropathy and neuropathy can be reduced by improved blood glucose control.

Aim
To achieve blood glucose control as close to the normal range as possible without producing unacceptable hypoglycaemia. Caution is required in the very young and in the elderly.

Assessment
- Measure HbA_{1c} using the DCA 2000
- Measure blood glucose if HbA_{1c} measurement is not available

How often

- ***HbA_{1c}***
  - Every 6 months for insulin-treated people
  - Every 12 months for non-insulin treated people
- ***Blood glucose***
  - Every 3 months for insulin-treated people
  - Every 6 months for non-insulin treated people

Interpretation of results

Parameter	Target	Action Recommended
HbA_{1c}(%) Normal: 4 – 6%	≤ 7%	> 8%
Blood Glucose (mmol/l) Fasting 2h after meal	 ≤ 6 ≤ 8	 > 8 > 10

What to do

1. If diabetes control is unsatisfactory, look for possible reason(s):
diet, intercurrent illness, stress

2. Review management
- Review and adjust treatment
- Educate patient – diet, exercise, medication compliance
- Consider referral to next level of Health Workers
- Consider insulin if on maximum doses of oral agents

Competency 4 - Hypoglycaemia

Competency	Recognition, management and avoidance of hypoglycaemia.
Background	Hyoglycaemia is an acute complication of diabetes treatment. It is an emergency situation which must be treated immediately. Health Workers need to be aware of the causes, recognition and treatment of hypoglycaemic episodes so they can assist patients in developing strategies to recognise, treat and prevent hypoglycaemia.
Purpose of this topic	To provide Health Workers with information about the importance, causes and treatment of hypoglycaemia.
Essential points to cover	• Definition of hypoglycaemia • Who gets hypoglycaemia • Signs and symptoms of hypoglycaemia • Possible causes of hypoglycaemia • Treatment of hypoglycaemia • Strategies for prevention of hypoglycaemia
Teaching Strategies	Ask the Health Worker to utilise the following case studies to give appropriate information that illustrates: - identification/detection of hypoglycaemia - immediate and follow up management - preventive strategies
Assessment	Using the case studies the Health Worker demonstrates a sound understanding of the identification of hypoglycaemia, management and preventive strategies.

Case Study 1 - Hypoglycaemia

Raisen is 53 years old and has had Type 2 diabetes for many years.

Recently he started taking twice daily Mixtard 30/70 because the tablets weren't controlling his blood glucose levels.

He is a farmer and starts work very early in the morning. He has breakfast early and sometimes does not stop working until late morning.

When he arrives at your Health Centre at 10am you notice that his speech is slurred and he is very slow responding to your questions.

1. What do you think is happening to Raisen?
2. As the Health Worker in charge of the Centre what would you do to help him?
3. When he has recovered what would be appropriate questions to ask?
4. What sort of advice would you give Raisen to prevent this happening?
5. To whom would you refer him and why?

Case Study 2 - Hypoglycaemia

Madeline is 48 years old and has had Type 2 diabetes for 3 years.

2 weeks ago she started taking Daonil 5mg before breakfast and dinner.

She comes to see you at your Health Centre because yesterday evening just before dinner she became sweaty and started shaking and didn't know what was happening. She took her Daonil when she came home from work and then went to her mother's house for dinner.

1. How would you explain what happened to Madeline?

2. What could be the reasons for this happening?

3. How should she treat it if it happens again?

4. What advice would you give Madeline to prevent this happening again?

Case Study 3 - Hypoglycaemia

Tomas is 46 years old and takes twice daily Mixtard 30/70 for his Type 2 diabetes.

He goes to a birthday celebration and has his insulin and a snack before leaving home. He was dancing and drank 6 bottles of beer but did not eat anything else.

At 1am he feels sweaty, dizzy and weak. His friend notices that he looks pale and is acting a bit confused.

1. What is happening to Tomas?
2. Why has this occurred?
3. What should Tomas do to treat it?
4. What could happen if he doesn't treat it straight away?
5. What could his friend do to help?
6. What advice would you give Tomas to prevent this happening again?

Competency 4 - Hyperglycaemia

Competency	Recognition, early management and referral of acute and chronic hyperglycaemia including hyperosmolar coma.
Background	Hyperglycaemia can be acute or chronic. While occasional high blood glucose levels may not require treatment, constantly high levels can lead to short and long term complications. Health Workers need to be aware of the causes, recognition and treatment of hyperglycaemic episodes so they can assist patients in developing strategies to recognise, treat and prevent hyperglycaemia.
Purpose of this topic	To ensure that Health Workers are aware of the significance of hyperglycaemia and the strategies for its prevention and management.
Essential points to cover	• Definition of hyperglycaemia • Signs and symptoms of hyperglycaemia • Possible causes of hyperglycaemia • Difference between acute and chronic hyperglycaemia • Treatment of hyperglycaemia • Strategies for prevention of hyperglycaemia
Teaching Strategies	Ask the Health Worker to utilise the following case studies to give appropriate information that illustrates: - identification of hyperglycaemia - how to manage diabetes medications - food and fluid intake - when to get help
Assessment	Using the case studies the Health Worker demonstrates a sound understanding of the identification of hyperglycaemia, management and preventive strategies, including sick day management.

Case Study 1 - Hyperglycaemia

Violet is a 47 years old clerk who has had Type 2 diabetes for 6 years.

She takes twice daily Mixtard 30/70.

She comes to your Health Centre late in the afternoon complaining of mild fever, abdominal cramps and diarrhoea since late yesterday.

She did not take her insulin this morning because she knew she wouldn't be able to eat and was afraid of having a hypo. She has only been drinking sips of water all day.

You check her blood glucose level, it is 19.2mmol/L.

1. How would you explain this reading to Violet?
2. How will you advise Violet to manage her diabetes this evening?
3. What will you tell Violet to do if this happens in the future?

Case Study 2 - Hyperglycaemia

Serah is a 43 years old housewife.

She has a BMI of 31. Her uncle and older sister have Type 2 diabetes.

She comes to see you at your Health Centre complaining of:

- feeling tired for 5 months
- excessive thirst and passing a lot of urine for 3 weeks
- blurred vision for 3 days

1. What do you think is wrong with Serah?

2. How would you make an assessment?

3. How would you explain why the symptoms occur?

4. What information/advice would you give Serah?

5. To whom would you refer her and why?

Case Study 3 - Hyperglycaemia

Albert is a 50 years old Taro grower who has had diet controlled Type 2 diabetes for 6 years.

He comes to your Health Centre complaining of having no energy and feet have started to tingle. You notice that he has put on a lot of weight.

He says he has stopped following his diet and is drinking alcohol in gradually increasing amounts.

He has not been to the Diabetes Centre or Health Centre for over a year.

You check his blood glucose level, it is 15.1mmol/L just before lunch.

1. What are the possible causes of Albert's lack of energy and tingling feet?
2. What advice would you give home regarding his diabetes management?
3. What will be the long term consequences if Albert does not make changes?
4. To whom would you refer Albert and why?

Competency 5 - Physical Assessment

Competency	Basic physical assessment for people with known diabetes eg height, weight, BMI, BP, blood glucose, foot assessment.
Background	Regular physical assessment should be part of routine care of all people with diabetes. All Health Workers should be able to provide minimal assessment in order to give advice, develop intervention strategies and refer appropriately.
Purpose of this topic	To provide Health Workers with information about methods for physical assessment
Essential points to cover	• Importance of blood glucose control in assessment of diabetes control • Assessment of blood pressure • Importance of weight reduction and maintenance • Regular foot assessment • Referral criteria
Teaching Strategies	Ask the Health Worker to: - perform a physical assessment on a person with diabetes demonstrating the correct technique for assessing: ♦ blood pressure ♦ height and weight ♦ BMI ♦ blood glucose ♦ the feet ♦ other lifestyle factors - give explanations for performing each assessment and the findings. - give follow up advice
Assessment	Observe the Health Worker performing a physical assessment using the correct techniques and providing appropriate information and advice.

Competency 6 - Risk Factor Assessment

Competency	Assessment of risk factors for diabetes in people not known to have diabetes.
Background	Type 2 diabetes is a major cause of morbidity and mortality in Nauru. It is much more common and develops at an earlier age than in the non-Pacific Island population. Deaths due to diabetes are common with a significantly reduced life expectancy.
Purpose of this topic	To ensure that Health Workers are aware of the importance of early diagnosis of diabetes.
Essential points to cover	• The risk factors • Assessment of risk factors • Importance of early diagnosis • Who should be tested
Teaching Strategies	Ask the Health Worker to perform a risk factor assessment on a person not known to have diabetes including: - taking an appropriate history - correct measurement of height and weight - correct calculation of BMI - explaining the importance of early diagnosis of diabetes.
Assessment	The Health Worker demonstrates an ability to apply his knowledge of the importance of early diagnosis through a competent performance of a risk factor assessment and conveying a health promotion message to the patient.

Identifying Risk Factors and Preventing of Type 2 Diabetes

Background

Lifestyle factors are important in the development of Type 2 diabetes, in particular overweight, physical inactivity and some dietary factors. Past studies and studies in progress have demonstrated that lifestyle modification, especially increased physical activity and dietary modification, can prevent the development of Type 2 diabetes in high risk individuals.

Aim

To identify individuals at risk of the future development of Type 2 diabetes and encourage lifestyle changes.

Assessment

Risk factors for the future development of Type 2 diabetes include:

- Family history of diabetes
- Women with a previous history of gestational diabetes
- Obesity
  - in adults - BMI ≥ 30
  - in children - overweight according to age specific weight charts
- Past history of impaired glucose tolerance

Who by

All Health Workers have a role in the prevention of Type 2 diabetes.

How often

Conduct regular assessments for the presence of risk factors during:

- visits to hospital clinics and routinely on admission to hospital
- visits to village health centre
- school health visits

What to do

Provide verbal and written advice about risk of Type 2 diabetes and dietary and physical activity interventions to reduce risk. In addition people who smoke should be advised to stop smoking.

Competency 7 – Risk Reduction

Competency	Ability to advise people with risk factors about risk reduction, knowledge of appropriate messages and strategies.
Background	Lifestyle factors are important in the development of Type 2 diabetes, in particular, overweight, physical inactivity and some dietary factors. Studies have demonstrated that lifestyle modification, especially increased physical activity and dietary modification, can prevent the development of Type 2 diabetes in high risk individuals.
Purpose of this topic	To ensure that Health Workers understand that they play a major role in promoting public awareness about the risk factors and healthy lifestyle, and to ensure that they are aware of the key messages for people at risk of diabetes.
Essential points to cover	• Strategies for weight management • Importance of reducing fat in diet • Practical approaches to exercise
Teaching Strategies	Ask the Health Worker to give advice to a person at risk of diabetes and develop prevention strategies. Include making appropriate recommendations about: - weight management - diet - exercise - other lifestyle factors - follow up appointments
Assessment	Observe the Health Worker in the process of consultation and information exchange demonstrating the ability to give appropriate advice and prevention strategies to a person at risk of diabetes.

Risk Reduction: Obesity Control and Smoking Control

Background
Overweight and smoking are important factors in the development of diabetes complications, especially macrovascular disease.

Aim
- To prevent weight gain in non overweight individuals and encourage weight loss in overweight individuals
- To encourage smoking cessation in people with diabetes who smoke

Assessment
- Assess weight by measurement of Body Mass Index (BMI)
- Assess smoking behaviour

How often

Each year

Interpretation of results
Overweight - BMI ≥ 27
Obese - BMI ≥ 30

Height (cm)	Weight (kg at which BMI reaches 30 kg/m^2)
150	67.5
155	72.1
160	76.8
165	81.7
170	86.7
175	91.9
180	97.2
185	102.7
190	108.3
195	114.1
200	120

BMI = weight (kg) / height (m^2)

What to do
Action is recommended if the weight is above the upper limit indicated in the table.
- Refer to dietician, if available, or
- Provide individualised dietary and exercise advice
- Encourage regular physical activity
- Encourage smoking cessation

Risk Reduction: Blood Pressure Control

Background
Hypertension is a recognised risk factor for microvascular and macrovascular complications of diabetes.

Aim
To identify individuals with elevated blood pressure and to reduce blood pressure below target levels in people with diabetes.

Assessment
Measure blood pressure after a minimum of 5 minutes sitting. Record diastolic pressure at the disappearance of sounds.

How often

Every clinical visit

Interpretation of results (in adults over age 18)

Category	Systolic BP	Diastolic BP
Normal (and Treatment Target Levels)	< 130	< 85
High-normal	130 – 139	85 - 89
Hypertension	≥ 140	≥ 90
Isolated systolic hypertension	≥ 140	< 90

Note: In the presence of other risk factors for vascular disease (dyslipidaemia, smoking, microalbuminuria, existing cardiovascular disease) hypertension should be defined as a systolic BP ≥130 mmHg and/or a diastolic BP ≥ 85 mmHg and the treatment target is < 125/75**.**

What to do
1. All people with hypertension should receive non-pharmacological interventions including:
   - weight control
   - regular moderate exercise
   - reduced salt consumption
   - reduced alcohol consumption and avoid binge drinking
   - advice to stop smoking

2. If pharmacological intervention is required
   - ACE inhibitors are the preferred agents for treating hypertension in people with diabetes
   - Avoid use of thiazide diuretics which may worsen glucose tolerance
   - Most people will require more than 1 medication to control blood pressure

Competency 8 - Diabetes Medications (Tablets)

Competency	Knowledge and understanding of the function and action of available oral hypoglycaemic tablets.
Background	Because of the natural progression of Type 2 diabetes, tablets may be required to maintain blood glucose levels in an acceptable range and minimise the risk of long term complications. As there is great variation in action of these medications, Health Workers require an understanding of the recommendations for administration and safe use so they can give appropriate advice.
Purpose of this topic	To provide Health Workers with basic information about the action and safe use of tablets for diabetes.
Main points to cover	• Importance of commencing, changing and continual review of diabetes tablets • Basic action of different types of tablets • Potential side effects • Precautions
Teaching Strategies	Ask the Health Worker to explain the appropriate action, side effects and precautions for the different types of tablets to several patients who are using various combinations of available tablets.
Assessment	The Health Worker demonstrates a sound understanding of the beneficial and potentially harmful effects of diabetes tablets.

Competency 8 - Diabetes Medications (Insulin)

Competency	Knowledge and understanding of the function and action of the insulin.
Background	Because of the natural progression of Type 2 diabetes, insulin may be required to maintain blood glucose levels in an acceptable range and minimise the risk of long term complications. As there is great variation in action of different types of insulin, Health Workers require an understanding of the recommendations for administration and safe use so they can give appropriate advice.
Purpose of this topic	To provide Health Workers with basic information about the action and safe use of insulin and tablets for diabetes.
Main points to cover	• Importance of commencing, changing and continual review of medications • Basic action of insulin • Potential side effects • Precautions • How to safely and accurately administer insulin
Teaching Strategies	Ask the Health Workers to: - explain the action, side effects and precautions for the different types of insulin - demonstrate the correct technique for drawing up of a single and mixed dose of insulin - demonstrate the correct injection technique - explain the checking procedures required before drawing up insulin - describe the correct method of sharps disposal
Assessment	The Health Worker demonstrates a sound understanding of: - the beneficial and potentially harmful effects of insulin - safe administration of insulin - safe disposal of sharps

Competency 9 - Guidelines and Referral Criteria

Competency	Knowledge of the Diabetes Guidelines and Referral Criteria available in Nauru.
Background	Complication screening should be part of routine care of all people with diabetes. Screening is useful in detecting and treating early asymptomatic complications. It ensures that regular pathology checks and risk factors are assessed. Management can be modified to achieve optimal diabetes control. It creates an opportunity for patient education.
Purpose of this topic	To provide participants with information about methods for assessing metabolic control and potential diabetes complications.
Essential points to cover	• The Diabetes Guidelines and Referral Criteria available in Nauru
Teaching Strategies	Ensure that the Health Worker: - can perform each assessment within their capability - knows how often each assessment is done - knows how to interpret results - can advises on follow up management - knows which assessments Health Workers are able to perform in which health facility - knows when and where to refer patients - knows who to contact in an emergency
Assessment	The Health Worker will describe in his own words: - how each test is done - how frequently each check should it be done - the target levels - what should be done if a test is abnormal The Health Worker will demonstrate the correct technique for assessing: - blood pressure - height and weight - BMI - blood glucose - the feet The Health Worker will explain the results and give appropriate advice

Diabetes Management and Referral Criteria

Type 2 Diabetes

People who are <u>not known</u> to have diabetes:

If the patient is not known to have diabetes check for symptoms and risk factors:

Symptoms

- thirst
- excessive urination
- tiredness
- weight loss

Risk Factors

- age 30 or older
- family history of diabetes
- overweight BMI ≥ 30
- women with previous history of gestational diabetes
- hypertension ie BP > 140/90 or on antihypertensive medication
- previous cardiovascular disease

Test the blood glucose on all people with symptoms and/or risk factors

If the blood glucose is normal in a person who has diabetes symptoms you must repeat the blood glucose test

Refer to a Referral Hospital if:

- capillary blood glucose is ≥ 7 mmol/L
- capillary blood glucose is ≥ 11 mmol/L (URGENT referral is required)

If no blood glucose strips are available for testing, refer anyone with risk factors and symptoms

Refer to a Referral Hospital if blood pressure > 140/90

Offer lifestyle advice to reduce modifiable risk factors

Patients who are <u>newly diagnosed</u> with Type 2 diabetes:

All newly diagnosed should be referred to a Referral Hospital

All patients <u>with</u> Type 2 diabetes (<u>newly diagnosed or with known diabetes</u>):

Ask if patient has had a diabetes check-up in the past 12 months

If No

- Refer them for a complete and thorough check-up

If Yes

- Check the patient's
  - blood glucose (see below for appropriate action)
  - blood pressure (refer if blood pressure >140/90)
  - feet (refer if foot problems are present)

If blood glucose <15mmol/L

- Provide dietary and physical activity advice

If blood glucose 15 – 20 mmol/L

- Commence oral hypoglycaemic medications and provide dietary and physical activity advice
- Recheck blood glucose after 2 weeks
- If still 15 – 20mmol/L – refer within 2 weeks to a Referral Hospital

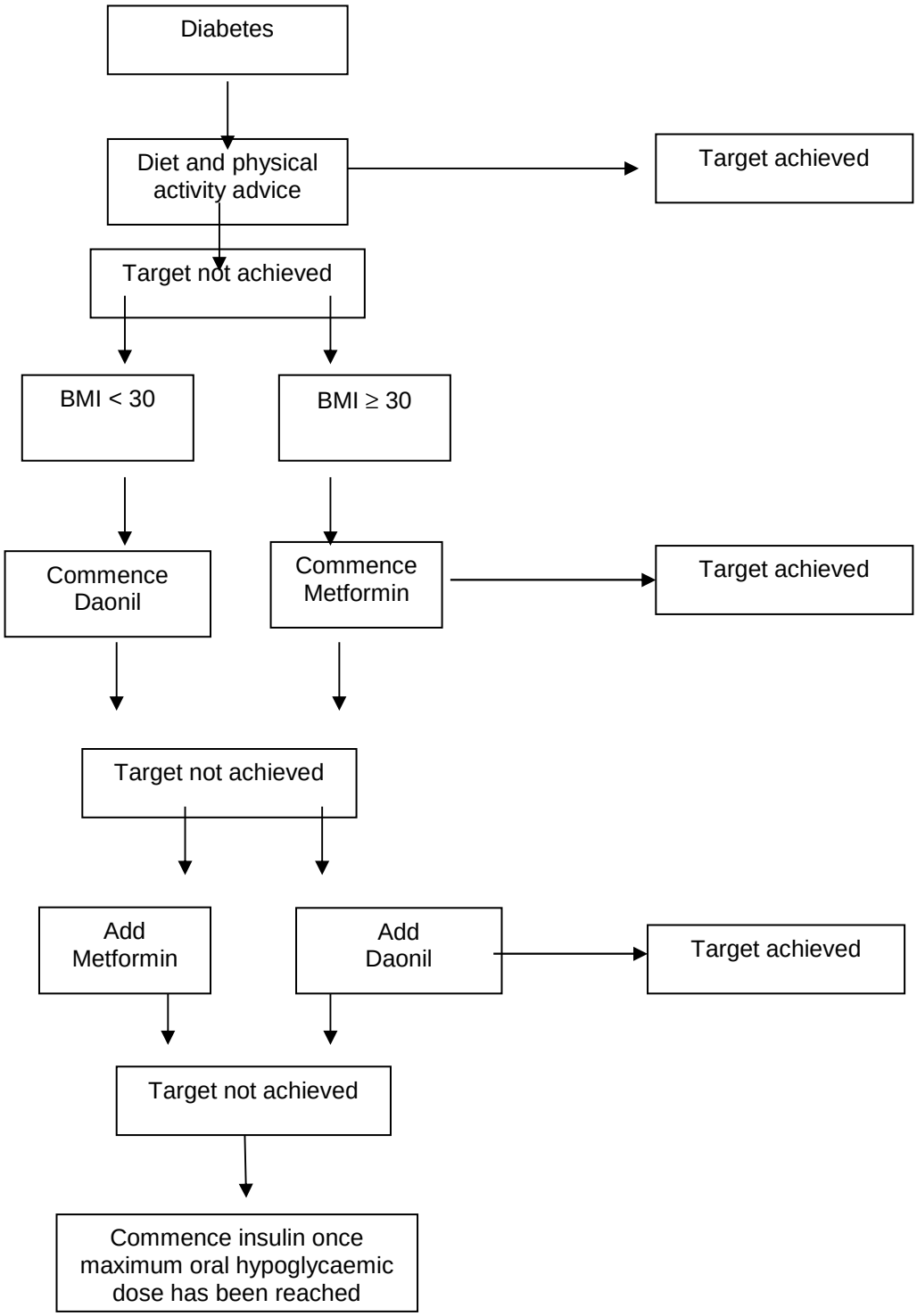
If blood glucose > 20mmol/L

- If well
  - Commence oral hypoglycaemic medication
  - Urgent referral to a Referral Hospital
- If unwell (vomiting, dehydrated, altered mental state, sepsis)
  - Commence IV fluids
  - Contact Emergency/OPD doctor
  - Give insulin
  - Send to a Referral Hospital

Type 1 Diabetes

All Type 1 diabetic patients should be referred to a Referral Hospital

Management of Newly Diagnosed and Established Type 2 Diabetes



Competency 10 - Resources

Competency	Knowledge and understanding of available resources to manage people with diabetes.
Background	Diabetes kits will be available in the Health Centres and Health Workers need to know how to use the kits and how to maintain their contents. People with diabetes need to be given education and be encouraged to be involved in the management of their diabetes.
Purpose of this topic	To provide Health Workers with information about resources available for people with diabetes in Nauru.
Main points to cover	• How and where to obtain diabetes medications • Where to obtain diabetes supplies and dressings • How to use diabetes kits • How to maintain the contents of the diabetes kits • Where to obtain diabetes information flyers to distribute to their patients and the wider community
Teaching Strategies	Demonstration of the diabetes kits
Assessment	The Health Worker compiles a resource list specific to their Health Centre including contact details of all people involved in: - emergency diabetes management - day to day diabetes management - supply of diabetes related products - supply of diabetes information flyers

The Diabetes Kits

In order to help Health Workers with detection and management of diabetes, diabetes kits have been developed for all Health Centres

The kits can be used for opportunistic screening to check the risk factors of people not known to have diabetes, to check the risk for complications for those with known diabetes, and to assist with the day to day management for people with diabetes.

Contents of the Kits:

Contents:	Quantity
Kit Box	1
Blood Glucose Meter	1
Blood Glucose Strips	2 Vials of 25
Blood Pressure Machine with Standard Cuff	1
Large Cuff	1
Foot Stamp	1
Ink Pad	1
Monofilament	1 Pack of 25
Height Measure	1
Visual Acuity Chart	1
Diabetes Management and Referral Criteria	**1**
Spare Batteries for Blood Glucose Meter	2
Spare Batteries for Blood Pressure Machine	4

Diabetes Information Flyers

Members of the public frequently have incorrect information and ideas about diabetes and healthy lifestyle. With the increasing incidence of diabetes in Nauru there is an important role for Health Workers to play in giving accurate information to promote healthy lifestyle, risk reduction and early detection of diabetes in their communities.

Information Flyers for people with diabetes and for the wider community are available. In addition to providing individual education and distribution of written information, another important approach for Health Workers to take is to present information through community health talks.