Algorithms to optimise the medication for patients with **Diabetes Type 2**

and

Guidelines for Referral to Secondary Services
For Waitemata General Practitioners

FINAL VERSION - AUGUST 2010

A key outcome of the Diabetes Pathway Project, looking at treatment pathways for people with Diabetes who had high glycaemia, was a suite of local algorithms developed to assist primary medical services in managing the medication levels to optimise the treatment outcomes of these patients.

Why did we do this?
In the Waitemata District Health Board district in 2008, 29% of the people with Diabetes had an HbA1c of more than 8% or 64mmol/l. In Maori and Pacific people this increases to around 50%. These algorithms were produced locally to assist primary care practitioners to optimize medication for glycaemic control, lipids and blood pressure.

Education of the patient is paramount and continuing lifestyle advice is essential. DSME (Diabetes Self Management Education) is an essential step to attaining good quality self management. A life long condition needs life long learning. It is important to ensure the patient understands that diabetes is a progressive disorder and this requires ongoing coaching, education and support. However medication to control diabetes and its complications is almost inevitable. This set of algorithms is produced to assist management and hopefully reduce the number of patients with high HbA1c in the Waitemata District Health Board Area.

This version is produced by Dr Catherine McNamara, Dr Rick Cutfield, Dr Walter van der Merwe, Lynn Randall, Harbour Health, Lesley Hawke, Pharmacist WDHB and Jo Knight PMP.

Your feedback now is welcomed.

Waitemata
District Health Board
Te Wai Awhina
Making a healthy difference to the community

WDHB acknowledges the support and contributions of Waitemata PHOs and participating GP clinics.

Treatment Algorithm for the Management of Type 2 Diabetes

Patients need 3-6 monthly HbA1c and will progress at different rates
Doses of tablets can be adjusted up to monthly based on SMBG readings

Recheck HbA1c within 2-3 months & maximise mono-therapy if indicated (see note 1 d)

Step 1: At diagnosis or HbA1c≥6.5<9% (50-75 mmol/mol)
Give life style advice & start metformin (500mg bd) see note 1a
If metformin contraindicated or patient intolerant commence alternative agent (see note 1b)

If HbA1c>9% (75 mmol/mol) at diagnosis and patient symptomatic, consider starting a sulphonylurea in combination with metformin to get CG (capillary glucose) stabilised (see note 1c)

Or consider basal insulin with metformin.

Refer to:
- DSME
- Retinal Eye Screening
- Get Checked

Consider referring to the following:
- Podiatry
- Care Plus
- GRx
- Health Psychology

Step 2: If HbA1c is >7% (53 mmol/mol) (or individualised target)* on maximum metformin or alternative maximum mono-therapy treatment add second line agent as shown below

Add sulphonylurea (see note 2a)

Add DPP4 inhibitor eg.Sitagliptin (see note 2b)

If BMI 28, Consider adding a glitazone eg Pioglitazone (see note 2c)

Add Acarbose

(see note 2d)

Step 3: If HbA1c >7-8% (53-64 mmol/mol) on maximum dual agents consider below

Add basal insulin (See Note 3a)

Consider trial of triple oral medication (see note 3b) OR consider s/c Byetta (Exenatide) or Victoza (Liraglutide) (see note 3c)

Starting Insulin for adult type 2 diabetes patients in primary care

Start with 6 -10 units of Protaphane or Humulin NPH, titrate dose by 2-3 units every 3-4 days until required SMBG levels are reached (see glucose targets overleaf)

- Consider starting nocte insulin for consistently high fasting morning SMBG readings
- If SMBG readings are consistently higher during the day, then may consider starting mane insulin (especially in elderly)
- Aim for a pre-breakfast reading of 5.5-7.5 mmol/L
- Continue oral hypoglycaemic agents e.g. Metformin 1g bd (providing no renal impairment) with or without a sulphonylurea

When is it the right time?

- Consider starting insulin when appropriate for individual patient and HbA1c is above 8%(64 mmol/mol).
- Coach the patient to continue to make appropriate lifestyle changes
- Ensure maximum dose of oral hypoglycaemic agents has been reached, unless contraindicated.
- Ensure patient is well educated on starting insulin e.g. dietary requirements, use of metre and pens, Tx hypoglycaemia
- Provide patient with starting pack which includes pen, log book, script, needles, written instructions and 'hypo' management information with contact details in case of emergency.

Follow-up

Follow-up phone call after the first day and provide support if needed

- Follow-up with support again after first week
- Make a follow-up appointment for 2-3 weeks after starting insulin, encourage patient to bring SMBG logbook for assessment.
- After three months re-test HbA1c and continue to monitor every 3 - 6 months.
- If HbA1c still high, review SMBG logbook & consider intensifying insulin further (see insulin intensification algorithm notes)

Patient Advice (SMBG)

Self-Monitoring Blood Glucose Checks

1. Fasting pre-breakfast to check for hypoglycaemia and to help with titration of insulin dose
2. Pre-evening meal to check for hyper or hypoglycaemia
3. Two hours post evening-meal to monitor any surging glucose and ensure safe levels pre-bed
4. Consider a pre-lunch SMBG to monitor any daytime trends if required

TREATMENT AND MANAGEMENT OF TYPE 2 DIABETES

Most patients with Type 2 Diabetes will require one or more oral agents to control their diabetes. Metformin is the preferred first line treatment (even in non-obese patients). Time to mono-therapy failure is of the order of 3 years but this differs a lot with factors such as ethnicity, BMI etc. Patients need to be aware that escalation of therapy is 'on the cards' and that this may include insulin. DSME is essential in providing an 'overview' of diabetes. DSME is an essential step to attaining good quality self management on a day to day basis. Education needs to be on-going life long learning.

How to Use the Stepped Approach to Type 2 Diabetes Medication:

Patients with Type 2 diabetes should have their medication monitored and adjusted regularly to maintain optimal HbA1c levels. Rate of progression is variable but the algorithm should be used to optimise control. Each step involves starting/adding a new medication. Within each step, further dosage modification will be required over a variable time period. *Individualised HbA1c target is appropriate e.g. in elderly patients.

This Notes section provides additional information relevant to each of the 3 main steps in the algorithm.

1a: Usual starting dose of metformin is 500mg bd **with food**. If adverse GI side-effects occur, reduce to 500mg od for 2-4 weeks and titrate back up. If HbA1c remains>7-8% (53-64 mmol/mol) on metformin 500mg bd, increase the dose to 850mg bd or maximum of 2.5g in divided doses as tolerated.

Contraindications for metformin include: Severe adverse GI side-effects; renal failure (eGFR≤30); severe heart failure or liver failure; very low BMI with clinical features to possibly suggest underlying Type 1 DM

1b. Alternative first line treatment could be a sulphonylurea (see note 2a) or a DPP4 inhibitor such as sitagliptin (see note 2b). If the patient is overweight (BMI≥28), a glitazone such as pioglitazone could be considered (see note 2c).

1c. Patients with particularly high HbA1c (e.g. >9% or 75mmol/mol) at initial diagnosis, may require simultaneous commencement on metformin **and** a sulphonylurea in order to bring CGs under control more quickly (see note 2a) and may be able to 'wean off' the sulphonylurea, once metformin dose is titrated up and lifestyle factors are adopted.

1d. Newly diagnosed patients should have HbA1c checked within 3 months and medication titrated accordingly. Lifestyle advice should be reinforced and referral to DSME, Diabetes eye screening etc instigated.

2a. Add Sulphonylurea: This has been traditional second line Tx. However availability of newer agents such as sitagliptin and pioglitazone mean these agents could be considered **(see notes 2b/c). All patients on sulphonylureas should be taught how to do SMBG because of risk of hypoglycaemia.**

Typical starting doses are:

- Glipizide 2.5 mg od or bd and titrate after 1-2 months depending on SMBG/HbA1c. (Max. is 5-10mg bd)
- Gliclazide 40 mg od/bd and titrate after 1-2 months depending on SMBG/HbA1c. (Max. is 160mg bd).

2b. Sitagliptin (Januvia) 100mg od is a non-funded medication (costs approx $100 per month). Does not need to be taken with food. In combination with metformin, does not cause hypoglycaemia and is weight neutral. Dose does not require titration beyond 100mg. Use 50mg for those with eGFR between 30-50.

2c. Pioglitazone 30mg od. (Special Authority approval required). Should be avoided in patients with liver disease, heart disease or osteoporosis. Onset of action takes up to 6 weeks. Does not need to be taken with food. In combination with metformin, does not cause hypoglycaemia. Dose increased to 45mg od.

Main side effect is moderate weight gain ~3kg partly (can be more) due to s/c fluid retention but generally well tolerated.

2d. Acarbose - start with 25mg with evening meal; increase to 50mg with evening meal; then 50mg 2x daily; then 50mg 3x daily. Major side effect: flatulence. NB. Special authority no longer required.

3a. Add basal insulin (see starting insulin guideline below)

3b. Trial of triple oral agents: This is usually only effective in patients who are just starting to fail maximum dual therapy (HbA1c<8.5% or 70 mmol/mol).

3c. Byetta (Exenatide) and Victoza (Liraglutide) are an option in patients who can self-fund ($250 per month) & are willing to inject s/c bd. (Please refer these patients to the Diabetes Service.)

INTENSIFYING INSULIN

NOTE: Most of these regimens are less flexible, fixed ratio insulins and include once or twice daily basal insulin eg. NPH or Glargin and bd premixed Insulin e.g. Humalog Mix 25 or Penmix 30. This means the patient needs to have a fair amount of **lifestyle consistency** with regards to timing of meals, amount of carbohydrate eaten at each meal and daily physical activity levels etc.

Titrating Insulin Dose: If a patient starts on once daily basal insulin, concentrate on getting the glucose 8-12 hours post-dose into target initially. You can use the Glycaemic Targets Table below as a guide for patients.

GLYCAEMIC TARGETS TO FACILITATE SET-DOSE INSULIN ADJUSTMENT

BEFORE BREAKFAST (FASTING)	5.5-7.5mmol/L
BEFORE OTHER MEALS	4.5-7.5mmol/L
BEFORE BED	6.0-8.5mmol/L

Intensifying insulin beyond once a day dose for Type 2 Diabetes:

The majority of patients will eventually need twice daily insulin. If HBA1c & SMBG readings remain high (>7-8% [53-64 mmol/mol] or above individual target).

Intensify treatment by:

1. Check compliance e.g. log book, injection technique and site
2. Consider adding Protaphane/HumulinN at breakfast (or bedtime if on mane insulin)
3. Usually begin with 6 units and increase by 2 units every 3-4 days until pre-dinner glucose is in target (or fasting glucose in target if adding bedtime insulin)
4. If requiring large doses of insulin & especially if problems with high CGs before lunch & after dinner, consider changing to a bd premixed insulin eg. Humalog mix 25 or Penmix 30/70. Can start at same dose as Protaphane/Humulin N. Premixed insulin needs to be taken with food, so pre-bed dose should shift to dinner-time. **Sulphonylureas should stop when premixed insulin is started.** Humalog Mix 25 or Mix 50 contains 25% and 50% Humalog respectively. These insulins **must** be taken immediately with food. Penmix 30 and Humulin 70/30 contain actrapid (30%) as the fast acting insulin. These insulins should ideally be taken 30 minutes before food. There seems to be no major advantage of the newer fast acting premixes (i.e. Humalog Mix), over Penmix 30 for most patients, apart from convenience of taking immediately with food, and possibly less hypoglycaemia.
5. Titrate mane or dinner-time dose one at a time (not simultaneously). The evening dose is usually adjusted first. Increase each dose by 2-3 units every 3 days.
6. If hypoglycemia occurs, or fasting glucose level <4.5 mmol/l, reduce bedtime dose by 4 units, or 10% if dose >60 units. Similarly if recurrent hypoglycaemia occurs during the day, reduce breakfast dose of insulin in similar fashion.
7. Some patients may prefer flexibility of basal bolus regimen eg. tds short acting with basal insulin. Patients requiring these more complex insulin regimens should be referred to the Diabetes Service.
8. Lantus may be used in preference to Protaphane or Humulin N. Lantus is now funded with some restrictions for use in Type 2 Diabetes. Lantus may have an advantage in reducing hypoglycaemia.

References for Glycaemia Medication

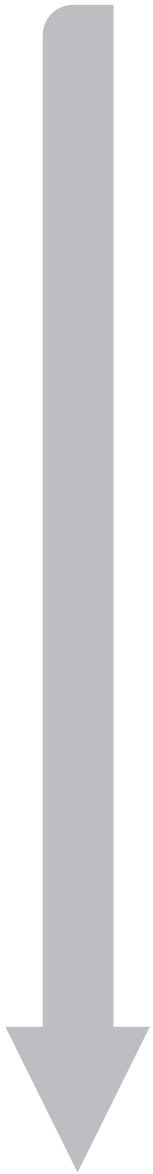
International Diabetes Federation (2005). Global guideline for type 2 diabetes. http://www.idf.org/webdata/docs/IDF%20GGT2D.pdf

Map of Medicine (2010). Type 2 diabetes - management. http://eng.mapofmedicine.com/evidence/map-open/diabetes2.html

New Zealand Guidelines Group (2003). Evidence-based best practice guidelines: management of type 2 diabetes. Wellington

Blood Pressure Algorithm for Patients with Diabetes Type 2

Target BP in patients with Type 2 Diabetes is 130/80 (140/80 in over 70y and those with established heart disease). This is often difficult to achieve using one agent, therefore a stepped approach to management is often needed as shown (see notes following).



STEP 1: START ACE INHIBITOR
or ARB if intolerant to ACE (see note 1a)

Maximise ACE or ARB
(see note 1b)

STEP 2: ADD CALCIUM CHANNEL INHIBITOR
(see note 2)

STEP 3: ADD A DIURETIC
e.g. chlorthalidone 12.5mg od
(see note 3, see special note for the elderly)

STEP 4: ADD SPIRONOLACTONE 12.5mg DAILY
(see note 4)

STEP 5/6: ADD BETA BLOCKER OR ALPHA BLOCKER
(see note 5/6)

STEP 7: ADD CLONIDINE PATCH 100-300 microgram WEEKLY

ALLOW 2-6 WEEKS between each dose adjustment

and

CHECK U/Cr
2 weeks after introduction or increase of ACE inhibitor / ARB or diuretic

For assistance with those tricky cases which don't fit the algorithm
Call the Endocrinologist Hot-line on 021 2428702
Or please contact the Medical Registrar via the switchboard on 4868900
After hours the Medical registrar on call at 4868900

BLOOD PRESSURE MANAGEMENT IN TYPE 2 DIABETES

Background and Introduction:

High blood pressure is very common in individuals with Type 2 diabetes.

- Up to 75% of cardiovascular complications in Type 2 diabetes are hypertension-related.
- Target BP in diabetes patients is <130/80 but this is seldom achieved (≤140/80 in patients>75y).

Lifestyle modification is important but antihypertensive drug therapy is usually required. Most individuals will require combination therapy. In the elderly and patients with postural giddiness, check standing and sitting blood pressure. Treatment may need to be adjusted to avoid excessive postural hypotension (e.g. standing systolic < 100mmHg (or 120 in individuals over 70 years)*. Referral to specialist Diabetes or Hypertension clinic may be indicated.

The basic principle of blood pressure management in Type 2 diabetes is to achieve target blood pressure with a regimen which includes a reasonable dose of ACE-inhibitor (or ARB (antagonist) eg. Candesdartan or Losartan in ACE-intolerant patients). These, calcium channel blockers and thiazide diuretics are the three most important antihypertensive drug classes, and are often required in combination. To expedite blood pressure control it is a reasonable option to start patients with stage 2 hypertension (>150/90) on 2 antihypertensive drugs simultaneously (apart from in patients aged over 70y)*.

*** Elderly patients require commencement on lower doses of blood pressure medications & a more gentle titration.**

Notes:

Step 1a. Start lisinopril 10mg od or Cilazapril 1-2.5mg od or quinapril 5-10mg od. Intolerant to ACE start candesartan 8mg od or Losartan 12.5mg od.

Step 1b. ACE or ARB should be increased over several weeks as required and tolerated (Lisinopril up to 40mg, Cilazapril 5mg, quinapril 40mg) with careful monitoring of Cr+ Electrolytes until BP in target**.** Up to 20% creatinine increase acceptable; more than that cut back to previous dose or stop and consider nephrology referral.

Step 2. Add Calcium channel blocker e.g. Amlodipine 2.5-5mg od or Diltiazem CD 120mg od If BP remains elevated, titrate calcium channel blocker to maximum e.g. amlodipine 10mg od or Diltiazem CD 240-360mg od *(Felodipine is an alternative to amlodipine although amlodipine has the potential advantage of a much longer half-life). DO ECG if starting Diltiazem* (significant bradycardia or anything more than first-degree heart block are contraindications).

Step 3. Add a Diuretic.eg chlorthalidone 12.5mg od. *Bendrofluazide and hydrochlorothiazide are alternatives to chlorthalidone but are shorter acting and less potent* ***but should be used first in the elderly****. 12.5mg chlorthalidone is roughly equipotent to 5mg bendrofluazide or 25mg hydrochlorothiazide but because of the differences in half life, early morning blood pressure may be higher in patients on bendrofluazide or hydrochlorothiazide even with equivalent doses*

Chlorthalidone dose can increase to 25mg od. **Check Cr+ Electrolytes 2 weeks after initiation on diuretic.**

A proportion of patients on thiazide will require potassium replacement, and it is important to maintain serum potassium > 3.5mmol/l. A small number will develop significant hyponatraemia, and this usually necessitates cessation of the drug.

NOTE: Thiazide diuretics do not work well when the GFR is < 30-40ml/min and may require replacement with BD or TDS Frusemide. If these patients are not already in the renal system, they should be referred for renal review.

Step 4. Add Spironolactone commencing at a dose of 12.5mg od and increasing to 25mg daily if required.

Check Cr+ Electrolytes 2 weeks after initiation or increase in dose. Some patients on spironolactone, particularly those with reduced GFR, develop hyperkalaemia. Spironolactone is also an occasional cause of hyponatraemia. If this problem arises, stop Tx.

Steps 5, 6&7. Some patients with very resistant hypertension require 5, 6 or 7 agents. These patients should probably be referred to specialist Diabetes or Hypertension Clinic Twelve-lead ECG to be done and reviewed by a doctor prior to commencing metoprolol or clonidine and again prior to any dose increase in any of these drugs. Significant bradycardia or any degree of heart block are contraindications.

Lipid Algorithm for Type 2 Diabetes Patients

At diagnosis, all patients receive lifestyle advice

Treat T2 diabetes patients with Statin as shown

Optimal lipid levels for people with Diabetes
Total Cholesterol <4.0 mmol/L
LDL Cholesterol <2.0 mmol/IL
HDL Cholesterol ≥1.0 mmol/L
Triglycerides <1.7 mmol/L
NZ Cardiovascular Guidelines

Established C/V Event
eg MI, PVD, CVA or microalbuminuria
Statin with aim for LDL <1.7mmol/L
Or at least <30-40% of initial pretreatment level

Age over 45
With a target LDL of <2.0 - 2.5mmol/L
Use clinical acumen
OR LDL <30-40% of pre-treatment level
and/or Chol/HDL ratio of <4.0

Those **less than 45 years** old if at least one or other cardiovascular risk factor with a target LDL <2.0 - 2.5mmol/L

OR LDL <30-40% of initial pretreatment level
and/or Chol/HDL < 4.0

Intolerant of statins?
Myalgia, with or without plasma creatine kinase (CK) elevations.
If CK more than 5x upper limit of normal (see notes over) the statin should be stopped. Once asymptomatic and CK is reduced (if it was elevated) cholesterol goals can be approached by:
a. using a different statin e.g. Simvastatin, starting on a low dose and titrate up
b. use an alternate daily or twice weekly more potent statin e.g. atorvastatin, rosuvastatin
c. the combination of the lowest tolerated statin plus a cholesterol absorption inhibitor (Ezetimibe)
Eckel, RH J.Clin.End.& Metab. Vol.95 No5, 2010

Repeat Lipid tests every three months until target is reached and thereafter every 12 months

NOTES TO ACCOMPANY LIPID GUIDELINE FOR TYPE 2 DIABETES

Multiple clinical trials have demonstrated significant beneficial effects of statin therapy on CVD outcomes in subjects with Type 2 diabetes. The evidence for important CVD event benefit of drugs that primarily raise HDL or lower TG is weak (ADA). Ezetimibe modestly lowers LDL but there is no trial evidence showing a reduction in CVD events.

In those with known CVD or those patients over the age of 40 with another CVD risk factor (eg smoking, hypertension, microalbuminuria), a statin should be added regardless of baseline lipid levels (Heart Protection study). It is estimated that about 80% of patients with Type 2 diabetes will fall into this category.

There is little clinical trial evidence of benefit for patients with Type 2 diabetes under the age of 40 or for Type 1 diabetes patients, but statin treatment of Type 1 diabetes patients aged over 40 years, especially with another cardiovascular risk factors, should be strongly considered. Use Risk Tables (modified for diabetes) for others, and clinical acumen.

In those who have risk factors but without known CVD, the minimum aim is to lower LDL to less than 2.5mmol/L (although Canadian Diabetes Assn. and NZ Cardiovascular Guidelines say less than 2.0 mmol/L). Alternatively, one might aim for at least a 30-40% reduction from pre-treatment level, and/or a Total Cholesterol /HDL ratio of less than 4.0. In those with a previous cardiovascular event a target LDL of less than 1.7mmol/L is appropriate given a further reduction in events with more aggressive LDL lowering.

For patients with **severe fasting hyper triglyceridemia** review secondary causes (e.g. alcohol, hypothyroidism, renal or liver disease) and consider treatment with fibrate if TG more than 4.5mmol/L. Most commonly, Bezalip Retard 400mg is used in New Zealand (assuming eGFR>50ml/min). Monitoring of renal function is appropriate with use of this drug.

In patients with a **combination of high LDL and TG**, use a statin first and then :
If high C/V risk consider fibrate and statin if fasting TG more than 2.5mmol/L, but beware of increased risk of myositis when these drugs used together.
If high C/V risk consider ezetimibe and statin if LDL not at target or not at least 30% lower than baseline (note access criteria for this drug are under review).

If low HDL-C (with LDL-C &TG at target)
a. Optimise LDL Chlol. Though HDL-C is a C/V risk there is little evidence that raising HDL lowers C/V events.
b. Prescribe statin followed if required by bezafibrate if TG above target
c. Weight loss will usually increase HDL

Statin intolerance- Creatine Kinase [CK]
Normal Ranges: Male: 60 – 220 **and** Female: 30 - 180

Maori and Pacific Island patients- consider starting statins earlier for those who appear to have increased CV risk independent of traditional risk factors.

For Lifestyle Guidelines see C/V Guidelines NZGG.

HMG Co-A Reductase Inhibitors LDL-C Equivalency in patients with Hypercholesterolemia*

• This information is not based on a head to head comparison
not currently funded

Simvastasin	Atorvastatin	Rosuvastatin#	Ezetimibe/Simvastatin	Ezetimibe	Approximate LDL reduction (%)
----	----	----	----	10mg	15-20
5-10mg	----	----	----	----	21-29
20 mg	10 mg	----	----	----	30-38
40 mg	20 mg	5-10mg	10/10 mg	----	39-47
80 mg	40 mg	20mg	10/20 mg	----	48-54
----	----	40mg	10/40 mg	----	55-59
----	----	----	10/80 mg	----	>59

References

Texas Diabetes Council Lipid Algorithm for Type 1 and 2 Diabetes Mellitus in Adults accessed on 18th May 2010
New Zealand Guidelines Group (2009). NZ Cardiovascular Guidelines Handbook, Wellington.
New Zealand Guidelines Group (2003). Evidence-based best practice guidelines: management of type 2 diabetes. Wellington.
www.diabetes.ca/for-professionals/resources/2008-cpg/ - accessed on 1st June 2010
Guidelines www.nice.org.uk/ - accessed on 1 June 2010

Diabetes Service, Waitemata DHB
Diabetic Foot Referral Criteria

Screening: Does the patient have any of the following "At Risk "Features?
- A history ulceration/amputation/Charcot neuroarthropathy
- Active foot problem – ulcer, infection (acute/non acute) deformity causing callus/corns
- Absent pedal pulses
- LOPS-Neuropathy with Insensitivity to 5.07 Semmes Weinstein monofilament

YES

Urgent Referral to Secondary Care Indicated?
- Significant acute cellulitis
- Non-healing deep ulceration with acute cellulitis
- Systemic symptoms of infection
- Radiological evidence of osteomyelitis and acute cellulitis

YES

Acute Admission
Admission to emergency department. Discuss with diabetes or admitting registrar for admission to medical or surgical team.

NO

Secondary Care Referral?
- Must have the following:
- Current ulceration
- Acute Charcot deformity
- Active diabetic foot complication

YES

Secondary care Podiatry Outpatient Service
Fill out referral form - North Shore Hospital
Fax: 09 441 8986
Phone: 09 486 8920 x 2505

NO

At/High Risk Community Clinic Podiatry Referral?
Must be referred if any of the following are present
- History of ulceration/amputation
- LOPS
- Deformity - e.g bunion, hammer toes; causing callus/corn or pre-ulcer lesion
- Absent pedal pulses with or without ischaemic symptoms
- ESRF (end stage renal failure)
- Nail Pathology in the presence of PAD+LOPS

YES

Community Podiatry
Fill out relevant referral form depending on the PHO that the persons GP belong to.
Or
If patient is domiciled in DHB district but not enrolled in local community PHO, fill out referral form and Fax to: 09 441 8986

NO

Give patient footcare advice
Get Checked; Review annually for changes in neuropathy and circulation – Practice Nurses/GP's
Review glycaemic control and vascular risks

Consider Referral to Private Podiatry
Podiatrists provide:
Foot care education
Nail and skin care
Surgery
Footwear and orthotics advice

NO

- ESRF (end stage renal failure)
- PAD (peripheral artery disease)
- LOPS (loss of protective sensation)

Dated: June 2009

Due for Review: June 2011

Type 2 Diabetes Patient Targets

These targets are general and clinical acumen must be used in applying to the wide variety of patients with Type 2 Diabetes e.g. elderly patients

Blood Sugars	**Glycaemic targets**
Before breakfast (fasting)	5.5-7.5 mmol/L
Before other meals	4.5-7.5 mmol/L
Before bed	6.0-8.5 mmol/L

HbA1c (which indicates average blood sugar levels over the past 3 months) 6-8% or 41-64 mmol/mol.

Blood Pressure
The target BP for patients with Type 2 Diabetes is 130/80
For patients over 70 years and those with established heart disease 140/80

Lipids

For those with an established cardiovascular event e.g. MI, PVD, CVA or Microalbuminuria
The target is LDL 1.7 mmol/L or at least 30-40% of initial pretreatment level

For those over 45 years treat with statin
With a target of LDL 2.0-2.5 mmol/L
or LDL < 30-40% of initial pretreatment level and /or Chol/HDL <4.0

For those less than 45 years with at least one other cardiovascular risk factor
Target is LDL <2.0-2.5 mmol/L
or LDL < 30-40% of initial pretreatment level and /or Chol/HDL <4.0

REFERRAL GUIDELINES TO THE SECONDARY CARE DIABETES SERVICE

Introduction

Diabetes is a chronic condition which requires good understanding and management skills by the patient and regular surveillance and support from a health practitioner team. Type 2 diabetes is usually associated with other vascular risk factors which require equal attention (see treatment algorithms for BP & Lipids).

Checklist for Newly Diagnosed Patients with Type 2 Diabetes

1. **DSME** : All patients with newly diagnosed Type 2 diabetes should have the opportunity to attend a Diabetes Self-Management Education (DSME) course. Patients with more long-standing disease may also benefit from the support and advice provided by DSME. If a patient is unable to attend a PHO run DSME course, please consider the patient for a Diabetes Auckland course or 1:1 advice from a suitably qualified practice nurse or dietitian.
2. **Retinal Screening**: Patients should be referred for Retinal Screening on diagnosis.
3. **Foot care**: Observe for any indications of peripheral neuropathy by completing a thorough foot check and educate the patient about regular care of their feet. Consider referral to a community Podiatrist for initial assessment if indicated.

Treatment

Diabetes is a chronic progressive condition. Newly diagnosed patients will require lifestyle advice and commencement on metformin. **Regular monitoring of HbA1c and other parameters should follow the recommended stepped approach to oral medications and then onto insulin (see treatment algorithms provided).**

Education about, and reinforcement of, advice to comply regularly with medications and adopt appropriate lifestyle measures is essential in facilitating better understanding of the condition.

A FREE ANNUAL "GET CHECKED" ASSESSMENT SHOULD BE OFFERED TO ALL PATIENTS WITH DIABETES.

Subsidised programs such as Care Plus should be utilised where possible, especially when financial restraints are preventing the patient from accessing the Primary Care service or obtaining follow-up prescriptions.

Who to refer to the diabetes clinics at North Shore and Waitakere Hospitals

- Patients with Type 1 diabetes
- Adolescent patients with any type of diabetes
- Patients with nephropathy (eGFR<40 or significant proteinuria). (Refer to Renal Service **or** Diabetes Service depending on stability of diabetes)
- Patients with Type 2 Diabetes with significant complications and those with poor control or problems with recurrent hypoglycaemia
- Any other issues which are difficult to resolve in the primary care setting.
- Any patients pregnant or conisdering pregency refer or discuss with Diabetes Team

Telephone Advice and Support for Practices:

The Endocrine Registrar can be contacted for urgent telephone advice during office hours and will liaise with consultants for advice if required. Diabetes Nurses can also provide urgent telephone advice. The Diabetes Team may be available to visit practices for educational sessions and for support around insulin starts etc if required.

Contact	For	Contact Number
Endocrinologist	GP advice	**021 242 8702**
Physicians	Please contact Endocrine Registrar via switchboard	**486 8900**
After hours advice	Medical Registrar on call	**486 8900**
Diabetes Specialist Nurse	Ext 2505	**486 8900**

How to refer patients for assessment in clinic:

Please include the following clinical details:

- Duration and type of diabetes
- Current medication
- Recent HbA1c and any other results if available
- Brief summary of problem necessitating referral

Please send referrals to: Fax 441 - 8986

Guidelines for discharging patients back to Primary Care:

After a period of initial assessment and follow-up, our aim will be to discharge patients back to primary care with a plan of care. For patients with Type 1 Diabetes, we will continue to see once per year where possible, as these patients are on more complicated insulin regimens etc.

All patients are actively encouraged to visit their GP as their primary care giver regardless of their attendance at diabetes service.