

Diabetes Care for Age Related Residential Care Facilities in Hawke's Bay

(Revised edition October 2013)



Table of contents

| | |
|---|----|
| Introduction | 1 |
| Health Professionals' role in diabetes care | 2 |
| Suggested resources to support diabetes care | 3 |
| Supporting staff to deliver effective diabetes care and staff education | 4 |
| Annual diabetes review for <u>all</u> ARRC residents | 5 |
| Diabetes care – dietary and nutritional recommendations | 7 |
| Diabetes care – physical activity recommendations in ARRC facility | 8 |
| Blood glucose monitoring guidance | 9 |
| • Capillary blood glucose testing frequency | 9 |
| • HbA _{1c} test | 10 |
| • Capillary blood glucose testing technique | 11 |
| • Infection control | 12 |
| • Quality control | 14 |
| • Education and competency | 15 |
| Administering diabetes medicines | 16 |
| Acute diabetes complications | 18 |
| • Hypoglycaemia | 18 |
| • Hyperglycaemia | 20 |
| • Diabetic ketoacidosis | 20 |
| • Hyperglycaemic hyperosmolar state | 21 |
| • Infections | 22 |
| • Incontinence | 23 |
| Long-term diabetes complications | 24 |
| • Cardiovascular health | 24 |
| • Kidneys (diabetic nephropathy) | 24 |
| • Foot care | 25 |
| • Eye care | 25 |
| • Oral health | 26 |
| • Avoiding hospital admission | 26 |
| Patient safety issues | 27 |
| Clinical audit | 28 |
| Appendices | 30 |
| References | 54 |

Introduction

Diabetes is a common condition that can have a significant impact on the health and well-being of older people. Diabetes is generally only one of several chronic conditions which are increasing in older age and require greater provision of care. The well-being and quality of life sustained by patients with diabetes will be improved by well-planned, appropriate and comprehensive care. This requires a trained and competent workforce. Information, training and education as well as practical guidance is vital to help Age Related Residential Care (ARRC) facility staff to know what to do in the daily care of residents with diabetes and to help, support and manage diabetes related complications.

There is ample clinical evidence that good and practical management guidelines improve outcomes and quality of patient care. However, applying guidelines to the day-to-day medical and nursing care remains difficult despite best efforts by many committed health care professionals. The key is to come up with a set of guidelines that nurses and health care assistants could use based on researched best practice to provide a high standard of diabetes care. This in turn will decrease the need for hospital admissions and will empower nurses to make decisions based on a sound understanding of the disease, medications, blood glucose monitoring, and management of hypoglycaemia, hyperglycaemia and sick days.

The aims of this document are to:

- Maintain best possible quality of life and well-being without subjecting ARRC facility residents with diabetes to unnecessary and inappropriate interventions.
- Ensure adequate and structured care planning, with all residents with diabetes having an individualised and structured diabetes care plan.
- Provide support and education to all staff at ARRC homes to facilitate and drive improvement in diabetes care.
- Have effective clinical governance and implementation strategies to allow attainment of these targets.

The recommendations and guidance will give consistency across the Hawke's Bay region ensuring the best possible care for elderly people with diabetes. Clinical governance for diabetes care in Hawke's Bay is undertaken by the Diabetes Leadership Team (DLT) the Hawke's Bay Diabetes Team (HBDT), the Hawke's Bay District Health Board Clinical Council and the Health Hawke's Bay Clinical and Quality Advisory Committee (CQAC).

Any previous version of the publication, *Diabetes Care for Age Related Residential Care in Hawke's Bay*, is now superseded by this 2013 edition.

Health professionals' role in diabetes care

As a person with diabetes moves between providers of primary and secondary care; as well as from independent living to managed care, this transition requires communication and cooperation from all health professionals, while acknowledging the differences in their professional responsibilities.

The person's general practitioner is responsible for:

- The individual's medical care
- Referring the resident to diabetes nurse/specialist as required

The Age Related Residential Care staff:

- Liaise with the resident's general practice staff
- Liaise with other health professionals/agencies, e.g. physiotherapist, occupational therapist, dietitian etc.
- Liaise with pharmacy staff
- Liaise with residents' families or next of kin

Annual diabetes reviews are completed in partnership with general practitioners - residents' care plans are updated at this time.

Suggested resources to support diabetes care

Each Age Related Residential Care facility will have a number of resources to assist in the care of a resident with diabetes. These include, but are not limited to:

Written documentation

- Facility policies and procedures
- 'Diabetes Care for Age Related Residential Care Facilities in Hawke's Bay', including the wall charts and Annual Review template
- Waitemata District Health Board Residential Aged Care Integration Programme (RACIP) Guidelines¹
- New Zealand Primary Care Handbook 2012²

Optional resources include:

- bpac^{NZ} articles (www.bpac.org.nz)
 - *Monitoring diabetes in people over 75*. bpac^{NZ} Report. 2012.³
 - *Testing for CVD, diabetes and renal disease in elderly people*. Best Tests. 2012 March.⁴
- Overseas documents including:
 - *Good clinical practice guidelines for care home residents with diabetes*. A document prepared by a Task and Finish Group of Diabetes UK, January 2010, Professor Alan Sinclair (Working Group Chair) et.al.⁵
 - *Guidelines for the management and care of diabetes in the elderly*. May 2003.⁶
 - *Diabetes guidelines for elderly residents in long-term-care (LTC) facilities*. April 2010.⁷

References and sources of further information (see Appendices 4, 5, 6, 7).

Equipment

Each ARRC facility that has residents with diabetes should have the following items of equipment available:⁵

- Stethoscope
- Sphygmomanometer
- Blood glucose meter which is regularly standardised, blood glucose strips, 'one-use' finger prick devices, sharps disposal box (including quality assurance programme)
- Weighing scales and a height measure scale (stadiometer)
- Glucose tablets (to treat hypoglycaemia)
- Glucagon kit (check expiry date regularly)
- Ketone test strips
- 10g monofilament

Supporting staff to deliver effective diabetes care and staff education

Provision of appropriate education for health care assistants will be the responsibility of the ARRC management and trained nurses in the individual facilities.

Aims are to:

- Engage ARRC management to adopt local guidelines and nurse education
- Ensure a high quality of diabetes care in ARRCs
- Make available adequate training for nurses in ARRC
- Encourage 'champion or resource nurses' in ARRCs
- Have all residents with diabetes engaged in a formal annual review
- Ensure all HBA_{1c} results are copied directly to ARRCs
- Ensure adequate support from primary care practices and specialist nurses (as needed)

Diabetes Care for Primary Health Care Nurses

An on-line diabetes knowledge programme has been developed by the New Zealand Society for the Study of Diabetes (NZSSD), supported by the Diabetes Nurse Specialist Section (DNSS) of NZNO. The content of this programme is aligned with the nationally endorsed National Diabetes Nursing Knowledge and Skills Framework (NDNKSF) (2009).

This seven module on-line learning tool for primary healthcare nurses is intended as a professional development activity, contributing seven hours to an individual's professional portfolio.

- MODULE .01 About Diabetes
- MODULE .02 Self-management strategies
- MODULE .03 Blood glucose monitoring
- MODULE .04 Hyperglycaemia and hypoglycaemia
- MODULE .05 Self-management support
- MODULE .06 Complications of diabetes
- MODULE .07 Insulin initiation

Available from: www.nzssd.org.nz or www.nzno.org.nz

This on-line training is recommended by Health Hawke's Bay and the Hawkes Bay District Health Board and replaces the training previously undertaken locally.

On completion of this on-line course, an annual educational update will be available through Health Hawke's Bay.

Annual diabetes review for all ARRC residents

1. It is the recommendation that every resident has an annual health review.⁸ The importance of diabetes means that every year, **every resident** (with or without diabetes) **will**:

Either

- Be screened for diabetes **if not already diagnosed**. Use either of the following methods:⁹
 - In symptomatic individual an HbA_{1c} ≥50 mmol/mol (and, if measured, a fasting blood glucose ≥7.0 mmol/L or a random glucose ≥11.1 mmol/L) is sufficient to establish the diagnosis of diabetes.
 - In asymptomatic individuals the same criteria apply but, to confirm the diagnosis of diabetes, a confirmatory test (preferably HbA_{1c}) is needed on a separate occasion. Those with an HbA_{1c} of 41-49 mmol/mol are categorised as 'pre-diabetes'. Residents with values in this range should have a full cardiovascular risk assessment and appropriate management, with HbA_{1c} repeated after 6-12 months.

It needs to be kept in mind that HbA_{1c} alone in elderly individuals (>80 years) or patients with uraemia, infection, iron deficiency anaemia or genetic variants of haemoglobin may lead to inaccurate diagnosis.

Or

- As part of their health review, those residents with diabetes have an 'Annual Diabetes Review' in the format recommended.
2. The Annual Diabetes Review will be carried out at the residence or at the GP's office, depending on the usual practice of the ARRC and the requirements of the resident.
 3. An Annual Diabetes Review should be done soon after a resident is newly admitted to the facility, irrespective of whether the 'annual' review is due or not, as most people's health status changes considerably when they go into care. It is also an opportunity to establish baselines against which to assess changes when the next review takes place.

Annual Review Format

- The review consists of three parts (see Appendix 1):
 - Data collection by nursing staff, including demographics, type of diabetes, current treatment, hypoglycaemic events recorded over the previous year and clinical data
 - Medical review of health data; medication review
 - Plan for the forthcoming year including glucose monitoring and next year's annual review
- It should be kept in mind when reviewing the clinical data, that older people may have different targets than those often published, to avoid problems with hypoglycaemia.

Resident's Care Plan

- Every resident has a care plan. In the case of those with diabetes, it is important that those at risk from acute diabetes related complications are identified. They include those with the following risk factors:
 - Advanced age
 - Other illnesses or conditions in addition to diabetes
 - Being prescribed five or more medications
 - Chronic renal problems
 - Poor nutrition

Diabetes care – dietary and nutritional recommendations

Guidelines¹⁰

- Residents with diabetes need to enjoy a varied diet with no unwarranted limitations.
- Eating a balanced diet together with taking any prescribed medication and monitoring blood glucose as appropriate, will benefit health.
- Residents with diabetes can eat a regular diet according to the recommendations below. The rest home menu for all residents should be based on encouraging foods which are high fibre, low saturated fat, moderate sugar and moderate salt.
- Weight management is an important part of managing diabetes. Older people in residential care may be more likely to be underweight rather than overweight, and the prevalence of malnutrition and under-nutrition is high. A higher fat diet including a range of higher fat foods including oils, margarines, cheese, butter, full fat milk and cream are recommended for residents who are struggling to maintain a healthy weight or have poor appetite.
- Both protein and calcium requirements for this group are higher than for younger adults. Both dairy products and meat (and alternatives) need to be encouraged and these items should not be limited.
- The ARRC facility menu will be audited by a dietitian who will ensure that it meets the dietary guidelines for this population group, and that a variety of suitable food items are included.
- Residents with Type 1 and Type 2 diabetes may require different dietary management. Please consult a dietitian for individual dietary advice as required.

Recommendations for ARRC staff

- Ensure meals and snacks are regular.
- Sugar may be used in the diet up to a maximum of two tablespoons per day. This should be taken as part of a mixed meal, not added to tea, coffee or drinks taken between meals.
- Encourage a range of healthy cereals to suit the taste preferences of most residents e.g. porridge, muesli, All Bran, Special K and Weet-Bix.
- Normal jams and honey (up to one teaspoon) can be offered at breakfast, lunch or dinner with wholemeal, fruit bread or toast.
- Encourage between-meal snacks which contain bran, oats or fruit as appropriate. Sandwiches made with wholemeal/wholegrain bread, fruit, plain cakes, muffins and scones are all suitable. Discourage icing on cakes.
- Cream with dessert may be offered if requested, but only a small amount i.e. a garnish. Yoghurt or custard is a better option.
- Offer stewed or tinned fruit in natural or lite juice.
- Normal desserts, including ice-cream may be offered. Most desserts are suitable. For any extra sweet dessert e.g. pavlova and jelly, give only a half portion and serve with fruit, custard or yoghurt as appropriate.
- Use artificial sweetener in beverages and sugar free fruit drinks or cordials between meals.
- Natural fruit juice may be offered as part of a meal.
- Encourage plenty of fruit and vegetables.

Nutritional Care of Residents

If a resident experiences weight loss, please refer to your appropriate ARRC facility policy, or in the absence of one, the HBDHB Rest Home Nutritional Care Decision Tree 2011 (Appendix 2).

Nutritional status of the resident can be accessed by a number of tools, including the Mini Nutritional Assessment (MNA), Malnutrition Universal Screening Tool (MUST) or Interai.

MNA

The MNA is a validated nutrition screening and assessment tool that can identify patients age 65 and above who are malnourished or at risk of malnutrition.

More information is available at: <http://www.mna-elderly.com>

MUST

'MUST' is a five-step screening tool to identify adults, who are malnourished, at risk of malnutrition (under-nutrition), or obese. It also includes management guidelines which can be used to develop a care plan. More information is available at: <http://www.bapen.org.uk/pdfs/must/must-full.pdf>

Momentum-interai

Momentum-interai is a software programme used by Hawke's Bay DHB and some rest homes, as a patient management software system.

Within this system, there are caps which are triggered to highlight areas of concern. One of these is a nutrition cap. This is triggered by a low BMI but does not trigger weight loss hence significant weight loss needs to be monitored as well.

High Energy High Protein (HEHP) action plan

HEHP action plan is compiled by a New Zealand Registered Dietitian. It has been created for 'frail older people' and is applicable to any residents with diabetes who becomes frail.

Information is also available in the Nutrition and Hydration Care Guide from Waitemata DHB (<http://www.waitematadhb.govt.nz/HealthProfessionals/RACIPcareguides.aspx>)

Diabetes care – physical activity recommendations in ARRC facility

Many improved health and well-being outcomes have been shown to occur with regular physical activity. Most physical activity can be adjusted to accommodate older people with a range of abilities and health problems, including those living in residential care facilities.¹¹

An example of this is the Otago Exercise Programme. By providing this programme, residents can improve their:

- Balance
- Muscle strength
- General fitness
- General well-being

Residents should be encouraged to do the prescribed exercises three times each week. These exercises can be divided up so exercises do not all have to be done at the same time. Between each set of exercises residents should take three deep breaths or more. They may feel a little stiff when they first start to exercise which is quite normal.

Safety considerations

Residents should:

- Never exercise holding on to an object which may move, for example a chair.
- Always use the side of something stable like a bench or solid table unless otherwise instructed.
- It is preferable to do exercise a little time after a meal, rather than immediately prior a main meal when blood glucose levels are likely to be low.

The appropriate staff member must contact:

- The instructor before a resident starts exercising again, if illness has stopped the resident from maintaining the exercise programme.
- The resident's GP if while exercising he/she experiences dizziness, chest pain or shortness of breath (unable to speak because of shortness of breath).

Residents can improve their general fitness simply by being more active in their day-to-day life. Some examples of activities to build into a resident's day include:

- Walk instead of driving to the shops
- Walk to talk to a neighbour face-to-face instead of phoning
- Take the stairs rather than the lift or escalator
- Get off the bus a block early and walk to destination
- When visitors and family arrive, go for a walk with them before having a cup of tea
- Garden when the weather permits
- Stand to fold washing

Walking is an excellent way to enhance general fitness. Residents should be encouraged to wear comfortable shoes and clothing, start with a warm-up (marching on the spot for two minutes) and finish with a warm-down (marching on the spot for two minutes).

The above has been adapted from the Otago Exercise Programme. Further examples of exercises may be found on page 37 (Appendix 3).

Blood glucose monitoring guidance

Capillary blood glucose testing frequency

The frequency of routine capillary blood glucose monitoring for each resident with diabetes is set out in the Age Related Residential Care with Diabetes Annual Review and Plan (Appendix 1).

Suggested frequencies are:

- | | |
|---|--------------------------------|
| • No routine testing | 6-mthly HbA _{1c} only |
| 1. Test before breakfast and before bed ONE day per week | Plus 6-mthly HbA _{1c} |
| 2. Test before breakfast test TWO consecutive mornings per week | Plus 6-mthly HbA _{1c} |
| 3. Test before each meal on TWO days a week | Plus 6-mthly HbA _{1c} |
| 4. Test before each meal AND two hours after each meal ONE day per week | Plus 6-mthly HbA _{1c} |

However, the resident's general practitioner may choose an alternative routine frequency. If a resident has a HbA_{1c} below or above the recommended range, the HbA_{1c} should be repeated after 3 months.

Blood glucose monitoring should always be undertaken if a resident with diabetes has:

- A change in behaviour or cognitive function
- Signs/symptoms of hypoglycaemia
- A change of insulin or tablet does (excepting Metformin)
- Infection
- Pyrexia
- Exacerbation of another illness

Tests are done for useful information. If the information is not useful, or not used, the test should NOT be done.

The above information has been summarised into a wall chart (Appendix 4).

The Clinical Advisory Committee acknowledge that in the March 2012 article 'Testing for CVD, diabetes and renal disease in elderly people' bpac^{NZ} recommended that '*In elderly people with diabetes, HbA_{1c} should be checked at least annually, however, testing should not be requested more frequently in people with stable, well-controlled diabetes*'. Due to the number of patients detected with low HbA_{1c} in the initial phase of this project, we have recommended six monthly routine HbA_{1c} assessments. This recommendation is also consistent with the American Diabetes Association Standards (2013).¹² The American Geriatrics Society (2003) suggest annual assessment only for those with stable HbA_{1c} over several years, otherwise a minimum of six monthly assessments; therefore a decreasing HbA_{1c} trend would also indicate six monthly assessments.

No resident with diabetes should have a fasting glucose, if on treatment, of less than 6 mmol/L and levels of glucose of <5 mmol/L should be avoided.

Request medicine review by general practitioner when resident taking medicine for the treatment of diabetes, has a fasting blood glucose <6 mmol/L.

HbA_{1c} test

The HbA_{1c} test (also called glycosylated haemoglobin level) is a laboratory blood test which measures a person's average blood glucose over the previous months and gives an indication of his/her longer-term blood glucose control.¹³ Measurement of HbA_{1c} remains the most useful tool for monitoring glycaemic control.

From August 2011, New Zealand laboratories are reporting HbA_{1c} values in the International Federation of Clinical Chemistry and Laboratory Medicine format, which is in mmol/mol. HbA_{1c} levels have previously been measured as a percentage (%).¹⁴

| HbA _{1c} mmol/mol (new units) | HbA _{1c} % (old units) |
|---|------------------------------------|
| 42 | 6 |
| 48 | 6.5 |
| 53 | 7 |
| 58 | 7.5 |
| 64 | 8 |
| 75 | 9 |
| 86 | 10 |
| 97 | 11 |
| 108 | 12 |
| 119 | 13 |
| 130 | 14 |
| 140 | 15 |
| 151 | 16 |

Source: New Zealand Society for the Study of Diabetes and Ministry of Health 2011.

It is helpful if each resident with diabetes has a documented target HbA_{1c} range outlined in his/her Diabetes Annual Review and Plan. All HbA_{1c} results should be copied through to the ARRC facility so that the Registered Nurse or clinical lead can monitor results and ensure the resident's HbA_{1c} sits within this ideal range. If the resident's HbA_{1c} results sit outside the target HbA_{1c} range, a documented discussion between the resident's doctor, the ARRC Registered Nurse or clinical lead, and the resident (including family/whanau if applicable) should occur so that strategies can be implemented to achieve an HbA_{1c} within the target range, in order to minimise complications.

A proposed HbA_{1c} range for elderly residents living within an Age Related Residential Care setting is between 54-64mmol/mol.

- * Between 65-86mmol/mol indicates the blood glucose levels are too high.**
- * Above 87mmol/mol or higher indicates the blood glucose levels are extremely high.**

If the resident is on insulin and/or taking a sulphonylurea agent (e.g. gliclazide or glipizide) and his/her HbA_{1c} level is less than 48mmol/mol this almost certainly indicates that he/she is experiencing multiple episodes of hypoglycaemia. Having HbA_{1c} levels this low is not safe for a resident on insulin and/or taking a sulphonylurea.^{5,7}

Capillary blood glucose testing technique¹⁵

1. Gather all necessary equipment prior to testing.
2. Obtain the resident's consent for the procedure to occur.
3. Maintain the resident's privacy.
4. Caregiver washes and dries hands before putting on gloves.
5. Before testing, wash the resident's hands in warm water to ensure they are clean.
6. The test strip is placed into the glucose meter and rested on a dry surface.
7. Check the lancet depth setting on the finger prick device – using a low depth reduces pain and minimises scarring.
8. A disposable lancet is placed against the side of the resident's finger, not the tip or pad, and a puncture is made. Never use a limb affected by stroke or similar.
9. To avoid excessive tissue fluid it is not encouraged to squeeze at the fingertip; rather 'milk' down the finger if blood flow encouragement is required.
10. Wait the required time for the meter to show a reading.
11. While waiting for a reading, apply a clean paper towel to the test site.
12. Read the meter result while sharing this result with the resident.
13. Dispose of used equipment in the correct manner. The used lancet must be disposed of in a sharps container.
14. Remove gloves; wash and dry hands.
15. Return equipment to the correct location.
16. Record the result and test time, and report to the Registered Nurse.

Please note:

CareSens and CareSens N meters have a defined temperature range of 10-40°C. For accurate results, please ensure you test within this range.¹⁶

Replace the lid of the vial after removing a test strip. If the vial is left open for longer than ten minutes, the strips may become susceptible to humidity and blood glucose readings will be affected.¹⁶

Wrong test strips: please ensure that you are using the correct strip with your meter. CareSens N and N POP meters use CareSens N test strips. CareSens II meters use CareSens strips. Do not use another brand of test strips with CareSens meters.¹⁶

If test strips or meters do not work, please see Quality Control section.

Infection Control

Blood glucose monitoring and insulin administration involves exposure to body fluids therefore there are infection and safety risks associated with these activities. Effective infection prevention strategies must be used to minimise these risks.^{17,18,19}

Insulin administration

- The risk of needle stick injury is significant whenever administering insulin.
- Insulin pen devices should only be used where the patient is able to self-inject and recap their insulin pen needle.
- In all other instances, single-use insulin syringes should be used to draw up and administer insulin.
- Insulin administration equipment (pen, needles, and syringes) should never be used for more than one person.^{17,20}

Sharing of insulin pens and insulin cartridges may result in the transmission of hepatitis viruses, HIV or other blood-borne pathogens.^{17,20,21}

Blood Glucose Testing

- In all instances of blood glucose testing these risks must be assessed with the benefit of obtaining a blood glucose level.
- If there is no benefit to the person from obtaining a blood glucose level i.e. changes in management; the need for carrying out the blood glucose monitoring should be reconsidered.

Finger Prick Devices

- Restrict use of finger prick blood sampling devices to individual people.^{21,22}

Finger prick devices should NEVER be used for more than one person^{17,21,22}

A finger prick device used on multiple people is unsafe and an infection risk.

- Select single-use lancets that permanently retract upon puncture to minimise needle stick injuries.^{17,21,22}
- Dispose of used lancets or single use lancing devices into an approved sharps container at the point of use.²¹
- Store unused and used diabetes equipment and supplies separately.²¹

Point of care (POC) blood glucose meters

- POC blood glucose meters should be dedicated to each individual person and not shared.^{20,21}
- A dedicated meter for emergency situations may be considered.²³
- Where a dedicated POC meter for an individual person is not possible, the meter must be properly cleaned and disinfected after every use.²⁰
- The owner's manual for the CareSens N meters advises using a soft cloth or tissue to wipe the meter exterior. If necessary dip the cloth in a small amount of alcohol. Do not use organic solvents such as benzene, acetone or household or industrial cleaners with the exception of Sodium Hypochlorite 0.55%.²⁴
- Do not insert anything into the port that receives the test strips. If specific directions are not provided by the manufacturer, the device should not be shared.^{20,21,233}
- Alcohol can degrade plastic over time, so should not be used on equipment without manufacturer's instruction.²⁵

Additional steps to minimise the risk of infection:

- Wear gloves during finger prick glucose monitoring, administration of insulin and any other procedure that involves potential exposure to blood or body fluids.^{19,21,22}
- Perform hand hygiene (i.e. hand-washing with soap and water or using an alcohol-based hand rub) immediately before donning and after removal of gloves and before touching other medical supplies intended for use.^{17,18,21}
- Change gloves and perform hand hygiene after each person's test or insulin administration, and after touching potentially blood-contaminated objects, surfaces or finger prick wounds before touching other people or clean surfaces.^{17,18,21}
- Where practicable, maintain supplies and equipment such as finger prick devices and the POC glucose meter within an individual person's rooms.²¹
- Any trays or carts used to deliver medications or supplies to individual people should remain outside the rooms.²¹
- Unused supplies and medications taken to a person's bedside during finger prick monitoring or insulin administration should not be used for another resident.²¹

Quality Control

Internal Quality Control

Built-in quality checks occur prior to every test and error messages are displayed to inform the user of quality issues.

It is recommended that a quality control check is performed on a blood glucose meter:

- If the meter has been dropped (also confirm that the battery is still in place)¹⁵
- When the cap has been left off the pottle of test strips (strips should then be disposed of and a new pack used)²⁶
- When the test strip pottle has been exposed to extreme heat, humidity or cold (strips should then be disposed of and a new pack used). Error message 'Er1' will appear on the meter if the meter senses that there is a fault with the test strip.^{20,23}
- A minimum of once a month. Control solutions are available from Pharmaco Healthcare, or a community pharmacy, to perform this test.²³
- According to facility policy

Facility policy on the frequency of quality control checks may be dependent on:

- Turn-over of strips. Check the expiry date on the test strip bottle every month.²³
- Number of staff accessing strips
- What clinical action is being taken according to the results
- When a patient is exhibiting symptoms that do not correspond to the test results. Retest and if meter reading still appears to be incorrect, check the meter with CareSens N control solution.²³

External Quality Control

- External quality control is not recommended by the manufacturer of CareSens N.²³
- Pharmaco is able to provide a replacement meter for any meter that appears to be functioning incorrectly.²³

CareSens N meters are all plasma equivalent calibrated meters, meaning there is no need to do a manual calibration as the meter does it automatically.¹⁶

What risk of contamination to the strips is there?

Should your strip become contaminated, wet, or damaged, your CareSens N meter will show an 'Er1' message on the screen, which means the meter is identifying the strip as used.

Additionally, if there is poor contact between the electronic sensors on the strip and the meter contacts, the error message will show.¹⁶

Education and Competency

It is the responsibility of each ARRC facility to provide appropriate training to the healthcare assistants' caregivers on the following aspects of diabetes care:

- Blood glucose monitoring techniques
- When to communicate to the facility Registered Nurse
- What should be communicated to the facility Registered Nurse

Staff annual competency review is according to the individual ARRC facility policy.

A competency assessment on blood sugar level (BSL) and insulin administration for each staff member (registered nurse, enrolled nurse and healthcare assistant) should be undertaken annually.

Educational resources on the CareSens N meters can be found:

- CareSens website: <http://www.caresens.co.nz/page/how-to.aspx>
- Goodfellow Education Module Toolkit <http://www.goodfellowclub.org/courses/changes-funded-diabetes-blood-glucose-meters-and-test-strips-toolkit>
- PHARMAC website: <http://www.pharmac.health.nz/medicines/your-health/diabetes/blood-glucose-meters-changes>
- Medsafe website: <http://www.medsafe.govt.nz/profs/puarticles/june2013monitorbloodglucose.htm>

Administering diabetes medicines

Insulin

Insulin Injections

Insulin is injected through the skin into the fatty tissue known as the subcutaneous layer (where there are fewer nerve cells and so it is less painful). The abdomen is the most common injection site. The buttocks and thighs are also used by some people, the arms less commonly so. It is essential to give each injection in a slightly different spot, within the chosen site, to prevent tissue damage.

An insulin syringe should be disposed of after one use. Insulin is measured in (international) units and insulin syringes are unique for use with insulin and are identified by having orange caps or packaging. Insulin syringes come in different sizes (30 unit, 50 unit and 100 unit). Insulin syringes should not be re-capped but dropped directly into an approved sharps disposal container.

Self-Administration of Insulin

If the resident is administering their own insulin with a 'pen' but asking someone else to change the needle, the manufacturer recommends a new needle every time. If a new needle is not used for each insulin dose, it is recommended to replace the needle at least every 2-3 injections. If the resident is not administering their own insulin, insulin should be administered via insulin syringe.

Insulin 'pens' (Novo Nordisk/Eli Lilly/Sanofi Aventis) should only be used when individuals are giving their own injections.

Pen needles: 4 or 5mm are the best choice (there is generally no evidence that longer needles need to be used).²⁷

Insulin pumps are becoming increasingly popular but are still only used by people with Type 1 Diabetes mellitus in New Zealand.

When administering insulin:

- Inspect insulin before use - cloudy insulin should be 'mixed' (by rolling the vial) before use and should have no large particles in it; clear insulin should never look cloudy
- Do not wipe the injection site with an alcohol wipe, just ensure the site is clean
- 10mL insulin vials are vacuum packed, so inject air into syringe to draw insulin out
- Inject at a 90 degree angle
- When the injection is given, leave the needle in situ for a few seconds to avoid leakage from the site

SOME INSULIN CANNOT BE MIXED and should be given in different sites - check the manufacturer's instructions.

Guide for Insulin Storage

Insulin in use should be stored at a steady room temperature (avoiding too hot or too cold temperatures) - cold insulin stings when injected. Once a vial is in use, the recommended shelf life is one month. Extra supplies of insulin should be stored in the fridge (but not next to the ice box). For the shelf life of insulin

stored in the fridge see the expiry date on the box or vial. Never freeze insulin - any insulin found frozen should be thrown away. Never expose to direct heat or light.

Many facilities have guidelines for insulin administration, depending on the company they belong to. These relate to who can administer insulin and the training involved, as well as how the insulin is stored and administered. It is advantageous to both the residents and staff that the latter be standardised.

Oral hypoglycaemic agents and metformin

Please refer to the Ministry of Health Medicines Care Guides for Residential Aged Care for information on metformin, sulphonylureas and other medicines for diabetes management.

Be wary of 'hypos' in the elderly who are on sulphonylureas (glipizide or gliclazide).

Acute diabetes complications

Hypoglycaemia

Generally, hypoglycaemia occurs when the blood glucose level is **less than 4 mmol/L**.

“Four is the floor”

Hypoglycaemia can happen in patients treated with **insulin and sulphonylureas** (gliclazide, glipizide). The experience of an episode of hypoglycaemia can range from it being unrecognised by the person to extreme discomfort whereby it can be frightening for the person and also their family, friends and carers.

- Severe hypoglycaemia is associated with **increased mortality**, especially in the elderly. **Be aware! Symptoms can vary from person to person.** Symptoms of hypoglycaemia are called ‘**warnings**’ as the feelings can be evident before the blood glucose drops very low. However, in older people **chronic hypoglycaemia** can occur if blood glucose levels **repeatedly** drop to less than 4 mmol/L. Repeated and/or chronic hypoglycaemia leads to **loss of ‘warnings’** and patients are at increased risk from hypoglycaemia. If this is recognised, then the person may be able to **treat** the low blood glucose **before it gets any lower**.
- Some people may not get any symptoms at all, particularly if they have regular low blood glucose levels. Older people may also have ‘**dampened down**’ **hypoglycaemia warnings** or none at all. For older people there are **added risk factors** which can lead to hypoglycaemia:
 - Advanced age
 - Other illnesses or conditions as well as diabetes
 - Being prescribed five or more medications
 - Chronic renal problems
 - Poor nutrition
 - Acute illness

What can cause hypoglycaemia?

- Too much insulin or too much diabetes medication
- Delayed or missed meal
- Not enough food containing carbohydrates
- Unusual activities
- Acute illness (especially infections and diarrhoea)
- Sometimes there is no obvious cause

Warning signs

- New onset confusion, irritability, anxiety or change in behaviour
- New weakness, trembling hands or shaking knees
- Feeling suddenly dizzy and lightheaded or new headache
- Fast pulse and palpitations (thumping heart)
- Pins and needles (tingling) of lips and tongue or feeling hungry
- Pale and sweaty skin (late sign!)
- Loss of consciousness

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Avoidance of hypoglycaemia

- Be aware
- Set appropriate and realistic blood glucose targets in the older adult (in agreement with the patient's GP)
- Monitor blood glucose in accordance with the person's care plan
- Increase monitoring frequency during any intercurrent illness
- Learn and remember the warning signs
- Test blood glucose if in doubt or if you suspect hypoglycaemia
- Act rapidly and follow the flowchart (see Appendix 5). This will be in every care plan and at the wall of the nurses' station.

Immediate treatment

In the conscious patient:

Give either:

- Half a cup of fruit juice or
- Glucose tablets (10-15 grams) or
- Three large teaspoons of sugar dissolved in water

Retest in 10 minutes:

- If ≤ 4 mmol/L, give further dose of fruit juice, glucose or sugar
 - NOTIFY GP if capillary blood glucose level is not above 4 mmol/L within 30 minutes but continue with hypo treatment.
- If >4 mmol/L, give either:
 - Slice of bread, small pottle of yoghurt and two plain biscuits or
 - 1 glass of milk or
 - Meal if due within 15 minutes

Reminder: Hypoglycemia less than 4 mmol/L may be asymptomatic but still requires treatment.

If the patient is unconscious:

Call the ambulance.

- Intravenous administration of 75-80mL 20% glucose or 150-160mL of 10% glucose (the volume will be determined by the clinical scenario). Once the patient regains consciousness, oral glucose should be administered, as above.
- If intravenous (IV) access cannot be rapidly established and the hypoglycaemia is induced by insulin, Glucagon 1mg should be given by intramuscular (IM), or subcutaneous (SC) injection.
NB: 1 unit of glucagon = 1 mg of glucagon.

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Hyperglycaemia^{28,29}

Hyperglycaemia can lead to two significant complications: Diabetic Ketoacidosis and Hyperglycaemic Hyperosmolar State. (Appendix 6)

Diabetic ketoacidosis

In the short term, consistent high blood glucose levels can lead to a condition called diabetic ketoacidosis (DKA). Ketones develop when the blood glucose level is high and a lack of insulin is available to the body, which would normally allow glucose to enter the cells for energy. Because people with Type 2 diabetes may still be producing some insulin, these acidic by-products may not be created.

Why does this happen?

This happens because of a lack of glucose entering the cells where it can be used as energy. The body begins to use stores of fat as an alternative source of energy, and this in turn produces an acidic by-product known as ketones.

How ketones affect the body

Ketones are very harmful and the body will immediately try to get rid of them by excreting them in urine. Consequently, when ketones are present and blood glucose levels are rising, people often become increasingly thirsty as the body tries to flush them out.

If the level of ketones in the body continues to rise, ketoacidosis develops (ketoacidosis means acidity of the blood, due to an excess of ketones in the body). Their harmful effect becomes more apparent, and nausea or vomiting may start. In addition, the skin may become dry, eyesight blurred and breathing deep and rapid.

Unfortunately, because of vomiting, the body becomes even more dehydrated and less efficient at flushing out the ketones, allowing levels to rise even faster. As the level of ketones rise, it may be possible to smell them on the breath - often described as smelling like pear drops or nail varnish.

Eventually, if untreated, the level of ketones will continue to rise and, combined with high blood glucose levels, a coma will develop which can be fatal. However, at any of these intermediate stages, ketoacidosis can be treated and damage usually limited, obviously, the sooner, the better.

Who is at risk?

Any person with diabetes who relies on administering insulin (i.e. by injections or an insulin pump) could develop diabetic ketoacidosis. In exceptionally rare cases people controlling their diabetes with diet or tablets have been known to develop ketoacidosis when severely ill.

During illness

The high-risk time for developing ketoacidosis is when a person is unwell. Part of the body's response to illness and infection is to release more glucose into the bloodstream, and to stop insulin from working properly. This happens even if the person loses their appetite or goes off food altogether. During periods of illness, even if a person is not eating, insulin is still needed and it is important never to stop taking insulin. See 'Sick Day Advice' Wall Chart (Appendix 7).

Detecting ketones

Ketones are easily detected by a simple urine dipstick test. The urine of people with diabetes should be tested for ketones if their blood glucose is high (usually over 15mmol/L) or if they have any symptoms of ketoacidosis. If high levels of ketones in the urine are discovered (the test strips will tell you if levels are high), and especially if their blood glucose levels are high, medical advice should be sought immediately.

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Hyperglycaemic Hyperosmolar State (HHS)

Hyperglycaemic Hyperosmolar State is a potentially life-threatening emergency.

Hyperglycaemic Hyperosmolar State occurs in people with Type 2 diabetes who may be experiencing very high blood glucose levels (often over 40mmol/L). Hyperglycaemic Hyperosmolar State is a serious and often fatal consequence of **hyperglycaemia and dehydration**.

The mortality rate from HHS increases with age and osmolarity (marker of dehydration). It can develop gradually (over a course of weeks) through a combination of illness, dehydration and an inability to take normal diabetes medication due to the effect of illness.

Symptoms can include frequent urination and great thirst, nausea, dry skin and mucous membranes (mouth, lips, tongue), disorientation and, in later stages, drowsiness and a gradual loss of consciousness.

Hospital treatment for HHS involves replacing the lost fluid caused by high glucose levels and the administration of insulin through a vein, to bring the blood glucose down to an acceptable level.

HSS does not usually lead to the presence of ketones in the urine, as occurs in ketoacidosis. HSS mortality figures range from 10%-63% (can lead to stroke, myocardial infarction, renal dysfunction and neurological complications). Up to 50% of patients with HSS may not have been diagnosed with diabetes (hence diabetes screening at admission to care). HSS is ten times more common than DKA; it affects mainly elderly people with poor fluid and nutritional input.

Symptoms of hyperglycaemia in elderly people may include:

- Reduced sensation of thirst
- Unable to feed themselves (depend on carers to give fluid regularly)
- Increased renal glucose threshold – change in glucose handling of the kidney
- Symptoms of polydipsia (frequent passing of large amounts of urine) may be masked by other illnesses such as urinary incontinence

Common symptoms of hyperglycaemia (lethargy, confusion, restlessness, blurred vision, infections and impaired cognition) may be considered symptoms of old age.

Management of HHS

Prevention and early recognition are paramount.

- Ensure regular fluid intake in the elderly (provide access to fluid)
- Encourage fluid intake especially in patients with diabetes
- Check tongue (mucous membranes) for dryness
- Watch for signs and symptoms of infections (see above)
- Watch for any significant change in behaviour and cognition in the elderly patients with diabetes (and report to nurse)
- Beware of signs of hyperglycaemia such as lethargy, confusion, restlessness, blurred vision, infections and impaired cognition
- Watch for new incontinence and or polyuria
- If in doubt, check blood glucose

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Infections

People with diabetes are more prone to infections, especially if the blood glucose levels are at a higher than normal or ideal level. Nearly all infections will cause blood glucose levels to rise.

Infections in older people, if not dealt with promptly, can lead to serious complications which may necessitate admission to hospital.

Signs and symptoms of infection include:

- Temperature (>37.0 C)
- Fatigue and chills
- Headache generalised aches
- Cough sputum production
- Nausea, vomiting or diarrhoea
- Cloudy or foul smelling urine, frequency or burning on passing urine
- Swelling, redness, tenderness, rash
- Foul smelling and/or discharging skin wound
- Sore mouth, white patches in the mouth

However, in the elderly signs and symptoms may not be obvious! A change in mobility or the onset of a confused state may indicate infection.

What to do?

- Urgent **referral to the GP** is necessary for the treatment of the infection
- Make sure the person does **not become dehydrated** by giving regular fluids
- If someone has **diarrhoea**, carers should be aware that they may be more prone to hypoglycaemia
- **Keep testing their blood glucose** to monitor improvement or deterioration

IMPORTANT!

- Do not stop diabetes treatment. The dose of diabetes medication may need to be increased for the duration of infection.
- **EXCEPTION:** Do not give Metformin if patient is vomiting or has diarrhoea.

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Incontinence

Urinary incontinence is the inability to hold urine in the bladder and occurs when the muscles and nerves associated with the bladder are unable to hold or appropriately release urine.

Women are twice as likely to experience incontinence as men. Incontinence in the elderly is a sensitive issue and can be an embarrassment for both the sufferer and their carer as neither may find it easy to talk about this very personal problem, resulting in the help needed not being forthcoming.

Causes can include

- Hyperglycaemia (high blood glucose levels) can cause thirst and increase urination
- Urinary tract infections
- Physical changes in bladder muscles (e.g. after menopause)
- Enlarged prostate gland
- Damage to the nerves caused by conditions such as diabetic neuropathy

Different types of incontinence

- Stress incontinence - urine loss occurs when coughing, laughing or during exercise
- Urge incontinence - sudden need to pass urine
- Overactive bladder - the nerves send the wrong signals to the bladder causing urgency, frequency and incontinence
- Functional incontinence - difficulties in managing toilet needs associated with other physical or mental illnesses

Treatment options

- Different treatments and interventions are available, depending on the type of incontinence and can range from pelvic floor exercises to medication
- Weight loss (if appropriate) and improved diabetes control can help
- The person's GP should be made aware of problems with incontinence and what measures have been taken to resolve the problem

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Long-term diabetes complications

Cardiovascular health

People with diabetes suffer a ten-fold increase in risk of stroke and cardiovascular conditions such as coronary heart disease.

Kidneys (diabetic nephropathy)

Kidney disease can happen to anyone, but it is more common in people with diabetes and people with high blood pressure. Kidney disease develops very slowly over many years and is most common in people who have had the condition for over 20 years. It follows therefore that older people in care homes may be more likely to have some level of kidney disease.

Included in the **Diabetes Annual Review** (also completed soon after the resident's admission to the home), are the following checks for kidney disease:

- a urine test for protein and albumin/creatinine ratio. Protein in the urine may be due to an infection, so this check is important
- a blood test which will measure the efficiency of the kidney function creatinine level, or eGFR and to check the levels of certain minerals (electrolytes) in the blood

Symptoms of kidney disease

When kidney disease first develops there are often no symptoms (signs) which is why screening and the annual review are so important. The first sign which may be noticed is ankle swelling. If kidney problems are not picked up early the following symptoms may begin to be evident:

- Passing much more or much less urine
- Tiredness
- Itchy skin
- Loss of appetite
- Nausea and vomiting
- Metallic taste in the mouth
- Drowsiness
- Darkening skin
- Muscle cramps
- Anaemia

It is important that the GP knows about any symptoms as the risk of kidney disease progressing can be reduced by good blood pressure and blood glucose control, so changes may be needed to the person's medication.

Treatment begins with possible changes in the diet and referral may be necessary to a specialist registered dietician who can help to plan an appropriate eating programme. Tablets may be prescribed to help the body get rid of extra fluid.

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Foot care

Diabetes can cause poor circulation and reduced feeling in the feet. In older people reduced mobility and failing eyesight can lead to a reduction in the level of foot inspection. (This may mean that damage has become more serious before anyone is aware of it.)

Damage can be prevented, but care is needed by the person with diabetes, their carers and health care teams. Care home residents may not be able to self-inspect their feet. Individualised foot care guidance will be documented in the care plan.

Follow the steps below to prevent or detect foot problems

1. Check feet daily, including in between toes and look for thickened hard skin, changes in colour and breaks in the skin.
2. Wash feet (minimum alternate days) in warm water and with a mild soap. Check the water temperature as the person with diabetes may not be able to feel hot or cold temperatures. Dry feet carefully, especially between the toes.
3. If the skin is dry, apply an emollient or moisturising cream but avoid the areas between the toes.
4. Do not use over the counter products to treat corns and calluses.
5. Avoid using hot water bottles (reduced sensation) – bed socks are better.
6. Make sure that socks and shoes are not too tight.
7. Ensure the resident has shoes which are comfortable and broad fitting, checking inside for stones, sharp objects or ruffled lining.
8. Avoid socks or stockings with wrinkles, prominent seams or darned areas.
9. Arrange an appointment with the podiatrist if you become aware of problems.
10. Act immediately if you spot the following danger signs:
 - Swelling
 - Changes in colour of the skin
 - Sores or cuts that do not heal
 - Skin that feels hot to touch
 - Difficulty in moving the foot

These could indicate poor circulation, an infection, the early stages of an ulcer, or gangrene.

Eye care

Age-related changes in the eyes mean that residents are likely to want more light for reading and may need glasses. Age is the most significant risk factor for developing common eye conditions such as glaucoma, age-related macular degeneration (AMD) and cataracts, which can lead to blindness.

Vision is assessed at least bi-annually as part of the Diabetes Annual Review, and for most, an examination of the retina by photographic screening or specialist examination is done every two years.

Good vision can also prevent falls.

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Oral health

As we get older gums may recede (shrink back), and teeth may become a little more sensitive as a result. A dentist or hygienist will be able to advise on the best brushing methods to keep any gum problems under control, and may suggest a mouthwash to deal with the sensitivity.

People with diabetes are more likely to get gum disease

- Although anyone can get gum disease, it is estimated that people with diabetes can be up to three times more likely to develop gum disease than people without diabetes.
- Gum disease is also more likely in people who don't clean their teeth regularly, or those who find it difficult to clean their teeth properly.
- If some teeth have been lost in the past, and a person has bridges or dentures, they may have particular cleaning needs and difficulties.

Avoiding hospital admission

- Good diabetes care and awareness of problems which may become more serious will help to prevent unnecessary admission to hospital.
- If the person with diabetes is unwell, their blood glucose level is likely to be higher – even if they are not eating.
- If the resident is unwell follow the **Sick Day Advice** wall chart guidelines. Appendix 7.
- If the resident is able to eat, but has no appetite:
 - Offer small meals and often
 - Try replacing meals with small snacks such as jelly and ice cream, custard or soup
- If the resident really can't manage to eat anything:
 - Try to ensure they drink plenty of fluid
 - Offer carbohydrate containing drinks such as milk, milky drinks or sugary drinks such as lemonade regularly at two hours intervals.
- If blood glucose is less than 8mmol/L refer to **Hypoglycaemia Wall Chart**. Appendix 5.
- If blood glucose is higher than 4mmol/L, give water, soda water or mineral water.

Acknowledgement: Content of this page has been sourced from *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.

Patient safety issues

The purpose of guidelines is to support safe, high quality health care. If up-to-date guidelines are followed, there is assurance that best practice is in place.

Indicators of best practice include evidence of practice meeting guidelines, such as:

Clinical:

- Is blood glucose monitoring being carried out according to the guidelines? See Blood glucose monitoring guidance (page 10) and Appendix 4.
- Are Diabetes Annual Reviews completed correctly? See Annual Diabetes Review (page 5) and Appendix 1.
- Is there evidence of clinicians thinking before acting on the outcomes of the diabetes annual checks?
- Is correct care administered to a resident during sick days? See the 'Sick Day' wall chart.
- Is correct care administered for treatment of hypoglycaemia or hyperglycaemia? See page 19 and Appendix 5 regarding hypoglycaemia and page 21 and Appendix 6 regarding hyperglycaemia.
- Is there a system for the regular overall review of diabetes outcome measures for residents in the facility? See page 28.

General Practice:

- Is the Diabetes Annual Review completed soon after admission for every new resident with diabetes, and is screening for diabetes included for every new resident who does not have diabetes diagnosed?
- A copy of the Diabetes Annual Review can be found on page 31 (Appendix 1).
- Is there a system for ensuring Diabetes Annual Reviews are completed on time? Check with your Diabetes Resource Nurse or Registered Nurse.

ARRC Facility:

- Is there evidence of correct infection control practices in place? See Infection Control (page 13).
- Is insulin being stored according to the guidelines? See Administering diabetes medicines (page 17).

Staff Training and Support:

- Is there a programme in place for training new staff in diabetes care? See Support Staff (page 4).
- Is there a system of review and update for staff already trained? Check with your Diabetes Resource Nurse or Registered Nurse.
- Are the Wall Charts placed in optimum locations and in good condition? New wall charts can be downloaded from the Health Hawke's Bay website (www.healthhb.co.nz).

Clinical Audit

Continuous Quality Improvement

With the implementation of these guidelines, it is recommended that the ARRC facility Clinical Manager look to monitor, review and audit how these guidelines are applied.

An indicator of quality suggests that at least 10% of residents with diabetes are audited annually.

The purpose of the audit is to review current practice, strive for on-going clinical improvement and recognise areas for action. The PDSA Quality Cycle is a suggested format. This audit could fit within the facilities twelve month audit calendar.

This model is not meant to replace change models that organisations may already be using, but rather to accelerate improvement. For more information about the fundamentals of the Model for Improvement and testing changes on a small scale using Plan-Do-Study-Act (PDSA) cycles, refer to the following websites:

Institute for Healthcare Improvement (IHI) www.ihl.org/knowledge/Pages/HowtoImprove/default.aspx
Institute for Innovation and Improvement.
www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/plan_do_study_act.html

PDSA Quality Cycle

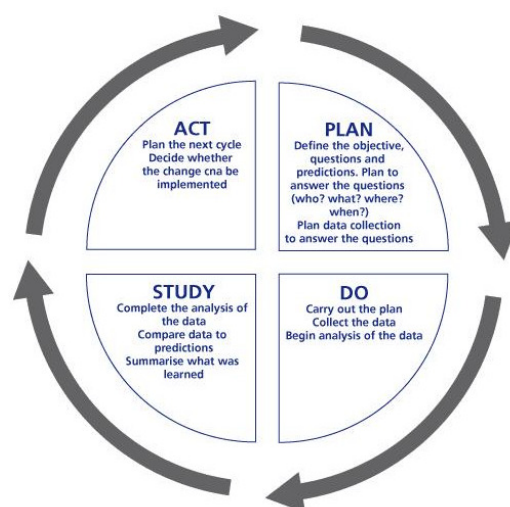
The four stages of the PDSA cycle are:³⁰

Plan – define the change to be tested or implemented

Do - carry out the test or change

Study – analyse the data before and after the change and reflect on what was learned

Act - plan the next change cycle or full implementation



PDSA cycles provide a framework for developing, testing and implementing changes leading to improvement. The model is based in scientific method and moderates the impulse to take immediate action with the wisdom of careful study. The framework includes three key questions and a process for testing change ideas.³¹

The Institute for Healthcare Improvement (IHI) uses the ‘Model for Improvement’ as the framework to guide improvement work. The Model for Improvement is a simple, yet powerful tool for accelerating improvement.³²

A PDSA cycle template has been provided in Appendix 8.

Appendices

Appendix 1

Age Related Residential Care Resident with Diabetes: Annual Review and Plan

Appendix 2

Hawke's Bay District Health Board Rest Home Nutritional Care Decision Tree 2011

Appendix 3

Examples of Exercise

Appendix 4

Routine Capillary Blood Glucose Monitoring Wall Chart

Appendix 5

Management of Hypoglycaemia in the Conscious Patient Wall Chart

Appendix 6

Management of Hyperglycaemia Wall Chart

Appendix 7

Managing Diabetes when the Resident is Sick Wall Chart

Appendix 8

PDSA Quality Cycle Template

Appendix 9

Patient Information Brochures

Appendix 10

PHARMAC Subsidy Rules

Appendix 1: Age Related Residential Care Resident with Diabetes: Annual Review and Plan



Age Related Residential Care Resident with Diabetes Annual Review and Plan

It is recommended that this checklist is completed by the ARRC Registered Nurse when a resident with diabetes is first admitted into the Facility and then once a year as part of the National Get Checked Programme.

Patient Name: _____

Address: _____ NHI: _____ DOB: _____ Ethnicity: _____

Male / Female _____ GP: _____

Year Diabetes Diagnosed: _____ Date Data collected: _____

| | | | | |
|--|--|--|---|-------------------------------|
| Prognosis indicator (Tick one or several) | Age <85yrs | Age >85yrs | Life expectancy <2yrs | Concurrent illness/disability |
| Type of Diabetes (Tick one) | Type 1 | Type 2 | Other | |
| Treatment (Tick one or more) | Diet only | Metformin | Sulphonylurea | Pioglitazone |
| | Insulin Lantus (Glargine) | Insulin Protaphane or Humulin NPH | Insulin Humalog or Novorapid or Apidra or Humalog Mix or NovoMix '30' | |
| Associated treatment (tick all that apply) | ACE inhibitor or A2 Receptor Blocker | Statin | Aspirin | Bezafibrate |

| This Year's Plan - Include the following checks: | | |
|---|---|--|
| ✓ | Glycaemic Control, nutrition and strength | HbA _{1c} , hypoglycaemic events, weight, waist circumference, skin integrity, falls |
| ✓ | Macrovascular | BP, IHD, Cerebrovascular disease, Foot pulses |
| ✓ Or ✗ | Lipids | Fasting cholesterol, TG |
| ✓ Or ✗ | Microvascular | Foot sensation, Microalbuminuria |
| ✓ | Renal | eGFR |
| ✓ Or ✗ | Retinal | Visual acuity, Retinal photographic screening |
| ✓ | Smoking | Smoking status |
| ✓ Or ✗ | Other | Details: |

Review due: _____ (month) _____ (year)

Nursing Assessment – complete only those items ticked in “This Year’s Plan”

| | | | | | |
|--|---|------------------------------------|---------|-------------------------|--|
| Glycaemic Control, nutrition and strength | HbA _{1c} | | | | |
| | Hypoglycaemic events | Number recorded since last review: | | | |
| | Weight | Weight now | | Change since last check | |
| | Waist circumference | | | | |
| | Change in nutrition / diet? | | | | |
| | Patient able to feed self? | | | | |
| | Skin integrity? | | | | |
| | Falls? | | | | |
| Macrovascular | BP | | | | |
| | Cerebrovascular disease present? | | | | |
| | Ischaemic heart disease present? | | | | |
| | Foot pulses | Left | | Right | |
| Lipids | Fasting | TC | | TG | |
| Microvascular | Foot sensation | Left | | Right | |
| Renal | GFR (tick one) | <30 | 30 - 45 | >45 | |
| | Urine albumin/creatinine ratio Tick one | <3.0 | | >3.0 | |
| Retinal | Visual Acuity | Left | | Right | |
| | Date of last retinal screening | | | | |
| Smoking | Smoking status | | | | |
| Other | (As per plan) | | | | |

Registered Nurse: _____ **Date:** _____
ARRC RN: PLEASE FAX TO GP PRACTICE FOR SCANNING **File in Residents notes**

Practice to complete

| | | | | |
|-----------------|--|--------|--|--------|
| Processed by | | (Name) | | (Date) |
| GP Visit booked | | (Date) | | (Time) |

Please Fax back to ARRC Facility to confirm receipt of form and inform of GP visit

Medical Review – complete only those items ticked in ‘This Year’s Plan’

Due: _____ (month) _____ (year)

| | | |
|--------------------------|--------------------------------|--|
| Glycaemic control | HbA _{1c} appropriate? | |
| Nutrition | Any concern? | |
| Macrovascular | BP satisfactory? | |
| Lipids | Lipids satisfactory? | |
| Microvascular | Foot health a concern? | |
| Renal function | Renal function a concern? | |

| | | |
|--------------------------|----------------------------------|--|
| Medication review | Change to diabetes medication? | |
| | Change to associated medication? | |

Next Year’s Plan - Year: _____

Blood Glucose Monitoring for this patient: (tick one)

– For guidance, see Routine Capillary Blood Glucose Monitoring wall chart

| Tick | Option | Action | Note |
|------|--------|--|--------------------------------|
| | 0 | No routine testing | 6-mthly HbA _{1c} only |
| | 1 | Test before breakfast and before bed ONE day per week | Plus 6-mthly HbA _{1c} |
| | 2 | Before breakfast test TWO consecutive mornings per week | Plus 6-mthly HbA _{1c} |
| | 3 | Before each meal on TWO days a week | Plus 6-mthly HbA _{1c} |
| | 4 | Before each meal AND 2 hours after each meal ONE day per wk | Plus 6-mthly HbA _{1c} |
| | 5 | Other: | |

Next Year’s Annual Review - Include the following checks:

| | | |
|--------|---|--|
| ✓ | Glycaemic Control, nutrition and strength | HbA _{1c} , hypoglycaemic events, Weight, waist circumference, Skin integrity, falls |
| ✓ | Macrovascular | BP, IHD, Cerebrovascular disease, foot pulses |
| ✓ Or ✗ | Lipids | Fasting cholesterol, TG |
| ✓ Or ✗ | Microvascular | Foot sensation, Microalbuminuria |
| ✓ | Renal | eGFR |
| ✓ Or ✗ | Retinal | Visual acuity, Retinal photographic screening |
| ✓ | Smoking | Smoking status |

General Practitioner: _____ **Date:** _____

Appendix 2: HBDHB Rest Home Nutritional Care Decision Tree

Rest Home Nutritional Care Decision Tree



Assess Nutritional status by either:

- Using a screening tool (MNA, MUST or MST) , or Interai
- Determining % of *unintentional* weight loss

$$\text{Percentage weight loss} = \frac{\text{Usual weight} - \text{Current weight}}{\text{Usual Weight}} \times 100$$

- MNA score ≤ 11
- MUST score ≥ 2
- MST score ≥ 3
- Significant Weight Loss
 - $\geq 2\%$ in 1 week
 - $\geq 5\%$ in 1 month
 - $\geq 7.5\%$ in 3 months
 - $\geq 10\%$ in 6 months
- Interai cap triggered

- MNA score > 11
- MUST score < 2
- MST score < 3
- No significant weight loss

- **Initiate ¹HEHP Action Plan** (following page)
- Start food record chart and monitor compliance to HEHP action plan
- ²Vitamin D supplementation
- Weigh Weekly

- ²Vitamin D supplementation
- Refer to MOH Eating Well for Older Adults booklet
- Weigh monthly
- Re-assess if unintentional weigh loss

Continued weight loss

Evidence of HEHP plan being followed correctly

Refusal to eat any meals or snacks

Referral to Dietitian
 Include information on;

- Presenting complaint/diagnosis
- Brief medical history including oral, dental and bowel status
- Current weight and height
- % weight loss and usual weight
- Oral intake and appetite
- Supplement and snack compliance
- Texture modifications
- Other relevant information

Fax to Community Dietitian (06) 8781327

Assess personal preferences and whether the resident is enjoying their meals

- Report and discuss care plan with family / elected power of attorney and any relevant MDT members such as
- General Practitioner
 - Mental Health
 - Palliative care team
 - Dietitian

1. For an official referral form or for general dietetic inquiries please contact: Community Dietitian (06) 878 8109 ext 6975
2. Vitamin D Supplementation will require a prescription

High Energy High Protein Action Plan for Residents with Poor Appetite, Poor Oral Intake and Weight Loss

1) Correct the cause/contributors to weight loss

It is essential to eliminate any barriers to optimal nutrition, and to identify and correct any conditions contributing to poor oral intake. Ask and listen to *why* a resident cannot finish a meal.

Common contributors to poor appetite, poor oral intake and weight loss

| Cause | Action plan |
|---|--|
| Does the resident have poor dentition? | ⇒ Refer to dentist for dental review. Ensure soft textured meals that are easy to chew or require little chewing. |
| Does the resident have difficulty swallowing? | ⇒ Refer to Speech and Language Therapist for appropriate food texture recommendations. |
| Does the resident suffer dry mouth and taste changes? | ⇒ Check for and treat oral thrush. Ensure oral cares are done daily, including tongue brushing. Try rubbing pineapple on gums and/or use saliva spray to help dry mouth. |
| Does the resident have signs of clinical depression? | ⇒ Review by Mental Health team or General Practitioner. Ensure the resident attends the dining room for meals. |
| Does the resident become too tired to finish meals or have difficulty feeding themselves? | ⇒ Initiate assistance at every meal. Ensure extra time for meals. Ensure assistance to and from the dining room. Adjust food texture to soft, pre-cut, easy to consume meals. |
| Is the resident constipated | ⇒ GP to review medications. Ensure 6-8 cups fluid/day. Increase resident activity levels where possible. Add high fibre foods to meals such as kiwifruit, prunes, bran, and wholegrain cereals. |

2) Initiate high energy high protein eating plan

It is important to organise with the kitchen to initiate a High Energy High Protein (HEHP) Menu for those you have identified as being underweight or with poor appetite or weight loss. The Menu should include;

- A) High energy high protein snacks** (examples over the page)
- B) Minimum one per day high energy high protein milk shakes** (Recipe over the page)
- C) Meal fortification** (examples over the page)
- D) Replace water and watery tea and coffee with fruit juice, full milk drinks or milkshakes**

3) Record food / fluid intake and take weekly weights

It is beneficial to have a process in place to enable you to monitor what your residents are eating and to ensure this action plan is being followed by all staff involved. Weekly weighs are important to ensure the action plan is working.

4) Elect a nutrition advocate

Meal times and eating can often be over looked as a high priority area of resident care. Consider appointing a staff member as a 'Nutrition Advocate' who will be responsible for ensuring these guidelines are being followed accordingly and that meal times are prioritised.

A) High energy high protein snack examples

Include for morning tea, afternoon tea *and* supper:

- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ cheese and extra butter or margarine on toast/crackers/scones/muffins ▪ instant pudding/milky pudding/ice cream ▪ creamy yoghurt/custard | <ul style="list-style-type: none"> ▪ milky Milo/milky coffee/milk (Std milk) ▪ high energy milk shake (see below) ▪ meat/cheese/egg mayonnaise sandwiches ▪ cuts/peanut butter |
|--|--|

B) High energy high protein milkshake recipe

Include minimum one per day either after or between meals:

| | |
|---|--|
| <p>Recipe: 200ml whole or fortified milk 2 tablespoons milk powder or Complan 2 scoops ice cream 50ml cream (optional) Method: Beat or blend well. Serve chilled.</p> | <p>Flavouring options: 2-3 teaspoons Milo, 1-2 teaspoons instant coffee, milkshake syrup, vanilla essence, honey, banana, ½ cup stewed fruit or fruit juice</p> |
|---|--|

C) Meal fortification examples

Fortify meals and drinks with the following high energy food products wherever possible

| | | | |
|-----------|---------------|--------------|--------|
| Cheese | Mayonnaise | Oil | Cream |
| Margarine | Peanut butter | Cheese Sauce | Butter |

For example: Add oil, margarine or cream to porridge, desserts, soups, mashed potato, and milky drinks.

Add cheese or cream cheese to crackers, muffins, scones, toast and potatoes.

Add cheese sauce, gravy and oil to vegetables and meat.

High energy high protein menu plan example

| | |
|-----------------------|--|
| Breakfast: | Porridge made with milk (cream as appropriate), brown sugar and stewed fruit or toast with extra margarine/butter or peanut butter plus milky drink |
| Morning Tea: | HEHP snack and/or HEHP drink (see HEHP snack examples) |
| Lunch: | Additional cheese sauce to vegetables, gravy to meats and oil / margarine / butter / cream to soups and mashed potatoes. Ensure dessert is taken with extra sauce/ice cream, cream |
| Afternoon tea: | HEHP snack and/or HEHP drink (see HEHP snack examples) |
| Tea: | Additional cheese/oil/margarine/butter/cream to soups and bread (as appropriate) |
| Supper: | Milky drink plus HEHP snack (see HEHP snack examples) |
| Extra: | At least one fortified milk shake/day (see HEHP milkshake recipe) |

Acknowledgement: Compiled by New Zealand Registered Dietitian March 2010 Reviewed April 2013

Appendix 3: Examples for Exercise

| | exercise | benefit to | action | resources |
|--|---|---|--|------------------|
| Module A Exercise Primary Areas Targeted Modifications Equipment Needed | 1. Sunshine arm circles | Torso and shoulders; opens ribcage | Make small circles by extending arms in front | Ball (optional) |
| | 2. Tummy twists | Sides of the waist | Soup cans or a hand weight for resistance. Can replace a ball | Ball (optional) |
| | 3. Hand squeeze | Grip-strength; chest | | Ball |
| | 4. Seated shin strengtheners | Shins and lower legs | Try to hold a ball on top of flexed feet | Ball (optional) |
| | 5. Back massage | Upper back and rear shoulder relaxation | | Ball |
| | 6. Neck stretch | Neck and shoulder relaxation | Gently reach extended arm behind back | |
| | exercise | benefit to | action | resources |
| Module B Exercise Primary Areas Targeted Modifications Equipment Needed | 1. Ball chest press | Chest; upper back | Stand and rock the body forward and back as you do the presses | Ball (optional) |
| | 2. Front arm raises | Shoulders | Soup cans or water bottles for resistance can replace a ball | Ball (optional) |
| | 3. Inner thigh squeeze | Inner part of thighs | Change the count of the squeezes | Ball |
| | 4. Duck wing squeeze | Shoulders; chest | Without a ball, move arms in flapping motion | Ball (optional) |
| | 5. Knee extensions (CDC and NIA) | Muscles surrounding the knee | Add a long lever by lifting and lowering entire extended leg | |
| | 6. Chest and upper back stretches (CDC) | Upper and lower back, shoulders, and chest relaxation | | |
| | | | | |

| | exercise | benefit to | action | resources |
|--|-----------------------------------|---|---|------------------|
| Module C Exercise Primary Areas Targeted Modifications Equipment Needed | 1. Chair stands (NIA) | Buttocks; front and back of legs | Try squats | Ball (optional) |
| | 2. Overhead arm extensions (NIA) | Back of arms; shoulders | Substitute seated tricep extensions | Ball (optional) |
| | 3. Elbow to knee | Stomach | Stand up to do this one | |
| | 4. Balancing toe taps | Stomach (abdominals); hip flexors and stabilizers for balance | Lift both feet off floor and release hands from chair; without ball, stand on one foot behind the chair | Ball (optional) |
| | 5. Seated heel raises | Calves of lower legs | Try doing this exercise standing | |
| | 6. Overhead reach with side bends | Opens entire torso; oblique abdominals | | |
| | exercise | benefit to | action | resources |
| Module D Exercise Primary Areas Targeted Modifications Equipment Needed | 1. Pliés | Front of thighs; inner thighs; buttocks | Hold a ball instead of holding onto the chair, or change the count of the pliés | Ball (optional) |
| | 2. Rear leg extensions (NIA) | Buttocks; back of thighs | Change the count of the extensions | |
| | 3. Side leg lifts (CDC and NIA) | Hips; outer thighs | Tap toes out to one side, then pull back in | |
| | 4. Inner thigh stretch | Inner part of thighs | Hold onto back of a chair for more support | |
| | 5. Sit and reach/stretch | Calves of the lower legs and back of legs | Reach to knees or ankles depending on flexibility | |
| | | | | |

Appendix 4: Routine Capillary Blood Glucose Monitoring Wall Chart

Routine Capillary Blood Glucose Monitoring

Tests are done for useful information. If the information is not useful, or not used, the test should NOT be done.

Monitoring of diabetes

One of the aims of diabetes management is the improvement of glycaemic control. Glycaemic control can be measured by assessment of capillary blood glucose levels and the concentration of glycated haemoglobin (HbA_{1c}).

Measurement of HbA_{1c} remains the most useful tool for monitoring glycaemic control. Current research suggests that for people with non-insulin treated Type 2 diabetes blood glucose monitoring has little or no effect on glycaemic control.

The monitoring of blood glucose is an invasive clinical intervention which poses risks. Gathering information about a person's blood glucose levels is only useful when it can be used to improve the individual's clinical outcomes.

Alternate monitoring may be as per the individual Resident's Care Plan.

Recommendations

| | | |
|---|---|---|
| Diet Metformin & Pioglitazone | → | Routine assessment of blood glucose levels is NOT recommended. ² Monitor glucose control using 6-monthly HbA _{1c} . When HbA _{1c} levels continue outside the individual's target, limited blood glucose monitoring may be a useful component of treatment review. |
| Sulphonylureas ① | → | Routine assessment of blood glucose levels carried out before breakfast and before bed, on ONE day per week . (this does not need to be the same day of the week) |
| Insulin (Basal Only) ② Lantus | → | Routine assessment of blood glucose levels carried out on TWO consecutive mornings per week . |
| Insulin (Fixed Dose) ③ Protaphane or Humulin NPH | → | Routine assessment of blood glucose levels carried out before each meal on TWO days a week . |
| Insulin (Basal/Bolus) ④ Humalog or Novorapid or Apidra PLUS Lantus or Protaphane/Humulin NPH or HumalogMix or NovoMix '30' | → | Routine assessment of blood glucose levels carried out before and TWO hours after breakfast, lunch and dinner on ONE day a week . (These residents may require more frequent testing.) |

PLEASE NOTE:

Blood glucose monitoring should always be undertaken if a resident with diabetes has:

- change in behaviour or cognitive function
- signs/symptoms of hypoglycaemia
- change of insulin or tablet dose (excepting Metformin)
- infection
- pyrexia
- exacerbation of other illness

THINK!!

What does the blood glucose result mean?
Do I need to act upon it/report it to someone else?
HYPOGLYCAEMIA IS SERIOUS AND NEEDS TREATMENT

Diabetes
Guidelines
for Elderly
Residents
in Age
Related
Residential
Care
(ARRC)
Facilities

Appendix 5: Management of Hypoglycaemia in the conscious patient Wall Chart

Hypoglycaemia is defined as: a blood glucose level less than 4mmol/L. Hypoglycaemia in the elderly can have significant complications, can be severe and prolonged and can precipitate a cardiovascular event (heart attack!)

'Four is the floor'

Residents with diabetes taking sulphonylureas or insulin are at an increased risk of hypoglycaemia. Symptoms usually begin when a blood glucose level is less than 4mmol/L. Blood glucose levels between 4-6mmol/L is too low for elderly people and requires medication adjustment.





Hypoglycaemia can progress to stupor, seizure or coma and will become a medical emergency if not treated promptly.

Predisposing factors for hypoglycaemia include: unsuitable diabetes medication regimen, poor nutrition, renal disease, advanced age (>80 years old).

Hypoglycaemia happens suddenly - minutes to hours.

- New onset confusion, irritability, anxiety or change in behaviour
- New weakness, trembling hands or shaking knees
- Feeling suddenly dizzy and lightheaded or new headache
- Fast pulse and palpitations (thumping heart)
- Pins and needles (tingling) of lips and tongue or feeling hungry
- Pale and sweaty skin (late sign!)
- Loss of consciousness

Be aware that symptoms may not be obvious and hypoglycaemia may be unrecognised by the patient.

| | | | |
|---|--|--|--|
| <p>Capillary glucose less than 4mmol/L</p> | <p>Needs Treatment</p>  | <p>Give either:</p> <ul style="list-style-type: none"> ✓ 4 glucose tablets (10-15g glucose) <i>or</i> ✓ 3 heaped teaspoons of sugar dissolved in water <i>or</i> ✓ Half a cup of fruit juice | |
| <p>Retest in 10 minutes</p> | | <p>If NO response or glucose less than 4mmol/L</p>  | <p>If response greater than 4mmol/L</p>  |
| <p>Repeat treatment</p>  | | <p>Give either:</p> <ul style="list-style-type: none"> ✓ Slice of bread, small yoghurt, 2 plain biscuits <i>or</i> ✓ 1 glass of milk <i>or</i> ✓ Meal if due within 15 minutes | |
| <p>Notify doctor if capillary glucose level is not above 4mmol/L within 30 minutes <i>and</i> continue with 'hypo' treatment.</p> | | <p>NOTIFY GP if capillary blood glucose level is not above 4mmol/L within 30 minutes BUT continue with 'hypo' treatment.</p> | |

REMINDER: Be wary of 'hypos' in the elderly who are on **sulphonylureas (glipizide or gliclazide)**. Re-check capillary glucose again in 3-4 hours after treating the hypo as the action of these medications can cause the capillary glucose to fall again.

If unconscious
This is a medical emergency.
If no doctor is immediately available dial 111.

Diabetes Guidelines for Elderly Residents in Age Related Residential Care (ARRC) Facilities

Appendix 6: Management of Hyperglycaemia Wall Chart

Hyperglycaemia - happens when blood glucose levels rise **too high**.

There is no cut off as high blood sugar levels needs to be assessed in the context how well a person with diabetes is. Generally, once the blood glucose is above 25 mmol/L, a person feels unwell, and has symptoms.

Be aware that glucose between 15-25 mmol/L can be too high for an unwell person with diabetes.

The symptoms include:

- increased thirst and urination
- headaches
- lethargy/ lack of energy

Recommendations for the management of capillary blood glucose levels:

| Capillary blood glucose | |
|--|--|
| Less than 6 mmol/L | Notify GP for review of diabetes medication |
| 6 – 15 mmol/L | This range is acceptable If the patient has hypoglycaemia (More than twice a month) notify the GP for review of diabetes medication. |
| Greater than 15 mmol/L | Carry out ketone urine test. Notify GP to review diabetes medication. |
| Greater than 25 mmol/L | Notify GP for active treatment guidance. |
| Complications of high blood glucose- hyperglycaemia | |
| <p>Hyperglycaemic Hyperosmolar State</p> <p>This occurs in people with Type 2 diabetes who are experiencing very high blood glucose levels (greater than 40 mmol/L).</p> <p>It can develop gradually, over a course of weeks, through a combination of illness, dehydration and an inability to take routine diabetes medication. Symptoms include frequency urination, great thirst, nausea, dry skin and mucous membranes, disorientation and during later stages; drowsiness and loss of consciousness.</p> <p>This is a potential life-threatening emergency and hospitalisation is required.</p> | <p>Diabetic ketoacidosis</p> <p>This occurs when ketones develop when the blood glucose level is high and there is a lack of insulin available to the body.</p> <p>Because the body cannot use glucose, it burns fat as an alternative energy source. The by-product of this process is the production of ketones. Ketones are easily detected by a simple urine test, using strips available on prescription. People with diabetes should have their urine tested for ketones if their blood glucose is high or they have symptoms of ketoacidosis.</p> <p>Any person with diabetes who relies on administering insulin could develop diabetic ketoacidosis.</p> |

Diabetes Guidelines for Elderly Residents in Age Related Residential Care (ARRC) Facilities




Appendix 7: Managing Diabetes when the Resident is Sick Wall Chart

Sick Day Advice

1. Illness such as colds, flu, infections, vomiting or diarrhoea may create special problems for people with diabetes, as illness tends to worsen diabetes control.
2. When sick, fluids are lost from the body and must be replaced. Give at least one glass of fluid every hour, especially if there is diarrhoea or vomiting. If blood glucose is **less than 8mmol/L**, give fruit juice or flat fizzy drinks. If blood glucose is **higher than 8mmol/L**, give water, soda water or mineral water.
3. If the resident has a sore mouth or cannot chew, offer custard, fruit yoghurt, Milo, ice cream or jelly.
4. If the resident has diarrhoea, avoid dairy products. Give Oxo cubes or beef stock, chicken cubes or stock, or Vegemite/Marmite as a drink, soup with dry toast or bread.

Special care is required to prevent more serious problems developing.

Recommendations

| | | |
|---|---|--|
| Test blood glucose 4 times a day |  | If the test is continually higher than 15mmol/L then contact the GP. |
| Continue to give usual diabetes tablets / insulin. EXCEPTION: Do not give Metformin if patient is vomiting or has diarrhoea. | | The blood glucose may rise during illness, so the diabetes medicines are needed. |
| Ensure plenty of fluids taken | | Dehydration can develop quickly Give one glass of fluid every hour. |
| Find the cause of the illness. |  | Contact the GP if necessary. |
| If the resident has any of the following: <ul style="list-style-type: none"> • Vomiting or diarrhoea persisting more than 12 hours • Persistent blood glucose levels >15mmol/L • Infection or fever |  | Contact the GP. |

Diabetes Guidelines for Elderly Residents in Age Related Residential Care (ARRC) Facilities

Appendix 8: PDSA Quality Cycle Template

PDSA Cycles _____

Date: _____

PDSA = Plan, Do Study, Act. Now choose one of these ideas and PLAN what you are going to do, DO it, STUDY what worked, what didn't then ACT – refine, continue, change tack depending on the results.

Topic Area _____

PDSA Cycle Number _____

| | |
|---------------------------------------|---|
| Idea | <i>Describe the idea you are testing: refer to the 3rd fundamental questions, 'What changes can we make that will result in an improvement?'</i> |
| | |
| | |
| Plan | <i>What exactly do you plan to do to test this idea? Remember to keep it simple!</i> |
| What will you do? | |
| Who will do it? | |
| When and where? | |
| Predictions and date to be collected: | |
| Do | <i>Was the plan executed? Document any unexpected events or problems.</i> |
| | DO = DONE |
| | |
| Study | <i>Record, analyse and reflect on the results.</i> |
| What did you find? | |
| What does it mean? | |
| | |
| Act | <i>What will you take forward from this cycle? (next step / next PDSA cycle)</i> |
| What next? | |
| | |
| | |
| | |

How useful was this PDSA for you or your organisation? (Please circle)

1
Not useful

2

3

4

5
Very useful

MODEL FOR IMPROVEMENT

The Three Fundamental Questions

Before completing the three fundamental questions and the PDSA cycle sheet, consider the topic that your work will relate to e.g., Self-Management Support, System Redesign, CVD, Diabetes, Access etc.

TOPIC AREA _____

1. What are we trying to accomplish?

(By answering this question you will develop your goal for improvement)

2. How will we know that a change is an improvement?

(By answering this question you will develop measures to track the achievement of your goal)

3. What changes can we make that can lead to an improvement?

(List your ideas for change and by answering this question you will develop the ideas you would like to test to achieve your goal)

Idea 1

Idea 2

Idea 3

Appendix 9: Patient Information Brochures

Patient information brochures are available from the following sources:

Hawke's Bay District Health Board
Resource Room
Napier Health Centre
76 Wellesley Road
Napier 4110
Tel: 06 834 1815 ext: 4162
Fax: 06 834 1894
E-mail: wendi.wolfen-duvall@hbdhb.govt.nz

Health Navigator New Zealand Website
<http://www.healthnavigator.org.nz/health-topics/diabetes>

Diabetes New Zealand
<http://www.diabetes.org.nz/home>

Appendix 10: PHARMAC Subsidy Rules

According to the Pharmaceutical Schedule and updates, as of 1 February 2013 the following subsidy rules applied:

Insulin Syringes

- Disposable with attached needle
- Maximum of 100 per prescription (prescribed on the same prescription as the one used for the supply of insulin or when prescribed for an insulin patient and the prescription is endorsed accordingly)
- Sizes: 0.3mL, 0.5mL and 1mL
- Gauge: 29g and 31g Needle size: 12.7mm or 8mm
- Subsidised brands: ABM, B-D Ultra Fine

Insulin Pen Needles

- Maximum of 100 per prescription (prescribed on the same prescription as the one used for the supply of insulin or when prescribed for an insulin patient and the prescription is endorsed accordingly)
 - Gauge: 29g, 31g and 32g
 - Sizes: 12.7mm (29g), 8mm (31g), 6mm (31g), 5mm (31g), 4mm (32g)
 - Subsidised brands: ABM, B-D Micro Fine
- (Note: Not all of the above brands are available in multiple sizes or gauge).

Blood Glucose Meters

- Only one CareSens N meter per patient (no further prescriptions will be subsidised). Patients who have a previously funded meter(not CareSens N) are eligible for a CareSens N meter
- Maximum of one meter per prescription (The prescription must be endorsed accordingly)
- A diagnostic blood glucose test meter is subsidised for a patient who:
 - is receiving insulin or sulphonylurea therapy; or
 - is pregnant and has diabetes; or
 - is on home TPN at risk of hypoglycaemia or hyperglycaemia; or
 - has a genetic or an acquired disorder of glucose homeostasis excluding type 1 or type 2 diabetes and metabolic syndrome.
- An Optium Meter is funded for the purposes of blood ketone diagnostics only if the patient has had one or more episodes of ketoacidosis and is at risk of future episodes. Only one meter per patient will be subsidised every 5 years.

Blood Glucose Testing (CareSens and CareSens N)

- The number of test strips available on a prescription is restricted to 50 unless:
 - Prescribed with insulin or a sulphonylurea but are on a different prescription and endorsed accordingly; or
 - Prescribed on the same prescription as insulin or a sulphonylurea in which case the prescription is deemed to be endorsed; or
 - Prescribed for a pregnant woman with diabetes and endorsed accordingly; or
 - Prescribed for a patient on home TPN at risk of hypoglycaemia or hyperglycaemia and endorsed accordingly; or
 - Prescribed for a patient with a genetic or an acquired disorder of glucose homeostasis excluding type 1 or type 2 diabetes and metabolic syndrome and endorsed accordingly.
- Freestyle Optium blood glucose test strips are fully funded only for those patients meeting Special Authority criteria. (Patient was testing and had received both blood ketones and blood glucose strips using the FreeStyleOptium (previously named OptiumXceed) blood glucose meter prior to 1 June 2012)

Ketone Testing

- Maximum of 20 strips per prescription (Not available on BSO)
- Subsidised brands: Freestyle Optium Ketone

Appendix 11: Blood Glucose Monitoring Sheets

The following five sheets have been developed for the recording of routine blood capillary glucose levels and any additional monitoring e.g. during periods of illness. They have been set up in 13 week blocks to allow the resident's general practitioner a quick glance and levels since his/her previous three-monthly appointment.

- ① Sulphonylureas (glipizide, gliclazide)
- ② Insulin: Basal Only (Lantus)
- ③ Insulin: Fixed Dose (Protaphane, Humulin NPH)
- ④ Insulin: Basal / Bolus (Humalog, Novorapid or Apidra and Lantus; Protaphane and Humulin NPH; HumalogMix or NovoMix '30')
- ⑤ Prescriber requested testing regimen

① Sulphonylureas (glipizide, gliclazide)



Age Related Residential Care Resident with Diabetes Blood Glucose Monitoring

Resident Name: _____ NHI: _____ DOB: _____

Regular Monitoring - Current Plan:

Test before breakfast and before bed **ONE day per week**

| Week | Date | Before Breakfast | Before Bed |
|------|------|------------------|------------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |

Sick Day Monitoring

| Date | Time | Reading | Time | Reading | Time | Reading | Time | Reading | Time | Reading |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

② Insulin: Basal Only (Lantus)



Age Related Residential Care Resident with Diabetes Blood Glucose Monitoring

Resident Name: _____ NHI: _____ DOB: _____

Regular Monitoring - Current Plan:

Before breakfast test **TWO consecutive mornings per week**

| Week | Date | Before Breakfast | Date | Before Breakfast |
|------|------|------------------|------|------------------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |

Sick Day Monitoring

| Date | Time | Reading | Time | Reading | Time | Reading | Time | Reading | Time | Reading |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

③ Insulin: Fixed Dose (Protaphane, Humulin NPH)



Age Related Residential Care Resident with Diabetes Blood Glucose Monitoring

Resident Name: _____ NHI: _____ DOB: _____

Regular Monitoring - Current Plan:

Before **each meal** on **TWO** days a week.

| Week | Date | Before Breakfast | Before Lunch | Before Evening Meal | Date | Before Breakfast | Before Lunch | Before Evening Meal |
|------|------|---------------------|-----------------|---------------------------|------|---------------------|-----------------|---------------------------|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |

Sick Day Monitoring

| Date | Time | Reading | Time | Reading | Time | Reading | Time | Reading | Time | Reading |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

④ Insulin: Basal / Bolus (Humalog, Novorapid or Apidra and Lantus; Protaphane and Humulin NPH; HumalogMix or NovoMix '30')



Age Related Residential Care Resident with Diabetes Blood Glucose Monitoring

Resident Name: _____ NHI: _____ DOB: _____

Regular Monitoring - Current Plan:

Before and TWO hours after breakfast, lunch and dinner on **ONE day a week.**

| Week | Date | Before Breakfast | 2 hours after Breakfast | Before Lunch | 2 hours after Lunch | Before Dinner | 2 hours after Dinner |
|------|------|---------------------|-------------------------------|-----------------|---------------------------|------------------|----------------------------|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |

Sick Day Monitoring

| Date | Time | Reading | Time | Reading | Time | Reading | Time | Reading | Time | Reading |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

⑤ Prescriber requested testing regimen



Age Related Residential Care Resident with Diabetes Blood Glucose Monitoring

Resident Name: _____ NHI: _____ DOB: _____

Regular Monitoring - Current Plan:

| Instructions: | | | | | | | |
|---------------|------|--|--|--|--|--|--|
| Week | Date | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |

Sick Day Monitoring

| Date | Time | Reading | Time | Reading | Time | Reading | Time | Reading | Time | Reading |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Acknowledgements

A Diabetes Clinical Advisory Group was formed in 2011 to review the information gathered from a study of glucose monitoring in Age Related Residential Care (ARRC) facilities in Hawke's Bay. The study was carried out in 2010 by Anne Denton and Di Vicary, Clinical Pharmacists from Health Hawke's Bay. This Clinical Advisory Group also provides guidance on the review of the resources.

We are indebted to all those involved with the development of these resources and their ongoing review, including attending meetings extramurally and accepting additional responsibilities. It is very much appreciated.

Our grateful thanks go to the Age Related Residential Care facility staff that provided feedback on the resources and then embraced them by incorporation into daily clinical practice. Your energy and enthusiasm for providing high quality care to your residents is infectious.

Additional acknowledgements:

Health Hawke's Bay

Hawke's Bay District Health Board

If you would like further information, please contact:

Di Vicary

Clinical Facilitator Medicines and Diagnostics

pharmacist@healthhb.co.nz

(06) 871 5663

Terrie Spedding

RN/Diabetes Nurse Specialist

Monday & Wednesday

terrie@healthhb.co.nz

(06) 871 5646

Janet Hill

Diabetes Information Service Centre Administrator

janet@healthhb.co.nz

(06) 871 5681

References:

- ¹ RACIP Care Guides. Waitemata District Health Board [internet]. 2010 [cited 2013 February 11]. Available from: <http://www.waitematahnb.govt.nz/HealthProfessionals/RACIPcareguides.aspx>
- ² New Zealand Primary Care Handbook 2012 Ministry of Health [internet]. 2012 [cited 2013 September 30]. Available from: <http://www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012>
- ³ Monitoring diabetes in people over 75. bpacNZ Report [internet] 2012 [cited 2013 February 11]. Available from: <http://www.bpac.org.nz/resources/reports/2012/diabetesMonitoring75.asp>
- ⁴ Testing for CVD, diabetes and renal disease in elderly people. Best Tests. 2012 March. Available from: http://www.bpac.org.nz/resources/bt/2012/03_elderly.asp
- ⁵ Sinclair A (Working Group Chair) et.al. *Good clinical practice guidelines for care home residents with diabetes*. Diabetes UK. January 2010.
- ⁶ *Guidelines for the management and care of diabetes in the elderly*. May 2003. The Australian Diabetes Educators Associated (ADEA). www.adea.com.au/asset/view_document/979316042
- ⁷ *Diabetes guidelines for elderly residents in long-term-care (LTC) facilities*. April 2010. Diabetes Care Program of Nova Scotia. www.diabetescareprograme.ns.ca
- ⁸ Diabetes Care Improvement Package - Frequently Asked Questions. Ministry of Health [internet]. 2012 July [cited 2013 February 11] Available from: <http://www.health.govt.nz/our-work/diseases-and-conditions/diabetes/diabetes-care-improvement-package>.
- ⁹ NZSSD Position Statement on the diagnosis of, and screening for, Type 2 Diabetes. September 2011
- ¹⁰ "Best Practice Nutrition Guidelines for Diabetic Residents" Robyn Richardson, Hawke's Bay District Health Board, Population Health Dietitian (Older People) Planning & Performance.
- ¹¹ The Otago Exercise Programme (OEP). October 2009. www.acc.co.nz/preventing-injuries/at-home/older-people/information-for-older-people/otago-exercise-programme/index.htm
- ¹² American Diabetes Association. Standards of Medical Care in Diabetes – 2013. *Diabetes Care*. 2013;36(supplement 1):S11-S66.
- ¹³ What is HbA_{1c} testing? www.everybody.co.nz
- ¹⁴ Guidance on the Management of Type 2 Diabetes 2011. 2011. Ministry of Health, New Zealand
- ¹⁵ Procedure for blood glucose monitoring. NHS Wirral. www.wirral.nhs.uk/document_uploads/Policies_and_Procedures_Nursing/NPD03ProcedureforBloodGlucoseMonitoring.pdf (Assessed, 8 September 2010).
- ¹⁶ CareSens website (<http://caresens.co.nz>). Accessed 22 February 2013.)
- ¹⁷ Infection prevention during blood glucose monitoring and insulin administration. Centers for Disease Control and Prevention. 26 August 2010. www.cdc.gov (Accessed 8 September 2010)
- ¹⁸ HBDHB Hand Hygiene and General Glove Use Policy. ©2008 (Accessed 10 September 2010)
- ¹⁹ HBDHB Standard Precautions Guidelines ©2008 (Accessed 10 September 2010)
- ²⁰ Information for Healthcare Professionals: risk of transmission of blood-borne pathogens from shared use of insulin pens. US Food and Drug Administration 19 March 2009 www.fda.gov (Accessed 8 September 2010)
- ²¹ Diabetes and Viral Hepatitis: Important information on glucose monitoring. Centers for Disease Control and Prevention. 27 August 2010. www.cdc.gov (Accessed 8 September 2010)
- ²² Use of finger stick devices on more than one person poses risk for transmitting blood borne pathogens: initial communication. US Food and Drug Administration 26 August 2010 www.fda.gov (Accessed 8 September 2010)
- ²³ Personal Communication with Pavey D. Pharmaco Healthcare, Auckland, New Zealand. 2013 February 27
- ²⁴ Personal Communication with Pavey D. Pharmaco Healthcare, Auckland, New Zealand. 2013 April 5
- ²⁵ Medicines and Healthcare products Regulatory Agency. Medical Device Alert MDA/2013/019. 2013 March 27 Available from: <http://www.mhra.gov.uk/home/groups/dts-bs/documents/medicaldevicealert/con254853.pdf>
- ²⁶ Guidance on the Management of Type 2 Diabetes. 2011. Ministry of Health, New Zealand
- ²⁷ Hirsch LJ, Gibney MA, Albanese J, et al. Comparative glycaemic control, safety and patient ratings for a new 4 mm x 32G insulin pen needle in adults with diabetes. *Curr Med Res Opin*. 2010; 26 (6): 1531–1541.
- ²⁸ Guidelines for the management and care of diabetes in the elderly. May 2003. The Australian Diabetes Educators Associated (ADEA). http://www.adea.com.au/asset/view_document/979316042
- ²⁹ Diabetic Ketoacidosis DAVID E. TRACHTENBARG, *Am Fam Physician*. 2005 May 1;71(9):1705-1714.
- ³⁰ Institute for Innovation and Improvement. www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/plan_do_study_act.html
- ³¹ Institute for Innovation and Improvement. www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/plan_do_study_act.html
- ³² Institute for Healthcare Improvement (IHI). www.ihl.org/knowledge/Pages/HowtoImprove/default.aspx