



# **Diabetes Management in Lanarkshire Care Homes**

#### Aim(s) and objective(s)

To ensure that those people with Diabetes Mellitus (DM) who are living in care homes are provided with an appropriate level of assessment, care and ongoing treatment.

#### Author(s)

June Currie, Diabetes Service Manager Trish McCue, Diabetes Specialist Nurse

#### User group

All Diabetes specialist staff in Lanarkshire All community health care professionals involved in diabetes care within NHS Lanarkshire Those people with DM (incl. partners, family and carers) living in Lanarkshire All Care Home staff

#### Guideline

#### SCREENING FOR DIABETES

The early identification of diabetes is important in order to control symptoms and prevent the onset of complications. On admission the following should be undertaken and recorded for all people without pre-existing diabetes

- Urinalysis for glucose and a fasting venous blood glucose measurement within 7 days of admission
- If diabetes suspected, GP should confirm using the Diabetes MCN Diagnosing Diabetes guideline
- If diagnosed with diabetes, develop care plan in conjunction with resident, care home staff and GP. Areas to include are blood glucose monitoring, BP, drug regimen, diet and weight management, skin and foot care and annual review including eye screening
- If not diagnosed with diabetes screening should be carried out at two yearly intervals. This should consist of testing fasting venous blood glucose and HbA1c measurement
- Family history of diabetes should be recorded

# MONITORING OF DIABETES IN CARE HOMES

On admission the following should be taken and **recorded** for all **people with diabetes**. These will also inform the **future management** for these patients which includes **annual review**.

#### Assessment

- Full diabetes history including enquiries about thirst, polyuria, nocturia, lethargy, recurrent infections, weight loss or weight gain
- Full medical history including any allergies
- Details of present medication including diabetes medication
- A history of the person's appetite, food and fluid intake. This should then be observed following admission
- A full continence assessment including bladder and bowel continence, constipation and urinary frequency
- Examination of the patient's feet, paying particular attention to infection, circulation, calluses, ulcers or deformity neuropathy and the patient's gait. The suitability of footwear and hosiery should also be considered. Refer to podiatry for ongoing review and treatment, if any concerns





#### Assessment (continued)

- Smoking and alcohol history
- General observation for visual impairment. Refer for retinal screening (if diagnosis not recorded on GP IT systems for back population of SCI Diabetes Retinal Screening register)
- Record whether or not the person attends hospital diabetes specialist service or has contact with the community diabetes specialist nurse or dietician
- Does the person self monitor their diabetes? Check when their equipment was last quality controlled and that their consumables are still within their expiry date. Check their technique (for further information see the Diabetes MCN Self Monitoring of Blood Glucose Guideline 2014)
- If on insulin, check the person's injection technique and injection sites
- History of hypoglycaemia, frequency, symptoms and treatment
- Height and weight
- Arrange for blood tests (U&E, eGFR, LFT, HbA1c, lipids, thyroid, and FBC) and white topped urine sample for dipstick urinalysis and albumin:creatinine ratio (ACR) (baseline set of results)
- Blood Pressure

**Future management** of the resident with diabetes will be determined by the information gathered on your initial assessment. Annual review for all patients with diabetes should be scheduled.

#### DRUG ADMINISTRATION

#### Introduction

Due to the nature of diabetes and its management for the prevention of the development and progression of complications, there is a tendency for people with diabetes to receive polypharmacy. This may include treatment for hyperglycaemia, hypertension or hyperlipidaemia and symptom management of complications.

All nurses have a duty when administering drugs to be familiar with the resident's care plan to ensure accuracy of prescription, judge the suitability of administration and to monitor the effects.

#### Insulin

Insulin which is currently in use does **not** need to be stored in a fridge. It can be stored for 1 month at room temperature, so change the expiry date on the packaging to 1 month from the date it is first used. If you choose to keep it in the fridge, it should be left at room temperature for 20 minutes before administration. Insulin that is cloudy should be thoroughly mixed before use. All spare insulin should be stored in a fridge until ready for use.

Some insulin should be given 30 minutes before a meal, but some are injected immediately before food. Please check before administration which insulin your resident is receiving.

A blood sugar reading should always be taken prior to insulin administration.

Insulin should never be withheld without advice from the Doctor or Diabetes Specialist Nurse.

#### **Insulin Absorption**

Three factors play a key role in insulin absorption:

- 1. Depth of subcutaneous tissue
- 2. Injection site
- 3. Injection technique

#### Sites and Injection Technique

The best place to inject insulin is into the fatty areas around abdomen, buttocks or thighs. Insulin is injected at a 90 degree angle. It is very important to alternate injection sites with each injection. The site of injection should be recorded as different sites absorb at different rates.





# Needle Size

Insulin needles come in different sizes. In general use:

 8mm for those of normal or overweight, pinch the skin if normal, do not pinch the skin if overweight

**Please Note:** If a patient is unable to administer their own insulin we do **not** recommend insulin pens where possible. Please use insulin syringes for these patients. If using pen device, use appropriate needle remover. For further advice see the Diabetes MCN Insulin Administration for Nursing Staff guideline 2014.

#### ORAL HYPOGLYCAEMIC (GLUCOSE LOWERING) AGENTS

#### Sulphonylureas:

Drug Name	Doses		
Amaryl®/Glimepiride	1mg, 2mg, 3mg, 4mg		
	Maximum dose: 6mgs daily		
Daonil®/Glibenclamide*	5mg		
	Maximum dose:15mgs daily		
Semi-Daonil®/Glibenclamide*	2.5mg		
Diamicron MR®	30mg		
	Maximum dose: 120mgs daily		
Diamicron®/Gliclazide	80mg		
	Maximum dose: 320mg daily		
Euglucon®/Glibenclamide*	5mg		
	Maximum dose: 15mgs daily		
Glibenese®/Glipizide	5mg		
	Maximum dose: 20mgs		
Minodiab/Glipizide	2.5mg,5mg		
	Maximum dose: 20mgs daily		

\*Avoid in the elderly, use shorter acting sulphonylureas instead. Residents on these drugs are at risk of hypoglycaemia.

#### Biguanide

Drug Name	Doses
Glucophage®/Metformin	500mg and 850mg
	Maximum dose: 3 grams daily
Glucophage SR®	500mg
	Maximum dose: 4 tabs once daily with evening meal

#### Thiazoidinedione

Drug Name	Doses
Actos/Pioglitazone	15mg,30mg, and 45mg
	Maximum dose:45mgs

#### Thiazoidinediones/Biguinide Combination

Drug Name	Doses
Competact®/	15/850
Pioglitazone+metformin	Maximum dose: 2 tablets daily

Glucosidase Inhibitor				
Drug	Name		Doses	
	0.44		50	1 4 0 4

2.09.10.00	20000		
Glucobay®/Acarbose	50mg and 100mg		
	Maximum dose: 200mgs three times daily		
<b>DPP-4 Inhibitors</b> * use with caution in the elderly			
Drug Name	Doses		





Onglyza®/Saxagliptin	2.5 - 5mg
	Maximum dose: 5mgs daily
Januvia®/Sitagliptin	100mg
	Maximum dose: 100 mg daily
Tradjenta®/Linagliptin	5mg
	Maximum dose: 5mg daily

# **DPP-4 Inhibitor + Biguanide** \* use with caution in the elderly

Drug Name	Doses		
Komboglyze®/saxagliptin + metformin	2.5mg/850mg and 2.5mg/1000mg		
	Maximum dose: 1 tablet twice daily 2.5mg/1000mg		
Janumet®/sitagliptin+metformin	50mg/1000mg		
	Maximum dose: 1 tablet twice daily		
Jentadueto®/linagliptin + metformin	2.5mg/850mg and 2.5mg/1000mg		
	Maximum dose: 1 tablet twice daily 2.5mg/1000mg		

#### **Dapagliflozin** \*not recommended in elderly >75yrs

Drug Name	Doses		
Forxiga®/Dapafliflozin	5mg, 10mg daily		
	Maximum dose 10mg daily		

# **INJECTABLE GLUCOSE LOWERING AGENTS**

#### **GLP – 1 Analogues** \* use with caution in the elderly

Drug Name	Doses	
Lyxumia®/Lixisenatide	10mcg, 20mcg daily	
	Maximum dose: 20mcg daily	
Byetta®/Exenatide	5mcg,10mcg	
	Maximum dose: 10mcg twice daily	
Bydureon®/Exenatide MR	2mg	
	Maximum dose: 2mg weekly	
Victoza®/Liraglutide	0.6mg, 1.2mg, 1.8mg	
	Maximum dose usually 1.2mg daily	

**NB** All are administered by subcutaneous injection; Exenatide within 1 hour before food; specific timing is less of an issue with Lixisenatide, Exenatide MR and Victoza – check with the health care professional.

# **Combination Therapy**

This is where more than one class of drug is prescribed together to lower blood glucose.

For more information see the Diabetes MCN Glycaemic Control in Type 2 Diabetes guideline 2014.

#### Other Drugs

People with Diabetes may be taking other types of medication. All drugs should be given as prescribed. Medication should be reviewed by a GP on a regular basis. Any suspected drug reaction/interaction should be recorded and reported to a GP.

#### Pharmacy

Any issues regarding the pharmaceutical care should be discussed with the contracted pharmacist for the care home.

#### Recording

All drugs administered and their effect should be recorded clearly in the resident's record. **HYPOGLYCAEMIA (LOW BLOOD GLUCOSE)** 



# Too much insulin or tablets (sulphonylurea)

- Missed or delayed meals
- Increased activity
- Liver or kidney disease
- Alcohol

Causes

# Signs and symptoms Mild

Sweating Dizziness Trembling Tingling Hunger Blurred vision Moderate Blurred Vision Palpitations Headache Odd behaviour Aggressive behaviour

# NB: Each resident may have only some of the above symptoms. It is important to be aware that after a long duration of diabetes or if the resident has history of dementia or cerebrovascular disease, warning signs of hypoglycaemia may be absent. It is important to recognise these symptoms if you are caring for a resident with diabetes who may not be aware of hypoglycaemia.

# Treatment

1 glass of original lucozade, followed by a sandwich or biscuit

**OR** 3 Dextrose tablets, followed by a sandwich or a biscuit

**OR** 1 tube of glucose gel rubbed into the inside of the cheek, followed by a sandwich or biscuit.

Check the blood glucose after 15 minutes and repeat above if necessary. If unable to swallow give Glucagen (GlucaGen HypoKit®) by injection (subcutaneously or intramuscularly) as prescribed AND call for ambulance / medical assistance.

Glucagen works by raising blood sugar and takes about 15 - 20 minutes to work. It is a prescription only medicine and staff education is necessary. If administered it will only last a short time, once the resident has recovered give 100ml of original lucozade or 4-6 Dextrose tablets or 1 tube of glucose gel. Follow this up with a sandwich or two biscuits.

In the case of **severe** hypoglycaemia the resident may be unconscious or experiencing seizures. Ensuring the resident's safety is the priority whilst maintaining their airway.

- Dial 999
- Administer Glucagen by injection subcutaneously or intramuscularly if prescribed.
- DO NOT GIVE ANYTHING BY MOUTH

# Follow up

Following hypoglycaemia treatment, insulin therapy should be administered as prescribed if the blood glucose reading is above 8mmol/l. Incidents of hypoglycaemia should be referred to GP or DSN for review of medication. Patients who have hypoglycaemic unawareness (no warning symptoms) should be assessed by a GP or Diabetes Specialist Nurse.

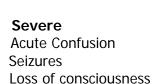
diabetes dilemmas

This occurs when the blood sugar drops to a level which does not sustain normal function. In most cases hypoglycaemia will occur at blood sugar levels below 4mmol/l but this may vary from person to person. It is important to establish and **document** the person's awareness of hypoglycaemia.

# Prevention of hypoglycaemia is paramount in the elderly.

# DIABETES Managed Clinical Network











# HYPERGLYCAEMIA (RAISED BLOOD GLUCOSE)

The GP, care staff and if appropriate, the Diabetes Specialist Nurse should agree an individual, appropriate blood sugar level.

# Symptoms

- None
- Polyuria
- Polydypsia
- Lethargy/tiredness
- Urinary incontinence
- Falls
- New onset confusion or worsening confusion

#### Causes

- Omission or reduction of insulin or tablets
- Increased carbohydrate/sugar intake
- Reduced activity
- Infection
- Acute medical or surgical illness
- Emotional upset

In Type 1 Diabetes prolonged episodes of hyperglycaemia may lead to Diabetic Ketoacidosis (DKA). In Type 2 Diabetes it may lead to Hyperosmolar Non-ketosis (HONK). Both are life-threatening conditions requiring hospital admission.

#### Sick day rules

Some common illnesses can upset diabetic control e.g. the common cold or flu, sore throats, stomach upsets and urinary tract infections. Blood sugar levels may rise even when the patient is unable to eat or drink.

Type 1 or Insulin Treated Type 2	Type 2 (Diet or Tablets)
DO NOT WITHOLD INSULIN	Continue tablets
Check blood glucose 2 hourly	Check blood glucose 4 hourly
Test urine for Ketones if blood glucose	
>15mmol/l	
If vomiting contact GP	If vomiting contact GP
If ketones present contact GP	

If unable to have solid food, try cereal, porridge, soup and bread or milk pudding. If unable to take any of above sweet drinks can be offered as a carbohydrate substitute especially if there are concerns re possible hypoglycaemia.

Encourage plenty of fluids e.g. water, diet or sugar free drinks.

If symptoms persist for 24 hours refer to GP.





# BLOOD GLUCOSE MONITORING IN CARE HOMES

#### Blood Glucose Monitoring

- Enables an understanding of a person's glycaemic control
- Can help identify trends of hyperglycaemia and hypoglycaemia
- Allows appropriate changes to be made to diet or medication

The normal blood glucose is between 4 - 6mmols/l, however in the elderly targets can be relaxed and range between 7 - 12mmols/l. The aim of treatment in the elderly is to avoid hypoglycaemia and the osmotic symptoms of hyperglycaemia (thirst and polyuria).

#### Recommendations

#### Type 2 Diabetes Treated With Diet and Exercise

- HbA1c is the primary outcome measure, and should not be measured more frequently than 3 months and at least 6-12 monthly. Target should be individual to the resident
  HbA1c is within individual target; blood glugges monitoring is not required routingly.
- HbA1c is within individual target: blood glucose monitoring is not required routinely

#### <u>Type 2 Diabetes Treated With Metformin (alone or in combination with pioglitazone,</u> <u>'gliptin, DAPA or non insulin injectable therapy)</u>

• See diet and exercise

#### Type 2 Diabetes Treated With Sulphonylurea (alone or in combination therapy)

- Hypoglycaemia a possibility therefore blood glucose monitoring recommended
- Two tests per day on 1 or 2 days each week at different times of the day

# Type 2 Diabetes Treated With Insulin

- Blood glucose monitoring should be an integral part of management
- Always check blood glucose prior to insulin injection

#### More frequent monitoring should be considered in the following situations:

- If HbA1c is out with individual target: particularly if dose titration is required
- During intercurrent illness and infection
- During periods of poor glycaemic control, especially if symptomatic
- When steroids are prescribed for other medical conditions
- Following sulphonylurea induced hypoglycaemia, until appropriate measures have been taken to reduce the risk of recurrence
- If conversion to insulin therapy is being considered
- Hypoglycaemia unawareness

**Please Note:** Please check urine for ketones if blood glucose greater than 20mmols/l. If urinalysis is positive for ketones, please contact the GP immediately.

# Type 1 Diabetes Treated with Insulin

- Blood glucose monitoring should be an integral part of management
- Always check blood glucose prior to insulin injection





#### More frequent monitoring is considered in the following situations

- If HbA1c is outwith individual target
- During intercurrent illness and infection
- After an episode of ketoacidosis
- Hypoglycaemic unawareness
- Frequent hypoglycaemia
- During steroid treatment
- Out patient procedures

**Please Note:** Please check urine for ketones if blood glucose greater than 15mmols/l. If urinalysis is positive for ketones, please contact GP immediately.

#### **General Recommendations**

- Only qualified nursing staff who have attended a training session in the use of blood glucose monitoring equipment should perform patient tests
- Meters should not be issued to residents without demonstration
- Residents who have their own meter should **never** share meter with other residents
- Finger Pricking devices must **never** be shared
- Make sure the resident's hands are clean prior to testing
- Use a different finger each time
- Use a new lancet each time
- Record results
- Dispose of consumables appropriately

# DIABETES AND DIET

A healthy varied diet is the cornerstone of treatment for diabetes. The main dietary principles include:

# **Regular Meals**

Residents with diabetes need to eat regular meals including breakfast, lunch, an evening meal and a small bedtime snack daily to prevent hypoglycaemia (a low blood glucose level) if they are taking tablets or insulin injections.

#### Carbohydrate / Fibre

- Foods containing starchy carbohydrate such as bread, potatoes, cereals, rice and pasta should be encouraged and form the main part of every meal. In particular high fibre foods such as wholemeal bread and wholegrain cereals help to prevent constipation. The fibre in porridge, peas, beans, lentils, fruit and vegetables also helps to improve blood glucose control
- When taking a high fibre diet it is very important to drink plenty of fluids (8-10 cups per day)

# Sugar

- Cut down on sugar and very sweet foods such as sugary drinks, sweets, chocolate and cakes. However there is no reason why residents with diabetes should not eat small portions of cake or chocolate occasionally providing it is part of a healthy diet
- Artificial sweeteners such as saccharin and aspartame are useful for sweetening puddings and cereals
- Sugar free drinks and reduced sugar jam and marmalade can be included

# Fruit and vegetables





- Include plenty of fruit and vegetables at each meal including fresh, frozen and tinned fruit in fruit juice. Five portions of fruit, vegetables or pulses are recommended each day, although it is recognised that this may not be achievable, especially in elderly residents with reduced appetite
- A glass of unsweetened fruit juice with a meal, homemade vegetable soup, and offering a selection of fruit and vegetable is also helpful

#### **Diabetic products**

Avoid specialist diabetic foods as they may contain as many calories as the ordinary version of foods and may cause stomach upset and diarrhoea if taken in large amounts.

#### **Special occasions**

Having diabetes doesn't stop you from joining in on special occasions e.g. Christmas, birthdays. The occasional sugary food or celebration meal will do no harm providing this is part of a balanced, healthy diet. It is best if having something sugary to have it just after a meal.

#### Achieving and maintaining a healthy weight

A healthy weight helps to improve diabetes control and reduce the risk of heart disease and stroke.

If the resident is overweight cut down on fatty foods. The best way to do this is by grilling or baking rather than frying foods. Avoiding high fat foods, e.g. pastry, cream, fat on meat, crisps, cheese and biscuits and by using lower fat alternatives such as semi-skimmed milk and low fat spreads.

It is recognised that some residents may be nutritionally at risk, for example being underweight due to acute or chronic illness, or if self-feeding is difficult. For undernourished residents low fat foods are inappropriate.

Full fat milk and dairy products should be given and other high fat foods which provide concentrated sources of calories. Where nutritional supplements are needed, or if other special diets are required, a state registered dietitian should be contacted and will provide further advice.

#### Advice for family and friends

Fresh fruit or sugar free diet drinks are suitable. Diabetic foods are no longer recommended. It is helpful to encourage visitors, who bring gifts such as chocolate, biscuits to offer alternatives instead e.g. magazines and toiletries.

# Alcohol

- Most people with diabetes can continue to include alcohol in their diet in moderation unless they have been medically advised to avoid alcohol
- Alcohol may be taken, but should be monitored to avoid adverse reactions with other drug therapy and prevent hypoglycaemia
- Never drink alcohol on an empty stomach offer some starchy foods to eat beforehand e.g. bread, toast, meal containing potatoes, pasta or rice
- A "hypo" can occur several hours after drinking alcohol so it is best to provide an extra snack, e.g. sandwich, toast, or crisps whilst drinking alcohol. Remember to include a supper with toast/bread

#### Referral to a dietitian

- All newly diagnosed residents with diabetes should be assessed by a State Registered Dietitian
- Residents who have any specific nutritional problems, e.g. poor appetite, poorly controlled diabetes, unexplained weight loss; swallowing difficulties should also be referred at any time.





# DIABETES FOOT CARE

The only way to promote good foot health and prevent problems is by practising regular foot care.

# Daily Foot Health duties:

- Inspect the feet daily check for cuts, blisters, bleeding, sores, swelling or discoloured areas
- Wash the feet daily with mild soap and warm water. Do NOT soak the feet
- Dry especially well between the toes
- Apply a moisturising cream (as often as recommended by the Podiatrist) to the feet, avoiding the areas in between the toes
- Ensure hosiery is clean, avoiding those with tight elastic and prominent seams
- Check the insides of footwear for foreign objects before putting them on

# Other foot health duties:

- Ensure that footwear is appropriate for the resident. Discuss this with the Podiatrist where necessary
- Only file the toe nails regularly if directed to by the Podiatrist

# Always refer anything you are not sure about. Please speak to the Podiatrist about any foot health concerns you may have. Always refer urgently:

- Discoloured areas
- Black areas
- Red, hot foot
- Cold foot







DIABETES ANNUAL REVIEW Please assess the following and arrange with your diabetes contact to review the resident's diabetes care.					
Name D.O.B Sex M/F					
Ethnicity Date o	of Diagnosis		Type of Di	abetes	
DATE				Action	
* Height					
* Weight					
* BP					
Blood Results					
* HbA1c (mmol/mol)			Τ		
Target HbA1c					
Total cholesterol/LDL					
U+E's		<u> </u>			
eGFR					
Liver function tests		<u> </u>			
Thyroid Function tests					
Urinalysis : Gluc/Prot/Ket					
Microalbumin (ACR or PCR)	Pos / Neg	Pos / Neg	Pos / Neg		
Other:					
			ļ		
Screening for complications					
Date of last eye screening					
Any retinopathy	Yes / No	Yes / No	Yes / No		
* Any visual impairment	Yes / No	Yes / No	Yes / No		
Date of last podiatry review			<u> </u>		
* Any foot problems	Yes / No	Yes / No	Yes / No		
Lifestyle Advice					
Never smoked	Yes / No	Yes / No	Yes / No		
Current smoker	Yes / No	Yes / No	Yes / No		
Ex-smoker	Yes / No	Yes / No	Yes / No		
Alcohol units/week	_				
Date of last dietician review					
*Current diabetes treatment					
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Other mediantian reviewed					
Other medication reviewed	Yes / No Yes / No	Yes / No	Yes / No		
* Injection sites examined Miscellaneous	Tes / NU	Yes / No	Yes / No		
* Review SMBG results	Yes / No	Yes / No	Yes / No		
	Yes / No	Yes / No	Yes / No		
* Hypoglycaemic episodes Mild, moderate, severe					
Hypo warning symptoms	Yes / No	Yes / No	Yes / No		
Additional Comments	Tes / NU	1657 110	Tes / NU		
Additional comments					

\* Interim review – every 3 to 6 months





#### References

Scottish Executive (2002) *Scottish Diabetes Framework.* Edinburgh: Scottish Executive. Scottish Executive (2006) *Scottish Diabetes Framework Action Plan.* Edinburgh: Scottish Executive. Diabetes UK (accessed 1.9.11) Good Clinical Practice Guidelines for Care Home Residents with Diabetes. <u>http://www.diabetes.org.uk/About\_us/Our\_views/Care\_recommendations/Good-clinical-practice-guidelines-for-care-home-residents-with-diabetes/</u>

SIGN (2010) 116: Management of Diabetes Edinburgh: Scottish Intercollegiate Guidelines Network

#### Further Reading

Diabetes UK web site - <u>www.diabetes.org.uk/</u>

United Kingdom Prospective Diabetes Study web site – <u>http://www.dtu.ox.ac.uk/ukpds/</u> Department of Health (2001) National Service Framework for Diabetes.

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/ DH\_4002951

Lanarkshire Diabetes MCN guidelines 2014. Available at: <u>http://www.nhslanarkshire.org.uk/Services/Diabetes/Pages/default.aspx</u>

#### **Diabetes MCN endorsement**

May 2014

#### **Review Date**

May 2017