

Module A

Principles of Diabetes

1A Screening, prevention and early detection of type 2 diabetes

Learning Aims

To recognise why screening for type 2 diabetes is important

To have an awareness of the risk factors which increase the risk of diabetes and what strategies are needed to minimise them

Elements of diabetes care for residents – what is usually expected?

Sinclair AJ et al, Diabetic Medicine (2019)



- To receive plenty of oral fluids to maintain a good state of hydration
- To maintain a daily appropriate exercise and nutritional plan with regular meals or, if appetite reduced, have food 'little and often'



- To receive their usual diabetes treatment
- To have regular twice daily capillary blood glucose testing with the aim to keep the non-fasting level between 7-12 mmol/l



- To have regular foot checks to ensure early detection of poor blood supply, infection, and regular changes of dressings
- To have the opportunity to have their wishes for any future event documented (e.g. hospital admission) by completion of a ReSPECT form or similar

Prevalence of Diabetes Mellitus in Care Homes: *the Birmingham and Newcastle Screening Studies*

Sinclair AJ, Gadsby R, Croxson SCM et al, *Diabetes Care* 2001; Asprav et al. *Diabetes Care* 2006, **29** (3):707-8

Little evidence of structured diabetes care

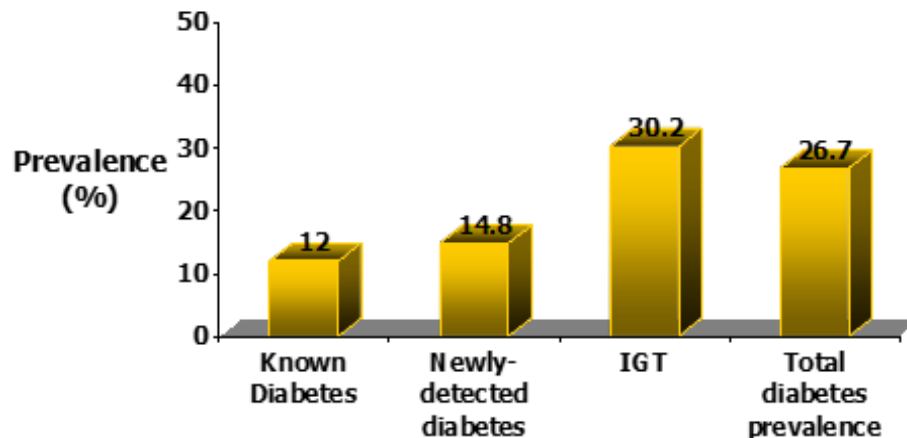
No specialist follow-up

(Reviewed by Sinclair AJ, Aspray TJ, 2009, *Diabetes in Old Age – 3rd edition*)

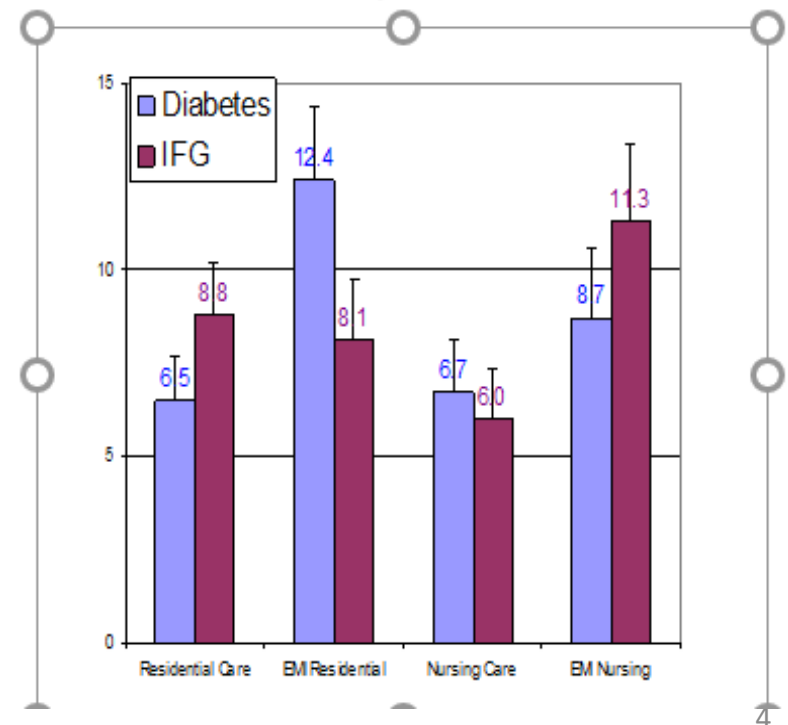
Diabetes is an independent risk factor for admission into a care home

High hospital admission rate with associated high mortality

The Birmingham Study 2001



The Newcastle Study 2006



Screening - 1

- ① Identifies at an early stage those apparently healthy people who may be at increased risk of developing a disease or condition.
- ① Allows further tests and appropriate treatment to be given to reduce their risk and/or any complications arising from the disease or condition.



Screening - 2

- ① The case for population screening for type 2 diabetes appears to be unproven.
- ① Population screening does not appear to meet all of the National Screening Committee criteria.
- ① Screening for higher risk groups may be more feasible
- ① Blood testing by HbA1c and glucose is the best way to detect it.

Type 1 diabetes

- ① Type 1 diabetes is not just a condition in younger people but occurs throughout all age groups
- ① Susceptibility to type 1 diabetes increases if a family member has (or had) type 1 diabetes
- ① Type 1 patients have usually lost a lot of weight before diagnosis.



Type 2 diabetes

- ① The risk factors for type 2 diabetes are well known and include a family history of the condition and having hypertension (high blood pressure).
- ① Being overweight is the primary risk factor. The more fat that has been deposited within the tissues, particularly of the abdomen, liver and muscles, the more resistant the cells become to the action of insulin.
- ① In men, the body stores fat primarily in the abdomen (visceral fat): but it may be stored around the hips and thighs also (subcutaneous fat), although this is more noticeable in women.

Physical exercise

- ① Physical exercise is now becoming recognised as essential activity in all age groups
- ① Physical inactivity and sedentary behaviour leads to an increased risk of type 2 diabetes
- ① Physical activity requires glucose as a source of energy
- ① It also makes tissues more sensitive to insulin, a hormone, that promotes glucose uptake



Other risk factors



- ① Apart from a family history in a parent or sibling, advancing age (>45 years) is another risk factor for type 2 diabetes
- ① There are also racial differences, and people coming from South Asia and Afro/Caribbean backgrounds are more likely to develop type 2 diabetes than Caucasians.

Care homes residents

- ① The risk of type 2 diabetes is increased in residents as they are older (often >75 years), have multiple conditions such as heart disease and frailty, and they may not be physical active.
- ① As people get older, body composition changes, and they lose muscle mass and strength (sarcopaenia), and experience an increase in fat mass often more noticeable in women.



Summary 1 -Risk factors for type 2 diabetes

- ⊙ Parent or sibling with type 2 diabetes
- ⊙ Ethnicity, especially South Asian or Afro Caribbean
- ⊙ Obesity, especially in the abdomen, or a history of recent increase in weight
- ⊙ High blood pressure
- ⊙ Low socio-economic status
- ⊙ Advancing age
- ⊙ Sedentary lifestyle

Summary 2 – further risk factors for type 2 diabetes

- ⊙ Diabetes that occurs in pregnancy that resolves after the pregnancy is over (gestational diabetes)
- ⊙ Very low or very high birth weight
- ⊙ Impaired glucose tolerance or impaired fasting glucose
- ⊙ Cigarette smoking

Diagnosis of Diabetes Mellitus

- ⊙ Both plasma glucose (sugar) and glycosylated haemoglobin (HbA1c) can be used to diagnose diabetes
- ⊙ HbA1c is a blood test and a high value gives you an indication for how long sugar has been elevated during the last 2-3 months
- ⊙ **Diagnosis:** A HbA1c equal to or greater than 47.5 mmol/mol or 6.5% (old units), or
- ⊙ **Diagnosis:** A fasting plasma glucose equal to or greater than 7 mmol/l or a 2h plasma glucose equal to or greater than 11.1 mmol/l , or
- ⊙ **Diagnosis:** the presence of classic symptoms (thirst, frequent urination, weight loss) or hyperglycaemic crisis (acute illness with very high glucose levels) plus a random plasma glucose of equal to or greater than 11.1 mmol/l

Impaired glucose tolerance

- ⊙ After a sugary drink, blood glucose levels rise but should return to normal levels after 2 hours (less than 7.8 mmol/l)
- ⊙ However, some people still have blood glucose levels between 7.9 mmol/l and 11 mmol/l after 2 hours - This is called **impaired glucose tolerance**
- ⊙ Both impaired glucose tolerance or impaired fasting glucose (another form of glucose intolerance) can eventually lead to full blown type 2 diabetes, sometimes after months or years.

Pre-diabetes – an early warning sign of diabetes

- ① The period before being diagnosed as having diabetes is often called pre-diabetes.
- ① This occurs when the sugar level is higher than the normal range but not high enough to be classified as diabetes.
- ① People with pre-diabetes may not have any symptoms initially



Best tips to prevent diabetes

- ① Making healthy eating and physical exercise part of our daily routines, and avoiding weight gain is absolutely essential.
- ① You should know the Body Mass Index (BMI) for all the residents within the care home as this indicates whether they might be at risk of diabetes
- ① South Asian people with a BMI score of 23 or more are at an **increased** risk of developing type 2 diabetes and if the BMI rises to 27.5 or more, they are at a **high** risk of developing diabetes.
- ① We should all aim at a BMI of less than 25.

Waist measurement

- ① In women, a waist measurement of more than 80cm (31.5 inches) suggests an increased risk of pre-diabetes.
- ① For white or black men, a waist measurement of more than 94cm (37 inches) indicates an increased risk.



Diabetes UK – consider finding a new slide of an older person?

Waist measurement

- 🎯 For Asian men, a waist measurement of more than 90cm (35 inches) indicates an increased risk. A waist measurement should be taken just below the tummy button (umbilicus), not around the hips.



1 -So how do we reduce the risk?

- ① Being overweight increases the risk of diabetes by 20-40 times compared with someone of a healthy weight. Importantly, if you can lose 10% of your current weight, you can reduce your chances of developing type 2 diabetes by half (50%).
- ① Inactivity is a key trigger for type 2 diabetes, therefore working the muscles harder and more often (e.g. by more physical activity) improves their ability to use insulin and absorb glucose.

2 - So how do we reduce the risk?

- ① It is not necessary to do strenuous exercise, simply moving from being sedentary to taking moderate exercise is the key.
- ① Walking briskly for half an hour every day reduces the risk of developing type 2 diabetes by about one-third.
- ① Within a care home setting, care staff should try and identify an in-house walk path or garden walk path if possible



3 - So how do we reduce the risk?

- ③ Too much TV watching also increases the risk of diabetes, because it encourages inactivity.
- ③ In one recent study, every hour watching TV increased the risk of developing diabetes
- ③ Within a care home, there has to be a natural balance between the enjoyment and relaxation components of watching TV with the adverse consequences of too much TV watching



Why is diet important?

- ① Your diet is important because it can influence your risk of developing diabetes
- ① There is good evidence that whole grains in the diet can protect against diabetes and carbohydrates that are highly refined (where the sugar is easily absorbable) leads to an increased risk of developing the condition.
- ① The bran and fibre in the whole grains make it more difficult for the digestive enzymes to get access to the glucose, which means that the sugar is more slowly absorbed into the blood and prevents excessive peaks in sugar levels.

Diet

The following increases the speed of food absorption and can cause high blood sugars:

- ① Cooking, which breaks down starch
- ① Refining – polished rice, mashed potatoes
- ① Fluids with food increase the rate of stomach emptying
- ① Added glucose does the same
- ① Sugary drinks, including fruit juice ,are the most rapidly absorbed form of nutrition, so encourage the use of water, coffee or tea (without sugar) instead

Slowing the rate of sugar absorption

The following slow the rate of sugar absorption from foods:

- ① Type of starch – rice and pasta are absorbed more slowly than bread and mashed potatoes.
- ① High fat content.
- ① Cell structure – beans peas and lentils retain their structure after cooking and whole fruit is absorbed more slowly than fruit slices.

Southern Mediterranean diet - 1

A typical healthy diet is like the one that is used in the Southern Mediterranean, with lots of fruit, vegetables, salads and fish.

This type of diet has been recognised by the WHO to being a healthy and sustainable diet

At the same time it is important to keep cakes, pies, pastries, puddings, concentrated dairy products, red meats and sweets to a minimum.



Southern Mediterranean diet - 2

- ① This sort of diet contains healthy fats such as olive and rapeseed oil, and very little in the way of saturated fat.
- ① Nuts and seeds are also a healthy thing to eat.
- ① Alcohol should be taken only modestly and it is important to stop smoking.

Diet and Care Home Residents

- ① Many residents in care homes may be undernourished which can adversely affect their health
- ① Ensure all residents have healthy and nutritious food at all times which is important to their quality of life and wellbeing
- ① Respect the food choices of your residents particularly with respect to their ethnic, cultural and faith views
- ① Try to encourage active liaison between your care home chef/team and community dieticians to support you to deliver effective and sustainable diets for your residents

Avoid smoking

- ① Smokers are about 50% more likely to develop diabetes than non-smokers.
- ① The key to preventing diabetes is avoiding weight increase and keeping active every day.
- ① When you eat, make sure it is a healthy diet.



Learning points

LP

Be alert to the possibility that residents of care homes may have undiagnosed diabetes.

LP

Be prepared to flag this up with the health care professionals if you suspect it – a simple blood test (HbA1c) will answer the question

LP

Understand the importance of both preventing and delaying the development of diabetes by means of a healthy lifestyle.

Further reading

- ⊙ Diabetes UK: <http://www.diabetes.org.uk>
- ⊙ ‘To reduce your diabetes risk – Live well’ – NHS choices: <http://www.nhs.uk/LiveWell>
- ⊙ ‘Diabetes type 2 – causes’ – NHS choices: <http://www.nhs.uk/Conditions/Diabetes-type2/Pages/Causes.aspx>
- ⊙ Diabetes risk factors – Diabetes UK: <http://www.diabetes.org.uk/Guide-to-diabetes/What-is-diabetes/Diabetes-risk-factors/>

Questions

Q1. Which of the options below are risk factors for developing type 2 diabetes?

- A. Being overweight
- B. Lack of physical activity
- C. Family history of type 2 diabetes
- D. All of the above

Questions

Q1. Which of the options below are risk factors for developing type 2 diabetes?

- A. Being overweight
- B. Lack of physical activity
- C. Family history of type 2 diabetes
- D. All of the above**

Questions

Q2. Which groups are at greater risk of developing type 2 diabetes?

- A. People of South Asian heritage
- B. People of Afro/Caribbean heritage
- C. People from deprived socio-economic backgrounds
- D. People of Scandinavian backgrounds
- E. None of the above

Questions

Q2. Which groups are at greater risk of developing type 2 diabetes?

- A. People of South Asian heritage**
- B. People of Afro/Caribbean heritage**
- C. People from deprived socio-economic backgrounds**
- D. People of Scandinavian backgrounds
- E. None of the above

Questions

Q3. Impaired glucose tolerance is:

- A. Slightly higher blood sugar if it is measured after a person has been fasting
- B. Slightly higher levels of blood glucose measured 2 hours after drinking a sugary drink
- C. A condition that can lead to type 2 diabetes
- D. Both B and C

Questions

Q3. Impaired glucose tolerance is:

- A. Slightly higher blood sugar if it is measured after a person has been fasting
- B. Slightly higher levels of blood glucose measured 2 hours after drinking a sugary drink
- C. A condition that can lead to type 2 diabetes
- D. Both B and C**

Questions

Q4. Pick the true statements:

- A. We should all aim to keep our BMI below 30
- B. People of South Asian descent are at increased risk of developing type 2 diabetes with a BMI score of 23 or more
- C. If you can lose 10% of your current weight you can reduce your chances of developing type 2 diabetes by half
- D. Taking moderate exercise is important

Questions

Q4. Pick the true statements:

- A. We should all aim to keep our BMI below 30
- B. People of South Asian descent are at increased risk of developing type 2 diabetes with a BMI score of 23 or more**
- C. If you can lose 10% of your current weight you can reduce your chances of developing type 2 diabetes by half**
- D. Taking moderate exercise is important**

Questions

Q5. Which of the following foods should only be eaten infrequently?

- A. Fish and chips
- B. Baked potatoes
- C. Orange juice
- D. 'Diabetic' chocolate

Questions

Q5. Which of the following foods should only be eaten infrequently?

- A. Fish and chips
- B. Baked potatoes
- C. Orange juice
- D. 'Diabetic' chocolate

Learning completed