

# Diabetes Medicines Use Review (MUR) Toolkit

## Introduction

**Diabetes is known to affect 2.9 million people in the UK,<sup>1</sup> equating to 4.45% of the population. Medicines as well as lifestyle changes play a key part in the management of both Type 1 and Type 2 diabetes. Pharmacists can play a significant role in improving patients' knowledge of and adherence to prescribed medicines.**

This 'Diabetes MUR toolkit' is designed to help improve the confidence of community pharmacy to provide high quality MURs for patients taking diabetes medicines. Diabetes MURs can help to:

- establish the patient's actual use, understanding and experience of taking medicines;
- identify, discuss and assist in the resolution of poor or ineffective use of medicines by the patient;
- identify side effects and drug interactions that may affect the patient's compliance with instructions given to them by a health care professional for the taking of medicines; and
- improve clinical and cost effectiveness of medicines prescribed to patients.

In turn this can improve the ability of patients to manage their diabetes medication and condition effectively, promoting good diabetes control and minimising harm both short and long term.

### The toolkit consists of:

- Information on diabetes and its management
- 'The Diabetes MUR Consultation' – designed to be used with patients during a diabetes MUR
- Patient MUR Record Form - designed to be given to the patient to outline an intervention plan to improve their diabetes control and implement lifestyle changes. It is NOT the clinical record for the pharmacist.

## Why should pharmacy get involved?

- Pharmacy teams come into regular contact with patients prescribed medicines for diabetes – over a period of six years there has been a 73.3% increase in the number of items prescribed for diabetes<sup>2</sup>
- Pharmacy can help identify some of the estimated 850,000 people with undiagnosed diabetes by providing screening services
- Between 30 and 50% of prescribed medicines are not taken as intended, and up to two-thirds of people with type 2 diabetes do not take their oral hypoglycaemics as prescribed<sup>3</sup>
- The Medicines Use Review service is aimed at supporting patients with long-term conditions such as diabetes
- Pharmacists have a pivotal role in promoting medicines adherence and improving diabetes management by delivering MURs.

## Learning objectives

- Update knowledge of Type 1 and Type 2 diabetes
- Identify treatments used in the management of Type 1 and Type 2 diabetes
- Understand the issues to cover in a MUR for a patient taking diabetes medicines
- Be able to confidently deliver high-quality MURs for patients prescribed diabetes medicines
- Be able to contribute to promoting good diabetes control and avoiding unplanned hospitalisations.

This document has been produced by Mediapharm as part of a joint working initiative between Devon Local Pharmaceutical Committee, Sanofi, Diabetes UK, National Pharmacy Association (NPA) and the Pharmaceutical Services Negotiating Committee (PSNC).

## About Diabetes

**Diabetes is caused by an absence of insulin, or a reduced sensitivity to insulin, which leads to raised blood glucose levels (hyperglycaemia).**

### Risk factors

Type 1 diabetes	Type 2 diabetes <sup>4</sup>
<ul style="list-style-type: none"> <li>Type 1 diabetes is caused by destruction of insulin-producing beta cells in the pancreas, the most common cause of which is an autoimmune response (an immune response to the body's own cells)</li> <li>Evidence suggests that unknown infectious agents trigger an autoimmune response in genetically susceptible individuals (Type 1 diabetes clusters in families)<sup>5</sup></li> <li>Rarely it may be caused by pancreatic conditions such as chronic pancreatitis.</li> </ul>	<ul style="list-style-type: none"> <li>Family history (parent, brother or sister has type 2 diabetes)</li> <li>Age (over 40 years old if white; over 25 if black, Asian or from another minority ethnic group)</li> <li>Overweight or a waist measurement of 31.5 inches or over for women; 35 inches or over for Asian men; and 37 inches or over for white and black men</li> <li>Hypertension</li> <li>History of heart disease or stroke</li> <li>Impaired glucose tolerance/impaired fasting glycaemia</li> <li>Women with history of gestational diabetes</li> <li>Women with polycystic ovarian syndrome who are overweight</li> </ul>

### Symptoms<sup>6</sup>

- Increased thirst
- Passing a lot of urine, especially at night
- Extreme tiredness or lethargy
- Weight loss
- Genital itching
- Itchy skin rash or slow healing wounds
- Tingling pain and numbness in feet, legs or hands (symptoms of neuropathy)
- Blurred vision.

### Complications<sup>7</sup>

Complications of Type 1 and Type 2 diabetes are the same. Prolonged hyperglycaemia causes both microvascular (e.g. retinopathy) and macrovascular (e.g. cardiovascular) damage. Complications include:

- Cardiovascular complications** for example, heart attacks, angina, stroke, peripheral artery disease
- Kidney damage** (nephropathy) sometimes leading to kidney failure
- Eye problems** (retinopathy) which can affect vision and lead to blindness
- Nerve damage** (neuropathy) that can cause a range of problems including neuropathic pain, foot problems, limb amputation and erectile dysfunction.

Microvascular complications are more common in people with Type 1 diabetes and macrovascular in people with Type 2 diabetes.<sup>8</sup>

### The Numbers

Around 90% of people with diabetes have Type 2 diabetes with the remaining 10% having Type 1.<sup>9</sup> The UK is facing an increase in the number of people with diabetes and it is thought that by 2025 some 5 million people will have

diabetes, most of these Type 2. This growth in diabetes will require innovative new ways to manage patients.

## Diabetes Management

**Good blood glucose control is important to avoid the symptoms of diabetes and to prevent complications developing. Good control of blood glucose is maintained by aiming for glycosylated haemoglobin (HbA1c) level of below 48mmols/mol (equivalent to 6.5% in the old nomenclature). For those at risk of severe hypoglycaemia, or for whom such tight control is not advised, the aim is a maximum of 59mmols/mol (or 7.5%).<sup>6</sup> National Institute for Health and Clinical Excellence (NICE) guidelines outline how Types 1 and 2 diabetes should be managed. These are discussed below.**

### Diet and lifestyle

Diet and lifestyle modification is integral to the management of both Type 1 and Type 2 diabetes.

People with diabetes should be advised to<sup>6</sup>:

- Eat regular meals based around wholegrain, starchy foods
- Eat at least five portions of fruit and vegetables per day
- Reduce calorie intake if overweight and increase physical activity
- Achieve and maintain a healthy weight
- Reduce fat intake (particularly saturated fat)
- Reduce sucrose intake
- Reduce salt intake
- Drink alcohol in moderation – ideally consume with or after food
- Stop smoking.

People taking hypoglycaemic drugs or insulin also need to be advised on balancing food intake and exercise with their medication together with reinforcing any additional monitoring requirements.

Lifestyle interventions are first-line treatments for Type 2 diabetes but diabetes medication may be required if these do not manage the condition. Insulin is required for those with Type 1 diabetes.

### Hypoglycaemia<sup>10</sup>

Hypoglycaemia is defined as a blood glucose level of less than 4.0mmol/l. Early symptoms include:

- Sweating
- Palpitations
- Shaking
- Hunger.

Late signs include confusion, drowsiness, odd behaviour, speech difficulty, lack of co-ordination and coma.

Note that blood glucose levels are not the same as HbA1c.

Mild hypoglycaemia (where someone is able to treat themselves) should be treated to raise blood glucose quickly with 15-20g glucose – the exact quantity will vary from person to person. This could be:

- 100ml Lucozade
- 150ml of a non-diet fizzy drink
- 200ml of smooth orange juice
- 3 or more dextrose tablets
- 4 large jelly babies
- 5 large jelly beans
- One tube (15g) of glucose gel.

If the person does not feel better after 5–10 minutes, one of the treatments should be repeated. When the person starts to feel better and a meal is not due they should eat starchy food such as a sandwich or banana.

In severe hypoglycaemia (where the person needs help to treat it), if conscious and able to swallow they should be offered one of the above treatments. If unconscious, the patient should be put in the recovery position and 999 dialled.

### Hypoglycaemia facts

- Patients with Type 1 diabetes typically experience between 1.0 and 1.7 severe hypoglycaemic events per year<sup>11</sup>
- In a survey of patients with Type 2 diabetes treated with a sulfonylurea, self-reported rates of mild and severe hypoglycaemia in a 9–12 month period were 39% and 7% respectively<sup>12</sup>
- Patients with Type 2 diabetes treated with a metformin are around 2.5 times less likely to experience hypoglycaemia when compared to a sulfonylurea.<sup>12</sup>

### Hyperglycaemia

Symptoms of hyperglycaemia include:

- Increased thirst
- Increased passing of urine
- Headaches
- Lethargy
- Abdominal pain.

### Type 1 diabetes insulin therapy in adults<sup>13</sup>

Patients with Type 1 diabetes are prescribed insulin for control of blood glucose. NICE recommends the following in terms of insulin regimens:

- **Multiple injection regimens** in adults who prefer them in an integrated package with education, food, skills training and appropriate self-monitoring. Multiple injection regimens involve the use of a short-acting (soluble) or rapid acting insulin analogue (e.g. insulin aspart, insulin lispro, insulin glulisine) before meals, with intermediate (isophane insulin) or long-acting (insulin glargine, insulin detemir) given once or twice daily for basal insulin supply
- **Twice-daily insulin regimens** for those:
  - Who want them
  - Who find adherence to lunch-time insulin injections difficult
  - With learning difficulties who may require assistance.

Biphasic insulins (a mixture of short acting insulin or a rapid-acting insulin analogue with intermediate-acting or long-acting insulin) are given twice daily before meals.

The use of oral hypoglycaemic drugs should be avoided in Type 1 diabetes.

Refer to NICE guideline 15 for information on the management of Type 1 diabetes in children and young people but remember that MURs can only be provided for those children who have the capacity to give informed consent. Under the current regulatory framework it is not permitted to conduct an MUR with the parent, carer or guardian of a person who is not competent.

### Most commonly prescribed insulins<sup>14</sup>

#### 1. Long Acting Analogues

a. Insulin Glargine (Lantus) / Insulin Detemir (Levemir)

#### 2. Rapid Acting Analogues

a. Novorapid / Humalog / Apidra

#### 3. Pre-Mix Insulins

a. Humulin M3 / Novomix 30/ Humalog mix 25/ Insuman Comb 25

#### 4. Intermediate Insulins

a. Insulatard / Humulin I / Insuman Basal

### Type 2 diabetes therapies<sup>7</sup>

Oral glucose-lowering drugs will have been initiated where blood glucose is inadequately controlled (HbA1c  $\geq$  48mmol/mol) by lifestyle interventions of diet and exercise alone.

#### 1st line

- Metformin is widely used as a first line oral therapy for all patients
- A sulfonylurea (typically gliclazide) can be considered as an option where the person is not overweight; does not tolerate metformin; or requires a rapid response due to hyperglycaemic symptoms.

#### 2nd line (where blood glucose control remains or becomes inadequate with monotherapy)

- Add sulfonylurea to metformin
- Add dipeptidyl peptidase-4 (DPP-4) inhibitor (sitagliptin, vildagliptin) or thiazolidinedione (pioglitazone) to metformin if:
  - the person is at significant risk of hypoglycaemia or its consequences
  - sulfonylurea is not tolerated or is contraindicated
- Add DPP-4 inhibitor or thiazolidinedione to sulfonylurea if metformin is not tolerated or is contraindicated.

#### 3rd line (where blood glucose control remains or becomes inadequate with dual therapy)

- Add insulin to metformin and sulfonylurea (or to sulfonylurea and DPP-4 inhibitor or thiazolidinedione) particularly if the person is markedly hyperglycaemic
- Add DPP-4, thiazolidinedione, or glucagon-like peptide-1 (GLP-1) analogue or mimetic (e.g. exenatide, liraglutide) to metformin and sulfonylurea when insulin is unacceptable or inappropriate.

If blood glucose control remains inadequate with insulin then the dose should be increased and the regimen intensified over time. Pioglitazone can be considered with insulin if a thiazolidinedione had previously had a marked glucose lowering effect or blood glucose control is inadequate with high-dose insulin.

The New Medicine Service (NMS) includes Type 2 diabetes.

## Managing other risk factors

Studies have shown that controlling blood glucose levels is important for improving patient outcomes, however blood glucose control appears to be less effective in reducing cardiovascular disease than controlling either blood pressure or blood lipids.<sup>15</sup>

Patients with diabetes may also be prescribed the following medicines for the management of cardiovascular (CV) risk factors (NICE guideline 87):

- **Antihypertensives** – if lifestyle advice does not reduce blood pressure to 140/80mmHg (or 130/80mmHg if there is kidney, eye or cerebrovascular damage)
- **Statins** – dependent on CV risk status, a statin is recommended to achieve total cholesterol of  $\leq 4.0$ mmol/l. Optimal total cholesterol is less than 4.0mmol/l and low density lipoprotein cholesterol (LDL) less than 2 mmol/l
- **Aspirin** – low dose aspirin 75mg daily (or clopidogrel where there is clear aspirin intolerance) is offered to people with Type 2 diabetes aged 50 or over if blood pressure is below 145/90mmHg and to people under 50 with significant other CV risk factors (such as smoking and family history). Adults with Type 1 diabetes should be offered

aspirin if in highest and moderate high risk categories. However, the MHRA advises that aspirin is not licensed for the primary prevention of vascular events and if it is used the balance of benefits and risks should be considered for each individual, particularly the presence of risk factors for vascular disease (such as diabetes) and the risk of gastrointestinal bleeding.

## What can be achieved with good diabetes management?

Good diabetes management can have a significant impact on morbidity and mortality. The UKPDS study showed that better management of patients with an average HbA1c of 53mmol/mol (7%) can achieve a decrease in diabetes-related mortality, reduction in heart attacks and decrease in microvascular complications.<sup>16</sup> Sulfonylureas reduce the incidence of heart attacks by 15% and death by 13%, whilst metformin reduces heart attacks by 33% and death by 27%. Managing cardiovascular risk is important and doing so can achieve much to reduce the risk of micro- and macrovascular complications.

### Signposting

**NHS Diabetes** – [www.diabetes.nhs.uk](http://www.diabetes.nhs.uk)  
**Diabetes UK** – [www.diabetes.org.uk](http://www.diabetes.org.uk)

**Diabetes Matters** – [www.diabetesmatters.co.uk](http://www.diabetesmatters.co.uk)

**NHS Choices** – [www.nhs.uk](http://www.nhs.uk)

**Patient UK** – [www.patient.co.uk](http://www.patient.co.uk)

### NPA member resources

**Standard Operating Procedure NPSA Supplying Insulin  
Brief Guide to Diabetes Type 2**

### PSNC resources

PSNC and NHS Employers have agreed changes to the MUR service data requirements which will be implemented from 1st July 2012. These changes include a new requirement to keep records of each MUR provided using a national dataset. This new requirement is accompanied by the removal of the existing requirement to complete the national NHS MUR form for each MUR provided. Full information on the changes can be found at [www.psnc.org.uk/mur](http://www.psnc.org.uk/mur).

The data changes include the use of an MUR Feedback Form when there is a need to communicate with the patient's GP practice following an MUR. PDF and Microsoft Word eForm versions of this form can be found at [www.psnc.org.uk/mur](http://www.psnc.org.uk/mur).

### Your Continuing Professional Development

**Keeping a record of your CPD is now a mandatory requirement. There are many activities that can be used to form an entry in your CPD record and using the 'Diabetes MUR Toolkit' is one of them.**

A CPD record aid has been designed to help you in completing an entry for your official CPD record on the GPhC website at [www.uptodate.org.uk](http://www.uptodate.org.uk).

Go to [www.cpdeasy.com](http://www.cpdeasy.com) to access your CPD Record Aid for 'Diabetes MUR Toolkit.'

## References

1. Diabetes UK. Reports and statistics – diabetes prevalence 2011. Available at <http://www.diabetes.org.uk/Professionals/Publications-reports-and-resources/Reports-statistics-and-case-studies/Reports/Diabetes-prevalence-2011-Oct-2011/> (accessed 23.2.12)
2. Royal Pharmaceutical Society and National Pharmacy Association. Integrating community pharmacy into the care of people with diabetes. April 2010.
3. Department of Health. Management of medicines – a resource to support implementation of the wider aspects of medicines management for the National Service Frameworks for Diabetes, Renal Services and Long-Term Conditions. Department of Health, 2004.
4. Diabetes UK. Causes and risk factors. Available at [http://www.diabetes.org.uk/Guide-to-diabetes/Introduction-to-diabetes/Causes\\_and\\_Risk\\_Factors/](http://www.diabetes.org.uk/Guide-to-diabetes/Introduction-to-diabetes/Causes_and_Risk_Factors/) (accessed 23.2.12).
5. Clinical Knowledge Summaries. Diabetes Type 1 – what are the risk factors? Available at [http://www.cks.nhs.uk/diabetes\\_type\\_1/background\\_information/definition#475308](http://www.cks.nhs.uk/diabetes_type_1/background_information/definition#475308) (accessed 23.2.12).
6. Diabetes UK. Recommendations for the provision of services in primary care for people with diabetes. Diabetes UK, 2005.
7. National Institute for Health and Clinical Excellence. Clinical Guideline 87: Type 2 diabetes – the management of type 2 diabetes. NICE, 2009.
8. Clinical Knowledge Summaries. What are the clinically important differences in complications between type and type 2 diabetes? Available at [http://www.cks.nhs.uk/diabetes\\_type\\_1/background\\_information/complications/types\\_1\\_and\\_2\\_diabetes\\_compared](http://www.cks.nhs.uk/diabetes_type_1/background_information/complications/types_1_and_2_diabetes_compared) (accessed 23.2.12).
9. Diabetes UK. Diabetes in the UK 2012. Available at <http://www.diabetes.org.uk/Documents/Reports/Diabetes-in-the-UK-2012.pdf>.
10. NHS Diabetes. Recognition, treatment and prevention of hypoglycaemia in the community. December 2011.
11. NHS Patient Safety. The adult patient's passport to safer use of insulin. 2011. Available at <http://www.nrls.npsa.nhs.uk/alerts/?entryid45=130397> (accessed 18.6.12)
12. Michael Bodmer, et al Metformin, Sulfonylureas, or Other Antidiabetes Drugs and the Risk of Lactic Acidosis or Hypoglycemia. Diabetes Care. 2008 November; 31(11): 2086–2091 Jun;50(6):1140-7. Epub 2007 Apr.
13. National Institute for Health and Clinical Excellence. Clinical guideline 15: Type 1 diabetes: diagnosis and management of type 1 diabetes in children, young people and adults. NICE, 2004.
14. NHS Information Centre. Prescribing for diabetes in England: 2005/6 to 2010/11. Available at [http://www.ic.nhs.uk/webfiles/publications/prescribing%20diabetes%20200506%20to%20201011/Prescribing\\_for\\_Diabetes\\_in\\_England\\_20056\\_to\\_201011.pdf](http://www.ic.nhs.uk/webfiles/publications/prescribing%20diabetes%20200506%20to%20201011/Prescribing_for_Diabetes_in_England_20056_to_201011.pdf)
15. Yudkin JS et al. Intensified glucose lowering in type 2 diabetes: time for a reappraisal. Diabetologia 2010; 53: 2079-2085.
16. Holman et al. 10-year follow up of intensive glucose control in Type 2 diabetes. New England Journal of Medicine 2008; 359: 1577-89.