Blackburn with Darwen NHS Teaching Care Trust Plus

Primary Care Management of Type 2 Diabetes in Adults

NHS East Lancashire

Why actively manage T2D?

Diabetes is associated with two major groups of complications:

Macrovascular

MI, angina, stroke, vascular dementia, peripheral vascular disease (PVD), gangrene

Microvascular

Retinopathy and blindness, nephropathy and dialysis, neuropathy and pain or amputation, erectile dysfunction

Care is complex and takes significant input and time from professionals and patients alike to optimise

The aim of management is to prevent or delay complications, resolve or minimise symptoms and enable patients to actively manage their own condition as much as possible, with the minimum necessary burden of appointments and treatments, and the minimum level of adverse effects

Manage patients' diabetes not just their blood glucose

Involve patients in their care, setting priorities and goals for lifestyle change and treatments: these should be aligned with their needs and preferences and addressed in the order of greatest impact to reduce complications. Support verbal advice with written and electronic sources of information and education. Offer all patients the opportunity to participate in a structured education programme (DESMOND or XPERT) at / around diagnosis and annually thereafter if not taken up initially or reinforcement needed: this is an integral part of care.

Address in this order: Greatest impact to least impact

1. **Stop smoking advice & address obesity**
2. **Control BP < 140/80 (<130/80mmHg if eye, renal or cerebrovascular damage)**
3. **Assess CVD risk and offer simvastatin 40mg/day unless low risk**
4. **Offer metformin (if not already prescribed) and aspirin where appropriate (see below)**
5. **Optimise blood glucose control further (see below)**

This assumes glycaemic symptoms have been addressed (e.g. approximate random blood glucose values <11mmol/L / HbA1c < 75mmol/mol (<9%) and with the caveat that it is often possible to be addressing more than one area at the same time.

Case Finding

Have a low threshold for checking HbA1c as there are many undiagnosed patients:

- ✓ Be alert to suggestive symptoms of diabetes e.g. thirst, unexplained weight changes, fatigue, recurrent urinary, skin or fungal infections, polyuria and nocturia, new erectile dysfunction or other neuropathic symptoms, changes in visual acuity
- ✓ Check all patients with known vascular disease, CKD, hypertension, or primary prevention every 5 years
- ✓ Consider annual checks (optimal interval uncertain) in patients at higher risk of developing diabetes, e.g. obese, taking antipsychotic medication or long-term corticosteroids, known polycystic ovaries, Asian or African-Caribbean origin, family history of diabetes, personal history of gestational diabetes or gave birth to baby > 4kg (8.8lb)
- ✓ Follow up all patients with glucosuria identified on routine urine dipsticks done for other reasons (e.g. UTI)

Diagnosis

Patient with 'symptoms' (typically polyuria, thirst, weight loss and fatigue) + one of the following
OR if 'asymptomatic' + two of the following (can repeat same test):

- **HbA1c ≥ 48mmol/mol (≥ 6.5%).** **A value <48mmol/mol does not exclude diabetes diagnosed using glucose tests**
- **Fasting glucose ≥ 7.0 mmol/L**
- **Random BG ≥ 11.1 mmol/L**
- **2 hr post-prandial glucose ≥ 11.1mmol/L after 75g oral glucose (OGTT)**

HbA1c is not a reliable diagnosis test in conditions of altered cell turnover (anaemia, renal failure, haemoglobinopathy) or pregnancy. Situations where HbA1c must not be used as the sole test to diagnose diabetes: ALL symptomatic children and young people, Symptoms suggesting Type 1 diabetes (any age), Short duration diabetes symptoms, Patients at high risk of diabetes who are acutely ill, Taking medication that may cause rapid glucose rise e.g. corticosteroids, antipsychotics, Acute pancreatic damage/pancreatic surgery. If the second HbA1c sample is <48 mmol/mol (6.5%) treat as high risk of diabetes and repeat the test in 6 months or sooner if diabetes symptoms develop.

Arrange glucose tolerance test (GTT) if random BG 7.1-11.0mmol/L or fasting glucose 6.1-6.9mmol/L:

- **If fasting value remains 6.1-6.9mmol/L: record as Impaired Fasting Glucose (IFG)**
- **If 2 hour value ≥ 11.1:mmol/L: diagnose as Type 2 Diabetes**
- **If 2 hour value ≥ 7.0 but <11.1mmol/L: record as Impaired Glucose Tolerance (IGT)**
- **For those with IFG or IGT: repeat FBG annually and GTT as indicated**

Lifestyle advice

Offer all usual assistance to help smokers quit & integrate individualised and on-going nutritional advice alongside physical activity and weight loss

- Where necessary refer for expert input e.g. dietician
- Promote a healthy balanced diet as applicable to the general population: high-fibre, low glycaemic index foods e.g. fruit and vegetables (5 portions daily), wholegrains and pulses, include low-fat dairy products and oily fish, and control levels of saturated and trans fatty acids. Avoid the use of "diabetic foods". Appropriate alcohol intake (due to calorie burden and hypoglycaemia risk in some)
- If overweight aim for a 5-10% initial weight loss (any loss is beneficial; more is better in the long-term)
- Increase physical activity, building up to 30 minutes on 5 days each week (more may be needed in overweight or obese people in order to reduce or maintain weight). Encourage completion of whatever is possible with due regard to physical or other limitations
- Weight loss promoting agents such as orlistat should be offered at all stages to all those suitable according to NICE guidance. See full guidelines.

Diabetes clinic checklist

Remember to read code correctly and register patients on the appropriate registers.

Initial tests

- Fasting lipids
- Urine sample for Albumin Creatinine Ratio
- U&E + eGFR
- Depression screening
- Foot check (inspection, pulses and sensation) – reinforce foot care advice
- Refer for retinal screening (and podiatry where input necessary)
- Advise about patient support groups
- Refer to structured education programme
- Implications for driving (inform DVLA and insurer where required – www.dvla.gov.uk/medical.aspx)
- Complete prescription charge exemption form for those on hypoglycaemic drugs
- Discuss "sick day" and holiday rules

Ongoing tests

6 monthly

- HbA1c

Annual

- Urine sample for Albumin Creatinine Ratio
- U&E + eGFR
- Fasting lipids (LFTs if on statins/glitazone)
- CV risk – if not receiving a statin, using the UKPDS risk engine (until offered treatment with lipid-lowering therapy)
- Retinal screening & Depression screening
- BP– for those not diagnosed or treated as hypertensive
- Foot check (inspection, pulses and sensation) – annually and reinforce foot care advice
- Neuropathic symptoms and erectile dysfunction
- Regular dental check ups

Urine samples & microalbuminuria

The urine should be a first-morning sample but if one is not available a random sample is acceptable. If abnormal and not already known to have microalbuminuria repeat twice using first-morning samples – if either abnormal record as confirmed microalbuminuria and review BP/ACEI, lipids, glycaemic control and other aspects of management. Consider causes other than diabetic nephropathy if no significant retinopathy, very high or resistant BP, sudden onset of proteinuria (ACR > 100mg/mmol), significant haematuria, significant decrease in renal function, or systemically unwell.

Aspirin

"Aspirin is not licensed for the primary prevention of vascular events. If aspirin is used in primary prevention, the balance of benefits and risks should be considered for each individual, particularly the presence of risk factors for vascular disease (including conditions such as diabetes) and the risk of gastrointestinal bleeding." – MHRA Advice Drug safety update (Volume 3, Issue 3, October 2009)

Agreeing a suitable HbA1c target

Remember the 'Goldilocks effect' - *Blood glucose lowering: not too little, not too much*

When setting a target glycated haemoglobin (HbA1c):

- ***involve the person in decisions about their individual HbA1c target level, which for many may be above that of 48mmol/mol (6.5%) ****
- ***avoid pursuing highly intensive management to levels of less than 6.5%.***
- ***less stringent target of about (not usually below) 58 mmol/mol (7.5%) is appropriate for individuals with a longer duration of diabetes and those who require third-line therapy***
- ***inform a person with a higher HbA1c that any reduction in HbA1c towards the agreed target is advantageous to future health***

* Younger people with little co-morbidity were more likely to benefit from tighter control of HbA1c, whereas less stringent goals may be more appropriate for people with established cardiovascular disease, those with a history of hypoglycaemia, or those requiring multiple medications or insulin.

- Wait at least 3 months after a change in treatment/lifestyle to measure HbA1c to assess the impact
- Once stable check HbA1c every 6 months

Self-monitoring of blood glucose

See self-monitoring of blood glucose guidelines (www.elmmb.nhs.uk click on 'Guidelines –disease specific')

- Offer self-monitoring (including prescribing of test strips) ONLY where it has a specific purpose and there is a plan for how the results will be recorded, monitored, interpreted and acted upon. This will normally be covered as part of a structured education programme. Routinely address inappropriate testing with the aim to either re-purpose or stop ineffective monitoring
- For all new suitable patients the agreed formulary meter is **CARESENS N (using CareSens N Biosensor strips)** made by SPIRIT Healthcare.
- Ensure those who are using insulin or oral corticosteroids, who are pregnant, or those who are at risk of hyper or hypoglycaemia (e.g. due to intercurrent illness, changes in medication, labile control or where a safety issue exists e.g. prior to driving) have access to self-monitoring as required
- Review the continued need for, and pattern of, self-monitoring at least annually. As part of this review ensure equipment is being maintained, including the need for calibration and reinforce correct test technique
- People who have experienced hypoglycaemia requiring medical attention should be referred to a specialist diabetes team.

Blood glucose control

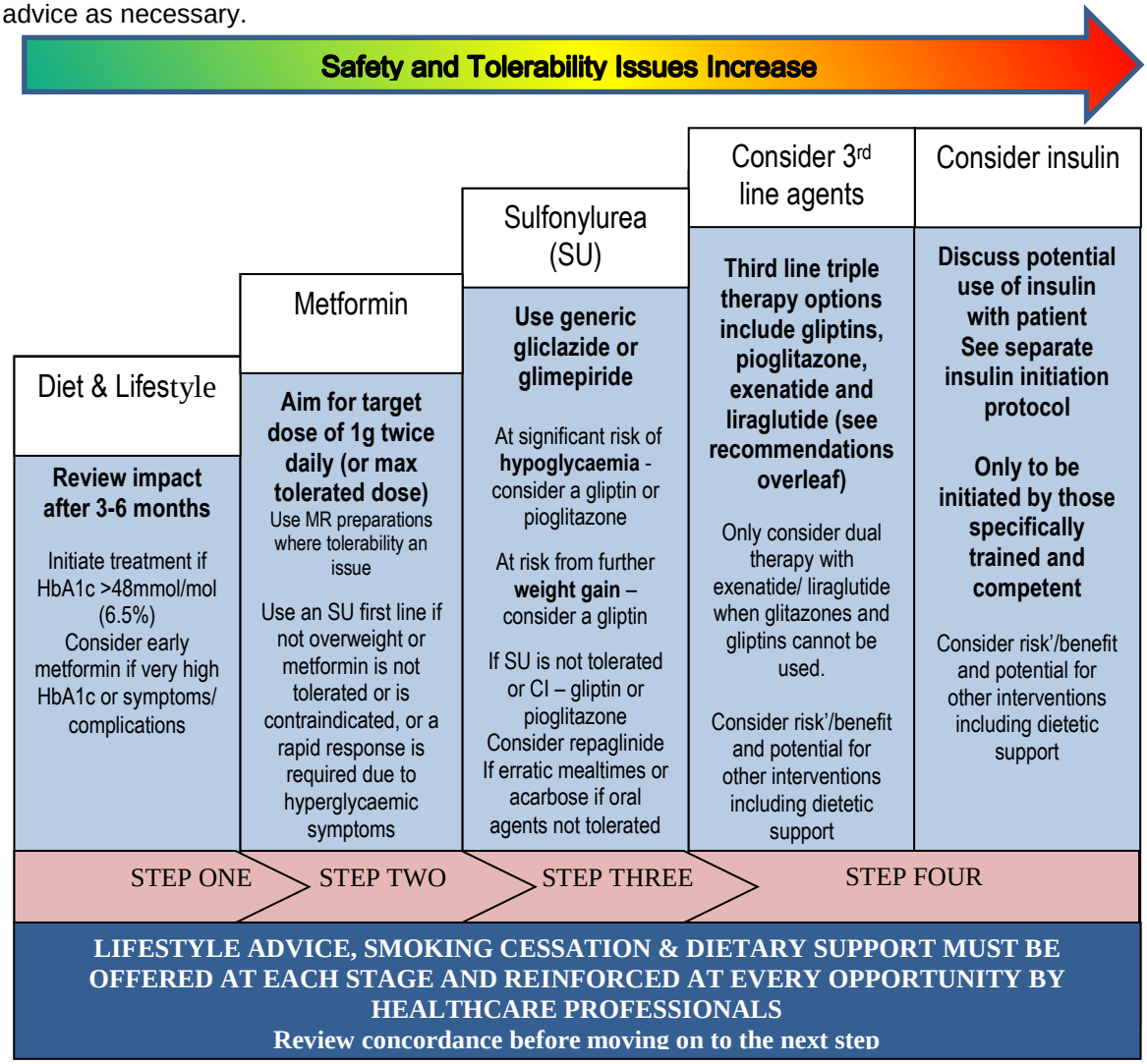
- Stopping smoking, lowering blood pressure, offering a statin (and aspirin where appropriate) have all been shown to be more effective at reducing the major complications than just treating glucose intensively
- However glucose control remains an important part of management and should be adequately addressed

Metformin

To date metformin is the only hypoglycaemic drug that has shown convincing evidence of reducing the serious complications of T2DM: it is imperative that every patient is optimised on a significant or maximal tolerated dose up to 2gram/day. This may require very slow titration and in some cases the use of modified release or sachet formulations.

Explain to patients that for every 14 people who take optimal dose metformin for 10 years, 1 will not die because they did so. Work with patients to achieve this.

In patients with significant renal impairment (eGFR < 45mL/min/1.73m^2) many therapies (not just metformin) may have increased risks or be "off label": discuss / seek advice as necessary.



Metformin - GREEN Traffic Light For full prescribing guidance see www.elmmb.nhs.uk or www.nice.org.uk

• Step up metformin (~£46/year) over several weeks to minimise risk of gastrointestinal (GI) side effects. Give 500 mg with evening meal for at least 1 week then 500 mg with breakfast and evening meal for at least 1 week then 500 mg with breakfast and 1 gram with evening meal; aim for target dose of 2 gram daily in two divided doses, or max tolerate dose.
• Consider trial of once daily metformin modified release tablets (~£131/year) ONLY if GI tolerability prevents the person continuing with metformin.
• Review metformin dose if estimated glomerular filtration rate (eGFR) < 45 ml/minute/1.73-m^2. Stop metformin if eGFR < 30 ml/minute/1.73-m^2

Sulfonylureas (e.g. gliclazide, glimepiride) - GREEN Traffic Light

• Prescribe a sulfonylurea with a low acquisition cost (**not** glibenclamide) when an insulin secretagogue is indicated.
• Gliclazide (up to ~£35/year): Initially, 40–80 mg daily, adjusted according to response; up to 160 mg as a single dose, taken with breakfast; higher doses should be divided; max. 160mg twice daily.
• Glimepiride (up to ~£29/year): Initially 1 mg daily, adjusted according to response in 1 mg steps at 1–2 week intervals; usual max. 4 mg daily (exceptionally, up to 6 mg daily may be used); taken shortly before or with first main meal. Avoid long acting products in those at risk of severe hypoglycaemia (e.g. elderly).
• Educate the person about the risk of hypoglycaemia. Consider an alternative if he or she has renal impairment. Sulfonylureas can cause weight gain.

THIRD LINE THERAPIES

Gliptins (e.g. sitagliptin/linagliptin) - GREEN Traffic Light

• Gliptins may be used in patients:
  • where the addition of sulfonylureas is not appropriate/ not tolerated (e.g. significant risk from hypoglycaemia)
  • AND represents an alternative to other agents such as glitazones when they are also contraindicated (e.g. heart failure, fracture risk) or not tolerated / effective, or where further weight gain would be problematic. (Gliptins are weight neutral)
• Sitagliptin (~£432/year): 100mg once daily - does not require dose titration. Reduce dose when eGFR <50mL/min. Sitagliptin is licensed for dual or triple therapy use with metformin and/or a sulfonylurea, glitazone and insulin.
• Linagliptin (~£432/year) is an alternative in moderate to severe renal impairment incl haemodialysis (no dose reduction required) (**GREEN** Traffic light)
• **Continue ONLY if ≥ 5mmol/mol (0.5%) reduction in HbA1c in 6 months – otherwise stop**

Pioglitazone - GREEN Traffic Light

• Pioglitazone can cause weight gain, fractures, heart failure and bladder cancer. Do not start or continue a glitazone if the person has current evidence or a history of heart failure or is at higher risk of fracture. Prescribe generically - price will reduce rapidly from current ~£360/year. Note combinations of pioglitazone with metformin are still branded and the price will not drop for these products.
• If prescribing pioglitazone, warn about significant oedema and tell the person to seek medical advice if it happens. Patients should be closely monitored for signs of heart failure.
• **Continue ONLY if ≥ 5mmol/mol (0.5%) reduction in HbA1c in 6 months – otherwise stop**

Exenatide & Liraglutide - GREEN Traffic Light

Patient consent forms for all patients starting these drugs are available online at www.elmmb.nhs.uk/guidelines
• Consider adding exenatide or liraglutide to metformin AND a sulfonylurea (triple therapy) if a person has:
  • a body mass index (BMI) ≥ 35 kg/m^2 in those of European descent, with appropriate adjustment in tailoring this advice for other ethnic groups and other specific psychological or medical problems associated with high body weight
  • a BMI < 35 kg/m^2 and therapy with insulin would have significant occupational implications or weight loss would benefit other significant obesity-related comorbidities, such as sleep apnoea.
  • **Continue exenatide/liraglutide only if beneficial response occurs and is maintained: HbA1c reduction ≥ 11mmol/mol (1.0%) AND weight loss ≥ 3% after 6 months**
• Consider adding exenatide or liraglutide to metformin or a sulfonylurea (dual therapy) as a treatment option only if:
  •the person is intolerant of either metformin **or** a sulfonylurea, or treatment with metformin **or** a sulfonylurea is contraindicated, **and**
  •the person is intolerant of glitazones **and** gliptins, or treatment with glitazones **and** gliptins is contraindicated
  • **Continue exenatide/liraglutide only if beneficial response occurs and is maintained: HbA1c reduction ≥ 11mmol/mol (1.0%) in 6 months**
• Exenatide twice daily (~£828/year): Give within 1 hour before 2 main meals (at least 6 hours apart). If a dose is missed, continue with the next scheduled dose - do not administer after a meal.
• Exenatide once weekly [prolonged-release] (~£954/year): Give on same day each week any time of day, with or without meals.
• Liraglutide (~£951/year): Start with 0.6mg daily for 1 week then increase to maximum dose of 1.2mg daily, the 1.8mg/day dose should **not** be used. Can be given independent of meal times.

Rapid acting insulin secreatagogues (e.g. repaglinide) - GREEN Traffic Light

• They have a rapid onset of action and short duration of activity, and only need to be taken at mealtimes (shortly before each main meal). This makes them particularly useful alternatives to sulfonylureas for patients with irregular meal patterns or lifestyles (where hypoglycaemia would otherwise pose a risk).
• Repaglinide may be given as monotherapy for patients who are not overweight or for those in whom metformin is contra-indicated or not tolerated, or it may be given in combination with metformin.
• Repaglinide (~£81/year): Initially 0.5mg (or 1mg if transferred from other agents) with meals, adjusted according to response every 1-2 weeks; usual max. 4mg before main meals (up to a daily max. 16mg/day). Extra care in malnourished or debilitated patients. Note: Nateglinide costs significantly more (~£336/year) and should not be used first line.

Acarbose - GREEN Traffic Light

• Consider acarbose for a person unable to use other oral glucose-lowering medications (~£89/year).

This Quick Reference Guide has been ratified by the East Lancashire Medicines Management Board, July 2012.To be reviewed July 2014. Available online at www.elmmb.nhs.uk, and click on 'Guidelines'. Contact: Richard.lee@bwd.nhs.uk . Version 2.0.