Diabetes Care for Community Pharmacists: A Patient-Centred, Multi-Professional Evidence-based Approach

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Declaration of Interests

• Have worked with most of the large pharmaceutical industry groups over the years in terms of Conference Arrangements and Lectures.

• Occasional Advisory Board work

• Main recent projects includes Care Planning with MSD

• I am also a Director of the Apnee Sehat Social Enterprise
Learning Outcomes:

• During this session you will follow the journey of a patient with diabetes from early diagnosis through to the management of complications under your care including:
  - prevention, diagnostic criteria, structured education, screening, new drugs and when to use them, hot topics, Hypoglycaemia, DVLA guidance

• Appreciate the clinical outcomes that can accrue from Multi-factorial intervention

• Reflect on how individual practise can be improved for patient benefit
Diabetes Care: A Patient-Centred, Multi-Professional Evidence-based Approach

- **Clinical Vignette**
- **UK Key facts**
- **Diagnosis using HbA1c**
- **Prevention of Diabetes**
- **New Studies**
- **Driving and Diabetes**
- **Alphabet Strategy**
  - Statins and Exercise
  - Ramadan Care
  - New Therapies
- **Multi-factorial Intervention**
- **Education**
- **Final Remarks**
Meet our Patient!

Ahmed Ramsinghbert!

- 56-year-old Taxi driver, married, 2 children, family history of diabetes.
- Type 2 diabetes, 8 years’ duration, putting on weight, occasionally sweaty.
- Better with chocolate! Jalebis are banned unless Eid!
- Brother, aged 62, recently had a heart attack.

**Taking:**

- Metformin 500 mg x 3 per day
- Gliclazide 80 mg x 2 per day
- Simvastatin 40mg
- Ramipril 1.25mg x 1 per day

- BP: 142/84, T-Chol 4.9 mmol/l, LDL 2.7
- HbA1c 70mmol/mol = 8.5%

**What does best practice look like?**

**Is this always achievable?**

**Practical Tips for over-coming barriers**
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Diabetes – a UK health challenge

Diabetes is a major health problem in the UK:
• Over 3.0 million people diagnosed\(^1\)
• Approx 4.9% of UK adult population\(^1\)
• T2D accounts for 85-95% of all cases\(^1\)

The total number of people with diabetes in the UK could increase to >5.5 million by 2030\(^2\)

References last accessed December 2012:
1. IDF Atlas. [www.idfatlas.org](http://www.idfatlas.org)
2. Diabetes UK. [www.diabetesuk.org](http://www.diabetesuk.org)
Adults with diabetes have an annual mortality of about 5.4%, double the rate for non-diabetic adults. Life expectancy is decreased by 5–10 years.

# UK Diabetes Complications:
Based on 2.9 million people (2012)

<table>
<thead>
<tr>
<th>Complication</th>
<th>n People</th>
<th>Diabetes %</th>
<th>No Diabetes %</th>
<th>Risk ↑</th>
</tr>
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<tbody>
<tr>
<td>DKA</td>
<td>13920</td>
<td>0.48</td>
<td>0.02</td>
<td>24</td>
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<tr>
<td>Angina</td>
<td>90770</td>
<td>3.13</td>
<td>0.64</td>
<td>4.9</td>
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<tr>
<td>MI</td>
<td>17400</td>
<td>0.60</td>
<td>0.16</td>
<td>3.8</td>
</tr>
<tr>
<td>Cardiac Failure</td>
<td>45820</td>
<td>1.58</td>
<td>0.39</td>
<td>4.1</td>
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<tr>
<td>Stroke</td>
<td>20010</td>
<td>0.69</td>
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<td>3.1</td>
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<tr>
<td>ESRD</td>
<td>11020</td>
<td>0.38</td>
<td>0.08</td>
<td>4.8</td>
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<tr>
<td>Retinopathy Rx</td>
<td>12180</td>
<td>0.42</td>
<td>0.03</td>
<td>14</td>
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<tr>
<td>Minor Amputn</td>
<td>3770</td>
<td>0.13</td>
<td>0.01</td>
<td>13</td>
</tr>
<tr>
<td>Major Amputn</td>
<td>2030</td>
<td>0.07</td>
<td>0.01</td>
<td>7</td>
</tr>
</tbody>
</table>

Calculated from QoF Prevalence and NDA Data by GEH Team (2012).
Prevalence = record of specific complication over a defined time period (one year).
Diabetes Care:
A Patient-Centred, Multi-Professional Evidence-based Approach

- Clinical Vignette
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- **Diagnosis using HbA1c**
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- New Studies
- Driving and Diabetes
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  - Statins and Exercise
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Advancements in T2D testing

Then
OGTT
Glucose

Now
HbA$_{1c}$

Diagnosis of Diabetes: Question

The Following statements are correct:

• **A:** HbA1c of 48 mmol/mol (6.5%) is diagnostic of diabetes if symptoms are present
• **B:** HbA1c value of less than 48 mmol/mol (6.5%) excludes diabetes
• **C:** The oral GTT should no longer be used
• **D:** The HbA1c criteria can apply to diagnosing Type 1 Diabetes Mellitus
• **E:** High diabetes risk is defined as an HbA1c 42-47 mmol/mol (6.0 – 6.4%)

**Answers**

1: if all correct
2: if all incorrect
3: if A, B, C correct
4: if A, D, E correct
5: if A, B, E correct
Diagnosis of Diabetes: Question

The Following statements are correct:

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**Answers** 4: A, D, E correct
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Finnish Diabetes Prevention Study
Legacy Effect at 13 years- open after 4 years

Proportion of subjects without Diabetes during the trial

Risk of developing diabetes reduced by 58% after 4 years.
11% versus 23% Cumulative risk of developing diabetes*

200 intervention free from DM →
166 conventional free from DM →
32% reduction maintained

Tuomilehto et al 2001*, Lindstrom et al 2013**
DPP: Benefit of diet + exercise or metformin on diabetes prevention in at-risk patients

N = 3234 with IFG/IGT without diabetes

Cumulative incidence of diabetes (%)

Placebo
Metformin
Lifestyle

31% reduction
↓58%

*vs placebo
IFG = impaired fasting glucose

Diabetes Prevention Program (DPP) Research Group.
Metformin to Prevent Diabetes?

Preventing type 2 diabetes: risk identification and interventions for individuals at high risk

Issued: July 2012  NICE PH guidance 38: Rec 19

Whose health will benefit?

• **Adults at high risk**: fasting plasma glucose or HbA1c shows progression towards T2DM, despite intensive lifestyle-change

• **Individuals at high risk**: unable to participate in lifestyle-change because of disability or medical reasons

• **Who should take action?** Doctors, non-medical prescribers and pharmacists in primary and secondary healthcare

What action should they take?

• Use clinical judgement on whether (& when) to offer metformin to support lifestyle change if HbA1c or fasting glucose deteriorate despite:
  – participation in an intensive lifestyle-change
  – or they are unable to participate in an intensive lifestyle-change
Metformin to Prevent Diabetes?

Preventing type 2 diabetes: risk identification and interventions for individuals at high risk Issued: July 2012  NICE PH guidance 38: Rec 19

- Discuss with the person the potential benefits and limitations of taking metformin, taking into account their risk and the amount of effort needed to change their lifestyle to reduce that risk.
- Explain that long-term lifestyle change can be more effective in preventing or delaying type 2 diabetes.
- Encourage them to adopt a healthy diet and be as active as possible. Stress the added health and social benefits of physical activity (eg reduce risk of CHD, improves mental health and good way of making friends).
- Advise them that they might need to take metformin for the rest of their lives and inform them about possible side effects.
- Continue to offer advice on diet and physical activity along with support to achieve their lifestyle and weight-loss goals.
Metformin to Prevent Diabetes?

Preventing type 2 diabetes: risk identification and interventions for individuals at high risk Issued: July 2012  NICE PH guidance 38: Rec 19

- Check the person's renal function before starting treatment, and then twice yearly (more often if they are older or if deterioration is suspected).

- Start with a low dose (for example, 500 mg once daily) and then increase gradually as tolerated, to 1500–2000 mg daily. If the person is intolerant of standard metformin consider using modified-release metformin.

- Prescribe metformin for 6–12 months initially. Monitor the person's fasting plasma glucose or HbA1c levels at 3-month intervals and stop the drug if no effect is seen.

NNT: Prevent 1 case of diabetes, 3 years,
- 6.9 people for the lifestyle-intervention program or
- 13.9 people would have to receive metformin 850mg bd
- £1.31 per 28 days x 3 years x 13.9 NNT = £712.60
Factors to consider when choosing a procedure in obese patients with type 2 diabetes

• Expertise & experience in the bariatric surgical procedures

• Patient’s preference when the range of risks & benefits, the importance of compliance, & the effects on eating choices and behaviours have been fully described

• Patient’s general health & risk factors associated with higher peri-operative morbidity & mortality

• Duration of the diabetes

• The follow-up regimen for the procedure and the commitment of the patient to adhere to it
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Severe hypoglycaemia and cardiovascular disease: systematic review and meta-analysis with bias analysis

- Netherlands, US, Japan study on severe hypoglycaemia and risk of cardiovascular disease (CVD) in T2DM
- 6 studies 903,510 participants
- Severe hypoglycaemia strongly associated with higher risk of CVD (2.05; 95% CI 1.74–2.42; \( P<0.001 \))
- Data indicated that co-morbid severe illness alone may not explain the association between hypoglycaemia and CVD

Clinical Inertia in People With Type 2 Diabetes
A retrospective cohort study of more than 80,000 people

• To determine time to treatment intensification in T2DM
• Retrospective cohort study based on 81,573 people with type 2 diabetes in the U.K. Clinical Practice Research Datalink
• With HbA$_1$c $\geq$7.0, $\geq$7.5, or $\geq$8.0%
  – From No OAD: 2.9, 1.9, or 1.6 years
  – Median time to intensification with insulin was $>7.1$, $>6.1$, or 6.0 years for those taking one, two, or three OADs
  – Mean HbA$_1$c at intensification with an OAD or insulin for people taking one, two, or three OADs was 8.7, 9.1, and 9.7%
• Delays in treatment intensification in people with type 2 diabetes despite suboptimal glycemic control

Kunti K et al 2013 Diabetes Care
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Diabetes UK Website 2014 April 28th
Diabetes and Driving

Ahmed Ramsinghbert!
- 56-year-old Taxi driver

On insulin: Group 1 driver (cars and motorbikes)

If on insulin: must tell DVLA
Your licence will then be renewed every one, two, or three years.
Any changes to your condition or treatment should be reported when they happen.
Drivers who are under medical supervision by a doctor do not need to notify if insulin is used for a temporary period only (less than three months, or for gestational diabetes less than three months after delivery) unless they have problems with hypos/severe hypos/hypo unawareness
Not on insulin: Group 1 driver (cars and motorbikes)

If you are a Group 1 driver on non-insulin medication for diabetes you do not need to notify unless:
You have had two episodes of severe hypoglycaemia within the last 12 months (where you were completely dependent on another person to treat your hypo)
You develop impaired awareness of hypoglycaemia (where you are unable to recognise the hypo when it starts)
You experience a disabling hypo whilst driving
You have other medical conditions or changes to existing medical conditions which could affect your ability to drive safely.
Examples are: problems with vision (e.g. laser treatment/injections), circulation, or sensation (e.g. peripheral neuropathy).

Hypo-related problems are most likely to happen on sulphonylurea or glinide tablets. If you are unsure whether your medication could cause hypos check with your diabetes care team.
Group 2 driver (bus or lorry)
You must tell the DVLA if you have diabetes for which you take any type of medication.
If you have insulin treatment you will undergo an independent medical assessment every year. This also applies to holders of C1 licence which may previously have been included on your standard car/motorbike licence. You should monitor your blood glucose levels regularly and store results on a memory meter. You will need to provide three months of continuous meter readings at your assessment. Any changes to your condition or treatment (e.g complications which might affect your ability to drive safely) should be reported.
Hypos and driving
DVLA will be concerned if you are unable to recognise or self-treat your hypos. If you are on insulin, check your blood glucose within two hours before getting behind the wheel and every two hours whilst driving. The DVLA advise that if blood glucose is 5mmol/l or less you should take carbohydrate before driving. If it is less than 4mmol/l do not drive. See advice below on hypo advice for drivers. If you hold a Group 2 licence and take non-insulin medication which may cause a hypo you should check your levels at least twice per day at times relevant to driving. The results should be recorded on the meter memory.
Diabetes and Driving

Safe driving tips
Avoid delaying or missing meals and snacks
Take breaks on long journeys
Always keep hypo treatments to hand in the car
Do not drink alcohol and drive.

In the Event of a hypoglycaemic attack

Many of the accidents caused by hypoglycaemia are because drivers have continued to drive, ignoring their hypo warning signs (e.g., hunger, sweating, feeling faint). If you have a hypo whilst driving:
Stop the vehicle as soon as possible
Switch off the engine, remove the keys from the ignition and move from the driver’s seat
Take some fast-acting carbohydrate, such as glucose tablets or sweets, and some form of longer-acting carbohydrate.
Do not start driving until 45 minutes after blood glucose has returned normal.
Poor warning signs, Motor Insurance

If you have poor warning signs, or have frequent hypos, you should probably not be driving because of the risk to yourself and others. Discuss this with your diabetes healthcare team.

If your team advise you to notify the DVLA/DVA you must do so. If you fail to do this, your doctor has an obligation to do so on your behalf.

**Motor Insurance: if diabetes present**
You must declare you have diabetes even if you are not asked about this. You should also inform your insurance company of any changes to your condition or treatment.
Failure to do so, or failure to notify the DVLA/DVA where required, could mean you are not covered.
If you feel your premium is too high it is worth challenging your insurer. Insurers can only refuse cover, or charge more if they have evidence of increased risk.
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Diabetes Care “Checklist”
A Patient-Centred, Multi-Professional, Evidence-based Approach

• **Advice:**
  – Diet and weight control, Physical activity, not smoking

• **Blood Pressure:**
  – aim $\leq 130/80$

• **Cholesterol:**
  – TC $\leq 4.0$, LDL $\leq 2.0$, HDL $\geq 1.0$

• **Diabetes Control:**
  – HbA1c% $< 59$ (7.5%), ideal $> 48$ (6.5%)

• **Eyes:**
  – check yearly at least

• **Feet:**
  – check yearly at least

• **Guardian Drugs:**
  – ?Aspirin 75mg
  – ?ACE inhibitors, ARBs

JD Lee & V Patel 2012
Reducing Complications

Can we reduce these outcomes?

Cardiovascular Death... by 56%
All death... by 46%
CABG... 50%
Stroke: non-fatal... by 85%
Amputations... by 50%
Revascularisation for PVD... 50%
End Stage Renal failure by ... by 83%

**Diabetes Care: The Complications**

- **Retinopathy**
  Commonest cause of blindness < 65
- **Nephropathy**
  30% of all new renal replacement therapy
- **Foot problems**
  Commonest cause of amputation

**Macrovascular**
CVD disease 2–4 fold increased risk of CHD and Stroke, 75% have hypertension

**Retinopathy**
Commonest cause of blindness < 65

**Nephropathy**
30% of all new renal replacement therapy

**Foot problems**
Commonest cause of amputation

**Macrovascular**
CVD disease 2–4 fold increased risk of CHD and Stroke, 75% have hypertension
Risk Factors for Premature Death

Question

The following are the in the correct order of importance:

- **A**: Obesity, Smoking, Alcohol, Suicide
- **B**: Smoking, Obesity, Alcohol, Suicide
- **C**: Smoking, Obesity, Alcohol, RTA
- **D**: Obesity, Smoking, RTA, Alcohol
- **E**: Obesity, Smoking, Suicide, Alcohol

Please indicate your answer:
Each year smoking causes the greatest number of preventable deaths

References:
Interactive Effects of Fitness and statin treatment on mortality risk: a cohort study

Kokkinos et al Lancet 2013

Running to the statin?
Interactive Effects of Fitness and statin treatment on mortality risk: a cohort study

• **Least Fit: \( \leq 5 \text{ METS}: \)**
  - slow pace walk to 1 mile per 17-20 minutes

• **Moderately Fit: 5.1-7 METS:**
  - slow jog, 1 mile per 12-15 minutes

• **Fit: 7.1-9 METS:**
  - jog, 1 mile < 12 minutes

• **Highly Fit: >9 METS:**
  - faster jog, 1 mile < 10 minutes
Interactive Effects of Fitness and statin treatment on mortality risk: a cohort study

- Data were analysed on 4997 people on statins versus 5046 not taking statins (overall 38% had diabetes)
- Overall the adjusted mortality was reduced by 35% in those taking statins (27.7% versus 18.5%)
- The least fit on statin were assigned a relative mortality risk of 1.0.
- The other categories on fitness and statin use had mortality risks as follows (all highly significant except *):
Effects of Fitness and statin treatment on mortality risk
NNT: Number Needed to Treat

- % Died at 10 years follow up
- NNT (number of people that needed to be treated with statins for 10 years to prevent one mortality)
- *NNT = 100/Absolute % Risk reduction x 10 years
- Adjusted for age, BMI, B-blocker use, BP Rx, aspirin, smoking, CVD, hypertension, diabetes

<table>
<thead>
<tr>
<th></th>
<th>No Statin</th>
<th>Statin</th>
<th>NNT*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least Fit:</td>
<td>52%</td>
<td>37%</td>
<td>67</td>
</tr>
<tr>
<td>Mod. Fit:</td>
<td>34%</td>
<td>21%</td>
<td>77</td>
</tr>
<tr>
<td>Fit:</td>
<td>20%</td>
<td>10%</td>
<td>100</td>
</tr>
<tr>
<td>Highly Fit:</td>
<td>13%</td>
<td>6%</td>
<td>143</td>
</tr>
</tbody>
</table>
Interactive Effects of Fitness and statin treatment on mortality risk: a cohort study

- **Least Fit**: No statin +35%, On statin 1.0 = 0%
- **Moderately Fit**: No statin -2%*, On statin -35%
- **Fit**: No statin -19%, On statin -59%
- **Highly Fit**: No statin -47%, On statin -70%

- Easy really, put a statin at the end of a 1 mile run
- Get to it in less than 10 minutes, take the statin
- Repeat daily ideally!
Blood Pressure
UKPDS 38: 154/87 versus 144/82

MI
-34%

Microvascular endpoint
-34%

Heart failure
-35%

Stroke
-37%

All macrovascular endpoints
-44%

Retinal photocoagulation
-56%

Any diabetes-related endpoint
-24%

Deaths reduced by 32%

UK Prospective Diabetes Study (UKPDS) Group (38). BMJ 1998;317:703–713
Primary prevention diabetes patients with one other risk factor (hypertension, smoker, micro-albuminuria, retinopathy)
CARDS study: Treatment effects

<table>
<thead>
<tr>
<th>Event</th>
<th>Placebo*</th>
<th>Atorva*</th>
<th>Hazard Ratio</th>
<th>Risk Reduction (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary endpoint**</td>
<td>127 (9.0%)</td>
<td>83 (5.8%)</td>
<td></td>
<td>37% (17- 52)</td>
</tr>
<tr>
<td>Acute coronary events</td>
<td>77 (5.5%)</td>
<td>51 (3.6%)</td>
<td></td>
<td>36% (9- 55)</td>
</tr>
<tr>
<td>Coronary revascularisation</td>
<td>34 (2.4%)</td>
<td>24 (1.7%)</td>
<td></td>
<td>31% (-16- 59)</td>
</tr>
<tr>
<td>Stroke</td>
<td>39 (2.8%)</td>
<td>21 (1.5%)</td>
<td></td>
<td>48% (11- 69)</td>
</tr>
</tbody>
</table>

**Favours Atorvastatin**  **Favours Placebo**

**Fatal MI ,Other acute CHD death, non fatal MI, Unstable angina, CABG, Fatal stroke, non fatal stroke**

* N (% randomised)
TNT Study: Secondary Prevention

- Secondary Prevention: Reduction in CVD events by 25% (Diabetes or Metabolic Syndrome).
- Local targets fit for purpose

DM and CHD patients

- Atorvastatin 80mg
- Atorvastatin 10mg
Diabetes Control:
UKPDS: 1% decrease in HbA$_{1c}$ is associated with a reduction in complications by….


- 43% Amputation or fatal peripheral blood vessel disease*
- 37% Microvascular complications e.g. kidney disease and blindness *
- 21% Deaths related to diabetes*
- 14% Heart attack*
- 12% Stroke**

* p<0.0001
** p=0.035

UKPDS: metformin in overweight subjects


- Diabetes-related endpoints: Reduction (%): p = 0.0023
- Diabetes-related deaths: Reduction (%): p = 0.017
- All-cause mortality: Reduction (%): p = 0.011
- Myocardial infarction: Reduction (%): p = 0.01

*p* values in comparison to conventional treatment group
GLP-1 effects in humans
understanding the natural role of incretins

1. β-cell: Enhances glucose-dependent insulin secretion in the pancreas

2. α-cell: Suppresses postprandial glucagon secretion

3. Liver: Reduces hepatic glucose output

4. Stomach: Slows the rate of gastric emptying

5. Brain: Promotes satiety and reduces appetite

GLP-1 secreted upon the ingestion of food L-cells

Exenatide, Liraglutide, Lixisenatide:

- Investigated in combination with metformin, SFU, both, and TZD
- ↓ HbA1c 0.8-1.0%
- Usually weight loss (2 to 4 kg over 6 months)
- Common side-effect: nausea, painful injection sites, vomiting
- Hypos with SFU, not with metformin
Consider as 3rd line therapy if:

- BMI $> 35 \text{ kg/m}^2$ (adjust for ethnicity) \textit{and} specific psychological or medical problems associated with obesity
- BMI $< 35 \text{ kg/m}^2$ \textit{and} insulin therapy would be undesirable \textit{or} weight loss would be medically beneficial

Stop if A1c reduction at 6 months $< 1.0\%$ and weight loss $< 3\%$

Also Liraglutide, also once-weekly Exenatide, Lixisenatide
Mode of action of DPP-4 inhibition

DPP-4 inhibitors improve glycemic control by:
- Diminishing incretin response
- Prolonging incretin activity
- Inhibiting DPP-4

Hyperglycemia leads to:
- Diminished incretin response
- Further impaired islet function
- Increased glucagon from α cells
- Decreased insulin from β cells

Improved glycemic control results from:
- Improved islet function
- Increased insulin from β cells
- Decreased glucagon from α cells
**NICE and SIGN recommendations:**

**DPP-4 inhibitors:**
Sitagliptin, Vildagliptin, Saxagliptin, Linagliptin, Alogliptin

- DPP-4 inhibitors may be used to improve blood glucose control in people with type 2 diabetes\(^1\)

- A DPP-4 inhibitor may be preferable to Pioglitazone if:\(^2\)
  - Further weight gain would cause or exacerbate significant problems associated with a high body weight, or
  - A TZD is contraindicated, or
  - The person has previously had a poor response to, or did not tolerate, a TZD

- There may be some people for whom either a DPP-4 inhibitor or a TZD may be suitable- choice of treatment should be based on patient preference\(^2\)

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Benefits vs risks of diabetes therapy must be assessed for each patient

**Metformin:**
- Standard or Slow release or powder
- Max. 3000mg daily

**Incretins injections:**
- Exenatide bd sc or once-weekly
- Liraglutide od sc
- Lixisenatide od sc

**Insulin:**
- Fast analogue, soluble, isophane, long-acting, mixtures

**Sulfonylureas:**
- Gliclazide (also MR)
- Glimepiride
- Glibenclamide
- Nateglinide

**TZD:**
- Pioglitazone

**SGL 2 Inhibitors:**
- Dapagliflozin
- Canagliflozin
- Y
- Z

**DPP-IV Inhibitors:**
- Sitagliptin
- Vildagliptin
- Saxagliptin
- Linagliptin
- Alogliptin
Diabetes Care and Ramadan

• Islam has basic duties, known as the Five Pillars of Islam:

1. **Shahadah / Kulma** The declaration of faith
2. **Salah / Namaz** Five compulsory daily prayers
3. **Zakat** Annual alms tax, poor and needy
4. **Sawm** Fasting during Ramadan month
5. **Hajj** Pilgrimage to Mecca

• The Shahadah is intended to be a constant presence, the day is punctuated by five prayers, while Zakat and fasting occur annually. The Hajj comes once in a lifetime.
Who should avoid fasting?

- It is important that those wishing to fast have reasonably well-controlled diabetes prior to fasting to reduce the risk of emergencies such as hypoglycaemia or hyperglycaemia.

- Education should start early to ensure patients optimise their control in good time. Education should include advice on diet, medication and hypo/hyperglycaemia.

- Advise against fasting\(^1\) in:
  - “Brittle” type 1 diabetes
  - Those with hypoglycaemia or marked hyperglycaemia during Ramadan.
  - Poorly controlled type 1 or type 2 diabetes
  - Those known to be non-adherent
  - Those with serious complications, such as unstable angina
  - Those with a recurrent history of diabetic ketoacidosis
  - Pregnant women
  - Those with inter-current infections

During Ramadan, in those with type 2 diabetes:

- **Physical activity** decreased in 37%
- **Food intake** increased in 19%
- **Fluid intake** was reduced in 30%
- **Sugar intake** was increased in 23%
- **Weight gain** occurred in 19%
- **Insulin dose** decreased in 25%

Morbidity of hypoglycaemia in diabetes

Brain
Blackouts, seizures, coma
Cognitive dysfunction
Psychological effects

Cardiovascular
Myocardial ischaemia (angina and infarction)
Cardiac arrhythmia

Musculoskeletal
Falls, accidents (driving)
Fractures, dislocations
Recommendations during fasting

Oral therapies – general recommendations

• **Patients treated with metformin alone**
  – Omit the lunchtime dose.
  – Consider reducing to 500 mg doses max, dose twice daily

• **Patients treated with sulphonylurea or combination therapy:**
  – ? Reduce SU dose or consider changing SU to a DPP-4 inhibitor

Recommendations during fasting (2)

A brief note about insulin – general recommendations

Analogue or human insulin bolus?
• A bolus that can be given immediately prior to meals is preferable. Fasting patients prefer to eat as early after sunset as possible: i.e. they need to be able to “inject and eat”.

Three-times daily regimen
• Short-acting insulin with/before sunset and pre-dawn meals, with longer-acting insulin in late evening.

Twice-daily premixed insulin regimens
• If patients are to remain on premixed insulin, then advise to take bigger dose before the sunset meal and smaller dose before the pre-dawn meal.
• If both the doses are the same, take one-half to one-third of the morning dose before pre-dawn meal with full dose before sunset meal.
CONTROL YOUR Diabetes in Ramadan

What is diabetes?
Your body turns the food you eat into glucose, so it can be used as energy. The pancreas is an organ that lies near the stomach, it produces insulin that helps lower the blood glucose levels once you have eaten.

In diabetes, your body stops producing enough insulin or cannot use the insulin it makes effectively. Therefore, a patient with diabetes will have a constant high blood glucose level.

The glucose that accumulates in the blood causes damage to the heart, kidneys, eyes and nerves.

Fasting and Diabetes...
It is very important in those wishing to fast to have good blood sugar level control before Ramadan.
This helps reduce the chances of very high or low blood sugars when fasting.

An alteration in your eating habit without changing your insulin or other diabetes treatment can also cause dangerous changes to the blood sugar levels.

Your doctor will advise you about your medication.
With good control of blood glucose levels you can avoid damage to your body.

Recommendations:
- Avoid sugary foods such as milk shakes, cakes and Indian sweets
- Avoid fried foods such as Samosas and Pakoras
- Use less fat in cooking (butter, ghee and oil)
- Check your blood sugar level throughout Ramadan and your diabetic treatment will be adjusted according to these readings
- Check your blood sugar levels before Suhour (tawwakel meal), before Iftar (evening meal) and a few hours after Iftar
- Break your fast if your blood sugar level is too low, less than 4

When to avoid fasting:
- Constant high blood sugar levels, usually above 15 - seek medical attention
- If you forget to take the correct medication and diet
- Serious illnesses: uncontrolled blood pressure, chest pain or infections
- Menstruating, pregnant and nursing women
- Knees problems
- Elderly and frail patients who are not alert
  Those travelling a distance greater than 50 miles in a single journey

Five Pillars of Islam:

Salah:
Prayer five times a day

Shahada:
Declaration of Faith

Hajj:
Pilgrimage to Mecca

Sawm:
Fasting in Ramadhan

Zakah:
Giving Charity
Pre-Ramadan assessment

- All patients wishing to fast should undergo pre-Ramadan medical assessment and education
  - **Medical assessment**
    - 1–2 months before Ramadan
    - Appropriate tests – HbA₁₅₀, lipids, blood pressure
    - Advice on risks
    - Necessary change to diet or medication regimens
  - **Education**
    - Patients and family should receive education on:
      - Signs and symptoms of hyper- and hypoglycaemia
      - Blood glucose monitoring
      - Taking medicines
      - Management of acute complications
Clinic advice during Ramadan

- Discussions with doctor, nurses, multilingual worker

**Treatment**

Metformin 500 mg tds

Novomix 30: 24 units am, 16 units pm

Ramipril 10 mg

Indapamide MR 1.5mg
Clinic advice during Ramadan

- Day-centre discussions with doctor, nurses, multilingual worker

<table>
<thead>
<tr>
<th>Treatment advice example:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sehri</td>
<td>Iftari</td>
</tr>
<tr>
<td>Metformin 500 mg</td>
<td>Metformin 500 mg</td>
</tr>
<tr>
<td>Novomix 30: 16 units</td>
<td>Novomix 30; 24 units</td>
</tr>
<tr>
<td></td>
<td>Ramipril 10 mg</td>
</tr>
<tr>
<td></td>
<td>Indapamide MR 1.5mg</td>
</tr>
</tbody>
</table>
E is for ....Eye screening

- **Diabetic Maculopathy:** Commonest cause of blindness in UK under 65
- Haemorrhages and/or hard exudates within one disc diameter of the macula, with or without visual loss
- **Treatment:** clinical risk factors (BP, Glycaemia, cholesterol) and focal laser photocoagulation
F is for ...

FOOT SCREENING
Guardian drugs

- ACE-inhibitors and Angiotensin-II Receptor Antagonists have a special role in preventing diabetes complications (MICRO-HOPE, LIFE)
- ACE-inhibitors and Angiotensin-II Receptor Antagonists may have a special role in preventing diabetes
- Statins are guardian drugs
HOPE: stroke rate - ramipril vs placebo in Diabetes Patients

RRR = 33% (10 - 50) p=0.0074
RENAAL
Losartan v Placebo in T2DM with Proteinuria

**Doubling of Serum Creatinine**
- Risk Reduction: 25% (p=0.006)

**ESRD**
- Risk Reduction: 28% (p=0.002)

**ESRD or Death**
- Risk Reduction: 20% (p=0.010)

**Graphs**

- **P (+ CT)**: 762, 689, 554, 295, 36
- **L (+ CT)**: 751, 692, 583, 329, 52

- **P**
- **L**
Diabetes Care: A Patient-Centred, Multi-Professional Evidence-based Approach

- Clinical Vignette
- UK Key facts
- Diagnosis using HbA1c
- Prevention of Diabetes
- Bariatric surgery
- New Studies
- Driving and Diabetes
- Alphabet Strategy
  - Statins and Exercise
  - Ramadan Care
  - New Therapies
- Multi-factorial Intervention
- Education Final Remarks
Blood pressure, Cholesterol, Diabetes control, ACE-I, Aspirin!

Doing all this polypharmacy will poison Ahmed!
The Steno-2 Study: A summary

Steno Diabetes Centre
Copenhagen, Denmark

- 160 with T2D and microalbuminuria
- 80 allocated to conventional treatment
- 80 allocated to intensive treatment
- Mean age 55.1 years
- Mean follow-up 7.8 years
## Intensive Steno-2 targets achieved-
same as NICE Targets

<table>
<thead>
<tr>
<th></th>
<th>Intensive</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advice</strong></td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Blood Pressure</strong></td>
<td>131 / 73</td>
<td>146/78</td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>TC 3.5 mmol/l</td>
<td>5mmol/l</td>
</tr>
<tr>
<td></td>
<td>LDL 1.8 mmol/l</td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes Control :</strong></td>
<td>7.9%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>HbA1c%</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Eyes</strong></td>
<td>Annually</td>
<td>Annually</td>
</tr>
<tr>
<td><strong>Feet</strong></td>
<td>Annually</td>
<td>Annually</td>
</tr>
<tr>
<td><strong>Guardians :</strong></td>
<td>All on ACE-I</td>
<td></td>
</tr>
<tr>
<td><strong>aspirin, ACEI / AIIA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Statins</strong></td>
<td>85%</td>
<td>22%</td>
</tr>
</tbody>
</table>
Steno 2: Event reduction

- Cardiovascular disease: 53%
- Nephropathy: 61%
- Retinopathy: 58%
- Autonomic neuropathy: 67%
# Steno-2 : CVD event reduction

<table>
<thead>
<tr>
<th>Event</th>
<th>Conventional</th>
<th>Intensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Death</td>
<td>7 ...died earlier!</td>
<td>7</td>
</tr>
<tr>
<td>MI : non-fatal</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>CABG</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>PCI</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Stroke : non-fatal</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Amputations</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Revascularisation for PVD</td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>

P<0.002

85 events in 35 patients
44% overall

33 events in 19 patients
24% overall
# Steno-2: CVD deaths at 13 years

<table>
<thead>
<tr>
<th>Event</th>
<th>Conventional Mortality 30%</th>
<th>Intensive Mortality 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Deaths</td>
<td></td>
<td>Reduced by 57%!</td>
</tr>
</tbody>
</table>

*P<0.05*

Cholesterol was 3.8 mmol/l at 13.3 years
<table>
<thead>
<tr>
<th>Event</th>
<th>Reduction in Intensive Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Deaths</td>
<td>46%</td>
</tr>
<tr>
<td>Cardiovascular Deaths</td>
<td>57%</td>
</tr>
<tr>
<td>Cardiovascular events</td>
<td>59%</td>
</tr>
<tr>
<td>End Stage Renal Failure</td>
<td>1 versus 6 patients</td>
</tr>
<tr>
<td>Retinal Laser Rx</td>
<td>55%</td>
</tr>
</tbody>
</table>

\[ P<0.05 \]
Diabetes Care:
A Patient-Centred, Multi-Professional Evidence-based Approach

- Clinical Vignette
- UK Key facts
- Diagnosis using HbA1c
- Prevention of Diabetes
- Bariatric surgery
- New Studies
- Driving and Diabetes
- Alphabet Strategy
  - Statins and Exercise
  - Ramadan Care
  - New Therapies
- Multi-factorial Intervention
- Education Final Remarks
Alphabet strategy consultation

- **Introduction Hello!** How are you? How can I help you today?
- **Patient:** Dizzy turns, loss of energy,
- **HCP:** OK lets talk about that first. I will then go through your ABC care plan with you

- **Advice:** Weight 112 kgm, BMI 31, smokes 20, exercise little
- **Blood pressure:** 154/92, rechecked 146/86
- **Cholesterol:** 6.4 mmol/l, LDL 4.2 mmol/l, HDL 0.8 mmol/l, creatinine 132 umol/l
- **Diabetes control:** HbA1c% 8.3%, metformin 500mg tds,
- **Eye examination:** no retinopathy
- **Feet examination:** no problems
- **Guardian drugs:** ?

- **Problem List:** 1. Hypoglycaemia
  2. Smokes
  3. BP too high
  4. Cholesterol too high

- **Plan:** 1. ? ‘gliptin
  2. Encourage smoking cessation
  3. Start ? diuretic

**Follow up:** 3 months with HbA1c%, lipid profile, U&Es
Patient Education
Is diabetes **slowly stealing** your vision?

**How your eyes work**

- The retina is made up of delicate tissue that is sensitive to light rather like the film in a camera.
- The centre of the retina is a small area called the macula. It is vital because it enables you to see fine detail.

A person with diabetes can have eye disease and not even know until it is serious and irreversible vision loss has occurred. The only way to diagnose early signs of diabetic eye disease is by a dilated eye exam at least once a year.

**Diabetic Retinopathy**

- Diabetic retinopathy is the commonest cause of blindness under the age of 65 in the Western World.
- Many diabetes patients have retinopathy at diagnosis.
- 1500 new cases of blindness could be prevented by yearly screening in UK. This is happening in most centres.
- 20 years after diagnosis 95% with Type 1 diabetes have retinopathy.

When was the last time you had your eyes checked?
BLOOD PRESSURE

Have you hit the bulls-eye?
Discuss your BP target with your diabetes care team

- Excellent control of blood pressure is required!
- Raised blood pressure can increase most complications of diabetes.
- It is important that it is checked regularly.
- You may need to change what you eat and exercise more.
- Please take your medication regularly.

UK Prospective Diabetes Study
Blood Pressure Control Study
A Blood Pressure of 144/82 versus 154/87

Death related to diabetes reduced by 32%
Heart Attacks reduced by 21%
Stroke reduced by 44%

Do you know your target?

DIABETES CONTROL

Are you in control of your diabetes?

- Blood glucose should be kept within a controlled range 4-7 mmol/L
  This can be achieved by regular blood glucose monitoring at home.

What is HbA1c?
- This value tells you the amount of glucose sticking to your blood over the last 60 days. It reflects how well your diabetes has been controlled.

Lowering your HbA1c can help to reduce your risk of:
- Poor circulation to the legs
- Eye and early kidney disease
- Heart Failure
- Heart Attacks
- Stroke

What is your HbA1c?
Diabetes Care Planning

Remember!

Our patient spend **3 hours** a year with HCP in Diabetes
And the other **8763 hours** looking after themselves!

---

**Advice:** Exercise, diet, not smoking, regular testing & clinics
- **Blood Pressure:** Always less than 130/80
- **Cholesterol:** Less than 4
- **Diabetes Control:** HbA1c 7.0% or less
- **Eyes:** Check yearly or at least
- **Feet:** Check your feet

**Guardian Drugs:** Aspirin 75 mg protects against heart disease

---

Below you will find some of the tests that may be performed when you attend the clinic, and an explanation of why they are important

<table>
<thead>
<tr>
<th>Name:</th>
<th>Remember that all members of the diabetes team are here to help. It may take some time to reach targets that you are aiming for.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Number:</td>
<td>Remember that as you reach your targets the chances of developing serious complications of diabetes will be reduced</td>
</tr>
</tbody>
</table>

**ADVICE:** Diet and exercise – Healthy eating and regular exercise will benefit all members of the family. Maintaining a healthy diet and preventing or reducing weight gain will help you control your diabetes.

**Smoking:** It is widely accepted that smoking causes heart and lung disease. Most diabetic complications are worsened by smoking.

**Driving:** Plan your trip carefully, avoid hypoglycaemia while driving, keep glucose in the car

**BLOOD PRESSURE (BP):** Raised blood pressure can make you prone to all complications. It is important that your blood pressure is checked regularly. You may need to take tablets to control it, also change what you eat and exercise more.

**CHOLESTEROL:** The amount of fat in the blood. Some blood fats are necessary to provide important energy sources. Too much fat can cause you to be overweight, making it much more difficult to control your diabetes and can cause heart problems.

**DIABETES CONTROL:** HbA1c %. An average measurement of your diabetes control over the last 60 days. This measures the amount of glucose sticking to your blood.

**EYES:** Diabetes can cause changes at the back of the eye. It is essential to identify any changes before sight is affected. Eyes will be examined at least yearly. Eye drops will be used and may affect vision for 1-2 hours. A list of recommended optometrists who screen for diabetic eye disease is available.

**FEET:** Diabetes can cause changes to blood vessels and nerves in the foot. It is essential to note any changes in toe shape, foot shape, skin texture, skin colour and skin sensation. Seek advice early for the above. General advice on foot care is available from a Podiatrist.

**GUARDIAN DRUGS:** Aspirin reduces risk of Heart disease and will help most patients with diabetes. ACE-inhibitors (the proper name of the drug will end in “prl”) help reduce most diabetes complications and will help most patients with diabetes. Please discuss these drugs with your team.
Patient Education: Education and Prevention

Prevent Diabetes

STEP 1: Exercise more
- Get up, get out and get moving
- Choose an activity you enjoy
- Take a walk, work, gardening
- It doesn’t matter what you do as long as you enjoy it
- Do physically active 30 minutes a day 5 days a week, enough to make you breathe a bit
- What do you enjoy?

STEP 2: Eat healthy
- Make healthy food choices and eat smaller portions
- Increase fiber intake
- Choose more fruits and vegetables, beans and whole grains
- Cut down on sugar, salty and fried foods
- Eat five portions of fruit and vegetables a day
- You can still enjoy you snacks, just eat less

STEP 3: Lose weight
- Make healthier food choices and eat smaller portions
- Being overweight puts you at risk of Type 2 Diabetes
- Adding around 10 pounds or more to your weight can help increase your risk
- Weight loss is
- Set a realistic, target weight
- Lose weight about 1/2 to 1 kg per week
- Trim the waistline, wear loose fitting clothes and extra walk
- RECORD YOUR PROGRESS!

Look out for the signs of Diabetes...
- Nervousness
- Feeling large amounts of thirst

Do you have diabetes?

What is Impaired Glucose Tolerance?
This is when your blood glucose levels are higher than normal but not enough for Type 2 Diabetes. If you have Impaired Glucose Tolerance, you are more likely to develop Type 2 Diabetes.

Follow the steps in this booklet and you can reduce your chances of getting diabetes by 80%!

You have the power to PREVENT DIABETES

Stroke
Eye disease
Heart disease
High BP
Kidney disease

Lower Blood Pressure
- Know your BP target
- Control Cholesterol
- Know your cholesterol target

Diabetes control
- Know your HbA1c target

Eyes
- Check your eyes at least twice a year
- Check annually by a professional

Feet
- Check daily by yourself
- Check annually by a professional

Guardian Drugs
- Speak to your diabetes care team about these

All Diabetes problems can be reduced by following a programme like the Alphabet Strategy

Advice
- Not smoking
- 5 portions of fresh fruit and veg daily
- Weight normal/reducing
- Exercise 30 minutes, 5 times a week

Blood Pressure
- Know your BP target

Cholesterol
- Know your cholesterol target

Diabetes control
- Know your HbA1c target

Eyes
- Checked annually and treated

Feet
- Check monthly by yourself
- Check annually by a professional

Guardian Drugs
- Speak to your diabetes care team about these

BMJ Masterclasses
Individualised to the Patient

CONTROL YOUR Diabetes in Ramadan

What is diabetes?
Your body turns the food you eat into glucose; so it can be used as energy.
The pancreas is an organ that lies near the stomach, it produces insulin that helps lower the blood glucose levels once you have eaten.
In diabetes your body either produces enough insulin or cannot use the insulin it makes effectively. Therefore a patient with diabetes will have a constant high blood glucose level.

Fasting and Diabetes...
It is very important in those wishing to fast to have good blood sugar level control before Ramadan.
This helps reduce the chances of very high or low blood sugars when fasting.
An alteration in your eating habit without changing your insulin or other diabetes treatment can also cause dangerous changes to the blood sugar levels.

Recommendations:
- Avoid sugary foods such as milk shakes, cakes and Indian sweets
- Avoid fried foods such as samosas and Pakoras
- Use less fat in cooking (dishes, ghee and oil)
- Check your blood sugar levels before Sahur (evening meal), before iftar (evening meal) and a few hours after iftar
- Check your blood sugar levels after Sahur (evening meal), before iftar (evening meal) and a few hours after iftar
- Break your fast if your blood sugar level is too low, less than 4

When to avoid fasting:
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- If you forget to take the correct medication and diet
- Serious illness: uncontrolled blood pressure, chest pain or infections
- Pregnancy or nursing women
- Kidney failure
- Elderly and frail patients who are less diet
- Those travelling a distance greater than 50 miles in a risky journey

Five Pillars of Islam

- Salah: Prayer five times a day
- Shahada: Declaration of Faith
- Hajj: Pilgrimage to Mecca
- Sawm: Fasting in Ramadan
- Zakah: Giving Charity

Ramadhan Mubarak

"Oh you who believe! fasting has been prescribed to you as it was prescribed to those before you, so that you may become pious." - Al-Quran

"Whoever of you is present in that month let him fast. But he who is ill or on a journey shall fast a similar number of days later on. God desires your well-being not your discomfort!" - Al-Quran
Patient Education

Ramadan and Diabetes

Fasting safely during the Holy month of Ramadan

General Advice

- The Diabetes Care Team would like to help you Fast safely during Ramadan. We provide Ramadan diabetes advice in the local community and also at the hospital.
- Over-eating during Ramadan and Eid can increase your blood sugars and make you put on weight.
- Fasting allows you to abstain from smoking: Ramadan is a good time to stop smoking!
- Eat 5 portions of fruit and vegetables a day
- Ramadan is a good time to make small lifestyle changes. These changes will help you to have good control of your diabetes and reduce chance of a heart attack or stroke.

Diet

- When you open your Fast limit the amount of sweet foods such as dates, milkshakes, jelabi and burfi.
- At Sehri and Iftar time eat more starchy foods, such as basmati rice, chapattis, brown bread and cereals.
- Eat more fruit, vegetables, dhal and low fat yoghurts.
- All drinks should be sugar-free, avoid adding sugar to tea and coffee. Limit the amount of salt you add to food.
- To avoid dehydration make sure you drink plenty of water before starting the Fast.
- When you break your Fast, try not to have too many fried foods such as samosas, paratha and pakoras!

Medication

- During Ramadan it is very important to keep taking your regular tablets. Some tablets will need adjusting.
- Your tablets will keep your blood glucose in control and keep you feeling well.
- If you decide to Fast and you are on insulin, you will need to be very careful, your insulin dose will need to change. Do not stop your insulin.
- For further advice contact the diabetes team at the hospital or your own GP.

Diabetes Control

- Check your blood glucose regularly, it should be between 4 – 7.
- When your blood glucose drops below 4, you may be at risk of having a hypo. You may feel weakness, sweating, trembling, tingling in the lips and fingers and slurred speech. If this happens then you must take 2-3 glucose tablets followed by a snack.
Diabetes Care Referral Criteria

In all cases referral will be dependent on the expertise of the local diabetes care provider. In many cases, consultation will ensue with a secondary care colleague or the Community Diabetes Specialist Nurse (Diane James). Format is similar to that adopted by the 2010 NICE “ThinkGlucose” Campaign.

Primary care

Early Referral

- All new Type 1 Diabetes patients
- Pregnancy in any diabetes patient
- Gestational Diabetes
- All DM pts pending Surgery with HbA1c > 8.5% (72 mmol/mol)
- When individualised to a patient: “Poorly controlled” diabetes care parameters, after treatment in Primary care:
  - HbA1c > 9% (75 mmol/mol)
  - BP > 140/90
  - TN: Chol > 5 mmol/l or LDL > 3
  - Creatinine > 150 mmol/l or CKD 3
  - Proteinuria 1+ or greater
- DM Acute CHD or Stroke (last 3 months)
- Severe hypoglycaemia (episode requiring 3rd party assistance or HCP help)
- Worsening retinopathy requiring laser treatment or grade 3 or greater
- Foot Ulceration, Charcot, Necrobiosis
- Insulin Pump Care
- New Therapies eg GLP-1 injections + insulin

In-patient care

Early Referral

- Hyperglycaemia: glucose > 12 on treatment, in pregnancy if glucose > 5.5 pre-meals and >7.7 after meals
- Admission for urgent or major elective surgical procedure
- Acute coronary syndrome
- DKA/Hyperglycaemic Hyperosmolar state
- Severe hypoglycaemia
- Sepsis
- Vomiting
- Impaired consciousness
- Unable to self manage
- Previous diabetes problem as inpatient
- IV insulin infusion glucose outside limits
- IV insulin for over 48 hrs
- Parenteral or enteral nutrition
- Foot ulceration
- Newly diagnosed type 1 diabetes
- Newly diagnosed type 2 diabetes
- Pancreatitis in DM pt
- Patient request

Referred May Be Required

Referred Not Normally Required

- Diabetes care Education: Desmond, GERTIE (Type 1 Education Programme)
- Autoimmune: Hyperglycaemia, hypotension
- Erythrocyte dysfunction
- Diabetic “Arthritis” eg GTS
- Diabetic Neuropathy or myopathy
- Isolated nerve palsy: esp 3rd Nerve, foot drop
- Pre-conception care
- PCOS with or without Diabetes
- Obesity management: DM with BMI > 35
- Secondary DM: eg steroid use, acromegaly, psychoses Rx, pancreas disease
- Low level of concordance with care advice
- Pre-Ramadan advice

Referred Not Normally Required

- Minor, self treated hypoglycaemia
- Transient hyperglycaemia
- Simple educational need
- Routine dietetic advice
- Well controlled diabetes
- Good self management skills
- Routine diabetes care
Effective communication to other HCP

Coventry Diabetes Care

Dr Ali A Bett
The Park Medical Centre
39 Barton Road, Coventry

Dear Dr Bett

Re James Bond (25/12/1843)
19 St Bart’s Drive, Nuneventry

Appointment Type: Annual Review

Diabetes Diagnoses
1. Type 2 diabetes 1996, Insulin treated 2001
2. Hypcholesterolaemia statin treated
3. Angina- stable
4. Metabolic Syndrome (WHO)

Diabetes Rx
1. Metformin 500 mg bd
2. Aspirin 75 mg od
3. Ramipril 10 mg od
4. Atorvastatin 10 mg od

Other Diagnoses
5. Psoriasis
6. Recent admission for pneumonia
7. Prostatitis

Other Rx
5. Tamulosin 1 daily
6. GTN spray as required

Advice
WE: 86.6
BMI: Diot: Smoking: Con adıse: Exercise: Flu Vac: 11:03
BP: BP 1: 154/79
BP 2: 152/82
BP ↑
Chol: TC LDL HDL TG
4.3 2.1 1.4 1.6
Cr Creatinine Cr Cl
80
U Prot.
Micro labs
UA CR
NAD

Diabetes
Hba1c: 7.9 %
Hypoxia: No
Home Glucose: Stable 5 to 8
Eyes: DR: Background DR
L: FA: 6/12
DR: Exudates Maculopathy

Feet: R PT: Y DP: N PN: N Ule: L

Guardians

Heart Risk: UKPDS heart disease risk @ 10 yrs 16.5%

Assessment and changes to management
I reviewed this diary in clinic, there were two concerns. Firstly blood pressure being elevated and I have added in a diuretic. He also complains of muscle aches and pains and I have stopped the statin which can cause myalgia and I have given Ezetimibe 10mg od. I note he has an appointment to see Mr Kumar for his retinopathy shortly. Insulin dose has been adjusted. Other treatment remains unchanged.

Follow up and Investigations
Review in 3 months time with HbA1c, U&E, Creatinine full Lipid Profile, TFTs checked before.
Yours sincerely

Dr Ali A Bett
Consultant Physician
Diabetes Care: A Patient-Centred, Multi-Professional Evidence-based Approach

- Clinical Vignette
- UK Key facts
- Diabetes Diagnosis using HbA1c
- Alphabet Strategy
  - Statins and Exercise
  - Ramadan Care
  - New Therapies
- Multi-factorial Intervention
- Implementation and Commissioning
- Final Remarks
Care processes

- Lower in T1DM
- Considerable variation in the completion of the eight recorded care processes
- CCGs/LHB: bottom 25% rates at least 10.9 % lower than those in the top quarter (56.1 per cent vs 66.9 per cent)
- When other factors, such as age, gender and type and duration of diabetes, were taken into account the 8 care processes were 7.1% less likely in SA, 4.2 % less in Black ethnicity
Treatment Targets

• Concurrent achievement of all three NICE recommended glucose, blood pressure and serum cholesterol levels continues to improve very slowly (19.3 per cent in 2009-2010; 19.7 per cent in 2010-2011; 20.8 per cent in 2011-2012)
Largest diabetes audit in world: England and Wales
Approx. 2 000 000 records, 80% of those with diabetes in England and Wales

- **8 Care processes (NICE):** weight, BP, HbA1c, Urine Albumin Creatinine ratio (UACR), cholesterol, feet screening, smoking status and advice (problems with eye screening data)

- Obesity: 50% in type 2, 25% in Type 1

- 2011: All 9 Care Bundle Processes: 56.4% in type 2, 38.5% in Type 1
- 2003: All 9 Care Bundle Processes: 8.1% in type 2, 6.8% in Type 1

- **Now all 8 care processes: 60.5% (last year 60.6%)**

- HbA1c% ≤ 7.5, Cholesterol ≤ 5 mmol/l, Relevant BP target:

- National Average: Top 25% 22.3% only.

- **So only 1 in 5 are reaching targets on average**
## Diabetes Matrix
An Integrated Approach to Prevention, Care and Commissioning

<table>
<thead>
<tr>
<th>Level</th>
<th>Target Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1: Community Prevention</strong></td>
<td>Entire Local Population</td>
</tr>
<tr>
<td><strong>2: Pre-Diabetic Screening</strong></td>
<td>At risk groups within the local population</td>
</tr>
<tr>
<td><strong>3: Early Diagnosis</strong></td>
<td>Pre-diabetic population, Known impaired glucose tolerance, newly diagnosed DM</td>
</tr>
<tr>
<td><strong>4: Forging Foundations</strong></td>
<td>Newly diagnosed: excellent care from start focus on lifestyle, experience, outcomes, concordance, preventing complications</td>
</tr>
</tbody>
</table>
| **5: Rolling Review** | 5A: Well controlled with few risk factors to manage. Achieving high quality care parameters  
5B: Complicated, higher risk or psychological or social issues affecting engagement with high quality care |
| **6: Early Escalation** | Uncontrolled clinical and social factors at high risk of complications, admission or morbidity. eg hypertension, poor concordance, poor glycaemic control |
| **7: Curbing Complications** | 7A: Patients with known complications/conditions: eg pregnancy, concurrent illness, planned surgery  
7B: Patients with unpredictable complications: reactions to medications, polypharmacy |
| **8: Avoidable Admissions** | Hypoglycaemia, DKA, Foot ulceration and infection, |
| **9: Unavoidable Admissions** | Patients with advanced disease and complications: acute coronary syndromes, stroke, amputation, nephropathy, neuropathy |
| **10: Rationalised Long Term Care** | Patients with co-morbidities not amenable to treatment: end-stage renal disease, review of medications, end-of-life care |
Diabetes Care “Checklist”
A Patient-Centred, Multi-Professional, Evidence-based Approach

- **Advice:**
  - Diet and weight control, Physical activity, not smoking

- **Blood Pressure:**
  - aim ≤ 130/80

- **Cholesterol:**
  - TC ≤ 4.0, LDL ≤ 2.0, HDL ≥ 1.0

- **Diabetes Control:**
  - HbA1c% < 59 (7.5%), ideal > 48 (6.5%)

- **Eyes:**
  - check yearly at least

- **Feet:**
  - check yearly at least

- **Guardian Drugs:**
  - Aspirin 75mg
  - ACE inhibitors, ARBs

JD Lee & V Patel 2012
The Alphabet strategy in action: Ahmed Ramsinghbert

- 54 year old builder, married, family history of diabetes
- Type 2 diabetes, 4 years duration
- Brother age 52 recently had a heart attack
- On metformin 500mg tds
- Gliclazide 160mg bd
- Simvastatin 40mg od
- Does not want insulin
Alphabet Strategy Consultation

• **Introduction** Hello! How are you? Are you having any problems with your diabetes?

• **Patient:** Dizzy turns, loss of energy, tummy pains

• **Advice:** smokes 20, exercise little, loves Indian sweets

• **Blood pressure:** 148/88 rechecked 146/86

• **Cholesterol:** 5.3 mmol/l, creatinine 132 umol/l

• **Diabetes control:** HbA1c 63 mmol/mol (7.9%)

• **Eye examination:** no retinopathy

• **Feet examination:** no problems

• **Guardian drugs:** ?

• **Problem List:**
Alphabet Strategy Consultation

**Introduction** Hello! How are you? Are you having any problems with your diabetes?

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**Eye examination:** no retinopathy

**Feet examination:** no problems

**Guardian drugs:** ?

**Problem List:**
1. Hypoglycaemia (has chocolate and weight increasing).
2. Side Effects metformin
3. Smokes
4. BP too high
5. Cholesterol too high
Alphabet Strategy Consultation

- **Introduction** Hello! How are you? Are you having any problems with your diabetes?
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- **Problem List:**
  1. Hypoglycaemia
  2. Side Effects metformin
  3. Smokes
  4. BP too high
  5. Cholesterol too high

- **Plan:**
  1. Consider SR Metformin
  2. Stop gliclazide: consider DPP-4 inhibitor
  3. Lifestyle measures: smoking, weight, physical activity
  4. Atorvastatin 20mg od . ? Ramipril
  5. Review appointment: HbA1c, lipids