Foreword from the lead author of the BMJ Research Paper of the Year 2013

In 2012, more than 371 million people across the globe were living with diabetes (3.3 million in the UK), 4.8 million people died because of diabetes, and more than $471bn was spent on healthcare for diabetes. The prevalence of diabetes is increasing in every country and increasing fastest in many countries with health systems ill prepared for the challenge. Our understanding of the aetiology, pathophysiology, treatment, and systems of care for diabetes has increased substantially in the 90 years since Banting (a family doctor) and colleagues discovered insulin. However, there is much still to do. The incidence of type 2 diabetes (the commonest form) can be halved by lifestyle change, but around half of those with type 2 diabetes are undiagnosed and hence untreated. The major complications of both type 1 and type 2 diabetes can be halved by intensive treatment of glucose and related risk factors. While Tudor Hart’s observation that much of chronic disease care involves doing simple things well for large numbers of people, few of whom feel ill, there remains a substantial implementation gap between research evidence and practice. This ebook will go some way towards sharing ideas, knowledge, and best practice, and reducing this gap.

Simon Griffin, professor of general practice and assistant director, Medical Research Council epidemiology unit, University of Cambridge, Cambridge, England

Last updated July 2013
Control with the largest T2D CV outcomes study at its heart

Onglyza offers your patients:

✓ Comparable HbA1c reductions to a sulphonylurea at 1 and 2 years, as demonstrated in a non-inferiority study, with a substantially lower incidence of hypoglycaemia*1,2

But there’s more to managing diabetes than glycaemic control

Introducing the Onglyza SAVOR study

The largest type 2 diabetes CV outcomes trial to date in 16,492 patients, across 26 countries:

✓ Onglyza did not increase the composite risk of cardiovascular death, non-fatal MI, or non-fatal ischaemic stroke vs placebo**3

So when metformin is no longer enough, start Onglyza for control with confidence at its heart

*Non-inferiority study comparing metformin and saxagliptin vs. metformin and glipizide **as add-on to standard of care T2D = type 2 diabetes. CV = cardiovascular. SAVOR = Saxagliptin Assessment of Vascular Outcomes Recorded in Patients with Diabetes Mellitus. MI = myocardial infarction

References:

Date of preparation: March 2014  140803.011  140905.011

Click here for prescribing information

AstraZeneca  www.diabetesalliance.co.uk  www.onglyza.eu
ONGLYZATM 2.5MG & 5MG FILM-COATED TABLETS (saxagliptin)

PRESCRIBING INFORMATION. Consult Summary of Product Characteristics before prescribing.

Presentation: 2.5mg or 5mg saxagliptin (as hydrochloride) film-coated tablets. 

Indications: Adults 18 and older with type 2 diabetes mellitus to improve glycaemic control in combination with diet and exercise as: (i) monotherapy in patients inadequately controlled by diet and exercise alone and for whom metformin is inappropriate due to contraindications or intolerance; (ii) dual therapy with metformin, when metformin alone does not provide adequate glycaemic control; and sulphonylurea, when sulphonylurea alone does not provide adequate glycaemic control and metformin is considered inappropriate; or thiazolidinedione, when thiazolidinedione alone does not provide adequate glycaemic control and thiazolidinedione is considered appropriate; (iii) triple therapy with metformin plus a sulphonylurea when this regimen alone does not provide adequate glycaemic control; (iv) combination therapy with insulin (with or without metformin), when this regimen alone does not provide adequate glycaemic control. 

Dosage: Adults: 5mg once daily with or without food at any time of the day. In combination with a sulphonylurea or insulin, consider a lower dose of sulphonylurea or insulin to reduce the risk of hypoglycaemia. 


Contraindications: Hypersensitivity to saxagliptin, any of the excipients or history of a serious hypersensitivity reaction, including anaphylactic reaction, anaphylactic shock, and angioedema, to any dipeptidyl peptidase 4 inhibitor. 

Warnings and precautions: Not for the treatment of Type 1 diabetes mellitus or diabetic ketoacidosis. Onglyza is not a substitute for insulin in insulin-requiring patients. Inform patients of the characteristic symptom of ketoacidosis. Onglyza is not a substitute for insulin in insulin-requiring patients. 

Pregnancy and lactation: Avoid use. Undesirable events: (adverse reactions reported with saxagliptin in clinical trials and from post- marketing experience): 

- Very Common: Hypoglycaemia (when added to; sulphonylurea, metformin plus sulphonylurea, and insulin with or without metformin) 
- Common: 
  - upper respiratory infection, urinary tract infection, gastroenteritis, sinusitis, dyslipidemia, hypertriglyceridaemia, arthralgia, erectile dysfunction; 
  - Rare: anaphylactic reactions including anaphylactic shock, angioedema. 

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. 

Adverse events should also be reported to Bristol-Myers Squibb Pharmaceuticals Ltd. Medical Information on 0800 731 1736 or medical.information@bms.com 

Date of preparation: March 2014 
140803.011 140905.011
“To tackle the rising problem of diabetes, clinicians should be well educated and be able to recognise the symptoms of the disease early in order to prevent or delay its progression”

Dr Sita Pokhrel, Doctor
It takes time for research papers to change practice. Here are some important diabetes publications that have done so

The Diabetes Control and Complications Trial (DCCT) 1993 and Epidemiology of Diabetes Interventions and Complications (EDIC) 2005

During my early diabetes career the most heated debate was about the relationship between glucose control and the vascular complications of diabetes. This permeated clinical settings and resulted in confused patients. In 1977 as part of the Diabetes Commission’s report, a clinical trial to examine this issue was recommended. The DCCT became possible as the result of two innovations. The first was a reliable method of measuring metabolic control over time - HbA1c. The second was the ability to measure glucose control in real time with self-monitoring of blood glucose. I was fortunate enough to be the chairman of the committee that helped design the trial and selected the clinical sites. I also chaired the Data, Safety Monitoring Board that monitored the trial. We all know the results: intensive glucose control markedly reduced microvascular complications. What was not clear was the effectiveness of intensive glucose control on macrovascular complications. To address this question and to look at the long term benefits of intensive management an observational trial following the DCCT patients was conducted for another decade, EDIC. EDIC revealed that the benefits of early intensive glucose management resulted in benefits in reducing microvascular complications for at least a decade even though the HbA1c in the intervention group increased to the same level as the control group within a year after the intervention trial ended. Thus, early intensive management of type 1 diabetes had decade long microvascular benefits. Additionally, the reduction in macrovascular events in treatment groups became significant.

Charles Clark, retired associate dean and professor of medicine, Indiana University School of Medicine, Indianapolis, USA and BMJ diabetes fellow

Action to Control Cardiovascular Risk in Diabetes (ACCORD) 2007, Veterans Affairs Diabetes Trial (VADT) 2008, & Action in Diabetes and Vascular Disease (ADVANCE) 2009

These three trials have shown that the benefit of blood pressure control ends at systolic pressures between 130-140 mm Hg, and that lower values may be harmful. From the ACCORD trial we know it is harmful to lower HbA1c below a certain value in a subset of persons with long standing diabetes in the presence of cardiovascular disease. The VADT adds that there is a u-shaped curve in the benefit of lowering HbA1c. It appeared that in early diabetes there was a benefit, but as time and the presence of macrovascular disease increased, lower HbA1c values had a detrimental effect. The issue is still not settled but it is clear there is an HbA1c value below which the risks outweigh the benefits.

Charles Clark, retired associate dean and professor of medicine, Indiana University School of Medicine, Indianapolis, USA and BMJ diabetes fellow

Aspirin & diabetes

The following papers help me decide when aspirin is appropriate:
• The 2008 Prevention of Progression of Arterial Disease and Diabetes (POPADAD) trial
• The 2011 Primary Prevention of Atherosclerosis With Aspirin for Diabetes (JPAD) trial
• The 2009 US Preventive Services Task Force Recommendations

Samit Ghosal, consultant endocrinologist, Kolkata, India
United Kingdom Prospective Diabetes Study (UKPDS) 1999

At this point the major question became whether DCCT findings applied to type 2 diabetes. The UKPDS addressed this by following 5,000 newly diagnosed persons with type 2 diabetes for two decades. The results confirmed that the beneficial effects of intensive glucose management on microvascular events applied to persons with both type 1 and type 2 diabetes. As with the DCCT, the benefit on macrovascular complications was marginal. Because there were so many more persons with abnormal blood pressure and lipids in the study, the UKPDS was also able to confirm the benefits of hypertension and hyperlipidemia treatment in the reduction of vascular events in type 2 diabetes as well as in those without the disease. The long term follow up study of UKPDS subjects confirmed the long term benefits of early glucose control in type 2 diabetes as in those with type 1 diabetes.

Charles Clark, retired associate dean and professor of medicine, Indiana University School of Medicine, Indianapolis, USA and BMJ diabetes fellow

Publication of UKPDS 33 suggested that ‘intensive blood glucose control’ to lower the HbA1c in people with type 2 diabetes reduced microvascular disease but not macrovascular complications. The UKPDS 34 in overweight patients found that metformin produced less of a reduction in HbA1c but reduced cardiovascular complications and death. More recently, further trials have examined the impact of intensive glycaemic control and have produced conflicting results. DTB 2013

UKPDS 34 provided strong evidence for metformin as a first line drug for type 2 diabetes. UKPDS 38 provided strong evidence for blood pressure control as the first line treatment for prevention of macro and microvascular complications of type 2 diabetes. UKPDS 39 was an article to remind us that blood pressure control is what is important in type 2 diabetes regardless of which “magic” anti-hypertensive pill is used.

Jose Mario Franco de Oliveira, associate professor of medicine, Universidade Federal Fluminense, Rio de Janeiro, Brazil and BMJ diabetes fellow

BMJ Research Paper of the Year 2013

Screening for type 2 diabetes and population mortality over 10 years (ADDITION-Cambridge): a cluster-randomised controlled trial Lancet 2012;380:1741-8

Researchers from the UK have discovered that screening for type 2 diabetes (in patients at increased risk) is not associated with any reduction in death rates from the disease within 10 years. Although it has been suggested that population-based screening and early treatment for type 2 diabetes could reduce the growing burden of this disease, uncertainty persists around the benefits of screening. Results from the study showed that 3% of those screened were diagnosed with type 2 diabetes. There were 1532 deaths altogether in those who had been screened, in 184,057 person-years of follow up (the number of years of the study times the number of people affected by type 2 diabetes).

BMJ Awards 2013

With the first Diabetes Mellitus Insulin-Glucose Infusion in Acute Myocardial Infarction (DIGAMI) study we implemented rigorous sugar control. With DIGAMI 2 we went back to what we did before! Sadia Khan, consultant cardiologist, Middlesex, England
Diabetes in 10 Minutes

Ten things to consider when managing type 2 diabetes

By BMJ’s diabetes expert, Dean Jenkins

1. DOES YOUR PATIENT REALLY HAVE TYPE 2 DIABETES? A minority of people may actually have some other abnormality of glucose metabolism. A particular clue is the person who was lean, not obese, at the time of diagnosis. Consider latent autoimmune diabetes of adulthood (LADA) - a form of 'slow onset' type 1 diabetes. C-peptide levels (indicating insulin production) may be low and they would have positive antibodies especially at the time of diagnosis. In younger adults, especially those with a strong family history of diabetes, consider maturity onset diabetes of the young (MODY) which is a number of monogenic forms of diabetes that may be surprisingly sensitive to small doses of sulfonylurea.

2. REMEMBER, PATIENTS PRESENT WITH COMPLICATIONS. Many people may have had type 2 diabetes for a number of years before diagnosis. Also, they may have had other abnormalities of hyperglycaemia prior to reaching the criteria for type 2 diabetes such as impaired glucose tolerance (IGT) or impaired fasting glycaemia (IFG). Abnormal glucose metabolism and other related cardiovascular risks would have already started causing complications of diabetes. At diagnosis it is important to screen for complications such as retinopathy, nephropathy, neuropathy, erectile dysfunction, and cardiovascular disease. This is particularly important in people with type 2 diabetes who present below the age of 40 who appear to be at especially high risk of also presenting with non-alcoholic fatty liver disease.

3. TYPE 2 DIABETES IS A CARDIOVASCULAR DISEASE. The leading cause of death in type 2 diabetes is cardiovascular disease—myocardial infarction, heart failure and stroke. The greatest risk reduction and the primary target for the management of type 2 diabetes is the reduction of blood pressure, cholesterol and smoking. While weight and glucose control appear to dominate discussions in diabetes clinics, remember it is the cardiovascular risks that are perhaps the most important. Microalbuminuria is a marker for an even higher risk of cardiovascular disease as well as indicating kidney damage.

4. TYPE 2 DIABETES IS PREVENTABLE SO SCREEN FOR IT. We know from a great number of studies that type 2 diabetes is preventable or at least its presentation can be delayed by a number of years in those who have IGT or IFG. Multiple lifestyle interventions including weight loss through calorie restriction, reduced fat intake, and increased exercise reduce the risk of developing type 2 diabetes over a 6 year period by almost two thirds. It appears that there is also evidence of improved outcomes in certain populations that are screened for type 2 diabetes since identifying the disease early allows for earlier intervention to prevent complications.

5. TYPE 2 DIABETES IS REVERSIBLE. The glucose thresholds for the diagnostic criteria are arbitrary and chosen principally on risks of future complications. Individuals can change their classification and this has become apparent in recent years with startling evidence from the dramatic weight loss induced by obesity surgery and very low calorie diets. Those who fulfill the criteria of type 2 diabetes before intervention may have a normal glucose profile after a substantial, 10 - 20%, loss of body weight.

6. THERE ARE PLENTY OF EVIDENCE-BASED GUIDELINES. The UK’s National Institute for Health and Care Excellence has published a range of guidelines on type 2 diabetes and these form the basis of many of the targets of care in
England and Wales. Despite this not all people with diabetes achieve care process or outcome targets for their diabetes and this is highlighted by national audits. To improve quality of care in type 2 diabetes the design of clinics needs to change in a way that allows the evidence-based interventions to be useful to greater numbers of patients.

7. DURING ILLNESS OR SURGERY PEOPLE WITH DIABETES MAY REQUIRE MORE TREATMENT. People with type 2 diabetes who experience the stress of trauma, surgery, acute illness, or treatment with certain drugs (e.g. corticosteroids) may have increased glucose abnormalities. People with IGT or IFG may develop a profile that resembles type 2 diabetes and present with marked hyperglycaemia. Even those with normal glucose profiles may, given sufficient physiological stress, present with hyperglycaema. Those with type 2 diabetes may require increased treatment and this should be anticipated. Insulin may be required to control the hyperglycaemia and it is by far the most flexible and rapid means of control. Those already on insulin will often need more insulin during acute illness.

8. REMEMBER COMPLICATIONS AT EVERY VISIT. At every encounter with a person with type 2 diabetes consider examining their feet, asking about their appointments for retinal photography, asking about symptoms of cardiovascular disease (MI, heart failure, TIA), asking about erectile dysfunction in men, and requesting a microalbuminuria sample if it hasn’t been recorded in the past year. A checklist of complications is important for every clinician who sees a person with type 2 diabetes.

9. REMIND YOUR PATIENT NOT TO SMOKE. Smoking and diabetes do not mix. Ask about smoking status at every opportunity and offer referral to smoking cessation services to smokers.

10. REFER YOUR PATIENT TO A STRUCTURED EDUCATION PROGRAMME. Clinical encounters with people with type 2 diabetes are usually pushed for time. You cannot cover everything in a single visit; also your patients may not be prepared for diabetes education when they are anxious about blood results or new treatments. Refer to structured diabetes education programmes where patients have the opportunity to spend time going through comprehensive curriculums using teaching methods that are evaluated and of high quality. If this service doesn’t exist in your area then set one up or be an advocate for starting one.

Dean Jenkins, programme developer BMJ Qualifications and honorary consultant physician Royal Cornwall Hospital, Truro, England
Does sugar cause diabetes?
BMJ’s community discusses

“When John Yudkin published Pure, White and Deadly in 1972 he met strong opposition from the sugar industry for linking heart disease to sugar. The sugar hypothesis fell out of favour and the fat/calorie hypothesis reigned supreme until now. Now the sugar hypothesis is gaining.” diabetesMD, Indianapolis, USA

“Poor children. They are born into a world where excess sugar in everything acts as an addiction factor.” Yoram Chaiter, Haifa, Israel

“There are two white poisons we have to avoid as soon as possible. Sugar and salt.” Majid Hameed, Basra, Iraq

JOURNAL CLUB
The Relationship of Sugar to Population-Level Diabetes Prevalence PLoS ONE 8(2): e57873
Summary: Using econometric models of repeated cross-sectional data on diabetes and nutritional components of food from 175 countries, the authors found that every 150 kcal/person/day increase in sugar availability was associated with increased diabetes prevalence by 1.1%

“This paper adds to the science behind the sugar hypothesis. It fulfills the Bradford Hill Criteria for testing scientific theories that cannot be tested by prospective trials either because, for example, they would be prohibitively expensive or unethical like a controlled, clinical trial of smoking and cancer.” diabetesMD, Indianapolis, USA

“It is true an ecological study does not substantiate causality, but we have enough other studies that do.” Yoram Chaiter, Haifa, Israel

POLL: Is the prevalence of type 2 diabetes a function of refined sugar consumption? CLICK HERE TO VOTE

Is pre-diabetes a disease entity? Members of BMJ’s community have different points of view

“Who stands to benefit from the creation of this new disease entity? The evidence suggests not the potential patients it would create. Therefore we are left with Big Pharma and, in those countries with private health care system, the clinicians themselves. That all strikes me as suspicious and disturbing.” skyesteve, Isle of Skye, Scotland

“Pre-diabetes is not a disease entity but patients need follow up as they might be prone to diabetes if preventive measures are not taken.” Dr K Ashutosh, Maharashtra, India

“Those in favour of pre-diabetes as a disease entity are known as glucocentric diabetologists, and have conducted the ORIGIN Study. Those against argue it is not a real disease because we don’t know for sure who will become diabetic.” Joey Rio, Rio de Janeiro, Brazil

POLL: Should people with “pre-diabetes” be treated with drugs? CLICK HERE TO VOTE
Is type 2 diabetes reversible?

The BMJ reports on JAMA research

Intensive, prolonged, and repeated efforts to encourage healthier lifestyles can induce remission of type 2 diabetes in some obese adults, say researchers published in JAMA (JAMA, 2012;308:2489-96). But complete remission remains rare, and even partial remission tends to be transient. At the end of a trial that lasted four years, 7.3% of adults given the intensive counselling intervention and 2% of controls were in complete or partial remission. The intervention worked best during the first year—a third of adults who were in remission at one year relapsed in the next. Participants who lost most weight, gained most fitness, and using no insulin at baseline had the best chance of remission.

The trial recruited just over 5000 overweight and obese adults with type 2 diabetes and was designed to look for cardiovascular events and deaths, not remission. These analyses are exploratory say the authors. But they do suggest that intensive lifestyle measures to reduce weight and increase fitness can help a few obese adults reverse their disease, at least for a while.

This result was disappointing, says a linked editorial in JAMA, but in line with other trials of intensive medical or lifestyle interventions. Bariatric surgery is beginning to look like a better option. Surgery is consistently associated with high rates of remission in large observational studies. BMJ research news, 2012

Randomised controlled trial: Bariatric intervention effective at reversing type 2 diabetes

Long-term outcomes in patients who have undergone a bariatric procedure demonstrate reduced mortality due to a decrease in cardiovascular disease and cancer rates. Given that patients with diabetes carry an even greater risk for atherosclerosis and cancer, it will be of particular importance to understand if the metabolic improvements in this population of people will also translate into similar long-term benefits. Evidence Based Medicine, 2012

BMJ rapid response: “Yes it is reversible. And preventable, with better diet and regular exercise”

Really? Does bariatric surgery look like a better option than improved diet and regular physical activity? The JAMA study demonstrated that one in nine patients might be able to either partly or totally reverse their diabetes by increasing exercise, with the added side effect of losing weight. Not a bad NNT, especially given that this study reported only one outcome measure—type 2 diabetes. Not to mention all the other health benefits of improved cardiorespiratory fitness, such as improved longevity, mental health, cognitive function, bone health, muscle health, joint health, lipid health, cancer risk reduction, cardiac health, lung health, renal health and improved productivity. I’m not sure that bariatric surgery, which carries a rather significant ~1% risk to health (death), has all these benefits or increases longevity and quality of life.

Richard Weiler, sport & exercise medicine doctor and GP, London, England

Thoughts from BMJ’s community

“Once criteria for bariatric surgery are met, the longer we wait then the higher the pre-op BMI (and hence the worse the final outcome in terms of BMI) and the longer the reversible comorbidities have to wreak long-term end-organ damage.” crlhc2, London, England
Why are diabetes and obesity so prevalent?

POLL: What do you think is the primary reason for the increase in obesity and diabetes over the past 20 years?

a) Working mothers & convenience foods
b) Children’s sedentary lifestyles
c) Supersizing of foods & sugared drinks
d) Fast food high in sugar, fat, salt & calories

BMJ’s community discusses

“Why do parents overfeed their offspring? How did we come to regard obesity as socially acceptable, and why did doctors fail to speak out about it as a major problem?” sken, Kent, England

“One important cause of what could aptly be termed ‘diabesity’ is genetic/constitutional predisposition.” Dr K Ashutosh, Maharashtra, India

“My feeling is that the increase in working mothers, the decrease in physical activity and the desire of the baby boomers to have it all for themselves and their children set the stage for this epidemic, but that the real centre stage actor has been the universal presence of delicious, addictive high calorie prepared food.” diabetesMD, Indianapolis, USA

Religious fasting in people with diabetes

London GP Tauseef Mehrali summarises the BMJ feature, Management of people with diabetes wanting to fast during Ramadan

• Muslims with diabetes may be exempted from fasting during Ramadan, although a high proportion fast
• Patients with diabetes who fast risk hypoglycaemia, hyperglycaemia, and dehydration
• Guidelines from the National Institute for Health and Care Excellence emphasise the importance of individualising care on the basis of patients’ social, cultural, and religious needs
• Diabetic patients who want to fast need assessments before Ramadan and education to increase their awareness of the risks of fasting.

BEAT THE DIABETOLOGIST

Which statement about fasting people with type 2 diabetes who take insulin is correct?

a) They should remain on the same dose of long acting basal insulin
b) They should remain on the same dose of long acting basal insulin, and if taking a short acting insulin they should reduce the dose of that by 50%
c) They should remain on the same dose of long acting basal insulin, and if taking a short acting insulin they should remain on the same dose of that
d) They should reduce the dose of long acting basal insulin by 20% to avoid hypoglycaemia

Take the full BMJ Learning module on diabetes & Ramadan for CME points

CLICK HERE FOR ANSWER
Is there a role for incretin mimetics in type 2 diabetes treatment? BMJ’s diabetes fellows go head to head

YES The main clinical advantages of agents acting on the GLP-1 (glucagon-like peptide1) axis is that when given alone or with a non-insulin secretagogue, they are not associated with hypoglycemia and are either weight neutral or result in weight loss. When metformin is no longer effective in lowering HbA1c, the DPP-IV inhibitors have the best pharmacological profile for second agents. A recent American College of Cardiology report showed a 44% reduction in hospital admissions and an 80% reduction in deaths in patients using these drugs. The major arguments against them are cost—which will come down—and the concern over long-term pancreatic adverse effects, specifically pancreatitis and pancreatic cancer. Pancreatitis has been seen in registry trials, but at an acceptable level. Attendees at a recent National Institutes of Health conference concluded: pancreatic adverse effects have a sound pathophysiological basis but while there is sufficient concern to warrant pooling of data there is insufficient data to substantiate significant pancreatic risks and insufficient data to recommend changes in the use/labelling of these agents. Meanwhile there is increasing data that current therapies (e.g., sulfonylurea and insulin), at least in the elderly, result in harm; and hospitalizations for hypoglycemia now exceed those for hyperglycemia in persons over 65. Impeding the development of agents not associated with hypoglycemia does not make clinical sense until we have better data on their risks and cardiovascular benefits.

NO The main goal of type 2 diabetes treatment is the prevention of its complications, most commonly cardiovascular disease. However, newer classes of diabetes drugs get onto the market at high speeds because of soft regulatory requirements that give undue importance to HBA1C as a reliable surrogate outcome for diabetic complications; these regulations do not require demonstration of cardiovascular benefit through long term randomised trials, nor are there safety requirements. GLP-1 receptor agonists—like exenatide, liraglutide, and sitagliptin—are indeed legal for clinical use; however the long-term benefits and harms are still unknown. All studies have been pharma sponsored; some authors were even employed by the drugs’ manufacturers. The use of GLP-1 agonists has consistently shown signs of increased chronic sub-clinical pancreatitis, acute pancreatitis, pancreatic cancer, and thyroid cancer in animals and humans. The only medium-term, prospective, randomised, placebo controlled, clinical trial within this class of drugs was with saxagliptin. This showed no hard endpoint cardiovascular benefits, but significantly higher episodes of hypoglycaemia were demonstrated in saxagliptin treated groups of patients. When dealing with “wonder” or “darling” drugs it is important to remember that side effects often take time to appear, and beneficial effects are often overplayed while harmful effects are downplayed—as was shown in the BMJ’s recent investigation into incretin mimetics. Let’s not forget the Rosiglitazone saga.

“GLP-1 is a gut hormone affecting β cells by influencing insulin release & α cells by reducing glucagon release. In type 2 diabetes GLP-1 activity is blunted causing hyperglycemia.”
Samit Ghosal, consultant endocrinologist, Kolkata, India

POLL: Should GLP-1 based drugs be banned while we gather more evidence?
CLICK HERE TO VOTE

Charles Clark, retired associate dean and professor of medicine, Indiana University School of Medicine, Indianapolis, USA
and BMJ diabetes fellow

José Mario Franco de Oliveira, associate professor of medicine, Universidade Federal Fluminense, Rio de Janeiro, Brazil and BMJ diabetes fellow
Management of inpatient hyperglycaemia

Top tips from a diabetes hospitalist who manages every inpatient with hyperglycaemia at a major teaching hospital in the USA

- As hospitalized patients often have unpredictable oral intake, and are susceptible to complications, oral antidiabetes medications are usually discontinued and insulin started.
- A continuous intravenous insulin infusion is usually preferred in critically ill patients whose insulin requirements may change rapidly and where poor tissue perfusion and oedema may impair subcutaneous insulin absorption.
- The use of well documented insulin infusion protocols and frequent glucose monitoring can help minimize hypoglycaemia risk. Sliding scale insulin alone is generally discouraged as it often leads to fluctuations in glycaemic control. A more physiologic approach using basal-bolus insulin therapy is recommended.
- Basal insulin is required to oppose endogenous glucose production and is provided in the form of long-acting insulin given once or twice daily or intermediate insulin in divided doses. For insulin-naïve patients with type 2 diabetes, a starting dose of 0.2 to 0.3 units/kg is what is usually recommended with more conservative doses for patients with renal or liver disease, the elderly, or patients who appear to be relatively insulin-sensitive. Mealtime and correction insulin is typically provided by rapid-acting or short-acting insulin. A starting dose of 0.05 units/kg at meals is generally considered appropriate and rapid-acting insulin may be administered immediately after a meal if oral intake is unpredictable. Additional insulin to correct hyperglycaemia can be administered along with nutritional insulin, or every 4-6 hours if nil by mouth.
- Insulin sensitivity factor may be estimated using the “100 rule”: 100 is divided by the total daily dose of insulin. E.g., if the total daily dose of insulin is 50 units, one expects one unit of insulin to decrease blood glucose by 2 mmol/L.

Brian Ulmer, diabetes hospitalist, Indiana University Health Physicians Methodist Hospital, Indianapolis, USA

For an in-depth step by step guide to inpatient glycaemic management go to BMJ Best Practice

JOURNAL CLUB

Randomized Study Comparing a Basal Bolus with a Basal Plus Correction Insulin Regimen for the Hospital Management of Medical and Surgical patients With Type 2 Diabetes Diabetes Care, 2013

Summary: The authors found that basal plus regimens with glargine once daily plus corrective doses with glulisine insulin before meals resulted in glycemic control similar to a standard basal bolus regimen and that the basal plus approach is an effective alternative to a basal bolus regimen in patients with type 2 diabetes.

“Most studies have been performed in specialized hospitals and implementing these regimens in general medical hospitals remains challenging. The approach used in this study is elegant and appears to be a practical approach to the problem.” Charles Clark, retired associate dean and professor of medicine, Indiana University School of Medicine, Indianapolis, USA
Insulin safety

Insulin is one of the top 10 high risk medicines worldwide. Errors arise because it has a narrow therapeutic range and requires precise dose adjustments. Tara Lamont, special adviser for the National Patient Safety Agency in England offers some safety tips

When prescribing insulin

• Never use abbreviations such as “u” or “iu”
• Use the correct name of the insulin (usually brand name) in full (e.g., Humulin S, Humulin I)
• Include strength and origin (e.g., human, animal, analogue)
• Remember some insulins have similar names but different properties (e.g., Novorapid & Novomix, Humulin & Humalog)
• Include the administration method (insulin vial, cartridge, prefilled pen)
• Remember that numbers after names (e.g., Novomix 30, Humalog 25) refer to ratios of short and long acting insulins in the preparation, not the number of units
• Review recent glucose control and insulin doses before prescribing
• Consider factors that may affect glucose control e.g., eating regimen, exercise, infection, surgery
• Look it up or seek advice if you’re unsure.

How do insulin analogues compare with human insulins for type 2 diabetes?

• Analogues don’t lead to better glucose control
• There is no difference in major hypoglycaemia (in most studies)
• Analogues may result in fewer episodes of minor and nocturnal hypoglycaemia
• Short acting analogues can be injected closer to meals
• Analogues cost two to four times as much

Insulin pumps in the hospital setting

Continuous subcutaneous insulin infusion (CSII) therapy utilising insulin pumps is popular among patients with diabetes. A reservoir of rapid acting insulin is used to provide a continuous infusion of basal insulin with fixed or variable hourly rates, and with supplemental (bolus) doses administered to cover carbohydrate intake and to correct hyperglycaemia. Insulin pump therapy may be continued during hospitalisation provided policies exist to ensure their safe use. This may involve a diabetes team familiar with CSII therapy. Contraindications to the use of insulin pumps during a hospital stay include major surgery, severe illness, altered mental status, diabetic ketoacidosis, or suicidal ideation. Pumps must also be temporarily disconnected for imaging procedures involving exposure to radiation or magnetic fields; an alternative method of insulin delivery is needed if pump therapy interruption is planned to last over an hour. Alternatives to pump therapy include basal long or intermediate-acting insulin with additional injections of rapid acting insulin for meal coverage and correction of hyperglycaemia, or IV insulin infusions for patients undergoing major surgery or who are critically ill.

Brian Ulmer, diabetes hospitalist, Indiana University Health Physicians Methodist Hospital, Indianapolis, USA
Does my young patient have MODY?

A BMJ Clinical Review helps with diagnosis of maturity onset diabetes mellitus in the young (MODY)

The recognition of MODY is challenging because of its relatively low prevalence and the overlap in presentation and clinical features with other subtypes of diabetes. Patients with MODY typically display one or more of the following: a strong family history of diabetes (of any type), onset of diabetes in the second to fifth decade, insulin independence, absence of features of insulin resistance, and absence of β cell autoimmunity. Patients with GCK gene mutations have a raised threshold for the initiation of glucose stimulated insulin secretion. This leads to lifelong, mild, stable hyperglycaemia, with fasting plasma glucose values of 5.5-8 mmol/L. Patients with HNF1A and HNF4A gene mutations are typically normoglycaemic in childhood but have a progressive defect of insulin secretion. The sequencing technique used in the UK diagnostic testing centre has greater than 99% sensitivity to detect a heterozygous base substitution. We recommend genetic counselling before predictive genetic testing, especially for children. Do not assume all family members will have MODY, because different types of diabetes can occur within the same family.


Patients with MODY who present at a young age may be misdiagnosed as having type 1 diabetes and inappropriately treated with insulin.

In contrast to type 2 diabetes, patients with MODY have β cell dysfunction that typically occurs in the absence of insulin resistance. BMJ, 2011

BEAT THE DIABETOLOGIST

1. Which of the following is true regarding MODY subtypes?
   a) Patients with mutations in genes that encode the enzyme glucokinase account for 1-2% of patients diagnosed with diabetes
   b) Mutations in genes encoding the enzyme glucokinase and the nuclear transcription factors hepatocyte nuclear factor 1α & hepatocyte nuclear factor 4α are the most common causes of MODY
   c) Current estimates of MODY subtypes prevalence are similar across countries
   d) Mutations in three different genes have been associated with a MODY phenotype

2. Which of the following is a typical presenting feature in a patient with MODY?
   a) Onset of diabetes in the first decade of life
   b) Features of insulin resistance
   c) Patients commonly require insulin treatment
   d) A strong family history of diabetes

CLICK HERE FOR ANSWERS

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Blood pressure and diabetes

An Education in *Heart* article explains coronary artery calcification (CAC) in people with diabetes

Patients with both diabetes and hypertension have increased cardiovascular (CV) risk. Is it appropriate to screen asymptomatic patients for evidence of coronary heart disease? The primary consideration should be whether this will alter the clinical management. CAC, as measured by CT, is a reliable marker of the total burden of coronary atherosclerosis. In asymptomatic patients, the presence of CAC indicates subclinical coronary disease and has been correlated with future CV events. While some would argue that the presence of diabetes is a coronary heart disease risk equivalent, CAC scanning may serve as a means to stratify patients into high and low risk for cardiovascular events. A recent study showed that diabetic hypertensive patients with CAC experienced higher rates of CV events over both short (3 years) and long term (15 years) follow-up. Screening for CAC may therefore be justified in diabetic hypertensive patients. Stress testing is alright for patients with CAC scores >400 but routine stress testing in asymptomatic patients with diabetes and hypertension is not recommended.

_Franz Messerli, professor of clinical medicine, St. Luke’s-Roosevelt Hospital, New York, USA_

BEAT THE DIABETOLOGIST

Should we proscribe or prescribe diuretics for obese people with diabetes?

Your 57 year old male patient with well controlled type 2 diabetes (well controlled regarding glycaemic levels and lipids) is more stressed at work and has more financial problems. He has stopped exercising for about 10 months. He is on metformin plus one sulfonylurea, atorvastatin 40 mg/day, and lisinopril 40 mg/day. His body mass index is 34 (used to be 31), and he is complaining of dyspnoea on walking longer distances. His office blood pressure is now 170/84 mm Hg. Ambulatory blood pressure monitoring confirms stage 2 hypertension. Ultrasound of renal arteries is normal. What would you do next for this hypertensive diabetic patient?

a) Healthy life-style intervention & add indapamide

b) Healthy life-style intervention and add amlodipine

c) Immediate healthy life-style intervention only

_Click here for answer_

Hypertensive people with diabetes

- Diabetes patients are more than twice as likely to develop hypertension.
- Concomitant hypertension and diabetes increases the incidence of coronary heart disease, cardiomyopathy, stroke, peripheral arterial disease, end stage renal disease, and microvascular complications relative to either hypertension or diabetes.
- The choice of medication is unique for each patient, but generally most will require two or more medications to achieve appropriate targets. In the diabetic hypertensive, ACE inhibitors and angiotensin receptor blockers are the cornerstone of treatment.

_Franz Messerli, professor of clinical medicine, St. Luke’s-Roosevelt Hospital, New York, USA_
A BMJ Head to Head asks: Should we dump the metabolic syndrome?

**YES** The metabolic syndrome lacks a useful definition. Diagnosis is redundant in those who already have diabetes and adds nothing to the management of those who do not. An academic industry has been founded on a diagnostic artefact with little prognostic or therapeutic value. Schemes that have emerged from attempts at producing a working definition have not proved useful for clinicians, who hardly ever record the diagnosis.

*Edwin Gale, professor of diabetes, Bristol, England*

**NO** Focus on the syndrome has brought diabetologists and cardiologists together. The diagnosis provides a focus on the cluster of cardiovascular disease and diabetes risk factors that require attention and emphasises the multifactorial nature of the risk for these diseases.

*George Alberti, senior research investigator, Department of Endocrinology and Metabolism, St Mary's Hospital and Imperial College, London; and P Z Zimmet, director, International Diabetes Institute, Melbourne, Australia*

**Diagnosing the metabolic syndrome**

Suspicion should be raised in patients with coronary artery disease (CAD) or with a family history of CAD or type 2 diabetes. Patients who are older, from urban areas, with Western lifestyles, or exhibiting certain features such as polycystic ovary syndrome are more susceptible.

*BMJ Best Practice: Metabolic syndrome*

**Hypotheses about the aetiology of the metabolic syndrome**

At TEDMED 2013 a physician with metabolic syndrome called Peter Attia hypothesised that maybe obesity is a result of metabolic syndrome rather than the cause of it and that refined sugar and starches may produce metabolic syndrome and then obesity rather than the other way around.

*Luisa Dillner, head of research and development, BMJ, London, England*

The exact mechanism of insulin resistance is uncertain but is likely to have an inflammatory origin which causes insulin receptor blockage, prevention of receptor production, or direct binding of insulin.

*Philip Houck, cardiologist and assistant professor of medicine, Texas A&M University, College Station, USA*

Evidence is accumulating that people with the metabolic syndrome are at increased risk of incident diabetes or cardiovascular disease. The question is whether the metabolic syndrome increases risk for adverse outcomes to a greater degree than predicted by the presence of its individual components.

*James Meigs, assistant professor of medicine, Massachusetts General Hospital and Harvard Medical School, Boston, USA*

**BEAT THE DIABETOLOGIST**

Which observation is suggestive of a diagnosis of the metabolic syndrome?

- a) BP 30/82 mmHg
- b) BMI 30.2 kg/m2
- c) Fasting glucose 6.2 mmol/L
- d) Triglycerides 1.4 mmol/L

*This question is derived from the online BMJ Qualifications Postgraduate Diploma in Diabetes Programme. Find out more here*
A surgeon in the West Indies gives his opinion on foot health

The diabetic foot is a victim of its own nerves, its own blood supply and above all of the individual to whom the foot belongs aided or abetted by carers where applicable. There must be commitment to normoglycaemia by correct dietary, exercise and pharmacologic means tailored to the particular circumstance. The insensate (anaesthetised) foot from neuritic complications is a perfect victim for traumatic assaults of all kinds. The bloodless (ischaemic) foot is no less a victim to infective and non infective complications. And the dirty foot merely offers a comfort operational zone for the pathologic overlays that can accompany both the insensate and bloodless foot. The combination of insensateness, bloodlessness and non hygiene is the best gift to ulcerative changes and ultimately gangrene.

Ulcers have to be managed along the lines of discouraging microbial proliferation, encouraging granulogenesis and stimulating epithelial cell proliferation in a systemic atmosphere of optimum haemoglobinisation, electrolytes, sugar and intravascular flow. The means and manner of doing these things will vary based on local facilities and resources but the principles involved must never be violated. The foot becomes diabetic only because the diabetic allows it. And the diabetic foot ends up in the bin largely because the team in charge allows it; the occasional exceptions allowed. Management facilities (cost, access, knowledge, etc) vary from place to place and morbidity patterns vary reflectively. It is not a useless prayer to wish for surgeons who are prone to waiting as long as it is safe to do so rather than amputating.

_Basil Jide Fadipe, consultant surgeon, Justin Fadipe Hospital, Commonwealth of Dominica, West Indies_

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BEAT THE DIABETOLOGIST

1. To what are the prominent veins in the foot of this patient with diabetes due?

- a) Charcot deformity
- b) Neuropathy
- c) Congestive cardiac failure
- d) Deep vein thrombosis

CLICK HERE FOR ANSWER

2. What condition should you suspect when you see specks of blood within thick callus in the diabetic foot?

- a) Hansen’s disease (leprosy)
- b) Neuroischaemia
- c) Neuropathy
- d) Impending ulceration

CLICK HERE FOR ANSWER

Thoughts from BMJ’s community

We have a team of interested physicians, thankfully, but we don’t have easy access to chiropody, podiatry, etc. And if the ulcer is above the ankle, they don’t have funding to see them. This is a shame really. DundeeChest, Dundee, Scotland

Take the full BMJ Learning module, Diabetic foot: diagnostic picture tests, to enhance your learning portfolio and gain CME points
Diabetes, the kidney, and old age

Consultants in England and Brazil join forces to explain diabetic nephropathy in older people

Demographically, type 2 diabetes is shifting from being a disease of middle age to a disease of older individuals. This shift impacts on the nature of diabetes complications including those involving the renal system. Unlike the ‘typical’ microvascular diabetic nephropathy (DN) of type 1 diabetes, the macrovascular form of DN in older people with type 2 diabetes is characterised by ischaemic nephropathy with low level albuminuria and relatively slow kidney function decline. In older people with type 2 diabetes, microalbuminuria is no longer specific of DN but mostly reflects diffuse underlying macrovascular pathology. This means microalbuminuria has become a marker of increased cardiovascular risk but is an unreliable tool for diagnosis of type 2 diabetes or its progression to end stage renal disease. More intensive glycaemia and hypertension control is recommended but the nature of diabetes in older age has challenged these paradigms ...

• Tight glycaemic control (HbA1c < 7%) reduces complications in younger type 1 diabetes but increases mortality in older people. In a decision analysis assessing therapy priorities and baseline health, blood pressure (BP) control conferred a larger benefit than glucose control at 75-79 years. • Hypertension control slows DN progression but in older people with diabetes and diffuse macrovascular complications, other co-morbidities should be considered. Excessive BP reduction may be associated with worsening of renal function.

Guidelines recommend reducing BP to <130/80 mmHg without clearly accounting for age or the nature of renal involvement. We may be justified to alter our attitude towards renin-angiotensin-aldosterone system blockade with ACE inhibitors or ARBs in type 2 diabetes. Such drugs may accelerate renal function decline rather than preserving it, therefore they should be used with great caution, and with frequent renal function and serum potassium level monitoring. This paradox is explained by the fact that DN in old age has a major ischaemic atherosclerotic component. Angiotensin II levels could have an important compensatory role in preserving glomerular filtration rate.

Ahmed Abdelhafiz, consultant geriatrician, Rotherham General Hospital and senior clinical lecturer, University of Sheffield, England; Meguid El-Nahas, chairman, Global Kidney Academy and professor of nephrology, University of Sheffield, England; and Jose Mario Franco de Oliveira, associate professor of medicine, Universidade Federal Fluminense, Rio de Janeiro, Brazil and BMJ diabetes fellow

“Decisions about older people with DN should be shared with patients, family & carers, and associated co-morbidities – frailty, cognitive dysfunction, increased susceptibility to drug toxicity – should be taken into consideration”

BEAT THE DIABETOLOGIST

In older patients with type 2 diabetes, microalbuminuria is:

a) A marker of progressive diabetic nephropathy
b) A marker of diffuse vascular pathology
c) Best treated with inhibition of the renin-angiotensin-aldosterone system
d) Progressive and irreversible

CLICK HERE FOR ANSWER
BMJ diabetes fellow, Jose Mario Franco de Oliveira asks, “Should the 2012 KDIGO guidelines apply to people with type 2 diabetes?”

A persistent reduction in GFR to less than 60 ml per minute per 1.73 m has usually been the standard definition of chronic kidney disease (CKD). The new Kidney Disease Improving Global Outcomes (KDIGO) guidelines say albuminuria should now be part of the criteria when diagnosing CKD. But should we adopt this for type 2 DN?

In the past decade we have witnessed a false epidemic of CKD, driven by the undue importance given to microalbuminuria in the diagnosis and progression of CKD. Microalbuminuria is more a biomarker of diffuse vascular inflammation with or without endothelial dysfunction, but is not as well related, as previously thought, to CKD diagnosis or progression to ESRD. In every cohort of people with type 2 diabetes followed-up for several years or decades, 25-40% will develop CKD; we don’t yet know all the reasons for this. In these patients GFR usually, but not always, slowly reduces over many years. Associated cardiovascular disease (CVD) such as hypertension, and increased CVD deaths also usually occur before reaching end stage renal disease (ESRD). So far, intensive glycaemic control has had no positive effect on ESRD prevention. Yes, it can significantly reduce albuminuria but this is at the cost of increased hypoglycaemic episodes. Additionally, we now also know that CKD in type 2 diabetes can indeed occur with or without the presence of abnormal albuminuria. Adequate management of these complex patients is not possible when it is mainly based on the surrogate measurements of albuminuria and eGFR. Applying KDIGO guidelines would further increase the overdiagnosis, overtreatment, and polypharmacy of CKD in type 2 diabetes.

Jose Mario Franco de Oliveira, associate professor of medicine, Universidade Federal Fluminense, Rio de Janeiro, Brazil and BMJ diabetes fellow.

Diagnosing diabetic nephropathy

**HISTORY:** Patients destined to develop DN usually have poorly controlled diabetes and family history of hypertension and/or kidney disease. They may also have hypertension and in particular nocturnal hypertension. Patients who do develop DN may have no symptoms of kidney disease until the disease is quite advanced when they may develop constitutional symptoms such as fatigue and anorexia. As patients become clinically uraemic, symptoms such as nausea and vomiting, dysgeusia, and hiccoughs supervene.

**EXAMINATION:** Examination should assess for findings of diabetic nephropathy, including hypertension and peripheral oedema. Costovertebral tenderness is a sign of pyelonephritis (a common complication in diabetes). In overtly uraemic patients, pericardial and/or pleuritic friction rubs, asterixis, and/or myoclonus may be evident.

**TESTS:** • Urinalysis may show proteinuria. • Detecting microalbuminuria early can prevent progression to macroalbuminuria. • Serum creatinine should be measured and the estimated glomerular filtration rate (eGFR) calculated. • Kidney size on ultrasound may initially be large if diabetes is uncontrolled but is usually normal once DN supervenes. • CT can demonstrate hydronephrosis and kidney size. • The most sensitive, specific test for DN is kidney biopsy.

BMJ Best Practice: Diabetic nephropathy
BMJ diabetes fellow Charles Clark is a big advocate for chronic disease self care. He explains here

We conducted the first controlled clinical trial on diabetes patient and physician education in 1987. The improvements in diabetes outcomes were modest and had mostly disappeared in about six months. Bob Anderson of patient empowerment fame says this is the common result when programmes are implemented in clinic settings. He points out that the major factors in the success of patient education programmes are the interpersonal and pedagogic skills of the instructor. This means we must turn to health professionals with training and skill in pedagogy. As the percentage of patients with chronic disease increases we need to re-examine the role of teaching educational skills.

Charles Clark, retired associate dean and professor of medicine, Indiana University School of Medicine, Indianapolis, USA

JOURNAL CLUB

Effectiveness of a diabetes education and self management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus BMJ 2012;344:e2333

Summary: A single education and self management structured programme for people with newly diagnosed type 2 diabetes showed no difference in biomedical or lifestyle outcomes at three years although there were sustained improvements in some illness beliefs.

“I find it ironic that researchers would expect that a one-time education programme would continue to make a difference three years later. This was also found by Norris et al in their 2001 meta analysis of the effectiveness of diabetes education programmes noting that the benefits tend not to be sustained much longer than six months. This does not mean that education does not work—it simply means that people need more than a one time experience (in the US that means 10 hours) of education. That is why the US standards for Diabetes Self-Management Education (DSME) have for the past five years and the International Diabetes Federation standards for the past three years required that Diabetes Self-Mangement Support (DSMS) be established at the end of the initial education. Recent models include the use of trained peers to facilitate this type of education. So, yes DSME works but DSMS is needed in order to sustain those gains over a lifetime of diabetes. After all, our patients therapies change as do their lives, priorities and demands. On-going support incorporates the clinical, behavioural and psychosocial aspects of diabetes.”

Marti Funnell, Ann Arbour, USA

BMJ diabetes blog: computer based self management

While there is a great potential for computer-based technologies to support people with diabetes a Cochrane systematic review points out that there remains uncertainty about which active components of these types of interventions actually work. Such interventions are complex and despite the enthusiasm of a number of mHealth, telemedicine, and telehealth supporters it is clear that technology in itself is not necessarily an effective tool.

Dean Jenkins, programme developer BMJ Qualifications and honorary consultant physician Royal Cornwall Hospital, Truro, England
So you want to be a diabetologist?

BMJ Careers gives an overview of careers in diabetes and endocrinology

The specialty is particularly challenging as diabetic and endocrine manifestations may not be localised to a particular organ system and can present with initially subtle features. Service development enhancing diabetes services enables practice of “true preventive medicine” targeting prevention of complications such as renal failure, myocardial infarction, lower limb amputations, and blindness. The patient cohort ranges from adolescents to the elderly, and challenging problems arise even in everyday clinics. Supervising and interpreting the results of endocrine testing for suspected pituitary or adrenal dysfunction is an exciting remit for the endocrine trainee, offering excellent integration of biochemistry and physiology with practical medicine. Part of this learning experience, though, is to understand when simpler diagnostic measures will suffice.

Jeevan Mettayil, SpR in diabetes and endocrinology, James Cook University Hospital, Middlesbrough, England; Richard Quinton, consultant and senior lecturer in endocrinology, and regional specialty adviser, diabetes and endocrinology, Royal Victoria Infirmary and University of Newcastle, Newcastle, England; Shahid Wahid, consultant physician and training programme director, diabetes and endocrinology, South Tyneside NHS Foundation Trust, South Shields, England

Qualities needed to succeed as an endocrinology trainee

- Aptitude towards multidisciplinary working
- Practical & analytical management of problems
- Understanding of clinical governance
- Evidence of learnt skills—ALERT & ALS courses, audits
- Practical evidence of teaching skills
- Equally at home with business development issues and multidisciplinary discussion of patient care issues
- Showing specialist interest by demonstrating relevant aspects of encounters during acute medicine duties
- High quality learning portfolio with evidence of service development and team working skills

BMJ Careers

Visit the BMJ Careers Centre for the latest diabetes jobs, news, and features: careers.bmj.com

ENDOCRINOLOGY PROS
- Varied clinical range of patients
- Diversity of career options for developing subspecialty interest
- Outpatient based specialty with predictable working hours
- Excellent opportunity for integrated research

ENDOCRINOLOGY CONS
- Acute medical commitment may not be liked
- Need to engage with medicopolitics
- Can be demanding, time consuming & stressful
Diabetes is a global problem and there is variation in how it is managed. Here are some perspectives from our community about diabetes services in their countries:

**UK**
“We’re managing much more diabetes in primary care settings nowadays. In 2001 the government brought out the National Service Framework for Diabetes which highlighted nine ‘basic care processes’ to be arranged annually: BMI measurement, blood pressure management, smoking status review, HbA1c review, microalbuminuria review, serum creatinine review, serum cholesterol review, retinopathy screening, and foot checks. GPs are incentivised to adhere to this with specifically related Quality and Outcome Framework (QOF) payments. At the practice where I work, the diabetes nurses do very good jobs of managing medication, controlling HbA1c, and performing regular reviews, and only come to discuss the complicated cases with the doctors. Endocrinology referrals are usually made for type 1 diabetes, gestational diabetes, latent autoimmune diabetes of adulthood, and maturity onset diabetes in the young, or for advice or clarification on complication management, HbA1c control, and diabetes type.”  
*Jasmin Malik, Manchester, England*

**BRAZIL**
“People with type 2 diabetes (90-95% of people with diabetes in Brazil) are mostly managed by primary care physicians. The complicated cases go to secondary and tertiary facilities. People with type 1 diabetes are usually managed in secondary or even tertiary prevention & treatment city facilities. There is a free medication program for Brazilian citizens with chronic and complex diseases and the morbidly obese have access to bariatric surgery in the public health system. A Sao Paulo Hospital is number one in the world for pancreas and kidney transplants.”  
*Joey Rio, Rio de Janeiro, Brazil*

**NEW ZEALAND**
“The government recently did away with a free at the point of care annual check for all people with diabetes within general practices and replaced it with a mixed delivery model where higher needs patients identified on the basis of HbA1c have access to free “intensive management” from an approved provider. Screening for diabetes is supported with a scheme providing free access, as part of five yearly CVS risk profiling, for Maori over 35 yrs and Pakeha (non maori) over 45 years. Specialist advice comes from a mixture of primary care based practice nurses with interests in diabetes, visiting nurse services from other health organisations (Maori, mainstream, primary care Organisation and District Health board funded), and a small number of hospital consultants. It is unusual for people with diabetes to have hospital consultant visits except as demanded for those who drive heavy goods vehicles, where the law bizarrely requires annual hospital consultant review.”  
*drjo, Opotiki, New Zealand*

**ISRAEL**
“In Israel diabetes is diagnosed and managed both in the community and at hospitals. We are familiar with the picture of young people with previously undiagnosed type1 diabetes coming in with ketoacidosis. Younger patients especially are under regular surveillance of diabetes specialists. With older patients, since treatment is mostly with oral hypoglycemics, family physicians usually do the management. Health maintenance organisations and the ministry of health set diabetes control goals. Still, there is plenty to do to achieve better patient cooperation and reduce complications.”  
*Yoram Chaiter, Haifa, Israel*

**BAHRAIN**
“Diabetes patients are first managed by family physicians. Patients with longterm complications are referred to tertiary care.”  
*nfrasool, Bahrain*

**CHINA**
“In China we don’t have primary care. Patients get diagnosed by hospital doctors, and there are many associations from where patients get suggestions and advice.”  
*yaowanxia, Xi’an, China*
INDIA
“It’s well known that India has over 60m people living with diabetes, second only to China. This prevalence has taught me to subject patients with atypical symptoms, signs, or other to lab work to rule out diabetes. It’s also well known that over here diabetes can be treated by any doctor – qualified or otherwise! I see patients landing in ICU with septicaemia, MI, impending blindness, and amputation after being treated by quacks with the ‘latest oral hypoglycaemic drugs’ and ‘herbal’ concoctions. All such sad endings are too many – despite the efforts of our physicians, diabetologists, medical organizations, and NGOs who are actively involved in free educational and preventive check ups.” csm@csm, Hubli, India

USA
“Diabetes care in the US accounts for about 18% of medical expenses. Most people with diabetes are cared for by primary care physicians; this includes most children and adolescents with type1 diabetes. The most common second physician consulted is a cardiologist. Endocrinologist care accounts for about 4% of persons with diabetes. The US does not have a national health service and some 16% of persons with diabetes are uninsured. They receive less care and have poorer outcomes than those who are insured. Generally those who are cared for in large, multi-speciality practices have the best outcomes.” diabetesMD, Indianapolis, USA

COMMONWEALTH OF DOMINICA
“Type 2 diabetes is endemic on this island of less than a hundred thousand people and has afforded a certain level of management skill to all practitioners as they have daily contact one way or another with a diabetic. Interestingly, treatment within the public sphere is free at the two ends of life: below 18 and above 60. As a surgeon in charge of a private hospital, my contact with people with diabetes is bimodal. At the primary care level, like any other island doctor, I’m forced to see people with diabetes in routine consultations calling for help only when clinical severity outpaces my skills or cost within a private sector becomes unaffordable and hence referral into the nearly costless public pool is better judgement. I also come across people with diabetes at secondary care level when refractoriness causes surgical complications; the more common being ulcers and cellulitis. Sadly, this island still has one of the highest lower limb amputation rates in the region, partly the result of poor patient compliance with regimes, and competing folkloric practitioners advertising unproven alternative herbal brands or other pseudo pharmaceutics.” basil jide fadipe, Commonwealth of Dominica, West Indies

Ethnicity & diabetes
Ethnicity has a major role in setting metabolic targets—a plethora of research supports this. The notion of increased diabetes prevalence in people of south Asian origin, black people, and people of Hispanic origin is well established. The accepted lower thresholds for action in relation to body mass index in people of south Asian origin (23.0 kg/m²) compared to people of European origin (25 kg/m²), as defined by the WHO, is one demonstration of this. Significant ethnicity based heterogeneity noted at the HbA1c loci by the 2012 NHANES III study is another. Numerous other new studies substantiate that people of south Asian origin have poorer metabolic responses to intensified treatment regimens and higher incidences of complications (independent of factors such as social deprivation) compared to white people. More extensive research in this area is coming. Samit Ghosal, consultant endocrinologist, Kolkata, India

For the latest diabetes articles & resources from BMJ go to BMJ’s diabetes portal
It is critically important that care and attention is given to looking after children with type 1 diabetes at school so school loss is minimised, problems are resolved quickly and children can participate in all activities. We carried out a project to improve the management of children’s diabetes at school, and to reduce anxiety and increase diabetes knowledge among school staff. By July 2012 our nurses had trained 342 volunteers who are providing care for 132 children.

The American Diabetes Association carried out an effective ‘Safe at School’ campaign by eliminating barriers to eating at appropriate times, increasing access to water and toilets, encouraging blood glucose testing in the classroom, and giving hypoglycaemia treatment wherever the child happens to be. We added that children need a safe place for blood glucose testing and injecting insulin, staff need to understand the diabetes basics, and parents need reassurance.


“Excellent work on an important area of care. In our region we have a leaflet that encourages children to have a “hypo box” which lives at school containing both short and slow release carbs and their testing kit. Teachers are told they must allow the children to access this if they feel the need. Good control of diabetes in early years is essential for making a good start on managing the condition and until children reach an age where they are able to do their own insulin injections, the support of teachers and school staff is vital. I’ve known one family who had to keep their child off school until the local outreach nurse could get into the school a week later to train staff on how to use the BM machine and give insulin. This child lost out on a week of education because the services were not there.” DrS, Birmingham, England

“The team had to work hard to persuade the authorities -who were fearful about litigation and the prospect of something going wrong- that this would be a successful and positive thing to implement - luckily they were able to go ahead and hopefully we will see more initiatives like this springing up across the country.” Matthew Billingsley, London, England

“Great to spend time with such an expert group from Oxford.” Dean Jenkins, Truro, England

LISTEN TO THE PODCAST HERE
Why diabetes?
Diabetes is a good condition to study in primary care because it involves the whole primary care team: the nurse, the GP, the administrator, dieticians. Key things that determine whether community diabetes care is any good are to do with organisation and delivery of care. It’s about doing things in a simple way for large numbers of people. Good research and delivery of care can have an important impact on diabetes.

How would you sum up your paper?
There was an assumption that screening the population is a good thing because it’s a common condition, people have it for many years before they are diagnosed, and once they are diagnosed treatment can make a difference to risk of complications like heart attack, retinopathy etc. As part of a research programme addressing this topic we undertook a randomised controlled trial where we randomly split GP practices into screening and non-screening practices. We identified a set number of people aged 40-69 years old at increased risk of having diabetes without knowing it from both groups of practices. We invited those in the screening practices for screening. Those in the non-screening group weren’t invited. We compared all cause mortality (cancer, cardiovascular disease, diabetes related mortality) in the screening practices and non-screening practices over a 10 year period. We found no difference in mortality in the groups, which perhaps suggests the benefits of screening might not be as great as previously expected.

What needs to change about the way primary care identifies and treats diabetes?
The delay between developing diabetes and it being recognised by patients or doctors is now much less than it used to be—it used to be between seven and 12 years but it is now three years. It may be that family doctors are getting better at recognising this condition, so there is no need for screening. I think the hot topics in diabetes still remain—how to manage blood glucose and what agents to use. Although we have had insulin since the 1920s our understanding of the physiology and our personalisation of the treatment according to each patient in front of us is still fairly basic and that’s probably an area for research. But if I really wanted to advocate an area for research it would be how to shift population distributions of diet, physical activity and BMI because they are the things which are going to make a real difference worldwide to diabetes and related complications, as well as cancer and cardiovascular disease. So, we need to find out how to get people to move about more and eat less energy dense food so they don’t develop obesity which is the predominant risk factor for type 2 diabetes.
Following the Cuban economic crisis of the early 1990s, food and fuel shortages resulted in a decline in dietary energy intake and large increases in physical activity. This resulted in an average population-wide weight loss of 4-5kg (8-11lbs). Rapid declines in death rates from diabetes and coronary heart disease were subsequently observed.

An international team of researchers from Spain, Cuba and the US examined the association between population-wide body changes and diabetes incidence, prevalence and death rates from type 2 diabetes and cardiovascular disease, cancer and all-causes in Cuba between 1980 and 2010. Lead author Manuel Franco explains the findings.
A round-up of quirky diabetes research from specialist journals

Diabetes is unexpectedly associated with a decreased risk of progression and rupture of abdominal aortic aneurysm and might even have a protective role in these aneurysms developing. In a case-control study in the United States, researchers reported that, after adjusting for demographic characteristics, the negative association between diabetes and TAAD remained highly significant. Furthermore, the more severe the diabetic complications, the lower the rate of hospital admissions with TAAD (Journal of the American Heart Association 2012;1).

People piloting personal health budgets in the UK can receive cash in lieu of conventionally managed health services. A person with diabetes could use the money to pay for “radical options” such as burlesque dance classes to help them lose weight (CMAJ 2012;184:E444-6). But watch out—a similar scheme in the Netherlands went out of control with exploding costs and fraud, and a USA based project was shut down because people spent money on pole dancing and holidays.

Lowered testosterone concentrations are associated with diabetes—but is this link clinically important? In a cross sectional study of 115 men with type 2 diabetes, 93 with type 1 diabetes, and 121 healthy controls, researchers found low levels of free testosterone in 61% of men with type 2 diabetes and 32% of men with type 1 diabetes (Clinical Endocrinology 2012;76:665-73). Testosterone concentrations were strongly inversely related to age and central obesity in the men with diabetes, but only weakly associated with symptoms of androgen deficiency and erectile dysfunction.

Beware accepting casual requests for medical advice from people you work with. A staff nurse asked a doctor on her ward to take a “quick look” at her red and swollen ankle. He examined her twice and diagnosed a sprain but failed to document the consultations. Her symptoms persisted and he sent her for a radiograph. Months later, after further consultations with a general practitioner and two orthopaedic surgeons, she was diagnosed with a midfoot and hindfoot Charcot collapse with poor prognosis. The original doctor had not known that she had diabetes and was criticised for his lack of record keeping. (Medical Protection Society Case Report January 2012).

Adherence to healthy eating before pregnancy is associated with a reduced risk of gestational diabetes (American Journal of Clinical Nutrition 2012;96:289-95). Data from the Nurses’ Health Study II cohort 1991-2001 indicated that risk of gestational diabetes was 24% lower in women who followed a Mediterranean type diet, 34% lower in those with an antihypertension diet, and 46% lower in those with a healthy eating type diet. All three diets included fruit, vegetables, whole grains, nuts, and low quantities of red meat.