



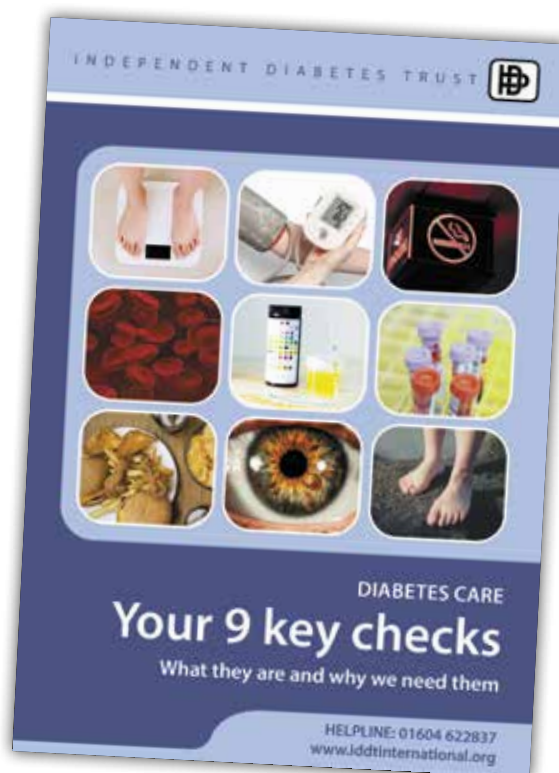
IDDT'S NEW BOOKLET FOR YOU!

IN THIS ISSUE: LATEST FREESTYLE LIBRE RESEARCH • URINARY ALBUMIN INTERNATIONAL NEWS • FEMALE SEXUAL DYSFUNCTION

DDT has just published a new FREE booklet to help you to make sure you have the 9 key checks that are important to maintain your health and to understand why these tests are so important.

Good control of glucose levels is a very important part of the prevention of the complications of diabetes and whether people have Type 1 or Type 2 diabetes, they are entitled to 9 key health checks/tests at least each year. These are an important way of measuring your health in relation to your diabetes and the aim of this new booklet is to explain what the checks are, what they are for and how they are carried out. It is also an opportunity for you to make sure that you are given the important checks to manage your diabetes and help to prevent or delay the complications.

We are happy to send you a free copy of our booklet, just get in touch with us in the usual ways.

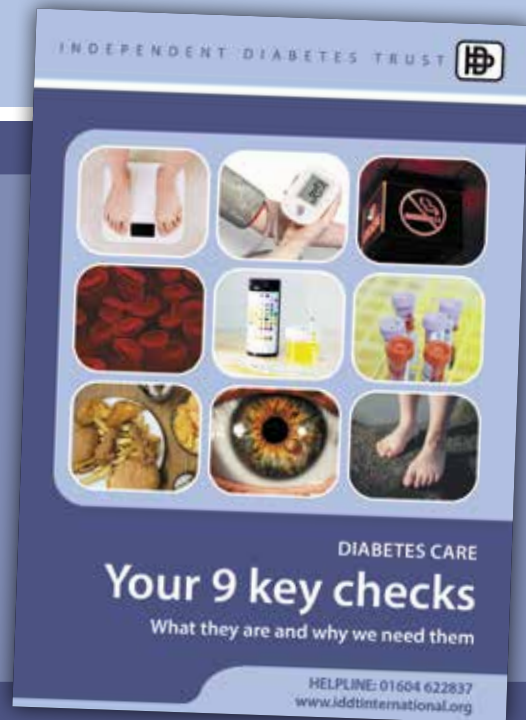




Diabetes Care Your 9 key checks

What they are and why we need them

This booklet provides you with information on the 9 key health checks/tests which everyone with Type 1 & 2 diabetes is entitled to.



ASK FOR YOUR FREE COPIES TODAY

FOR MORE INFORMATION PLEASE CONTACT US:

EMAIL: martin@iddtinternational.org or TELEPHONE: 01604 622837

InDependent Diabetes Trust
P O Box 294, Northampton NN1 4XS

www.iddtinternational.org
Charity Number: 1058284
Registered Number: 3148360

Drop in the rate of acute complications after using the FreeStyle Libre!

This French study looked at the rates of hospitalisation for acute diabetes complications before and after starting to use the FreeStyle Libre system. The hospitalisations were for diabetic ketoacidosis (DKA), severe hypoglycaemia, diabetes-related coma and hyperglycaemia and they were recorded for the 12 months before and after starting to use the device.

The study involved 74,011 patients with Type 1 diabetes or Type 2 diabetes who initiated the FreeStyle Libre system and were identified from hospitalisations with diabetes as a contributing diagnosis or the prescription of insulin. The results were as follows.

- Hospitalisations for acute diabetes complications fell in Type 1 diabetes (-49.0%) and in Type 2 diabetes (-39.4%) following FreeStyle Libre initiation.
- DKA fell in Type 1 diabetes (-56.2%) and in Type 2 diabetes (-52.1%), as did diabetes-related comas in Type 1 diabetes (-39.6%) and in Type 2 diabetes (-31.9%).
- Hospitalisations for hypoglycaemia and hyperglycaemia decreased in Type 2 diabetes

(-10.8% and -26.5%, respectively).

- Before starting to use the Libre, hospitalisations were most marked for people who were non-compliant with self-monitoring and for those with highest use of self-monitoring, which fell by 54.0% and 51.2%, respectively after starting to use the FreeStyle Libre.
- Persistence with FreeStyle Libre after 12 months was at 98.1%.

The researchers could only conclude that in this large study, hospitalisations for acute diabetes complications shows that a significantly lower incidence of admissions for DKA and for diabetes-related coma is associated with use of flash glucose monitoring, the FreeStyle Libre. (Diabetes Care, April 2021)

How much more evidence is needed for the NHS to allow everyone who wants to use the FreeStyle Libre to do so? It benefits people with diabetes now and also their future health, not to mention the long-term savings for the NHS.

As editor of the Newsletter, I know I bang on about this but the logic of this NHS decision absolutely defeats me!

AMERICAN DIABETES ASSOCIATION

Female sexual dysfunction

In our June issue of this Newsletter, we wrote about male sexual function as discussed at last year's American Diabetes Association virtual meeting, so we are following this with the meeting's view on female sexual dysfunction, another topic that is all too often not discussed.

Diabetes providers should screen for female sexual dysfunction

According to experts, the majority of women with Type 1 or Type 2 diabetes face issues related to sexual health and function and more than 7 in 10 female patients would like their doctors to initiate conversations about sexual dysfunction.

There was discussion about the mechanisms of female sexual dysfunction and the pharmacological interventions that can be used at various stages of the sexual response cycle - desire, arousal and climax. Issues can arise at any of these points and should be addressed when they continue for 6 months or more and cause distress to the patient but it was pointed out that all too often patients are not asked if there are any problems in this area.

Information suggests:

- Up to 71% of women with Type 1 diabetes and 69% of women with Type 2 diabetes report issues with sexual dysfunction.
- 72% of women reported that they want to talk to their doctor about sexual dysfunction and 73% of women would prefer the doctor to initiate the conversation.

The authors comment that the last points are reminiscent of 30 years ago when discussions about erectile dysfunction in men were difficult.

Potential causes

There are several potential causes of female sexual dysfunction in diabetes:

- atherosclerosis and neuropathy which can reduce circulation and sensation,
- high sugar levels can decrease lubrication and increase yeast infections,
- fear of hypoglycaemia, depression and anxiety can also be involved.

Possible treatments

- Testosterone therapy may help postmenopausal women.
- Dopamine and norepinephrine may help premenopausal women.

There are other strategies that non-specialists can use, such as psycho-education and behavioural recommendations, lifestyle modification, vaginal lubricants and moisturizers. Women can be referred to sex, psychological and physical therapists.

Opening the conversation

One of the experts also recommended that doctors and health professionals should help patients to discuss sexual health with their patients by asking open-ended questions such as "Many women with diabetes have issues with sexual desire, arousal, or orgasm. How about you?" (Dr Cheng, Associate Professor at the University of Toronto, Ontario, Canada and Sharon Parish, MD)

Note: If you would like a copy of IDDTs FREE leaflet 'Sexual dysfunction in men and women', please telephone 01604 622837 or email jenny@iddtinternational.org

What's New?

NHS to roll out trials of the artificial pancreas for people with Type 1 diabetes



Above – an example of an artificial pancreas system – the CamAPS FX.

On June 15th 2021, the then NHS Chief Executive Sir Simon Stevens announced a trial to support the wider roll-out of artificial pancreas technology across England for people with Type 1 diabetes. Artificial pancreas systems, also known as closed-loop technology, enable an insulin pump and a continuous glucose monitor to ‘talk’ to each other so that the correct dose of insulin is delivered automatically.

The trial will involve up to 1,000 people with Type 1 diabetes in around 25 specialist centres across England. The participants’ data and experiences with the technology will feed directly into the assessment of closed-loop systems by the National Institute for Health and Care Excellence (NICE).

Sir Simon Stevens said: “Living with diabetes is a daily challenge for millions of people across England, and this closed loop technology has the potential to make a remarkable difference to their lives. In a year that marks a century since insulin was discovered – which revolutionised the world of diabetes – this innovation is a prime example of the NHS’s continued progress in modern medicine and technology.”

Sweat sensor for glucose measurements

Some of us will remember the ‘watch’ that came out as a way of measuring glucose levels in sweat. It wasn’t very successful for various reasons, the main ones being that it didn’t stay put and some people don’t sweat! Now, researchers at the University of California have developed a sweat sensor which measures glucose levels on the skin and converts the readings into accurate blood sugar estimates. As glucose levels in sweat can vary from person to person, the sensor incorporates algorithms that personalise the measurement for each user.

The sensor consists of a polyvinyl alcohol hydrogel which absorbs the sweat. The gel lies over an electrochemical sensor, which detects and measures the amount of glucose present through an enzymatic reaction that creates an electrical charge. Collected data are interpreted using an algorithm that corrects the reading for each user based on a monthly finger prick calibration.



So far, the device has been tested in a small number of volunteers and could accurately predict blood glucose levels before and after a meal with over 95% accuracy.

One Drop wins CE mark for glucose prediction tool

The One Drop system gives blood glucose prediction analysis to accurately forecast glucose

levels up to 8 hours in advance. Its use is for people living with prediabetes, Type 2 diabetes including those on oral medications and/or insulin and gestational diabetes. By combining a blood glucose monitor with a patient-facing mobile app, the One Drop provides glucose predictions alongside real-time advice on exercise, diet and behavioural adjustments to achieve optimal blood sugar levels by using AI (artificial intelligence).

Last year, One Drop expanded its glucose forecasts to include overnight hypoglycaemia predictions for people using continuous blood glucose monitors. According to the company, the overnight hypo risk algorithms are up to 87% accurate. The eight-hour blood glucose forecasts are available for One Drop mobile iOS or Android users, which also offers one-on-one coaching. (May 2021)

It seems the digital diabetes management is the way forward with many companies developing similar predictive products and this market is expected to reach \$26.4 billion by 2024.

US approves the first smart insulin pen cap to help with dosing

The US Food and Drug Administration (FDA) has approved a smart cap system for insulin pens called Bigfoot Unity. It works with an integrated continuous glucose monitoring system to provide recommendations for insulin doses but for now only supports Abbott's FreeStyle Libre 2.

The connected smart cap displays the recommended dose, along with the person's glucose value and trend arrow. Time-of-dose data and details from the Libre are uploaded to the cloud where the system has a WiFi or mobile data connection. This means information does not have to be logged in manually on a separate device and healthcare professionals will have access to this through a secure web portal.

According to the manufacturers, Bigfoot Biomedical, it's the only FDA approved dose decision support system with real-time hypoglycaemia alerts so it can help people to reduce the guesswork for how much insulin they need.

The cap is compatible with all major rapid- and long-acting disposable insulin pens in the US – those from Eli Lilly, Novo Nordisk and Sanofi. It's designed for people with Type 1 or Type 2 diabetes aged over 12 years who are using multiple daily injection treatment and it will be available through some clinics in the US from spring 2021.

A new expression in diabetes management – TIR

With the arrival of continuous glucose monitors and the FreeStyle Libre has come a new expression, well if it is not new, its use has certainly become more widespread. The expression is 'time in range' and like many other terms in the medical world, it is shortened - to 'TIR' and means the time a person spends each day within the target blood sugars set for them.

Clearly, the availability of continuous monitoring of blood glucose levels, means that instead of specific points in time when a finger prick test is done, it is possible to see what happens to blood glucose levels throughout the day. This in turn, means that we can know how much of the day is spent within the target ranges, in hypoglycaemia and in hyperglycaemia. This also provides for another area of research.

Greater time within glucose targets boosts mood

This recently published research from the University of California looked into 'time in range' in people with Type 1 diabetes to see how it affected the participants mood. They found:

- the greater time each day within glucose targets, or TIR, helps to boost people's mood,
- that less time in the 'severe' hyperglycaemic range also enhances mood.

This is the first study to provide evidence that the time in range is associated with, and probably enhances, daily mood in people with Type 1 diabetes.

Just a thought – for those of us living with people with diabetes, it probably does not require a study to know this!

Zegalogue approved in the US – an easy-to-use Glucagon

Until a few years ago, the only emergency glucagon to revive someone having a severe low blood sugar was a complicated mix-and-inject kit with a large needle. However, the FDA in the US has given approval for a new quick, ready to use glucagon device which will be sold as both an auto-injector (like an EpiPen) and a prefilled syringe.

The new glucagon is called Zegalogue (scientific name dasiglucagon) and is an analogue for the human hormone glucagon. It triggers the pancreas to release glucagon, which tells the liver and muscle cells to convert stored energy into glucose and release that into the bloodstream to raise sugar levels.

Let's hope it appears in the UK before too long!

Increasing health inequalities for children and young people with Type 1 diabetes in the UK

The 2019/20 audit involved 29,242 children and young people with diabetes up to the age of 24 years with 27,653 having Type 1. There were two key findings:

- those from ethnic communities have higher HbA1cs compared to white ethnicity,
- there was significantly lower use of insulin pumps or real-time continuous glucose

monitoring amongst black children,

- there has been an increasing trend of widening health inequalities reported over the last 6 years.

The authors recommend that urgent research is carried out to look into the barriers of access to technologies in the UK including provider bias, systemic issues in the health system and individual and family factors. (Diabetic Medicine, June 2021)



Combatting insulin errors in hospital and the community

Insulin is a high-risk medication and NHS Improvement identifies moderate to severe harm or death can be caused by insulin errors. The development of over 30 different insulins and a variety of devices has added to confusion among people living with diabetes and healthcare professionals.

According to the last National Diabetes Inpatient Audit, 2 in 5 people with diabetes on insulin (40%) experienced an error related to the administration of their insulin while in hospital. There are also reported errors in the community, with 8,226 errors occurring in the community from January 2013 to the end of 2015.

To try to combat this, in October 2020 Trend Diabetes, which represents 14,000 diabetes nurses in all

groups, launched the 'Insulin Safety: Getting it Right' e-learning module. It was made available to all NHS Trust Employers free of charge with the aim of reducing insulin errors.

It is now available through Skills for Health, an online learning provider for health and social care settings, so it is available to professionals working in social care, nursing and care homes, prisons and private hospitals.

Over the last few years, various attempts have been made to improve insulin administration by people with diabetes and by healthcare professionals but with varying levels of success, so let us hope that this initiative makes a difference.

Addressing the waiting lists

As many of our members are aware, the pandemic has delayed elective surgery and other routine checks that people have missed during lockdown. In May, NHS England announced a £160m to address waiting lists and develop a blueprint for elective recovery.

NHS England is now looking to speed up the recovery by trialling new ways of working in a dozen areas and five specialist children's hospitals. These are being called 'elective accelerators' and they will each receive a share of the £160 million along with additional support to implement and evaluate innovative ways to increase the

number of elective operations they deliver.

Virtual wards and home assessments, 3D eye scanners, at-home antibiotic kits, 'pre-hab' for patients about to undergo surgery, artificial intelligence (AI) in GP surgeries and 'Super Saturday' clinics will also be trialled. The latter are where multi-disciplinary teams come together at the weekend to offer more specialist appointments. The aim is to exceed the same number of tests and treatments they did before the pandemic and develop a blueprint for elective recovery to enable hospitals to go further and faster.

Patient records to be shared

In May 2021, former Health Secretary, Matt Hancock, announced that patient data over the last 10 years will be collected centrally by NHS Digital. We are told that the advantages are that this information will be available to all those involved in the health care of patients and to the public who will be able to access their own records. It will also be available to researchers and has the potential to be available to commercial (pharmaceutical) companies. It is said that privacy

will be protected and the information will be anonymised by removal of the name, date of birth and NHS number but there are concerns that it will be possible to re-identify people from the medical records by, for example, identifying the birth of children and the town in which they were born. Ultimately the issue is about consent, do we as 'patients' give consent for our information to be used in research or perhaps of greater concern, by the pharmaceutical industry?

New UK Health Security Agency

On 1st April 2021, the new UK Health Security Agency (UKHSA) was formally established with Dr Jenny Harries as the Chief Executive. This new agency will work to protect the country from future health threats and ensure the nation can respond to pandemics quickly and at greater scale.

Initially the UKHSA will continue the fight against the COVID-19 pandemic bringing together the country's health security science capabilities, data analytics and genomic surveillance with at scale testing and contact tracing capability - combining key elements of Public

Health England with NHS Test and Trace including the Joint Biosecurity Centre.

It will also work with global partners to provide an international structure to protect future generations. The UK has also provided £4m to the World Health Organisation's (WHO) Contingency Fund for Emergencies to give the WHO the resources to quickly mount an effective response to disease outbreaks and humanitarian crises in developing countries and stop these health emergencies from spiralling out of control.

New guidelines on the management of diabetic ketoacidosis in Type 1 diabetes

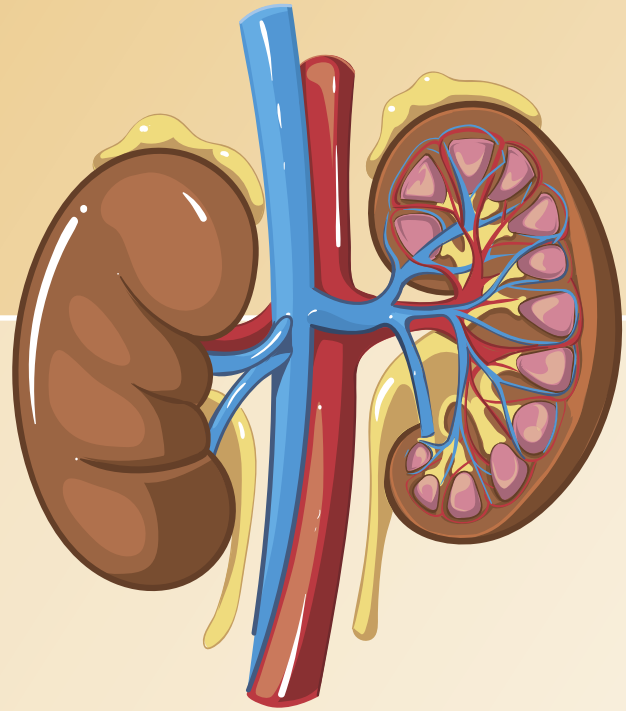
In June 2021, updated recommendations on the treatment of adults with diabetic ketoacidosis (DKA) were published. They aim to support the planning and delivery of high-quality care in hospitals.

The first guidance on the management of DKA was published over a decade ago and recognised that there was a large variation in management across the UK. The 2021 guidance update takes into account new learning since previous publications.

The recommendations have also been expanded to include 16 to 18-years-olds if they are looked after

by adult diabetes teams as recently there has been an extremely high prevalence of DKA in adolescence. In the UK young people aged between 16 and 18 may be admitted to a paediatric or adult unit. The paediatric and adult guidelines differ particularly around fluid replacement. It is considered appropriate for young people to be managed using local adult guidelines that the teams are familiar with rather than using potentially unfamiliar paediatric guidelines. (Developed and reviewed by a multidisciplinary team led by the Joint British Diabetes Society.)

URINARY ALBUMIN



We are all aware of the 9 key tests that should be carried out at least annually in everyone with diabetes. You are entitled to this annual check under the NHS Constitution and it is recommended by the National Institute of Health and Clinical Care Excellence (NICE). The aim of these tests is to take a measure of how well your diabetes is managed, in both the short and longer term, and to provide advice about continued support.

One of the 9 Key tests is urinary albumin. In this article, we look at urinary albumin and why it is measured.

What is urinary albumin?

Albumin is a protein that is in most animal tissues. In healthy people, urine contains very little protein and an excess is a sign of kidney or bladder infection or the first sign of kidney damage which is one of the complications of Type 1 or Type 2 diabetes. Healthy kidneys do not let albumin pass from the blood into the urine but if kidneys are damaged, they do let some albumin through. The most common causes of this are diabetes and high blood pressure, or both. As we know, long-term diabetes can be the cause of diabetes complications, such as kidney damage, but it is important to remember that when people are diagnosed with Type 2 diabetes, they can have had the condition for some years before diagnosis, so albumin can be present at diagnosis and is a sign of early kidney damage.

What do normal kidneys do and how do they do it?

- Inside each kidney there are about a million tiny units, called glomerula, that filter and remove excess fluid and waste products from the blood. The entire body's blood supply circulates through the kidneys.
- The kidneys get rid of the body's waste products and excess water as urine. The

waste products are formed from the breakdown of the protein we eat and from normal muscle activity.

- The kidneys also produce hormones that help in the production of red blood cells, build strong bones and help to keep blood pressure (hypertension) under control.
- One of the most important functions of the kidneys is the control of blood pressure. High blood pressure is very common in people with kidney failure and can occur from the early stages of kidney damage but it is a 'chicken and egg' situation - high blood pressure can cause kidney damage and kidney damage can cause high blood pressure.

Kidney disease and diabetes

Kidney disease (nephrology) is one of the complications of diabetes. Aggressive treatment of blood pressure and stopping smoking are important ways to prevent or treat kidney disease.

Diabetes can affect the kidneys in the following ways:

- If there is a lot of sugar in the urine, because you are running high blood sugars (for whatever reasons), this can lead to infection that can spread from the bladder to the kidneys. Chronic kidney infections do not always produce symptoms and may only show up on routine clinic tests.

- In both longstanding and poorly controlled diabetes, the kidneys have to work hard to get rid of the excess sugar and the small blood vessels in the kidneys can be damaged.
- If both diabetes and high blood pressure are present, the risk to the kidneys is greater.

Does kidney damage produce symptoms?

In the early stages there are no symptoms and any kidney damage should be picked up in the urine tests carried out at your normal clinic visit when albumin levels are measured. Passing foaming urine can occur from time to time but if this persistent or more noticeable over time, then you should see your doctor. Some of the signs and symptoms of kidney failure are:

- Extreme tiredness
- Swelling of hands, feet and face (oedema)
- Nausea and vomiting
- High blood pressure
- Shortness of breath
- Itchiness
- Difficulty sleeping
- Loss of appetite
- Difficulties concentrating and confusion

Microalbuminuria and the tests

Microalbuminuria is the name for the condition described above where abnormal amounts of protein (albumin) leak from the kidneys into the urine and is an early sign that kidney damage may be developing. If this progresses so that increased amounts of protein are excreted in the urine, then this is called macroalbuminuria.

The presence of microalbuminuria is one of the 9 key checks that people with diabetes should receive, at least annually. If present, then further tests will be necessary which involve testing in the laboratory all the urine collected during a 24hour period. This test checks the ratio of albumin to creatinine, another substance that if higher than normal is a good predictor of kidney damage.

Glomerular filtration rate (GFR, also named eGFR) is a test used to check how well the kidneys are working. It estimates how much blood passes through the glomeruli each minute. Your GFR tells your doctor your stage

of kidney damage and helps him/her plan your treatment. The earlier kidney damage is detected, the better the chance of slowing or stopping its progression.

If your GFR number is low, your kidneys are not working as well as they should, but what do the numbers mean? In adults, the normal eGFR number is more than 90. eGFR declines with age, even in people without kidney disease. The chart below gives the average estimated eGFR based on age.

| Age (years) | Average estimated eGFR |
|-------------|------------------------|
| 20–29 | 116 |
| 30–39 | 107 |
| 40–49 | 99 |
| 50–59 | 93 |
| 60–69 | 85 |
| 70+ | 75 |

Don't panic at one result! In general, a GFR below 60 for three months or more may mean kidney disease. Your doctor will want to investigate the cause and continue to check your kidney function to help plan your treatment.

Protection of the kidneys

Ace inhibitors

ACE inhibitors, are drugs normally used for the treatment of high blood pressure, such as enalapril or captopril. However, there is evidence that the use of ACE inhibitors in people who start to show small amounts of protein in the urine, helps to reduce the progression to macroalbuminuria. In other words, the use of ACE inhibitors has a protective effect on the kidneys, even in people whose blood pressure is normal.

SGLT2 inhibitors

These are relatively new drugs which work by blocking reabsorption of glucose in the kidneys, so lowering blood glucose levels. Research shows that they can have a protective effect on the kidneys in people with Type 2 diabetes by slowing down the progression to more serious kidney damage.

IDDT has a leaflet on Kidneys and Diabetes, so if you would like a copy, contact IDDT on 01604 622837 or email enquiries@iddtinternational.org or write to us at PO Box 294, Northampton NN1 4XS.

Looking at the accuracy of our tests

Hematocrit affects accuracy of blood glucose monitoring

Certain systems for self-monitoring of blood glucose (SMBG) demonstrate inaccuracy at low and high hematocrit (HCT). Manufacturers of glucose meters do define HCT ranges for accurate performance.

What does hematocrit mean?

The hematocrit is the proportion, by volume, of the blood that consists of red blood cells. It is expressed as a percentage so, for example, a hematocrit of 25% means that there are 25 milliliters of red blood cells in 100 milliliters of blood.

A recent study was undertaken to assess hematocrit levels that fall outside normal levels which could affect the accuracy of glucose meter readings and in turn, affect the management of diabetes. The researchers collected real-world data representing over 360,000 outpatients from the Netherlands, the Czech Republic and South Africa and data from 1,780 healthy Czech subjects. They found the following results.

- Hematocrit outside common glucose meter performance limits is not uncommon.
- 3% of outpatients in Europe have hematocrit outside commonly specified ranges, especially in those with diabetes.
- This is especially the case for older sub-populations with higher diabetes prevalence.
- In South Africa, low hematocrit is even more common, and across all ages.

The researchers concluded that self-monitoring blood glucose systems specified to perform only within the frequently used 30–55% hematocrit range would leave 3% of patients in Europe and 18% in South Africa at risk of a false test. This could affect their diabetes management, therefore people with diabetes should be carefully matched to self-monitoring meters.

Note: could this be an explanation of why some

people appear to have variable results, do they have a high or low hematocrit measurements?

BMI cut-offs for obesity and Type 2 diabetes risk according to ethnicity

National and global recommendations for body mass index (BMI) cut off points to trigger action to prevent obesity-related complications such as Type 2 diabetes, among non-white populations are questionable. This study aimed to identify ethnicity-specific BMI cut offs for obesity based on the risk of Type 2 diabetes that are risk-equivalent to the BMI cut off for obesity among white populations which is equivalent to or above a BMI of 30. In simple terms, what is the BMI level in people of different ethnicity where they become at risk of developing Type 2 diabetes?

The study included 1,472,819 people - 90.6% were White, 5.2% were South Asian, 3.4% were Black, 0.7% were Chinese and 0.2% were Arab. They were followed up for 6.5 years, after which 6.6% or 97,823 were diagnosed with Type 2 diabetes.

The results showed that for the equivalent age-adjusted and sex-adjusted incidence of Type 2 diabetes at a BMI of 30.0 kg/m² in White populations, the BMI cut offs were:

- 23.9 in south Asian populations,
- 28.1 in Black populations,
- 26.9 in Chinese populations,
- 26.6 in Arab populations.

This shows that Black Caribbean, South Asian, Chinese and Arab populations living in England had an equivalent risk of Type 2 diabetes at substantially lower BMI values than the current BMI cut offs for obesity. The researchers recommend that these findings should lead to revisions of current ethnicity-specific BMI cut offs to ensure that minority ethnic populations are provided with appropriate clinical monitoring to provide equal opportunities for increased prevention and early diagnosis of Type 2 diabetes.

Insulin injection technique errors

Canadian researchers have identified at least one insulin injection technique error in all people with insulin-dependent diabetes who were surveyed for a study. The study involved 230 people using an insulin injection pen and they found:

- an average of 3.5 errors of insulin injection technique,
- only 5% of the study participants made just one error,
- 2% made seven errors, with excessive injection force being the most common.

When the participants were shown a set of images showing how the skin might appear when the person with diabetes pressed the button on the insulin pen, over 30% opted for the image where the skin was significantly indented and 76% chose an image that showed greater than optimal force.

This study was only published in September 2020, so it is surprising that so many errors are still occurring. Are the same number of errors occurring in the UK? Perhaps we should look at some of the basics.....

How to perform an insulin injection

Prepare for your injection

- Make sure there is enough insulin in the pen for the required dose.
- Fit a new pen needle.
- Make sure you have a sharps disposal box for your used pen needles.

Performing your insulin injection

- Wherever possible, wash your hands with soap and water before injecting.
- Fit a new pen needle and remove the cap.
- Hold the pen upright and carry out an 'air shot' by dialling up at least 2 units and pressing the plunger to expel a test injection of insulin. This helps to clear any bubbles out of the needle but if you do not get a steady stream, repeat this until you do.



- Dial up your dose.
- Pick a soft fatty area to inject - tops of thighs, belly or bottom. The triceps (at the top and back of the upper arm) are not always recommended for children or thinner people.
- Some people may need to raise a fold of fatty flesh slightly between your thumb and fingers. If you are unsure about this, ask your healthcare professional.
- Put the needle in and keep the pen steady then push the plunger in relatively slowly to inject the dose.
- After the dose has been injected, hold the needle in for at least 10 seconds to help insulin get delivered and prevent any of the dose escaping out.
 - You should rotate your injection sites and avoid injecting in the same area as this could lead to lumps forming under the skin. If you continue to inject into these areas then the insulin is not absorbed properly.
 - A little blood may leak out after injecting but this is nothing to worry about, it is just caused by the needle going through a small blood vessel. You could be left with a small bruise for a few days.

Avoiding painful injections

- Always use a new needle.
- Use a needle of the right length, if in doubt ask your healthcare professional. These days a 4mm needle is considered safest for children and adults regardless of age, gender, ethnicity and body weight. This is because the 4mm needle is short enough to pass through the skin without the risk of injecting into muscle and you can inject 90° without folding the skin.
- Use insulin and a needle kept at room temperature.
- Push the needle in quickly and don't wiggle it around when injecting or withdrawing it.

International News

In the 100th year since the discovery of insulin, we take a look at the global situation with insulin and what is needed to improve the care of people with diabetes. Nobody with diabetes is lucky but some are certainly luckier than others...

Diabetes care in low-and-middle income countries

Diabetes care in low-and-middle income countries (LMICs) is complicated by under-resourced health systems, inaccessible, expensive insulin and blood glucose measuring technologies and limited patient and provider education.

A study published in 2019 showed that for people with diabetes in 28 low-and-middle-income countries, only 23% of people with diabetes achieved glycemic control and only 38% received treatment that included lifestyle advice and/or diabetes medications. Despite the World Health Organisation (WHO) target for countries to ensure 80% availability of affordable, essential medicines, only 3 of 13 LMICs studied met this target for human insulin (Brazil, Pakistan, and Kyrgyzstan).

Blood glucose monitoring is also prohibitively expensive for many people in LMICs with another finding that no low or middle-income countries could provide at least 2 strips/day at low or reasonable cost for children with diabetes. (IDF/Life for a Child).

Insulin may not need refrigeration so helping poorer nations

Research carried out by 'Doctors Without Borders' and the University of Geneva has found that insulin can be stored at less cold temperatures than previously thought. This has the potential to help people in warmer climates that are also often poorer than people who live in high-income countries. In regions such as sub-Saharan Africa where not every household has a refrigerator, people with diabetes have to go to hospitals for injections, sometimes several times a day. This creates a travel burden, limits their ability to work and increases discrimination. It is also a problem in refugee camps in hot climates.

The researchers tested insulin storage in real conditions ranging from 25 to 37 degrees Celsius for 4 weeks - the time it typically takes to use a vial. They found that the stability of insulin stored under these conditions was the same as cold-stored insulin. There was no impact on its effectiveness and it lost no more than 1% of its potency.

Current pharmaceutical protocols call for patients to store insulin at 1.6 to 7.77 degrees C until opened and then at 25 degrees C for 4 weeks. The regulation on pharmaceutical preparations allows a loss of up to 5%, so the above findings are well below this.

The researchers hope for a consensus statement focusing on at-home use of insulin in high-temperature settings when no refrigeration is available but point out that such changes would have to be accompanied by patient education, support and follow up so people can measure their own blood sugars and inject the correct amount of insulin. (PLOS One, February 2021)

The Global Diabetes Compact

Diabetes is global epidemic with around 6% of the world's population living with either Type 1 or Type 2 diabetes, that's more than 420 million people. This number has quadrupled since 1980 and is estimated to rise above half a billion by the end of the decade. Premature mortality from other major non-communicable diseases is decreasing but early deaths from diabetes have increased by 5% since 2000.

In 2020, the WHO announced an initiative to support people with diabetes - the Global Diabetes Compact. This brings together in one package all existing and new WHO materials to prevent and manage diabetes. For prevention, particular focus will be given to reducing obesity, especially among young people. For treatment, emphasis will be on improving access to diabetes medicines and technologies, particularly in poorer countries.

Defeating diabetes in Kenya

In April, it was announced that the Ministry of Health in Kenya entered into a partnership with insulin producer, Novo Nordisk and other key partners to establish an implementation framework to launch the 'Affordability Initiative' for diabetes care in Kenya. The framework has also brought on board 13 county governments and other organizations including supply chain organisations and implementing facilities. The Affordability initiative hopes to address key objectives such as ensuring affordable insulins reach patients. Ultimately, more people should receive better quality care and treatments and they should be empowered to better manage their condition and at the same time the capacity of healthcare workers should be built up to address the diabetes management challenge.

Sanofi Philippines to make second generation insulins more accessible

In time for the 100th year of Insulin, Sanofi Philippines has committed to build a healthier Philippines by making diabetes management easier and more accessible to Filipinos. Sanofi have committed to improving the health of Filipinos and are taking steps to make innovative health solutions, diabetes care more accessible and even more affordable second generation of insulins.

Let's do it for insulin - call in the US

Regular readers will be aware of the high cost of insulin in the US making it unaffordable for some people so that they miss or take lower doses than they need to save money. In a 2019 study, one in four people with diabetes reported underuse of insulin. The high costs are due the US patent system enabling high profits to be made by the pharmaceutical industry.

Interestingly, Joe Biden's administration has supported the World Health Organisation proposal of waiving this system for Covid-19 vaccines. This has left some politicians demanding a similar approach for other life-saving drugs, such as insulin. The call is "Let's do it for insulin next".

Am I still producing some insulin?

A question that is often asked by people with Type 1 diabetes, especially if they are having difficulty stabilising their blood glucose levels is 'Could I still be producing some insulin?'

A test for c-peptide is a way of finding out.

What is c-peptide?

C-peptide is a hormone produced by the beta cells in the pancreas, released at the same time as insulin and usually in the same amounts, so it is a measure of whether or not the beta cells are producing insulin. C-peptide has no effect on blood sugars but is a useful marker of insulin production.

While c-peptide is not usually routinely tested, it may be measured at diagnosis or if Maturity-Onset Diabetes of the Young (MODY) is typically misdiagnosed as Type 1. C-peptide can help detect MODY before further genetic testing. It can also show whether or not someone with Type 2 diabetes may require insulin.

The effects of residual c-peptide and insulin production

If you have had Type 1 for a while, your c-peptide levels will probably be close to zero but if you have recently been diagnosed or have Type 2, you may have higher levels of c-peptide and insulin production.

However, research using flash glucose monitoring (FreeStyle Libre) has shown that even minimal amounts of c-peptide secretion can protect people with Type 1 diabetes from hypoglycaemic events and can reduce variability in blood glucose levels. In a study of 290 people using flash glucose monitoring, those who retained some c-peptide secretion had significantly fewer hypos than those with no c-peptide. Even people with minimal residual c-peptide, had less hypos than those with no residual c-peptide. (Diabetologia, December 2019)

A separate study on 6,076 people with diabetes in Scotland showed that even small amounts of residual c-peptide could also help reduce complications including diabetic ketoacidosis (DKA) and retinopathy as well as severe hypoglycaemia.

It has also been shown that people who are diagnosed at younger ages are more likely to have a lower c-peptide level than those diagnosed over the age of 18. However, if c-peptide is detectable, it does not mean that you won't need insulin.

Unfortunately, for people who have had Type 1 diabetes for many years and whose c-peptide is already minimal, there is not much that can be done to revive beta cells with today's knowledge. However, for people who are newly diagnosed, there are various studies going on to find ways of helping to preserve whatever beta cell function they have left.

Pioneering chemist

HELEN MURRAY FREE

Died May 1st 2021

Helen Murray Free was a pioneering chemist who made a huge difference in scientific research that revolutionised diagnostic testing in the laboratory and at home. She died at the age of 98 in May this year.

Helen received a degree in chemistry in 1945 and worked for Miles Laboratories, later acquired by Bayer Diagnostics. She married Alfred Free, a biochemist and together the Frees improved the Clinitest tablet used to test glucose levels in urine. They also

developed other tablet tests for diabetes including Clinistix, the first dip-and-read diagnostic test strips for monitoring glucose in urine.

For those of us that have lived with diabetes for many years, we remember Clinitest tablets as the only way of measuring levels of glucose, albeit in urine. By today's standards not they were not accurate but it was the best we had and still is for people in underdeveloped countries, extending and saving lives!



WINTER IS COMING

But it could be different (again) this year...

This is the time when we normally advise about the seasonal flu jab but at the time of writing, it is not clear what will happen this year. Usually, we remind you that the flu jab is offered first to people in 'at risk' groups which includes those with diabetes, pregnant women and the elderly.

We also usually advise you about the 'pneumo' jab - a vaccination to protect against pneumonia. This jab is available to the following groups of people:

- children who are under two years of age – they are vaccinated as part of the childhood vaccination programme,
- adults who are 65 years of age or over,
- children and adults with certain chronic health conditions, including diabetes.

Note: at the time of writing, we don't know what the lockdown situation will be and who will be able to attend surgeries for the jabs. We expect that there will be government announcements at some point in time but if in doubt, you should contact your GP surgery.

THE IDDT'S LOTTERY DRAW WINNERS

We are delighted to announce the winners of our latest monthly lottery draws. They are as follows:

Winners of the April 2021 draw are:

- 1st prize of £576.00**
goes to Sylvia from Kettering
- 2nd prize of £432.00**
goes to Anon. from Swanley
- 3rd prize of £288.00**
goes to Owen from Anglesey
- 4th prize of £144.00**
goes to Alan from Worcester

Winners of the May 2021 draw are:

- 1st prize of £561.12**
goes to Anon from Enfield
- 2nd prize of £420.84**
goes to Anon. from Bingley
- 3rd prize of £280.56**
goes to Anon from Wolverhampton
- 4th prize of £140.28**
goes to Anon. from Cambridge

Note: The winners of the draws for June, July, August and September 2021 will be announced in our December 2021 Newsletter and on our website.

A huge 'Thank You' to everyone who supports IDDT through the lottery.

If you would like to join in for just £2.00 per month, then give us a call on 01604 622837 or email jenny@iddtinternational.org



BITS & PIECES

Heart disease and stroke no longer the leading cause of death in people with diabetes

A study funded by The Wellcome Trust has shown that between 2001 and 2018 heart disease and stroke are no longer the most common causes of death in people with diabetes in the UK.

The researchers from Imperial's School of Public Health looked at the records of 313,907 people with diabetes in England between 2001-2018 and linked this with death data from the Office of National Statistics.

- Death rates from heart disease and stroke for those with diabetes declined by 32% for men and 31% for women.
- Death rates from heart disease and stroke have reduced for the whole population, including those without diabetes.
- Death rates from vascular conditions account for 25% of all deaths in people with diabetes but 20 years ago they accounted for 45%.

The researchers explained that improvements in risk factors such as smoking and blood pressure have contributed to this reduction

and the improvements have been even greater for people with diabetes.

But...

The improvements in death rates from cancer have been more modest and improvements in those with diabetes lagged behind those in the general population. This is not helped by the fact that the UK lags behind other EU countries in terms of cancer survival rates.

Other death rates for respiratory conditions, liver disease and dementia were higher in people with diabetes compared to the general population.

The researchers speculate that the higher cancer rates could be due to people with Type 2 diabetes being more likely to be overweight and excess weight is a leading risk factor for cancer. One of the limitations of the study is that the data did not differentiate between Type 1 and Type 2 diabetes.

The research team recommend that guidance for the treatment of diabetes should be updated so that people with diabetes and their doctors are aware of the higher risks of this breadth of conditions. (The Lancet Diabetes & Endocrinology, February 2021)

Malnutrition is among risks for frailty in older adults

Researchers have reported that risk factors for frailty among older adults with Type 2 diabetes include malnutrition, glycaemic control, depression, exercise and alcohol consumption. Among the 35.1% of the patients who were malnourished or at risk for malnutrition, 69.6% were frail. (BMJ Open, March 2021)

Frailty is a distinctive health state related to the ageing process in which multiple body systems gradually lose their in-built reserves. Around 10% of people aged over 65 years have frailty, rising to between a quarter and a half of those aged over 85.

The recommendations for reducing the risk of frailty are:

- Be active most days of the week.
- Eat well.
- Keep your mind active and your attitude optimistic.

Study compares inhaled with injected insulin in Type 2 diabetes

A study has found that taking inhaled rapid-acting insulin at



CHANGING TIMES AND TECHNOLOGY

A concern for many people during the pandemic

There are many consequences of the pandemic and lockdown and one of them is the increasing use of technology and how this can affect people who do not have access to technology, perhaps don't even want to use it or are fearful of it! The mere mention of 'downloading an app' sends some of us oldies into despair.

This can leave people feeling they are missing out and not knowing what to do. So many sources of information and forms are now easily available online but not so easy to find the old-fashioned way.

In terms of health, the pandemic has highlighted this situation. One lady with a swollen leg told IDDT, "The GP has asked me to send photo of my leg and I don't have a computer or a mobile phone that will do this, so what should I do?" Yet another person told IDDT that her doctor had told her that she had to have a smartphone in order to have a FreeStyle Libre flash glucose meter – this is not true and would be hugely divisive if it were.

Statistics

- Only 80% of over 65s have internet at home
- Only 53% of over 65's have a smartphone

Looking at technology involving health, recent research by YouGov for the Health Foundation thinktank involving a representative sample of 4,426 UK adults showed:

- 60% of patients had used technology during the first wave of the pandemic, more than beforehand.
- Of the above, 83% reported a good experience but 42% said they thought not seeing the doctor in person resulted in a worse quality of care.
- A parallel survey of 1,413 NHS staff found that 78% thought expanding the role of technology had been helpful but 33% believed it made for a lower standard of care.

The future

There is no doubt that technology has been a huge help during the pandemic and there will have been lessons learned to improve services and systems for the future but until we have a world where everyone is technology savvy, the introduction of technology must be gradual and take into account that there are still a lot of us who don't use modern technology. Without this recognition, we risk divisive systems and situations where those with the technology receive better or quicker care and services than those without it.

mealtime along with insulin glargine (Lantus) resulted in similar reductions in HbA1cs, fewer hypos and lower body weight among adults with Type 2 diabetes when compared with taking insulin aspart (NovoRapid) plus insulin glargine (Lantus).

The major side effect of the inhaled insulin was a cough but it wasn't severe enough to result in discontinuation of the inhaled insulin and it improved over time. (Endocrine Practice, February 2021)

Inhaled insulin is not available in the UK but it is interesting, that studies of it are still appearing!

In gestational diabetes metformin outperforms insulin

Women with gestational diabetes (GDM) who were treated with metformin had significantly better blood glucose control after eating lunch and/or dinner when compared with those treated with insulin. Metformin treatment was also associated with less maternal weight gain, fewer hypos and a decreased rate of labour inductions and caesarean delivery among women with GDM when compared to insulin treatment. (American Journal of Obstetrics and Gynaecology, May 2921)

From our own CORRESPONDENTS



After 40 years with Type 1 diabetes

Dear Jenny,

The Newsletters say that you would like to hear from people with their concerns and views. I have to say that when I found IDDT a few years ago, you sent me your Information Pack for Type 1 diabetes and it was a revelation! After 40 years on insulin, it gave me more information than I have ever been given by my GP surgery and was clear and easy to understand. I tell everyone with diabetes that I meet about you and advise them to become members.

I recently asked my GP if I could have a FreeStyle Libre 2 to help me improve my blood sugars and as my HbA1c has been good at 42 at my annual reviews, I was surprised and delighted when my GP rang up and said yes. I have had the FreeStyle Libre 2 now for 3 weeks and it has been a surprise to see my daily BGs rising and falling throughout the day and night but 88% of my results are in the range of 3.9 to 10.00. It is still a learning curve but such an improvement over finger pricking although I still have to do that before driving as the DVLA still do not recognise the Libre results.

At a cost to the NHS of £70,00 per month for 2 sensors, it can make financial sense if you use 2 or 3 boxes of test strips per month. It should also improve diabetic control which again could reduce the number of people having amputations.

Thanks again for all the interesting and useful updates in your Newsletters.

J.G. - South East

Long-acting analogue insulin experiment

Dear Jenny,

I thought I would give you an update on two things: My CCG has updated everyone from a Libre 1 to a Libre 2 and the alarms have improved my control even more.

The system is still prone to “going off” before the 2 weeks life of the sensors are finished and I have had a couple of failures but to be fair to Abbott, they have replaced the faulty sensors without question.

Another interesting fact is that my Tresiba (degludec) 36 hour long-acting insulin did not at first seem to change the up and down swings that I have always had with long-acting analogue insulins. However, because I now have the Libre with alarms, I experimented with giving myself a small dose every 12 hours and my overnight blood sugars have now become very linear, staying between 4.5 and 6 all night until the inevitable “morning rise”. So much for 36-hour insulin!

P.R. - Bucks

Pork insulin IS available!

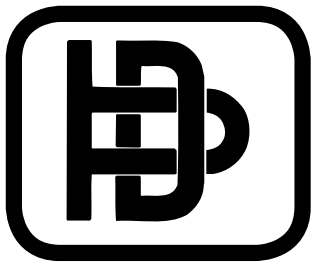
Dear Jenny,

I have had Type 1 diabetes for 69 years and have been using pre-mix pork insulin and for many years and just need some pork short-acting (soluble) insulin for times when my blood sugars are high which my previous consultant was happy to prescribe. However, my new consultant refuses to do so and has even said that pork insulin is no longer made. It is hard to argue with him as he has suggested that I might have a mental health problem simply because I want to continue to use the type of insulin that suits me for so many years. Is pork soluble insulin still made?

By telephone

Answer: Yes, Hypurin Porcine Neutral is the short-acting (soluble) pork insulin is available on the NHS. This misinformation by doctors and healthcare professionals is worrying. We advised this caller to suggest to her consultant that he checks Page 122 in MIMS which shows the availability of all insulins, including Hypurin pork insulins.

Apologies: A letter in the June Newsletter about poor podiatry services said that it was from West Yorkshire. In fact, it was from South Yorkshire.



IDDT NEWS



Don't forget the IDDT Event on Saturday 23rd October 2021!

Members have already received an invitation and a copy of the programme inviting them to our Annual Event on Saturday 23rd October 2021. It will be held at our usual venue, the Kettering Park Hotel and Spa, where all necessary safety measures will be in place. In fact, since re-opening, the company has won various awards for their Covid security arrangements including being accredited Covid-19 Confident by the AA.

We start the day with our Annual General Meeting and remind you that if you would like to nominate someone to become a Trustee of IDDT, then please put this in writing to IDDT along with the agreement of the person you are nominating.

The programme is a combination of speakers and discussion groups so should include something for everyone and as ever, it is an opportunity to meet other people who live with diabetes. For some people, lockdown has resulted in changes in diet and exercise routines, so having the dietitian speaking will give us a few reminders. We also welcome for the first time Abban Qayyum, a senior physiotherapist, who will be able to provide information to help us look after our long-term health.

In these still uncertain times, we recognise that some people may not wish to join us but there may be others who are just waiting for the opportunity! Therefore, it may be that we have to have some flexibility with the programme once we know how many people wish to attend. I am sure that you will understand this as it has become part of life.

We do hope as many of you as possible will join us on the day, teas, coffees and a meal at lunchtime are provided, so please do complete the booking form and return to IDDT by 1st October 2021. If you have any questions or would like another booking form, don't hesitate to give IDDT a call on 01604 622837 or email enquiries@iddtinternational.org.



'Thinking about Christmas'

Included with this Newsletter is a leaflet entitled, 'Thinking about Christmas' and although it seems early, Christmas and the New Year will be here sooner than we can imagine. With the leaflet you can order IDDT Christmas cards, the Diabetes Diary 2022 and IDDT's Shopping List.

This Shopping List has magnets on the back to attach to your fridge for easy jotting down and so it will not get lost! On one half of the page you plan your meals for each day and on the other half you write down the items you need to buy. This is a tear off section to take to the shops with you or to order your online shopping. It works well with the 28-day meal planner in IDDT's FREE booklet, "Diabetes Everyday Eating".

Take a look at the leaflet for gift ideas and support IDDT!

RESEARCH NEWS

September 2021 Newsletter

Issue 110

Progress on a Type 1 diabetes vaccine

There has never been a way to stop the development of the autoimmune condition, Type 1 diabetes, but now the Swedish biotech company Diamyd Medical is to carry out large-scale clinical studies of a vaccine that works to “reprogramme” immune cells to prevent the destruction of insulin-producing beta cells in the pancreas.

Diamyd has been working on this complex immunotherapy vaccine for over 20 years and the latest studies showed promising results. In the earlier clinical trials, the vaccine was injected into the lymph nodes of children and young adults (ages 12 to 24) who had been diagnosed with Type 1 diabetes within the past 6 months. They received 3 or 4 injections over 15 months. The results showed a significant retention of C-peptide which means it preserved or improved insulin secretion.

The large-scale Phase III trials are due to start during 2021 at 50 sites across Europe and the United States and will include roughly 330 children and young adults (ages 12 to 28) recently diagnosed with Type 1 diabetes. The participants will be randomised to receive either 3 or 4 injections of the Diamyd vaccine or 3 injections of a placebo one month apart and the outcomes will be measured after 24 months.

The active ingredient in the vaccine is GAD65 (glutamic acid decarboxylase-65), an enzyme that occurs naturally in the pancreatic beta cells that helps them work properly and continue producing insulin. A majority of people with Type 1 diabetes have GAD autoantibodies that target this enzyme, which results in the immune system attacking the cells that make insulin, so shutting off insulin production.

Will insulin in a pill ever happen?

Researchers from the New York University in Abu Dhabi have successfully developed a pill using nanomaterial layers that disseminate insulin

in rats safely without being destroyed by their stomach acids. This could be life-changing for the millions of people around the world who rely on insulin to live.

The insulin is loaded in a system that protects it from the acidic environment of the stomach. Once in the body, the system can sense the blood sugar level and can release the loaded insulin on demand.



Other attempts at orally administering insulin have been made in the past but the stomach acids and bile have quickly destroyed the insulin and its effectiveness.

This sounds like good news but it's important to remember that the study's success was only observed in rats, and human bodies are very different.

A potential new oral medication for Type 1 diabetes

A potential new drug presently referred to as TTP399 may have the power to lower and stabilise blood glucose in people with Type 1 diabetes. If successful and approved, TTP399 will be the first oral pill to treat Type 1 diabetes. Insulin will still be needed but TTP399 should lower blood glucose without raising the risk of diabetic ketoacidosis (DKA), and it will not increase the

risk for low blood glucose either.

TTP399 works on the liver to activate an enzyme called glucokinase. The liver plays a central role in maintaining a normal blood glucose level by storing or releasing glucose depending on your blood glucose levels and activities.

Normally, the beta cells in the pancreas make insulin and the alpha cells make glucagon. In Type 1 diabetes, the insulin release from the pancreas is insufficient or absent altogether, and the usual balance of insulin and glucagon that signals the liver what to do to keep your blood glucose normal, is lost. (Normally insulin production rises after meals and glucagon rises during fasting and exercise.) Even when insulin is administered, it never reaches as high levels as normal in the liver circulation, so key metabolic enzymes are never activated. The result is a lesser storage of glycogen in the liver and an excess release of glucose after meals and overnight due to glucagon being unchecked by insulin.

Glucokinase activation is very important because it stimulates glucose uptake from the blood and the synthesis and storage of glucose in the liver as glycogen. Having it normally activated would make you need less insulin on a daily basis because your liver would take up and store blood glucose after meals like it is supposed to. When glucokinase is not activated sufficiently, too much glucagon gets released and raises your blood glucose, even after meals when your levels are already higher.

TTP399 was recently given breakthrough therapy designation by the FDA in the US which provides the developer with added support and the potential to expedite development. It is hoped that the final trials being done on this medication prove it to be as effective as the earlier ones.

Research improves understanding about insulin producing cells and how Type 2 diabetes develops

A recent study has found that 'weak' beta cells bonding with more mature 'stronger' beta cells can boost the body's production of insulin. Beta cells are the insulin producing cells in the pancreas. Researchers from the University of Birmingham suggest that these findings can help to improve understanding of the processes that lead to the development of Type 2 diabetes.

Type 2 diabetes can develop when the insulin producing beta cells cannot release enough



insulin. The releasing of insulin is a tightly controlled process that requires hundreds of such cells clustered together to co-ordinate their response to signals from food, such as sugar, fat and gut hormones. This research showed that immature beta cells were able to overcome their relative deficiencies by partnering with 'stronger' counterparts to drive insulin release. Subtle differences in the levels of certain proteins found only in beta cells, and more broadly, differences in beta cell maturity, contributed to how clusters of insulin-producing cells, known as islets, function.

Study author David Hodson, Professor of Cellular Metabolism, said: "Our research shows that differences in beta cell maturity, defined using protein levels, are needed across the islet for proper insulin release. Unexpectedly, increases in the proportion of mature beta cells, is associated with islet failure. It seems that, rather like society, the islet needs cells with all ages to be properly functional. Redressing the balance between immature and mature beta cells restores islet function under conditions of metabolic stress – an excess of sugar and fat in the diet – providing evidence that both 'weak' and 'strong' beta cells could contribute to proper islet function and insulin release."

The research team believed maintaining a mix of 'strong' and 'weak' beta cells is important for effective insulin production. (Nature Communications, 2nd February 2021)

Gastric bypass surgery may reduce the risk of diabetic retinopathy

Swedish patients with Type 2 diabetes and obesity who underwent gastric bypass surgery showed a reduced risk of developing new diabetic retinopathy, compared with those who did not undergo surgery. The was an observational study

and it also showed:

- no evidence of an increase in sight-threatening or treatment-requiring diabetic retinopathy in people who did not have any retinopathy at the start of the study,
- in people with Type 2 diabetes and obesity who had pre-existing diabetic retinopathy before the surgery, their retinopathy was not made worse by the surgery.

To better understand the relationship between eye complications and gastric bypass surgery, the researchers looked at an Obesity register and a Type 2 diabetes register for all patients undergoing bariatric surgery between 2007 and 2013 with follow up in 2015. This involved 5,321 people who underwent surgery and the same number of matched controls, although those undergoing surgery were a little older and the findings showed:

- 188 patients in the surgery group and 317 patients in the control group developed new diabetic retinopathy.
- The risk for new retinopathy was reduced in the patients who underwent surgery.
- Dominant risk factors for development of retinopathy at the beginning of the study were diabetes duration, HbA1c levels, use of insulin, glomerular filtration rate (kidney function) and BMI.
- Researchers found no evidence of increased risk of the development of other sight-threatening or treatment-requiring diabetic ocular complications, such as proliferative retinopathy, the need for intravitreal drug administration or pan-retinal photocoagulation.

Although these results are encouraging, the researchers warned that rapid improvement in blood glucose control as a result of bariatric surgery may increase the risk of deterioration in pre-existing diabetic retinopathy. One trial also found that people with Type 2 diabetes taking semaglutide (DPP-4) had a significantly increased risk for retinopathy complications compared with placebo.

The researchers concluded that their findings support the view that, besides standard screening for diabetic retinopathy, there is no need for extended monitoring of patients with diabetes undergoing gastric bypass surgery if there is no retinopathy present. (JAMA Ophthalmology, January 2021)

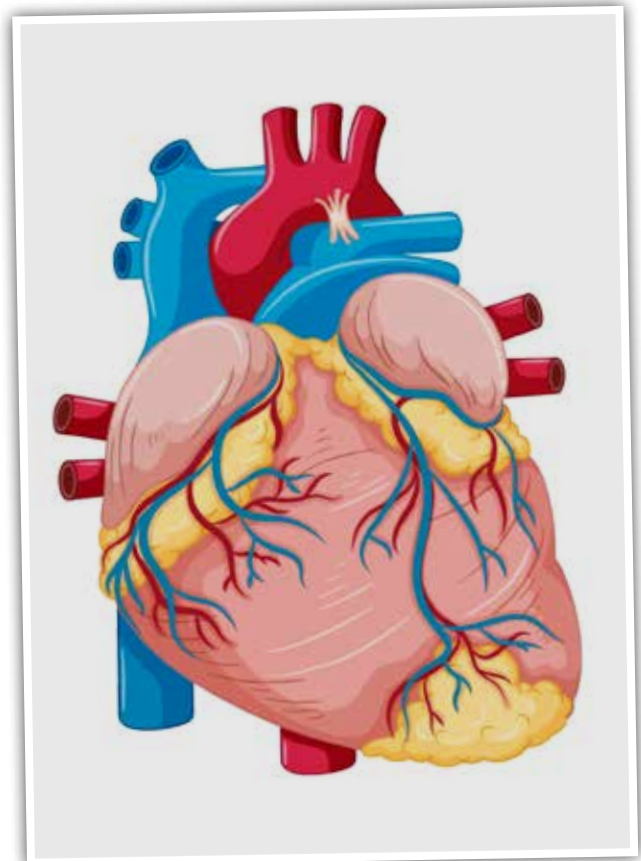
Worth noting - metabolic surgery may be best treatment for severe Type 2 diabetes!

A recently published study showed that metabolic surgery (bariatric surgery) yields better results in managing severe Type 2 diabetes over the long term than medications or lifestyle changes. More than one-third of the 60 patients involved in the 10-year study did not have diabetes 10 years after their surgery. (The Lancet, January 2021)

Zinc could be a key

Researchers at the University of St Andrews say a greater understanding of how zinc is handled in the body could lead to improved treatments for people with diabetes. They have been investigating the causes of potentially dangerous blood clots and why these occur more commonly in people with diabetes. Diabetes is a major risk factor for heart and circulatory diseases and because of the damage caused to the blood vessels, people with diabetes are up to three times more likely to develop conditions like heart attacks, stroke and vascular dementia.

The research investigated the role of zinc in these processes. Zinc is an essential nutrient that has many functions in the body. One of its functions is to help the blood to clot after injury. However, in some people with underlying health conditions,



such as Type 2 diabetes or obesity, clotting can occur more often when it's not required, causing damage to blood vessels and this increases the risk of serious health conditions such as stroke and deep vein thrombosis (DVT).

The researchers found the transportation of zinc in the blood is compromised in those with Type 2 diabetes due to the increased levels of fatty acids. These fatty acids prevent zinc from being carried in the normal way so allowing zinc to interact with clot-activating proteins and potentially triggering dangerous blood clots. They hope that these findings will help in the development of new treatments to reduce the risk of vascular disease in people with Type 2 diabetes. (Chemical Science, March 2021)

New stem cell therapy may prevent amputations

Early trials of a new stem cell treatment shows promise in reducing diabetes-related amputations. The trial involved injecting people with diabetes who have non-healing diabetic foot ulcers with a cell preparation of adult stem cells harvested from their own fat.

The results showed that the treatment induced regeneration of the blood vessels around the non-healing ulcers and this speeded up healing with no serious side effects.

63 people took part in the study and after 12 months, 50 people had 100% healing and 4 had greater than 85% healing. In addition, the healing process took place from two different directions – from the periphery as expected but also upwards from the ulcer bed.

The researchers concluded that this method of injection of stem cells can prevent limb loss and is easy to carry out quickly and safely. (Stem Cells Transitional Medicine, April 2021)

Worldwide a leg is amputated every 30 seconds as a result of non-healing diabetic foot ulcers, according to the American Diabetes Association. Many of these occur in poor countries where it is difficult to treat vascular disease and chronic ulcers and patients have to travel long distances with poor road conditions in order to obtain medical care.

The high/low carbohydrate debate continues

There continues to be a debate about the benefits, or otherwise, of low or high carbohydrate diets for people with Type 1 or Type 2 diabetes both on blood glucose control and weight. As we know, the Eatwell Guide, by Public Health England recommends around 50% of the diet should be made up of carbohydrates – certainly not low in carbs but there are different schools of thought and many people do not eat a high carb diet although there is equally a debate about how low to go! Carbohydrates provide energy for the body but if more carbohydrates are eaten than required for energy, then they are stored as fat and there is a subsequent weight increase. The other important factor, particularly for people taking insulin, the more carbohydrates that are eaten the higher the required dose of insulin or medication and the more likely to increase in weight because insulin increases weight.

It is interesting, therefore that despite the Eatwell Guide, the Scientific Advisory Committee on Nutrition (SACN), have issued a new report that suggests that a diet lower in carbohydrates is an effective option for up to 6 months for adults living with Type 2 diabetes and overweight/obesity.

These findings are based on assessments of weight change, blood sugar control, cholesterol and medication use. For the purpose of this research a low carbohydrate diet consisted of 37% carbs compared to 50% for the high carb diet.

SACN has concluded that for adults living with Type 2 diabetes and overweight/obesity, there are beneficial effects of a lower carbohydrate diet for up to 6 months for some of the outcomes, including improving blood sugar levels.

- People on lower carbohydrate diets lost more weight than those on higher carbohydrate diets in the first 3 months but not after, so it's unclear if the benefits of a lower carbohydrate diet are due to this early weight loss.
- Overall, there was not sufficient evidence to recommend a lower carbohydrate diet for longer than 6 months, so it is not clear whether a lower carb diet is beneficial for everyone with Type 2 diabetes.

Let us hope that more research is carried out in the area of diet in both Type 1 and Type 2 diabetes so that the recommendations are updated.



SNIPPETS

Long working hours not good for the heart

People who worked 55 hours or more per week were 17% more likely to die of ischemic heart disease and had a 35% greater risk of stroke when compared to those who worked 35 to 40 hours per week. The report showed that 488 million people worldwide were exposed to long working hours in 2016, and 745,194 of them died due to stroke and ischemic heart disease. (Environment International and the WHO, May 2021)

Covid-19 link to diabetes onset

A study has found a 39% higher likelihood of a new diabetes diagnosis among people who survived Covid-19 in older people in the US within six months following infection compared with people who had not had COVID-19. The findings suggest an incidence of 6.5 new diabetes cases for every 1,000 non-hospitalized COVID-19 patients and 37 cases per 1,000 COVID-19 patients who require hospitalisation. (Nature, May 2021)

Mediterranean diet may help to improve cognitive function

A recent study has shown that greater adherence to a Mediterranean diet may help improve memory performance and protects the brain from build-up of amyloid and tau proteins that may cause memory loss and dementia. The findings were based on data from 512 men and women. (Neurology, May 2021)

Herbal and diet supplements do not help weight loss – another myth!

A review of 54 studies found that herbal supplements had no clinically meaningful effect on weight loss when compared with a placebo. Only white kidney beans showed a statistically meaningful weight-loss effect. A separate review of 121 studies, also presented at the same event found that neither herbal supplements nor dietary supplements were tied to clinically significant weight loss. (European Congress on Obesity, May 2021)

High intake of ultra-processed foods tied to weight gain in UK children and young people

A recent study has found that higher consumption of ultra-processed foods like frozen meals, soft drinks, candy and salty snacks is linked to greater increases in adiposity (fat tissue) from ages 7 to 24. The findings, based on information from 9,025 British children, also showed that those in the high-consumption

group increased their intake of ultra-processed foods throughout the 10-year period at a speedier rate, compared with those in the lower-consumption category. (JAMA Pediatrics, June 2021)

Industry payments to doctors are associated with increased prescribing of long-acting insulin in the US

The rapidly increased cost of insulin in the US is a major public health issue. A new study has found that payments made by manufacturers to physicians were associated with a larger number of more expensive prescriptions for long-acting insulins covered by Medicare. More than 51,800 physicians received industry payments worth \$22.3 million in 2016, and they wrote, on average, 135 prescriptions for the diabetes treatment in the following year compared with 77 prescriptions written by doctors who did not receive payments from insulin makers. The larger number of prescriptions resulted in an average Medicare Part D claim of \$300, which was \$71 more than claims generated by doctors who did not receive payments. (Plos Medicine, 1st June 2021)

Covid billionaires

At least nine people have become new billionaires since the beginning of the COVID pandemic as a result of the excessive profits pharmaceutical corporations with monopolies on COVID vaccines are making. This information was supplied by The People's Vaccine Alliance before the May summit of G20 leaders.

Between them, the nine new billionaires, have a combined net wealth of \$19.3 billion, enough to fully vaccinate all people in low-income countries 1.3 times. Meanwhile, these countries have received only 0.2% of the global supply of vaccines, because of the massive shortfall in available doses, despite being home to 10% of the world's population.

In addition, eight existing billionaires who have extensive portfolios in the COVID-19 vaccine pharmaceutical corporations, have seen their combined wealth increase by \$32.2 billion, enough to fully vaccinate everyone in India.

It must be remembered that this massive accumulation of wealth is as a result of the monopolies the companies hold on the vaccines, vaccines which were largely public funded - tax payers' money! Is there any wonder we are cynical about the pharmaceutical industry?