

Insulin pump therapy – aiming for better blood glucose control in people with type 1 diabetes

The Guy's and St Thomas' NHS Foundation Trust insulin pump service is provided by a multidisciplinary team consisting of doctors, specialist nurses and dietitians. Our team is trained and expert in insulin pump therapy.

The service is for people with type 1 diabetes either considering or already using insulin pump therapy.

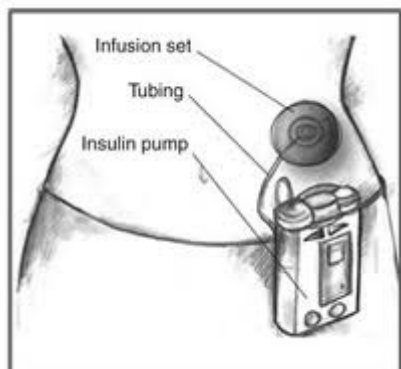
Content	Page
What is insulin pump therapy?	2
What does an insulin pump look like?	2
How does the pump work?	2
How well established are insulin pumps?	2
Insulin pump therapy is not an artificial pancreas (not yet, anyway)	2
Advantages and disadvantages of having insulin pump therapy	3
Is it right for me?	4
Will my blood glucose always be controlled if I'm using the insulin pump?	4
What will happen once I am referred to the insulin pump clinic?	4
Our expectation	5
Our aim/philosophy	5
Research studies	6
Further Information	6

What is insulin pump therapy?

Insulin pump therapy is called Continuous Subcutaneous Insulin Infusion (CSII).

The aim is to get better blood glucose control by mimicking insulin release in a person without diabetes.

What does an insulin pump look like?



How does the pump work?

An insulin pump is a small battery operated device, similar size to a pager. It contains a reservoir of insulin connected to a thin tube attached to a needle or cannula. This is then inserted under the skin, enabling the insulin to flow into your body. The pump is not automatic but it is programmed to deliver insulin constantly at a regular flow which you determine to suit your need. This will give you your basal (background) insulin. You can then press controls or buttons on the pump to give the meal-time insulin, which will be your meal bolus. The pump can be kept in your pocket, clipped to your waistband, or tucked into a sock or bra. The type of insulin used in the pump is quick acting insulin.

How well established are insulin pumps?

Insulin pumps were invented at Guy's Hospital in the late 1970s. The treatment has developed and improved over the years. It is now used by hundreds of thousands of people with diabetes throughout the world.

Insulin pump therapy is not an artificial pancreas (not yet, anyway)

It is important to realise that the insulin pump needs to be programmed by you with the help from your diabetes specialist health care team. The rates of insulin infusion used are guided by your needs (changing with food and exercise), and by the blood tests that you perform. You would need to test your blood glucose at least four times a day to get the most out of pump therapy.

What are the benefits and possible disadvantages of having insulin pump therapy?

Advantages	Disadvantages
<p>Insulin pump often improves daily variability in blood glucose and HbA1c.</p> <p>Pump delivers insulin more efficiently than multiple daily insulin injection. The pump can be programmed to automatically increase the basal insulin infusion rate during the early hours of the morning to help achieve better blood glucose and lower the “dawn phenomenon” which leads to a marked rise in blood glucose in the few hours before breakfast.</p> <p>Better quality of life, well-being and flexible schedule (meal times, exercise, lazy days etc).</p> <p>You can eat more, less or not at all.</p> <p>Basal rates are set to meet your body’s needs.</p> <p>Insulin pump is likely to reduce severe hypoglycaemia.</p> <p>It is easier to manage exercise without hypoglycaemia/hyperglycaemia.</p> <p>The pump infusion set only requires changing every two-three days, so there is no longer any need for Multiple Daily Injections.</p> <p>It is easier to manage diabetes control before and during pregnancy.</p> <p>Restored hypoglycaemia awareness.</p>	<p>Being attached to the pump almost all of time (although it can be disconnected for short times - swimming, showers, sex etc).</p> <p>Increased risk of Diabetic Ketoacidosis (DKA), hence the need to do four or more blood tests a day.</p> <p>If there is a problem with the cannula or the pump fails, no insulin will be delivered. As you don’t inject any background long acting insulin, your blood sugar may go dangerously high causing Diabetic Ketoacidosis.</p> <p>There is a chance of skin infections, especially if you don’t change the infusion set after three days.</p> <p>A pump isn’t a magic cure – you will still need to check your blood glucose, continue to carbohydrate count and adjust your insulin bolus.</p> <p>Pumps can be difficult to hide under clothing.</p> <p>As the pump allows greater flexibility and choice with food intake, some people may choose to eat less healthily and gain weight.</p>

Is it right for me?

An insulin pump is not suitable for everyone. You have to be motivated enough to care for your own diabetes. You have to be able to carbohydrate count and adjust insulin boluses for your food and daily activity. We recommend that you attend a structured education programme prior to commencing insulin pump therapy (e.g. DAFNE, Dose Adjustment For Normal Eating). This helps the transition to insulin pump therapy and supports your decision making in the future.

If you are able to do this and you meet the National Institute for Health and Clinical Excellence (NICE) guidance on insulin pump, your diabetes team will organise training and support for a trial of a pump, if you experience one of the following symptoms:

- significant highs and lows in blood glucose levels
- frequent low glucose levels that require someone else's help
- a continually high HbA1c despite best efforts on multiple daily injections.

Will my blood glucose always be well controlled if I am using the insulin pump?

Starting on insulin pump therapy is a trial. Due to the strict selection procedure, most people who use an insulin pump trial have much better glucose control, manage the pump procedures very well and will be completely satisfied. However, improved control is not guaranteed. Some people who use the pump may have no improvement in their blood glucose control after a few months or find it difficult to cope with the demands of the pump programme. A switch back to injections may be the most appropriate option. We find that less than 10% of people who start insulin pump therapy switch back to using insulin injections.

What will happen once I am referred to the insulin pump clinic?

First appointment

The consultant will explain the insulin pump programme at the hospital, the advantages and disadvantages of insulin pump therapy and give you a chance to ask questions and discuss the treatment.

You or the doctor may feel even at this early stage that you are unlikely to benefit from insulin pump therapy and you can discuss this.

However, pump therapy will usually be an option and the only decision you have to make is whether you wish to enter the pre-pump assessment programme. At this stage you will be encouraged to attend a structured education programme if you have not already done so in line with NICE guidance.

Pre-pump assessment programme

You will have an appointment with a diabetes specialist nurse and a dietitian who specialise in intensive insulin therapy, including insulin pumps. The aim of the programme is to try to improve your diabetes control by using best injection treatment: This will include a review of your injection technique, site, blood glucose monitoring and assess how you are adjusting your insulin. You will be shown the pump and you will have the opportunity to discuss any worries and questions you may have about the pump therapy.

Appropriate carbohydrate counting skills are needed before you can start insulin pump therapy. The specialist diabetes dietitian will review and assess your knowledge and skills as part of the multidisciplinary team assessment programme.

Before your next doctor's appointment you will have a plan of action to implement with any changes discussed with the team. In this period of time you have the opportunity to discuss any issues concerning the pump with your family and friends and to think about whether it is right for you.

Second visit with the doctor

At this visit the doctor will assess and review your blood glucose results with your current multiple daily injection, any changes in hypoglycaemia and your wellbeing.

You will be offered a trial of insulin pump therapy if there has been no improvement with the best injection treatment and both you and the diabetes team feel you would benefit from starting the pump therapy.

You may decide that insulin pump therapy is not for you. It is important to realise that some patients have improved control on their new insulin injection treatment and do not need to use a pump. Patients who do not need a pump or decide not to use a pump will be seen again in the general diabetes clinic, either at their usual hospital or at Guy's and St Thomas' NHS Foundation Trust.

Starting on insulin pump therapy

An appointment will be made for you to see the diabetes specialist nurse and dietitian to start insulin pump therapy either individually or in a group setting. This will involve three sessions and each session is three hours. It is essential to commit to this period of time to help you to gain confidence and to understand insulin pump therapy.

Our expectation

NICE guidelines recommend that people with Type 1 diabetes are offered 'structured education' and prior to starting insulin pump therapy we would encourage you to:

- Complete either DAFNE, GATTO (Guy's And Tommy's Type One) or your local structured education programme.
- Check blood glucose levels at least four times per day – often more when starting on insulin pump therapy.
- Count carbohydrates and adjust insulin doses to cover food.
- Commit to the treatment plan set out by the team.
- Attend your appointments. If this is not possible, phone us as soon as possible so we can rearrange your appointment and give your original appointment to someone else.
- Keep us informed of any changes of your personal details and treatment.
- Tell us about your experience of our service– this might be something that went well or a concern about the care given to help us improve our services.

Our Aim/ Philosophy

Our aim for the insulin pump therapy service is to be effective and efficient in providing expertise in the transition and treatment on insulin pump therapy.

We follow an agreed referral criteria defined by NICE and our local care pathway for starting insulin pump therapy. We aim to work with you, making joint decisions to get the best out of your insulin pump therapy and support you in your skill to self manage to improve your over all diabetes care.

Research studies

The medical school (King's College London), based at Guy's and St Thomas' NHS Foundation Trust is a distinguished and active research centre. It not only invented insulin pump therapy but continues to investigate new ways of improving care for people with diabetes.

Many research studies occur each year, which are important for developing treatment in the future and you may be asked to take part in a research study.

We are always interested in your views about your diabetes and delighted to discuss these and any progress in research. Please feel free to speak with your doctor or nurse.

Further information

For more information about insulin pump therapy, please speak to your diabetes specialist team. You may also find the following of interest:

Diabetes UK, Careline 0845 120 2960, www.diabetes.org.uk

INPUT, 01590 677911, www.input.me.uk

Juvenile Diabetes Research Foundation, 020 7713 2030, www.jdrf.org.uk

National Institute of Clinical Excellence (NICE), (clinical guidance for the NHS), www.nice.org.uk

Contact us

If you have any questions or concerns about insulin pump therapy, please contact diabetes specialist nurse on 020 7188 1993

diabetes dietitians on 020 7188 4356/1967

Out of hours, please contact hospital switch board on 020 7188 7188 and ask for diabetes consultant or registra on call.

Pharmacy medicines helpline

For information about any medicines that you have been prescribed at Guy's and St Thomas' hospitals, you can speak to the staff caring for you or call our helpline.

t: 020 7188 8748 9am to 5pm, Monday to Friday

Patient Advice and Liaison Service (PALS)

To make comments or raise concerns about the Trust's services, please contact PALS. Ask a member of staff to direct you to the PALS office or:

e: 020 7188 8801 at St Thomas'

t: 020 7188 8803 at Guy's

e: pals@gstt.nhs.uk

Leaflet number: 2048/VER2

Date published: May 2013

Review date: May 2016

© 2013 Guy's and St Thomas' NHS Foundation Trust