

# Hybrid Closed Loop Technology

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## What is Insulin Pump Therapy?

An insulin pump is a battery operated, programmable device that is worn on the outside of your body. It continuously delivers insulin through a soft cannula which sits just under your skin, typically around your stomach area.

Pumps only use rapid acting insulin such as Novorapid, Humalog or Fiasp.

The criteria for hybrid closed loop includes:

- HbA1c 58mmol/mol or more, or disabling hypoglycaemia despite best possible management with at least one of the following:



- Insulin pump (CSII)
- CGM




A pump delivers insulin in two ways:

**Basal** —The pump is programmed with a background or “basal” rate, which can be varied to meet your changing insulin needs over 24 hours. It is delivered continually throughout the day as units per hour.

**Bolus** — You also need to instruct the pump to deliver extra insulin before eating and/or to correct a high blood glucose level. It is important you have completed a carbohydrate counting course or equivalent prior to going on a pump as it is set with your insulin to carbohydrate ratios and correction ratio.

## Types of Insulin Pumps Available

Pump	Key Features	Insulin capacity	Simulator Apps / Further information
 <p><b>Tandem t:slim X2</b></p>	<ul style="list-style-type: none"> <li>- Tethered pump—attaches to your body by a length of flexible tubing between the pump itself and the cannula</li> <li>- Insulin delivery is controlled by the pump itself</li> <li>- Self fill cartridge with insulin vial and syringe</li> </ul>	300 units	Tandem Simulator App on your phone  <a href="http://www.tandemdiabetes.com">www.tandemdiabetes.com</a>
 <p><b>Ypsopump</b></p>	<ul style="list-style-type: none"> <li>- Tethered pump</li> <li>- Insulin delivery is controlled by the CamAPS app on a compatible smartphone and the pump itself</li> <li>- Novorapid pumpcart (available on prescription pre-filled)</li> </ul>	160 units	MyLife App on your phone  Ypsomed Explorer App on your phone  <a href="http://www.mylife-diabetescare.com">www.mylife-diabetescare.com</a>

<b>DanaRS</b> 	<ul style="list-style-type: none"> <li>- Tethered pump</li> <li>- Insulin delivery is controlled by the CamAPS app on a compatible smartphone and the pump itself</li> <li>- Self fill cartridge with insulin vial and syringe</li> </ul>	300 units	<a href="http://www.advancedtherapeutics.org.uk">www.advancedtherapeutics.org.uk</a>
<b>Medtronic 780G</b> 	<ul style="list-style-type: none"> <li>- Tethered pump</li> <li>- Insulin delivery is controlled by the pump itself.</li> <li>- Self fill reservoir with insulin vial</li> </ul>	300 units	Minimed Virtual Demo Pump Exploration—access through your PC  <a href="http://www.medtronic-diabetes.co.uk">www.medtronic-diabetes.co.uk</a>
<b>Omnipod 5</b> 	<ul style="list-style-type: none"> <li>- Patch pump—no tubing</li> <li>- Insulin delivery is controlled by a separate handset</li> <li>- Self fill pod with insulin vial</li> </ul>	200 units	Omnipod 5 Simulator app on your phone.  <a href="http://www.omnipod.com">www.omnipod.com</a>

## Hybrid Closed Loop Pumps (HCL)

Insulin pumps can connect to Continuous Glucose Monitors (CGM) and work in a hybrid closed loop system. This means the CGM measures glucose readings via a small sensor worn on the skin and continuously sends the readings to your pump.

This allows the pump to track your glucose levels and automatically adjust the insulin delivery to help improve your control. However, you still need to bolus before your meals on a hybrid closed loop system.

The following pumps work with a CGM in a hybrid closed loop system:

- **Tandem t:slim X2 Control IQ** Technology with the Dexcom G7
- **YpsoPump CamAPS** with the CGM Dexcom G6 and Freestyle Libre 3(android only)
- **DanaRS CamAPS** with the CGM Dexcom G6 (android only)
- **Medtronic 780G** SmartGuard with the Simplera Sync
- **Omnipod 5** with the CGM Freestyle Libre 2 plus



## Contact Details:

James Paget Diabetes Nursing Service - 01493 453897 or [DSN@jpaget.nhs.uk](mailto:DSN@jpaget.nhs.uk)

For educational material on insulin pump therapy visit: <https://abcd.care/dtn-education/pumps-csii>

For bite size e-courses on insulin pump therapy, HCL & carb counting: [www.mytype1diabetes.nhs.uk](http://www.mytype1diabetes.nhs.uk)

## Your Feedback

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### **Collaboration**

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### **Accountability**

We act with professionalism and integrity, delivering what we commit to, embedding learning when things do not go to plan

### **Respect**

We are anti-discriminatory, treating people fairly and creating a sense of belonging and pride

### **Empowerment**

We speak out when things don't feel right, we are innovative and make changes to support continuous improvement

### **Support**

We are compassionate, listen attentively and are kind to ourselves and each other



The hospital can arrange for an interpreter or person to sign to assist you in communicating effectively with staff during your stay. Please let us know.

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