

**Patient
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Insulin pump use before, during and after the birth of your baby

Introduction

This leaflet provides guidance on managing your insulin pump before conception, throughout your pregnancy, during labour and following the delivery of your baby.

Planning or thinking about pregnancy

If you are thinking about pregnancy, please let the insulin pump team know. A member of the pre-conception team will contact you to discuss what is expected before you stop using contraception. The contact details are at the end of this leaflet. You may find that you need to keep in regular contact with the pre-conception team to help you achieve a suitable HbA1c prior to conception.

Ideally 3 months prior to conception you should:

- take 5mg of folic acid once a day
- stop smoking
- aim for your HbA1c blood test to be below 48mmol/L with minimal hypos - monthly HbA1cs can be requested
- have a retinal eye screen review
- have a medication review with your GP or consultant (medication such as statins or ACE inhibitors are not safe during pregnancy)

If you are not already using flash glucose monitoring, you will be eligible for this to help optimize your glucose levels while you are planning for pregnancy.

Once your pregnancy has been confirmed, you will be offered continuous glucose monitoring (CGM). You will have antenatal and diabetes outpatient appointments every 2 to 4 weeks.

An eye examination will be carried out at least twice during pregnancy, normally following the first antenatal clinic appointment and at 28 weeks of pregnancy.

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The obstetric team will monitor you and your baby throughout your pregnancy and you will have regular contact with the diabetes team.

A baby's development will begin before you even know you are pregnant. In the first 12 weeks of pregnancy, your baby is very sensitive to high blood glucose levels. It is known that some congenital abnormalities, such as heart defects, are caused in this way.

Folic acid is a vitamin supplement that reduces the risk of congenital spinal problems in all pregnancies. We advise you to start taking folic acid 3 months prior to conception and for the first 12 weeks of pregnancy. Your GP will prescribe 5mgs of folic acid for you (this is a higher dose than the vitamin supplement that you can buy over the counter).

Insulin pump therapy requires intensive blood glucose monitoring and the basal rates and carbohydrate ratios need to be adjusted accordingly during pregnancy. Keep a record of your pre-pregnancy basal rates and carbohydrate ratios as you will return to these straight away after the delivery of your baby.

While you are working towards a pregnancy, please aim for blood glucose levels of 5-7mmol/L on waking and 4-7mmol/L before meals and at other times of the day.

If you are using flash/CGM we recommend you aim for:

- >70% time in range
- <4% hypoglycaemia
- < 30% above target
- An estimated A1c of <48mmol/l

The above flash/CGM targets will remain the same during pregnancy but we will encourage you to change your individual target range to 3.5-7.8mmol/l. During pregnancy, it is recommended that you aim for:

- <5.3 fasting and before meals
- <7.8 one hour after meals
- or <6.4 two hours after meals

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Basal rates and carbohydrate ratios

In the first trimester (3 months) of pregnancy you may need to reduce your basal rates and adjust your carbohydrate and correction ratios, especially during the night when there is a tendency for increased hypos. Treat hypos according to the flow chart in your CSII Pump therapy leaflet. Please ask a member of the team if you do not have this leaflet.

Nausea (feeling sick) and vomiting may be a problem during the first few months of pregnancy. Glucose levels can be maintained by adjusting the basal rates. You may also wish to give part of your carbohydrate bolus before eating and the remaining amount after you have eaten using the advanced bolus option.

Advice from the dietitian will be available at your antenatal clinic appointments.

As your pregnancy progresses, you will find that your insulin requirements increase - possibly up to 4 times - your pre-pregnancy requirements during your second and third trimester of pregnancy. This rise is caused by several factors; weight gain, increased calorie intake, creation of new tissue and an increase in hormones made by the placenta that conflict with the action of insulin. Also, the dawn phenomenon (rise in blood glucose in the early morning) is more exaggerated during pregnancy.

Advanced boluses during later stages of pregnancy

- Bolus 30 to 40 minutes before a meal using advanced bolus
- Split your bolus and extend for a duration of 2 hours with a 70/30 split.
- You may need to use a 'super bolus' (ask the dietitians for written advice on this)
- You may need to limit carbohydrate to 25g to 30g for breakfast and 50 to 60g with other meals if you are finding it difficult to achieve blood glucose levels within your target. These amounts are guidance and will be different depending on individual differences and your diabetes.

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Cannula insertion sites

It is recommended that you change the site of your cannula every 24 to 48 hours. As your pregnancy progresses, you may need assistance to insert your cannula, therefore it may be useful to teach your partner how to do this. The 45° angle cannula may prove more comfortable as your pregnancy progresses.

Ketoacidosis is serious, but even more so in pregnancy, as it could affect the health of your baby. To avoid ketoacidosis developing, you must test for blood ketones if your blood glucose is 10mmol/L or above, and if you feel unwell but have a normal blood glucose. Please refer to the sick day rules leaflet.

If your blood ketones are 1.5mmol/L or above you will need to go to the nearest Accident and Emergency Department as you will require hospital treatment.

In the later stages of pregnancy, if you experience a reduction in your insulin doses not caused by any obvious reason, please contact your obstetric team straight away for advice.

Steroids may be prescribed if your baby has to be delivered prematurely (before full term). This is to help the baby's respiratory system to cope. A temporary basal rate increase may be needed to keep your glucose levels within target. You will need to monitor your glucose levels more often to adjust the temporary basal rate as needed.

The diabetes team will be able to give you more detailed advice about steroid treatment if needed.

Labour and delivery

Remember to pack all your requirements for your pump and also back-up insulin pens. A member of the diabetes team will discuss with you whether or not you wish to stay on your pump for the delivery or have an insulin drip to control your blood glucose during delivery.

If you choose to stay on your pump, we advise that you change your cannula, infusion set and cartridge before the delivery. The cannula should be sited either in the upper arm, thigh or the buttock area.

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The start of labour will bring about changes in the amount of insulin you need. During active labour, muscle contractions can be similar to strenuous exercise, thereby reducing your insulin requirements. Aim to check your glucose levels at least hourly and be prepared to reduce the basal rate by 10 to 60% according to your blood glucose levels. Blood glucose levels above normal stimulate insulin production in the baby. This can result in neonatal hypoglycaemia shortly after birth. Quick treatment of hyperglycaemia with a bolus will help to stop this happening.

After the birth of your baby

After the birth of your baby and placenta, the amount of insulin you need will fall and may even be lower than before you became pregnant. Therefore, it is advisable to return to your pre-pregnancy basal rate and possibly use a temporary basal reduction for the time frame immediately after delivery, dependant on your blood glucose levels.

- You may need to reduce your basal rates by 30 to 50% in the first 24 hours after the delivery of your baby
- Your first meal may not need a bolus
- Increase your glucose target to 6 to 8mmol/L in the handset or PDM

Breastfeeding

If you are breastfeeding you may need less insulin than you would usually need, insulin requirements may reduce by about 30%. Your overnight basal requirements will be affected by night time feeds and will need to be adjusted. Regular low glycaemic index carbohydrate snacks around 15 to 20 grams will help to maintain blood glucose levels and may not need a bolus. Try to match your carbohydrate intake to your baby's breastfeeding habits.

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Contact information

Delivery Suite

Gloucestershire Royal Hospital
Tel: 0300 422 5525 (24 hours)

Antenatal Day Assessment Unit

Gloucestershire Royal Hospital
Tel: 0300 422 6104
Monday to Friday, 8:30am to 4:30pm

Diabetes Specialist Nurse Office

Tel: Cheltenham 0300 422 4266 (answer phone)
Tel: Gloucester 0300 422 8613 (answer phone)
All messages will be responded to within 48 hours

Email: ghn-tr.diabetespregnancy@nhs.net

References

The Insulin Pump Therapy Book, Insights from The Experts
MiniMed Technologies

'Pumping Insulin, Everything You Need For Success With An
Insulin Pump', Third Edition

NICE NG3 Diabetes in Pregnancy: Preconception to the
postnatal period

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