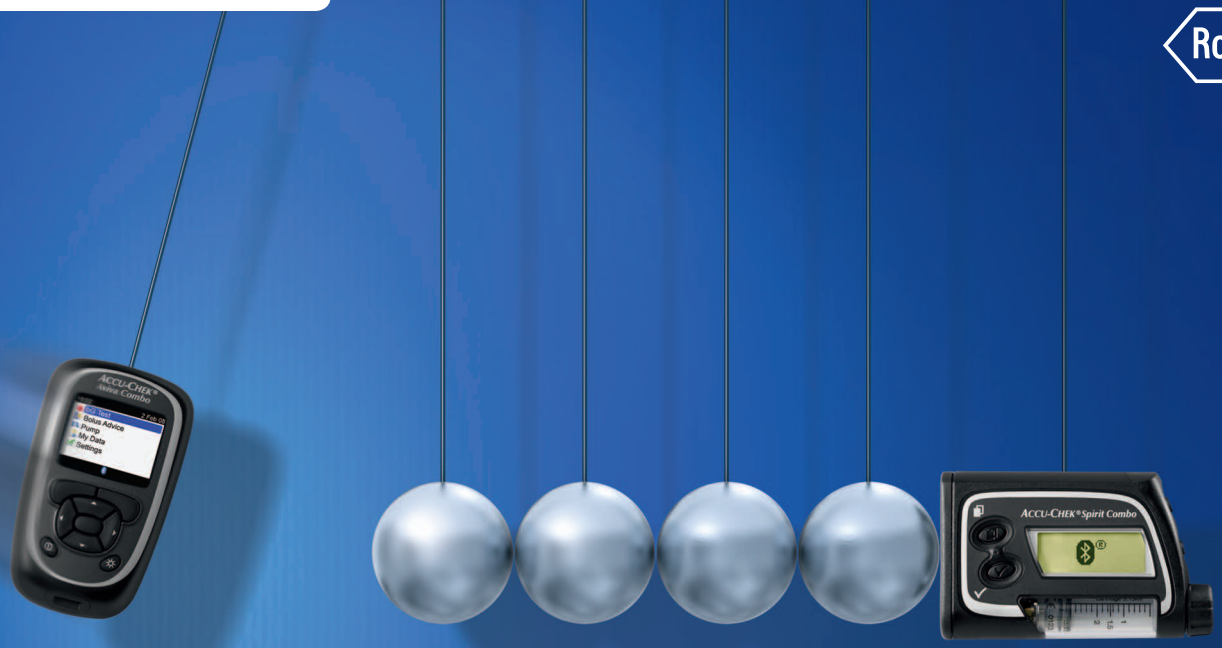
ACCU-CHEK® Combo

Roche



Accu-Chek Pump Starter Guide

Information and advice on starting insulin pump therapy

Pump therapy

Personal settings

Infusion sets

Blood glucose testing

Temporary basel rate

Hypo, Hyper & Ketoacidosis

Lifestyle advice

ACCU-CHEK®

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Section 1: **Why choose pump therapy?**

Improved quality of life

- Increased energy and well being
- Additional lifestyle flexibility
- Ability to improve control without additional injections

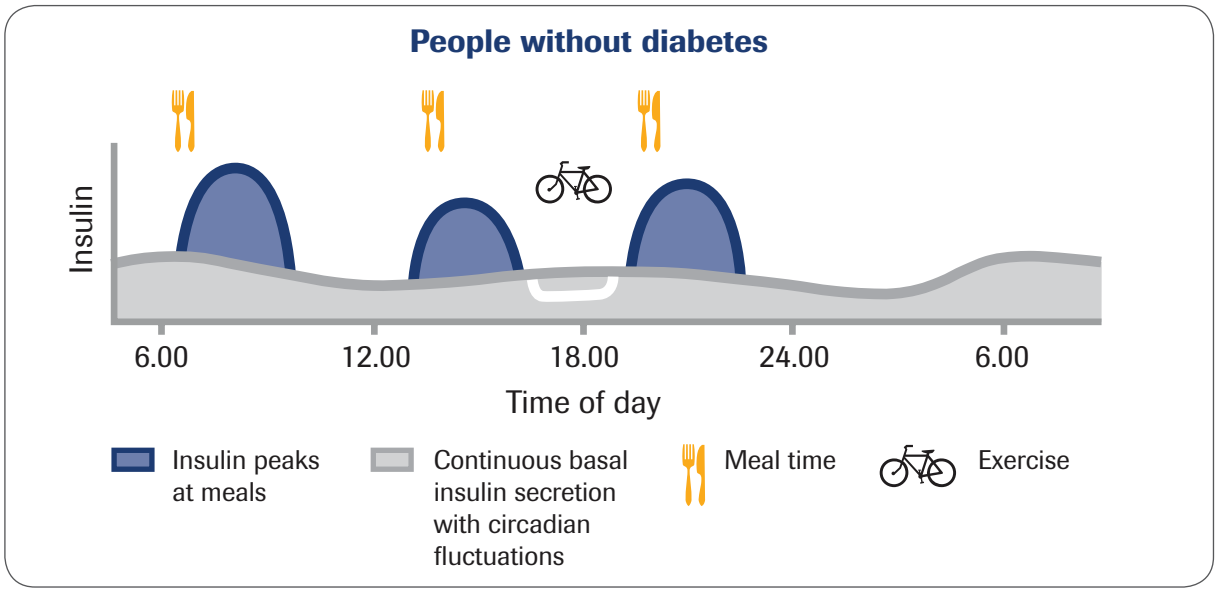
Better adjustment to diabetes

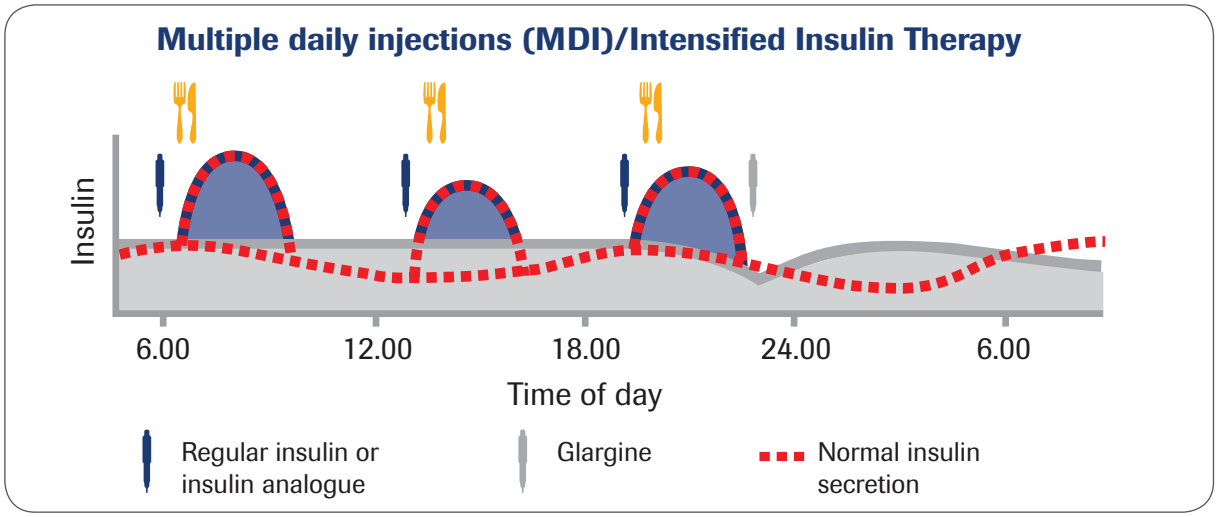
- Less hypoglycaemia
- Improved blood glucose and HbA1C
- Fewer fluctuations in blood glucose levels during the course of the day
- A decrease in HbA1C has proven to reduce long-term complications

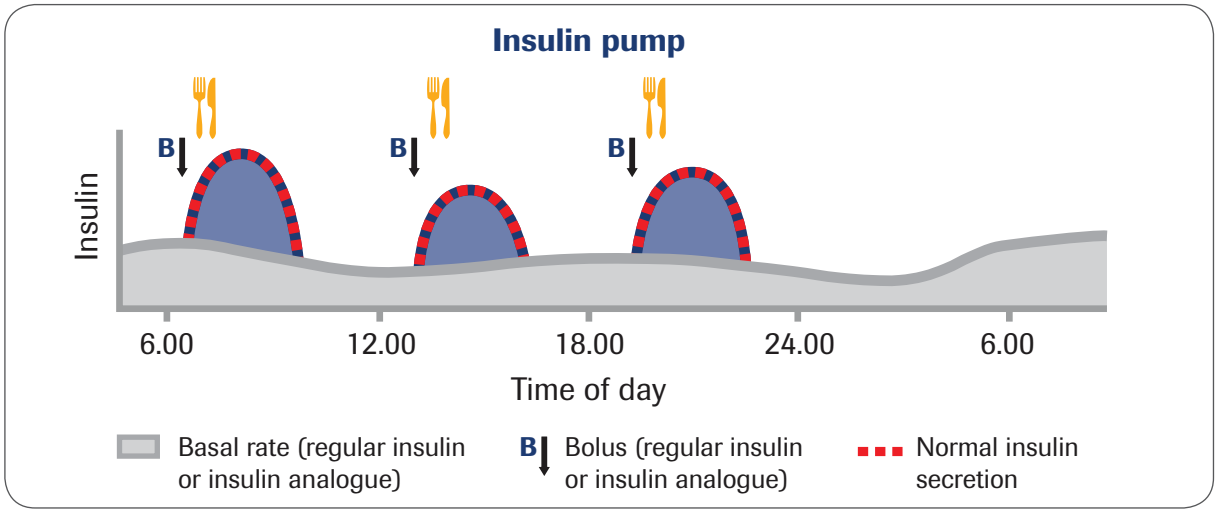
Your personal pump therapy goals

Insulin treatment strategies

Physiological insulin need during the day







Section 2: **Your personal settings**

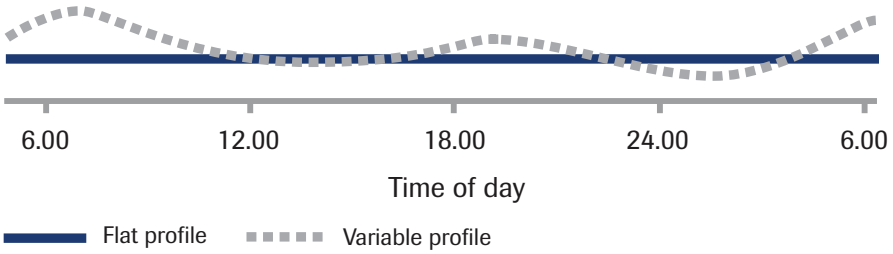
Basal insulin

- Your body needs basal (background) insulin to keep ticking over between meals and overnight
- Daily insulin requirements vary from person to person
- Your total pump insulin dose will consist of approximately 50% basal rate and 50% boluses
- Your starting basal rate must be reduced by up to 20-30% versus your current multiple daily injections (MDI) dosing
- Sometimes your basal rate may be calculated from your body weight

There are 2 approaches to setting the basal rate:

1. A **flatter profile** may be more suitable for older people and those who have had diabetes for many years

2. A **more variable** profile may be required for younger people and those experiencing the dawn or dusk phenomena



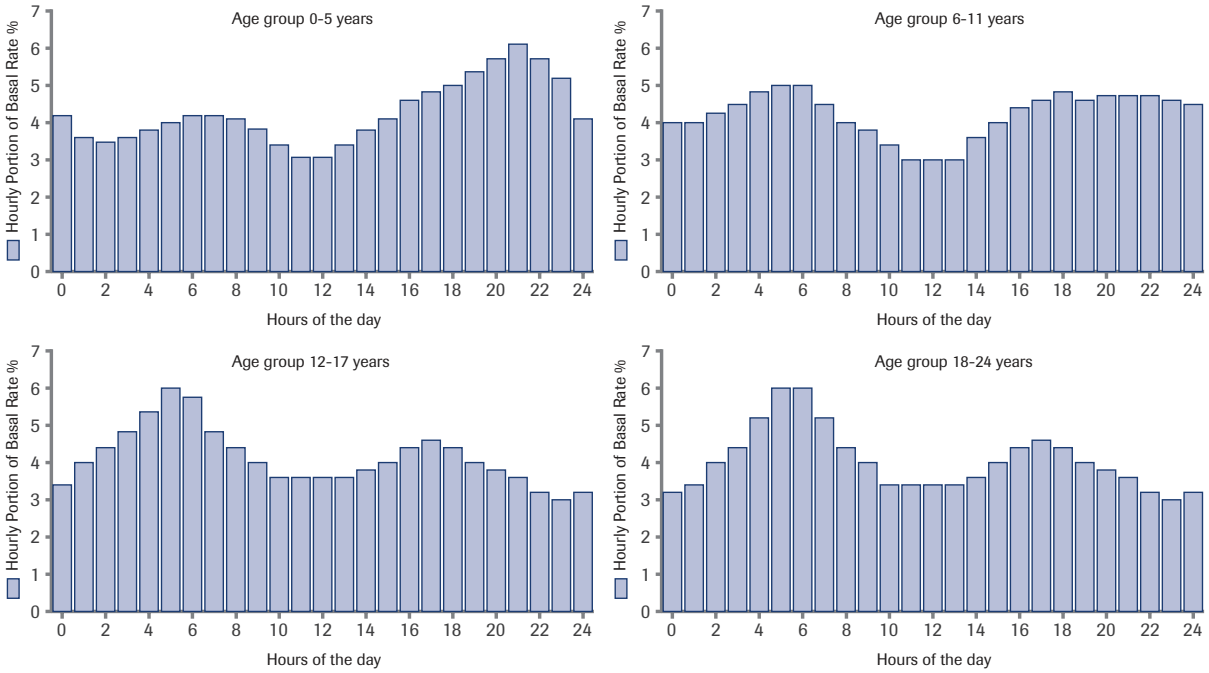
1. Setting a flat basal rate

Total daily insulin dose	**Total daily basal dose***	**Basal rate** (units per hour)**
20	10	0.4
30	15	0.6
40	20	0.8
50	25	1.0

2. Setting a variable basal rate

The **Accu-Chek 360° Insulin Pump Configuration Software** can help your HCP to set up Basal Rate profiles that are adapted to your personal needs using the **Profile Wizard**.

Basal Insulin Needs by Age Group (Bachran et al. 2010)



0-5 Years: (average of 837 profiles) Highest peak before midnight. Small peak in early morning lowest compared with other age groups. Lowest insulin need at noon.

6-11 Years: (average of 1739 profiles) Highest peak between 5-6 AM. Consistent basal from 5 PM to 2 AM. Lowest insulin need at noon.

12-17 Years: (average of 2985 profiles) Highest peak in the morning. Lowest insulin need at noon. Moderate afternoon peak.

18-24 Years: (average of 380 basal profiles) Highest peak in the morning. Lowest insulin need at midnight. Moderate afternoon peak.

The above Basal profiles are used in the Accu-Chek Configuration Profile wizard.

Note: Your Healthcare Professional will advise you which is best for you

Your target range

You should be able to obtain blood glucose levels that stay within your target range, as agreed with your diabetes nurse/doctor.

Note:

Your starting basal rate profile is:

Your starting blood glucose target range is:

Time	Units per hour	Time	Units per hour	Time	Units per hour	Time	Units per hour	Time	Units per hour
00.00-01.00		06.00-07.00		11.00-12.00		17.00-18.00		22.00-23.00	
01.00-02.00		07.00-08.00		12.00-13.00		18.00-19.00		23.00-00.00	
02.00-03.00		08.00-09.00		13.00-14.00		19.00-20.00			
03.00-04.00		09.00-10.00		14.00-15.00		20.00-21.00			
04.00-05.00		10.00-11.00		15.00-16.00		21.00-22.00			
05.00 06.00				16.00-17.00					

Programming an hourly basal rate

- Your pump delivers insulin every 3 minutes – 20 equal doses every hour, 24 hours a day
- This flow of insulin, measured in units per hour, is your basal rate
- Your basal rate profile consists of 24 hourly basal rates
- The basal rate for each hour of the day is programmed on a different screen
- Your pump allows you to administer multiple basal rate profiles

Adjusting your basal rate

- Basal rate adjustments should not be made based on one blood glucose reading
- Changes to your basal rate should be in times of stability
- Activity and food intake should be stable for 2 weeks
- Adjust your basal rate in blocks of time – not based on spot blood glucose checks
- When changing your basal rate allow for a delay in insulin action dependent on the type of insulin you use (e.g. analogue insulin 1 hour), check this with your diabetes nurse/doctor
- When you have checked your basal rate do not make further changes for 2-3 days
- It is recommended that adjustments are made gradually, in most cases individual hours are not adjusted by more than 0.1 units
- Blood glucose levels should be in target range before bed, on waking and before meals when your basal rate is correct
- Sometimes your diabetes nurse/doctor may ask you to skip meals to help check your basal rate

My personal guidance on adjusting my basal rate:

_____

_____

_____

_____

_____

Testing your basal rate

The purpose of testing the basal rate is to ensure that your programmed basal rate is meeting your body's requirements for your background supply of insulin. Basal rates should be tested periodically to maintain good glycaemic control. It is generally recommended that you check your basal rate if you:

- Are new to pump therapy.
- Are going through a period where you have to give several correction boluses in a day.
- Are going through a period of instability with your blood glucose control.
- Are making any lifestyle changes and think your basal rate needs reviewing.

Testing a basal rate involves fasting (no intake of carbohydrate) from at least 3-4 hours before and including the period of time that you are testing, unless otherwise instructed by your healthcare professional. Regular testing of blood glucose levels through out a fasting period will be able to tell you how effective your basal insulin rate is. It is advised that you divide your day into five time blocks and fast through only one block per day. The following blocks of time are suggested for you to use:

10pm - 2am	2am - 7am	7am - 12pm	12pm - 6pm	6pm - 10pm

My personal guidance on adjusting my basal rate:

General rules when testing a basal rate:

- Have your last meal 4 hours before the time period you will be testing, and avoid any low GI foods as they can continue to effect your blood glucose levels for several hours after eating. Eg: pizza, pasta, curries.
- Give your normal insulin bolus with your last meal.
- Do not have any snacks or carbohydrate (CHO) during the testing period, unless you are treating hypoglycaemia. In the event of hypoglycaemia, treat as normal with carbohydrate (CHO) and abandon the basal rate test and try again another day.
- Avoid giving any correction boluses where possible unless blood glucose is above _____ mmol/l (left blank for own entry). In the event that a correction bolus is required, abandon the basal rate test, and try again another day.
- Check blood glucose regularly throughout the testing period (i.e. 2 hourly where possible) and record results.
- Avoid intensive exercise before or during testing period.

What to do with the results:

- If your blood glucose levels do not drop or rise more than 2 mmol/l throughout the test period then your basal rate is probably correct.
- If your blood glucose level rises more than 2 mmol/l during the test period this generally indicates that you will need to increase your basal rate 1 to 2 hours before the start of the rise unless otherwise instructed by your healthcare professional.
- If your blood glucose level falls more than 2 mmol/l during the test period, this generally indicates that you will need to decrease your basal rate 1 to 2 hours before the start of the fall unless otherwise instructed by your healthcare professional.
- Basal rates adjustments should be made to the corresponding time period by _____ units/hour (left blank for own entry).
  - Increase basal rate if blood glucose show a rise during the testing period.
  - Reduce basal rate if blood glucose shows a fall during the testing period.
  - If you have to adjust the basal rate for a given period, always retest the next day to verify it.

PLEASE NOTE: This process may not be suitable for all pump users. Always discuss and agree insulin dose adjustments with your Diabetes Healthcare Professional before making changes to your therapy.

Testing basal rate Overnight

Testing period: 22.00 - 02.00 & 02.00 - 07.00

Date:.....

- Test your Blood Glucose

Hour	Units/Hour	BG	FB	CB	CHO
22.00		•			F
23.00					A
24.00		•			S
01.00					T
02.00		•			I
03.00					N
04.00		•			G
05.00					-
06.00		•			-
07.00					
08.00					
09.00					
10.00					
11.00					
12.00					
13.00					
14.00					
15.00					
16.00					
17.00					
18.00					
19.00					
20.00					-
21.00					-

Testing basal rate Morning

Testing period: 07.00 - Midday

Date:.....

- Test your Blood Glucose

Hour	Units/Hour	BG	FB	CB	CHO
22.00					
23.00					
24.00					
01.00					
02.00					
03.00					
04.00					
05.00					
06.00					F
07.00		•			A
08.00					S
09.00		•			T
10.00					I
11.00		•			N
12.00					G
13.00		•			
14.00					
15.00					
16.00					
17.00					
18.00					
19.00					
20.00					
21.00					

Testing basal rate Afternoon

Testing period: Midday - 18.00

Date:.....

• Test your Blood Glucose

Hour	Units/Hour	BG	FB	CB	CHO
22.00					
23.00					
24.00					
01.00					
02.00					
03.00					
04.00					
05.00					
06.00					
07.00					
08.00					
09.00					
10.00					
11.00					F
12.00		•			A
13.00					S
14.00		•			T
15.00					I
16.00		•			N
17.00					G
18.00		•			
19.00					
20.00					
21.00					

Testing basal rate Evening

Testing period: 18.00 - 22.00

Date:.....

• Test your Blood Glucose

Hour	Units/Hour	BG	FB	CB	CHO
24.00					
01.00					
02.00					
03.00					
04.00					
05.00					
06.00					
07.00					
08.00					
09.00					
10.00					
11.00					
12.00					
13.00					
14.00					
15.00					
16.00					F
17.00					A
18.00		•			S
19.00					T
20.00		•			I
21.00					N
22.00		•			G
23.00					

Handset Protocol

Before you can use your new Accu-Chek Combo Handset you must program it with your personal settings.

You must program these values to meet your personal requirements after consulting your healthcare professional about your personal settings.

Parameter	Your Personal Setting
Language	
Time Format	☐ 12h ☐ 24h
Carb Units	☐ Grams ☐ BE ☐ KE ☐ CC
Warning Limits	Hyper (high) BG Level mmol/L
	Hypo (low) BG Level mmol/L

Time Block		Lower Target Limit	Upper Target Limit	Carb Ratio		Insulin Sensitivity	
Start Time	End Time	mmol/L	mmol/L	Insulin Units	Grams, BE, KE or CC	Insulin Units	mmol/L
1							
2							
3							
4							
5							
6							
7							
8							

Advice Options	Your Personal Settings
Meal Rise	mmol/L
Snack Size	Grams, BE, KE or CC
Acting Time	h
Onset Time	h

Health Events	Percentage
Exercise 1	%
Exercise 2	%
Stress	%
Illness	%
Premenstrual	%

bG Test Reminders	bG Threshold or Snack Size	Reminder After Time (Hours and Minutes)
After High bG	mmol/L	
After Low bG	mmol/L	
After Meal	Grams, BE, KE or CC	

Alarm Clock Reminder	Time	Reason (bG Test/Other)
1		
2		
3		
4		
5		
6		
7		
8		

Acting Time

Is how long insulin works in your body

Onset time

Is how long insulin takes to be most effective

Meal Rise

Is an increase in your blood glucose level that is acceptable after administrating a standard bolus appropriate for a meal.

Correction bolus

A correction bolus is insulin given on top of your basal rate to correct your blood glucose level, or to cover the rise in your blood glucose.

A correction bolus should be recorded separately to a meal bolus, and in general should only be given pre-meal (or not within 2-3 hours of a previous bolus), unless ketones are present.

Meal bolus

- A meal bolus is used to cover the rise in blood glucose that results from eating carbohydrates
- You will need to give a meal bolus with all snacks and meals containing _____ g (left blank for own entry) or more of carbohydrate

To calculate the dose of a meal bolus you will need to know:

- Your insulin to carbohydrate ratio
- The quantity of carbohydrate in the meal
- The formula to calculate the dose of insulin

Quantity of carbohydrate

A given amount of carbohydrate will usually require the same amount of insulin regardless of food type, although you may find that different foods will affect your blood sugar at different rates. As you progress, you may find you need different carbohydrate ratios to suit different times of the day. You should discuss this with your diabetes team.

Note:
If you have learnt alternative ways of working out the correction or meal bolus (e.g. DAFNE) please continue to use the method that works successfully for you, and as advised by your Healthcare Professional

Your carbohydrate ratio is:

Your correction ratio is:

Formula for a meal bolus

To calculate the dose for your meal bolus use the following formula:

$$\frac{\text{amount of carbohydrate}}{\text{insulin to carbohydrate ratio}} = \text{dose of meal bolus}$$

For example

$$\frac{\text{60g of carbohydrate}}{10} = \text{6 units}$$

For example

$$\frac{\text{----------}}{\text{----------}} = \text{---------- (dose of meal bolus)}$$

Carbohydrates

- Carbohydrates are your body's preferred energy source, so make sure your diet contains an adequate amount

Where are carbohydrates found?

- Carbohydrates are found in a large variety of starchy foods such as bread, rice, fruit, potatoes, vegetables and many other food types

Carbohydrate counting

- Carbohydrate counting is essential in helping you attain good blood glucose control
- With experience and practice you will be able to estimate the carbohydrate content of meals and adjust your insulin dose accordingly

How to estimate the quantity of carbohydrates in a chosen food

- Measure the food (use scales, spoons or measuring jugs)
- Look up the carbohydrate content (use a carbohydrate counting book)
- Use the following formula to measure the quantity of carbohydrates

$$\frac{\text{total weight of food (grams)}}{100} \times \text{carbohydrate content of food per 100 grams} = \text{carbohydrate content (grams)}$$

For example

$$\frac{\text{60g of bread roll}}{100} \times \text{50g per 100} = \text{30g of carbohydrate content}$$

Advantages of carbohydrate counting

- Stabilise your blood glucose levels – minimising swings and fluctuations
- Achieve normal blood glucose levels after meals

Healthy eating

Although an insulin pump will help you better manage your diabetes, it is important to remain on a healthy diet

Your diet should consist of the following:

- Wide variety of foods
- Plenty of fruit, vegetables and salad
- Plenty of fibre
- Moderate protein and fat
- Moderate salt

Section 3: **Your Infusion sets**

Accu-Chek has a number of infusion sets to choose from. Your Healthcare Professional will help you decide which one is best for you.

ACCU-CHEK® FlexLink

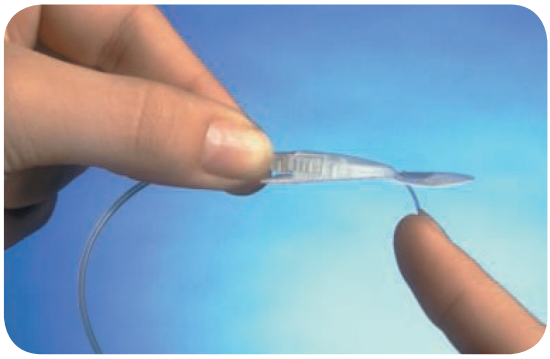
Fine silicon-coated 90°soft Teflon® cannula (0.5mm) for quick, easy and nearly painless insertion with the FlexLink insertion device.

Cannula lengths: 6, 8, 10mm
Tube lengths: 30, 60, 80cm

ACCU-CHEK® TenderLink

Soft cannula (0.5mm) with variable insertion angle. Diagonal insertion helps avoid contact with muscle and truly adapts to every movement.

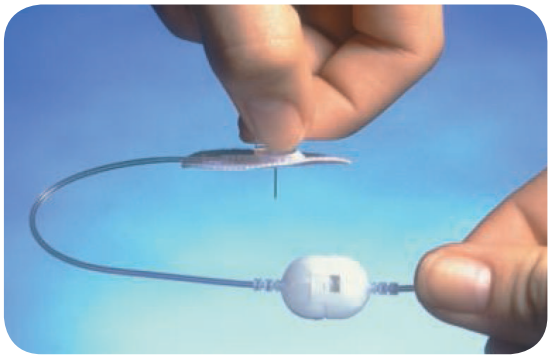
Cannula lengths: 13, 17mm
Tube lengths: 30, 60, 80, 110cm



ACCU-CHEK® Rapid-D Link

A 90° steel cannula enables the most simple and easy insertion, ruling out the possibility or error. A very thin needle (0.36mm) and the flattest insertion set available.

Cannula lengths: 6, 8, 10mm
Tube lengths: 20, 50, 70, 100cm



Prevention and elimination of air bubbles when filling a cartridge

Prevention of air bubbles when filling a cartridge

- Store insulin at room temperature for several hours before filling new insulin cartridges

and

- Transfer the insulin slowly from the vial into the cartridge

Eliminating air bubbles when replacing infusion sets

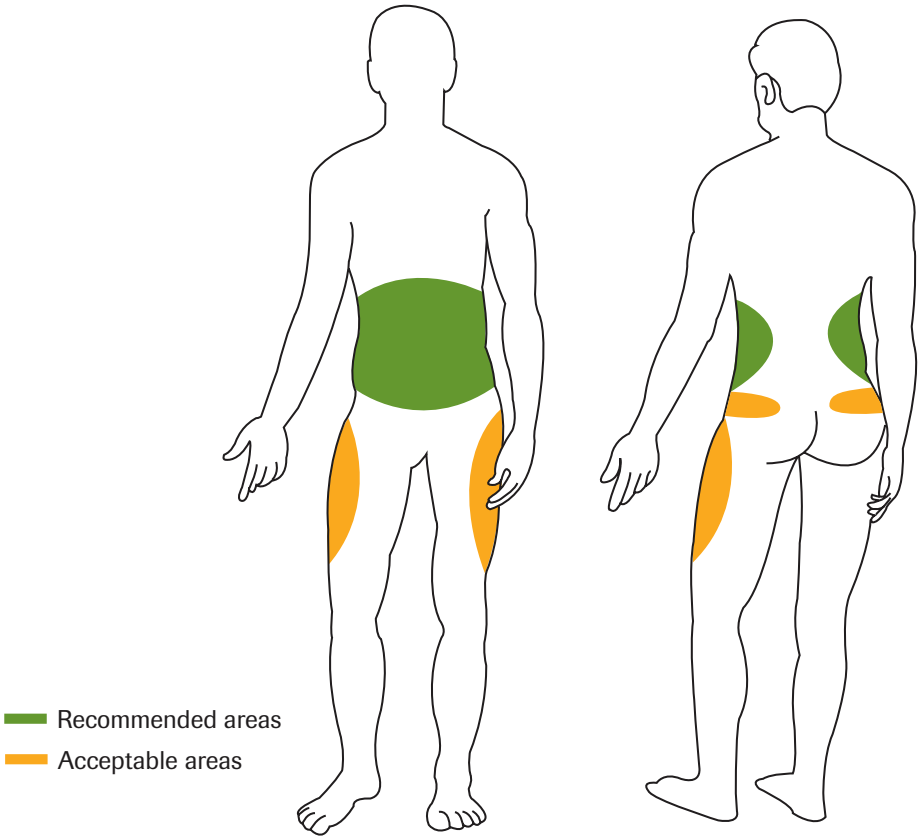
- Stand the insulin pump and the cartridge on end
- Start the infusion set priming programme
- Tap your finger on the cartridge compartment or the adapter

Tip:

During insulin delivery, air bubbles in the cartridge cannot enter the infusion set when the insulin pump is worn with the adapter facing downward

Infusion set injection points

Site selection



The abdomen and mid-section are generally good while the thigh and buttocks are ideal for young children

Note:

The infusion set should not be worn directly on the belt line or under the waistband

Your starting infusion set and injection points:

_____

_____

_____

_____

_____

Important rules for inserting infusion sets

- Wash hands thoroughly
- Do not touch the cannula or the Luer connector
- Ensure that the area where you are going to insert the cannula is clean and let it dry thoroughly
- Insert at least 3cm away – from the navel
  – from surgical scars
  – from the last insertion point
- Tip: Insert a new cannula before removing the old one
- Avoid inserting a cannula on a belt line
- Always check your blood glucose reading before and two hours after inserting a new cannula to ensure that you are getting your insulin
- Never change a cannula immediately before going to bed
- Pinch or stretch skin if needed
- Trim abdominal/leg hair or use razor

Local infections / Infusion site care

- Consult your Healthcare Professional if you suspect an infection
- If your cannula site becomes sore, red, inflamed or uncomfortable it is recommended that you change your cannula
- Check the infusion set and cannula twice daily to make sure it is secure and that the area where it is inserted is not inflamed or infected

Priming the cannula

- The Accu-Chek FlexLink will require a bolus of 1.0 unit of insulin
- The Accu-Chek TenderLink will require a bolus of 0.7 unit of insulin
- The Accu-Chek Rapid-D Link tubing needs to be primed before insertion until the insulin emerges at the tip of the steel cannula

Changing the infusion set

Replace the infusion set regularly

- Steel cannula every 1-2 days
- Teflon cannula every 2-3 days
- Some individuals may need to change cannulas more often due to skin sensitivity
- Rotate sites with each change

If infusion set is not replaced there is a danger of

- Reduced insulin effectiveness
- Infections at the injection point
- Hardening at the injection point
- Thickening of the subcutaneous fat tissue
- Increased danger of infection (abscesses)
- Occlusion of needle or cannula

Troubleshooting

Infusion Set-Related Hyperglycemia

- Did an occlusion alarm occur on the pump?
  See “Troubleshooting Occlusions and Obstructions” on the next page for proper procedure.

Related to the tubing

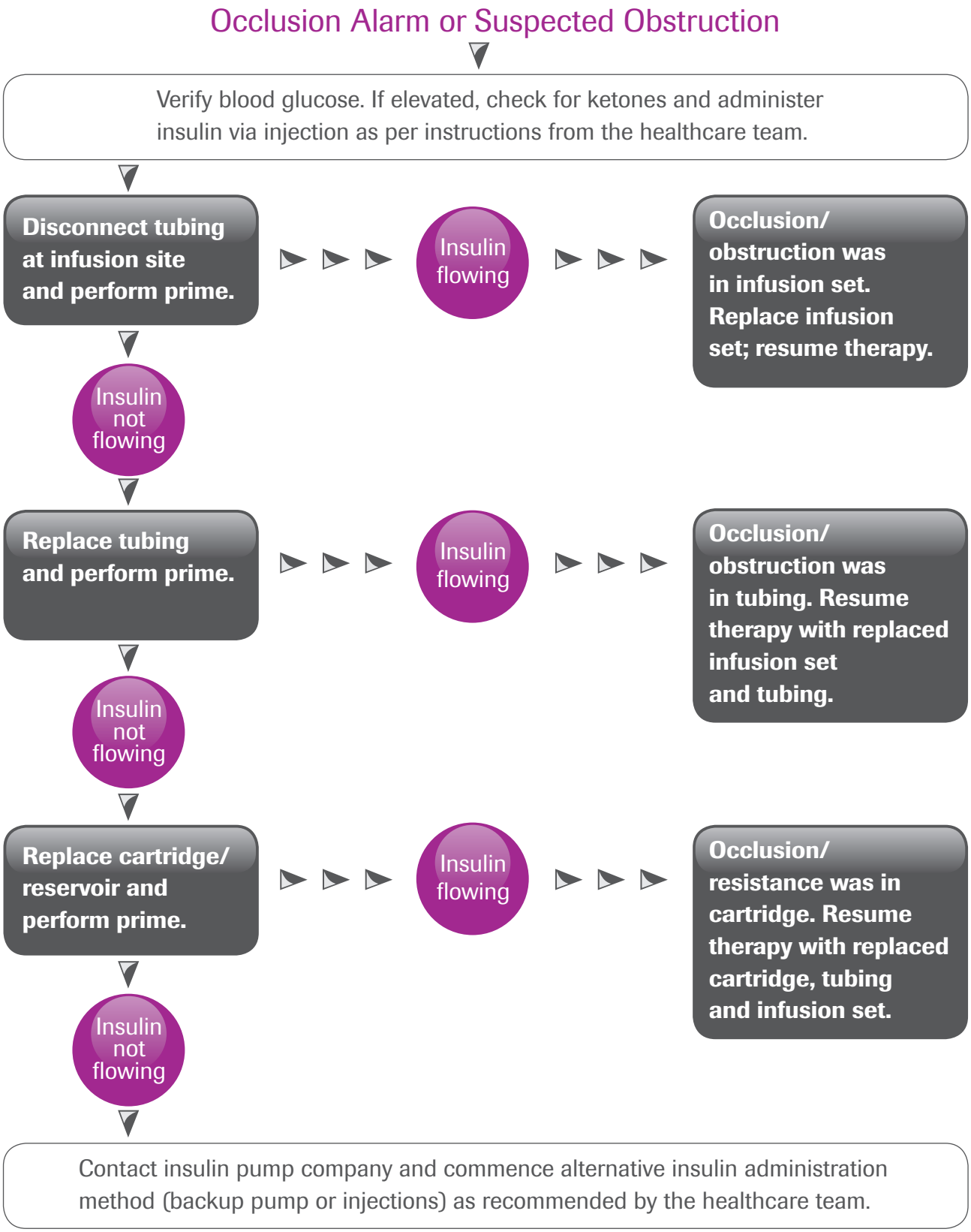
- Is there blood in the tubing?
  Is the tubing not “clicked in” to the infusion set?
  Is there air in the tubing?
- **Solution:** Disconnect the tubing from the set and prime out the air or blood **immediately** (infusing air instead of insulin does not harm the tissue, but it can lead to hyperglycemia due to interference with insulin infusion). Reconnect the tubing.
- **Prevention:** Fill the cartridge with room temperature insulin; draw the insulin from the vial using a slow and steady technique and be sure to check the tubing and system for air bubbles.
- Are there leaks in the tubing or at the luer-lock connection?
  Do you smell insulin?
  Has the tubing been used longer than recommended?
- **Solution:** Change tubing and prime according to manufacturers instruction for use.

Related to the site

- Is there blood in the cannula?
  Is the cannula dislodged from the skin or kinked?
  Is the dressing wet or leaking?
  Are there signs of an infection? (see page 29)
  Has the site been used longer than recommended?
- **Solution:** Change infusion set; inspect cannula for kinking upon removal.

Troubleshooting Occlusions and Obstructions

Use this handy flow chart to help identify and troubleshoot suspected occlusions and obstructions.



Options for wearing your pump

Section 4: **Blood glucose testing**

Blood glucose self-checks

- Wash hands prior to checking – fruit juice or perfume can cause measurement errors
- Do not squeeze blood from the pricked point – allow it to flow naturally
- Allow a sufficient amount of blood to be drawn properly from the test strip/field or apply it to the test field
- Repeat the measurement in case of inexplicable results
- In order to obtain correct measurements, the blood glucose instrument and the test strips should be protected from extreme temperatures and a control test carried out as recommended (see manufacturer's instructions)

Frequency of blood glucose measurement

	Adjustment phase	**Every-day use**
After waking up/ **before breakfast**	■	■
2 hours after breakfast	■	□
Before lunch	■	■
2 hours after lunch	■	□
Before dinner	■	■
2 hours after dinner	■	□
Before going to sleep	■	■
Around 2am	■	■ once every 2-4 weeks

My suggested plan is:

_____

_____

Section 5: **Temporary basal rate (TBR) increase**

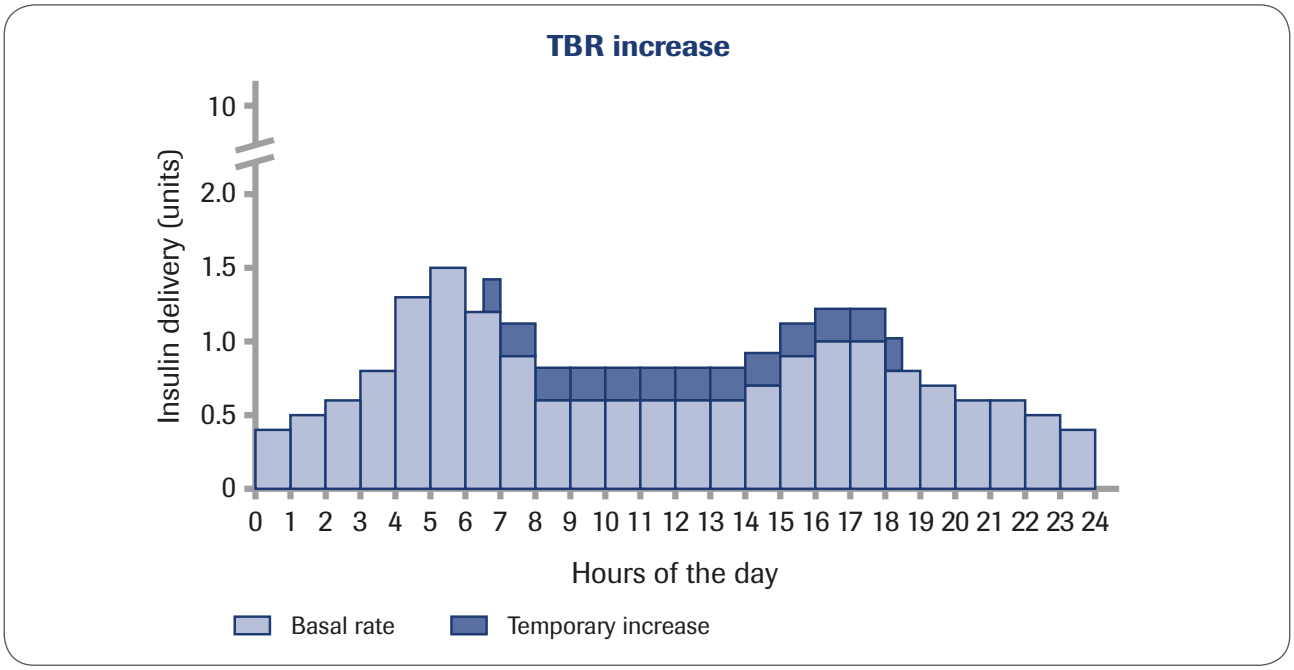
A temporary increase in basal rate is recommended in cases of:

- Infections
- Illness accompanied by a high temperature
- Reduced physical activity (e.g. when bedridden or relaxing)
- Women during their menstrual cycle (also temporary reduction possible)

Increase basal rate to greater than 100% of the programmed basal rate – duration independently adjustable

e.g: basal rate = 1 unit per hour
increase to 150%
basal rate = 1.5 units per hour

Temporary basal rates can be programmed in 15 minute increments for up to 24 hours. They are programmable to start immediately (not in advance).



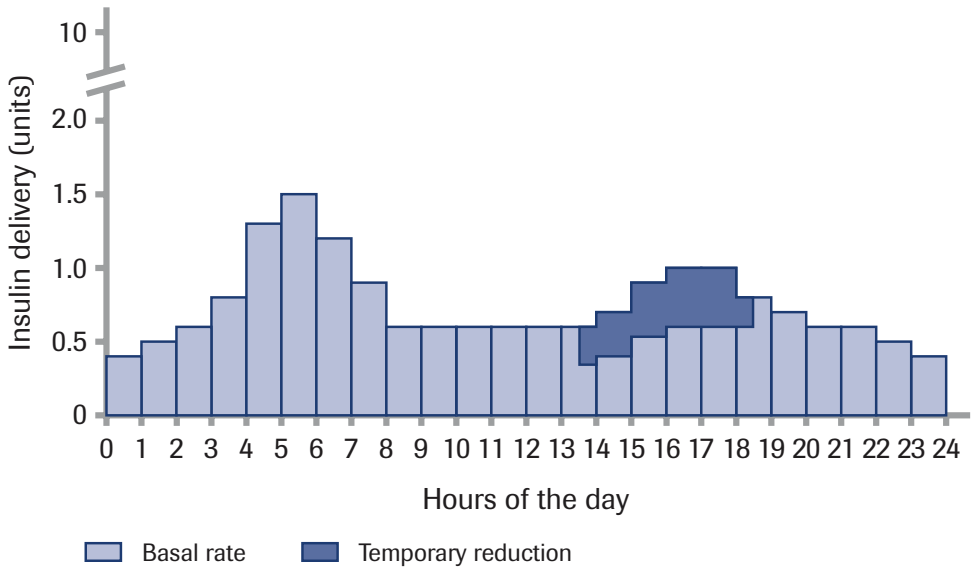
Temporary basal rate (TBR) reduction

A temporary reduction in basal rate is recommended in cases of:

- Increased physical activity and sports
- Alcohol consumption
- Women during their menstrual cycle (also temporary increase possible)

Reduce basal rate to less than 100% of the programmed basal rate – duration independently adjustable

e.g: basal rate = 1 units per hour
decrease to 50%
basal rate = 0.5 units per hour



Personal Note:

Section 6: **Hypoglycaemia, Hyperglycaemia & Ketoacidosis**

Hypoglycaemia

People who use insulin pumps can still experience episodes of hypoglycaemia, but the episodes are usually described as mild and easy to treat.

Also remember that for people using insulin pumps, the signs and symptoms of hypoglycaemia may return, change or that recognition may be different.

Causes of low blood sugar readings or hypoglycaemia

- Too much insulin
- Increase in physical activity
- Alcohol consumption
- Early stages of pregnancy
- Infusing insulin through “damaged sites” e.g. areas of lipohypertrophy
- Priming a new infusion line whist it is still attached to the body
- Cartridge replaced while infusion set is still attached to the body
- Not enough carbohydrates eaten for the bolus delivery
- Over correction of an elevated blood sugar
- Miscalculation of a bolus
- Under or over extension of a bolus
- Incorrect insulin pump operation
  - Programmed basal rate too high
  - Failure to remove a temporary basal rate increase
  - Unintentional change of basal rate profile
- Incorrect calculated insulin sensitivity

Correcting/treating hypoglycaemia

1. Keep the pump running and test your blood sugar
2. Consume _____ g of a fast acting carbohydrate, e.g. _____ Dextrose tablets or _____ of Lucozade
3. Recheck your blood sugar 15 minutes later. If still less than 4mmol/L, consume a further _____ g of fast acting carbohydrate. Repeat this process every 15 minutes until your blood sugar is 4mmol/L or above

Note:

The required amount of carbohydrates varies according to your blood glucose level and the given conditions. Your body's own reaction to hypoglycaemia can cause your blood glucose level to increase considerably a while later – measure your blood glucose more frequently if this happens to you

My personal guidance on treating hypoglycaemia:

Severe hypoglycaemia (third party assistance is required)

- Your family, friends and work colleagues should know what to do in the event of severe hypoglycaemia that results in unconsciousness or incapacitation

Treating severe hypoglycaemia

- Stop the pump/interrupt the insulin supply/disconnect the infusion set.
- If able to swallow, third party to treat using a fast acting carbohydrate in the form of a drink or 'Hypostop' until BG levels are greater than 4 mmol/l, then follow the procedure for a mild hypo glycaemia.
- If there is any suspicion that swallowing is impaired or that the pump patient is unconscious DO NOT give anything by mouth.
- Give Glucagon injection or dial 999

Important:

Out of hours emergency contact:

My personal guidance on treating severe hypoglycaemia:

Hyperglycaemia

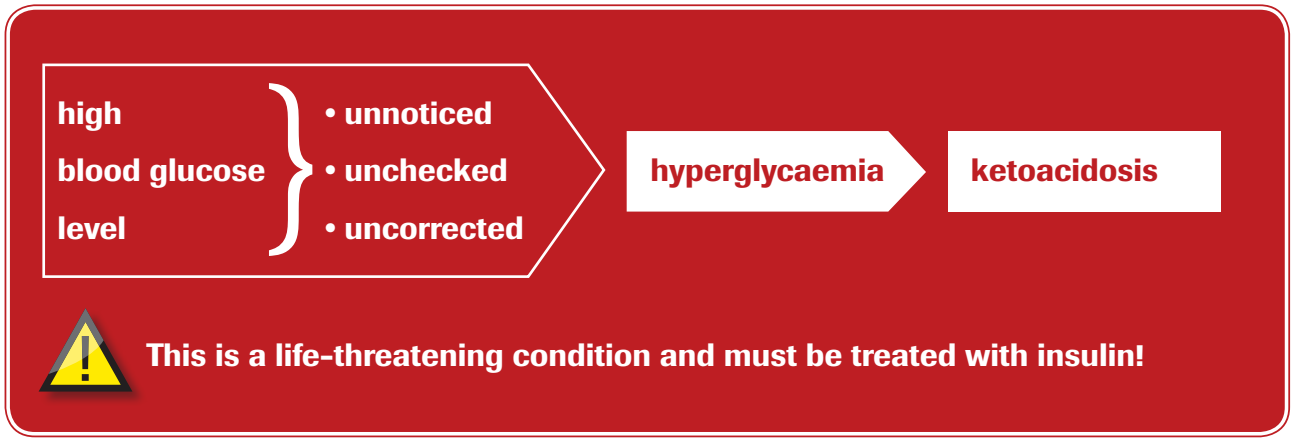
- Hyperglycaemia is when blood sugar levels are too high and are potentially dangerous if ignored
- Using insulin pump therapy reduces the risk of hyperglycaemia

Signs of hyperglycaemia and ketoacidosis

- Initial stages of thirst, increasing urge to urinate leading to extreme thirst
- Weakness, fatigue, disinterest, exhaustion
- General discomfort, loss of appetite, nausea, vomiting
- Abdominal pain and cramps
- Muscular cramps
- Distortions of vision and perception
- Disorientation
- Apathy
- Laboured (heavy) breathing
- Acetone-like breath

Ketoacidosis

- Ketoacidosis results from hyperglycaemia that is left unattended and occurs due to insufficient or no insulin in the body
- It is a life-threatening condition that must be treated with insulin



Causes of hyperglycaemia

General causes

- Too little insulin
- Illness accompanied by high temperature
- Reduced activity, e.g. when bedridden or relaxing
- Stress, anger, anxiety
- Advancing stages of pregnancy
- Hormonal changes, e.g. menstrual cycle
- Reduced effectiveness of insulin (following exposure to heat or cold)

Infusion set

- Infusing insulin through “damaged sites” e.g. areas of lipohypertrophy
- Infusion set empty or not primed
- Cannula blocked (occluded)
- Infusion set leaking or not correctly connected, e.g. at the connection between tubing and cannula or between tubing and Luer connector
- Bent needle or cannula
- Infections at the injection point due to:
  - Inadequate cleanliness
  - Cannula not changed frequently enough
  - Hypersensitivity to cannula, bandage or insulin
- Cannula slipped out of the skin because:
  - It was not properly secured in place
  - The adhesive tape came loose

Insufficient insulin given

- Forgot bolus delivery before or at mealtime
- Insufficient bolus for carbohydrate intake
- Failure to correct a high blood glucose level
- Incorrect calculation of correction bolus
- Treating hypoglycaemia with too much carbohydrate
- Insufficient blood glucose measurements to detect hyperglycaemia

Incorrect programming of pump

- Insulin pump in STOP (acoustic warning disabled, did not pay attention to alarm)
- Basal rate programmed too low
- Cartridge empty (did not hear alarm)
- Battery flat (did not hear alarm)

Treating/correcting hyperglycaemia

Measures for normalising blood glucose levels

- Administer correction bolus with the insulin pump
- Check blood glucose level again 2-3 hours later
- Test for ketones in the urine or blood if you have had no response to the correction bolus

Blood glucose level above 11mmol/L after the first correction bolus:

- If you have had no response to the first correction bolus, give the next bolus via a syringe or pen
- Identify cause of hyperglycaemia – see page 32
- Check blood glucose level again 2-3 hours later and test for ketones in the urine or blood
- Do not lie down to sleep before blood glucose returns to normal level (personal target range)

My personal guidance on treating hyperglycaemia:

Self-treating/correcting ketoacidosis

Blood glucose level above 14mmol/L and ketones present

1. You may need to double your usual correction bolus
   (deliver via an insulin pen and not by the pump)
2. Drink plenty of fluids (mineral water, unsweetened beverages – approx. 1 litre/hour)
3. Do not undertake physical activity – but do not lie down or sleep
4. Inform relatives or friends
5. Measure blood glucose level every 1-2 hours
6. Measure ketones every 2 hours
7. Check insulin pump, replace systems (insulin, adapter, infusion set)
8. In case of insulin pump failure, switch to an alternative insulin therapy

Goal

- Blood glucose level below 11mmol/L
- If you are unable to reduce your blood glucose below 11mmol/L and/or you cannot reduce your ketones, you must contact your diabetes nurse/doctor for medical advice or go to your local Accident and Emergency immediately

Preventing ketoacidosis

Ketoacidosis can be prevented by doing the following:

- Measuring blood glucose level at least 4 times per day – in the morning, at noon, in the evening before mealtime, before going to sleep
- Checking the accuracy of your blood glucose meter on a regular basis (please refer to your User Manual about how to run a Control Test)
- Keep syringes or pens, as well as regular insulin and fast-acting insulin analogue close by
- Knowing and recognising the signs of ketoacidosis and the correct way to respond

Important:

Out of hours emergency contact:

My personal guidance on treating ketoacidosis:

Section 7: **Lifestyle advice**

Sports and physical activity

Special considerations

- During sports and physical activity the body requires more carbohydrates than normal
- Sport and physical activity increase the insulin sensitivity of the body's cells
- Less insulin is required and/or additional carbohydrates need to be eaten prior, during and possibly after exercise

Planning depends on

- Type, duration and intensity of the activity
- Training condition
- Time of day
- Current blood glucose level
- Type and amount of carbohydrate eaten
- Amount of insulin available in the body
- Elapsed time since the last bolus delivery
- Placement of cannula

Note:

Your Healthcare Professional can help you work out how to reduce your insulin or eat enough carbohydrate to keep your blood glucose level balanced

Insulin pumps and driving

Important information regarding driving

- Check blood glucose level before every trip
- Always keep an adequate supply of fast-acting carbohydrates on hand in the vehicle (dextrose, Lucozade)
- Do not put the safety belt on over the insulin pump or the infusion set insertion point
- Take a break from driving every 2-3 hours and check blood glucose level

If signs of hypoglycaemia occur while driving

- Stop driving immediately
- Remove keys from the ignition
- Sit in the passenger seat
- Treat hypoglycaemia
- Take fast-acting carbohydrates (g)
- Resume driving only after another blood glucose check has shown your levels have returned to normal range

For the latest direction on driving and diabetes please visit the DVLA website at www.dvla.gov.uk

Insulin pumps and changing time zones

Time change of up to 4 hours

- Adjust the insulin pump's clock to local time on departure

Time change of 4 hours or more

- Adjust your insulin pump clock by up to 4 hours towards the new time zone on departure
- Check blood glucose level frequently
- Give correction boluses as required during travel, treating all hyperglycaemia and hypoglycaemia
- Within 1-2 days, set your insulin pump's clock to local time, as your routine normalises
- Frequent blood glucose tests are necessary when travelling

Please note:

If you are on a flat basal rate, you may not need to make time adjustments on your pump. However, it is still advisable that you test your blood glucose more frequently than normal

My agreed travel management plan:

Insulin pumps, water and heat

Contact with water

- Wearing a detachable infusion set makes it possible to swim or bathe without your insulin pump (for 1-2 hours) – this should only be done following advice from your Healthcare Professional
- Although your pump is waterproof it is not advisable to purposely bring it into contact with water

Sauna, solarium and steam bath

- Remove insulin pump and infusion set

Miscellaneous rules for pump therapy

- Keep your pump out of direct sunlight
- If you need to disconnect your pump for more than 2 hours, contact your diabetes nurse/doctor for advice
- Do not disconnect your pump for airport security – it must not go through the X-ray machine while running. Ensure that you have a doctor's letter so that security personnel will understand your needs
- Always have a back-up insulin delivery plan at hand as advised by your diabetes nurse/doctor

Insulin pumps and everyday life

For your everyday insulin therapy, keep the following at hand

- Dextrose or other fast-acting carbohydrate
- Insulin (pump) cartridges
- Insulin pen and needles or syringe
- Fast-acting and long-acting insulin
- Insulin pump batteries and battery key
- Infusion set
- Blood glucose meter
- Blood glucose test strips
- Diabetes diary
- Diabetes ID card
- Ketone test strips
- Insulin pump travel guide
- Adapter (depending on the specific insulin pump model)
- We recommend putting your Insulin Pump on your home insurance in case of accidental damage

Insulin pumps and travelling

For longer periods of absence, keep the following at hand

- Spare insulin pump, if available, and multiple daily injections (MDI) set which includes a pen and needles and insulin
- Important contact numbers
- Information on how to switch over to MDI
- Doctor's letter indicating your need to wear an insulin pump and carry spare equipment
- Additional travel tips from your Healthcare Professional
- Check your blood glucose regularly when travelling or changing your routine
- Always put your insulin and insulin pump accessories in your carry-on luggage

Note:

These items should be in addition to the items listed on the previous page

Insulin pumps and hospitals

For scheduled stays in clinics, examinations or operations

- Inform the doctor and the nursing staff about your insulin pump therapy beforehand
- You may be able to continue using your pump during your hospital stay if this is agreed with the ward staff, but you may be asked to switch to injections or an infusion instead. Talk to your Healthcare Professional about what you need to do

Certain examinations can interfere with the operation of the insulin pump, or even destroy it

- Magnetic Resonance Tomography (MRT)
- X-Ray
- Computer Tomography

In these instances…

- Remove insulin pump and infusion set and store them outside the room
- Use syringes or pens if necessary

The following required items can be obtained with a prescription:

- Insulin
- Blood glucose test strips, blood glucose meter
- Ketone test strips
- Spare syringe or pens and needles

Where can prescriptions be filled?

- Hospital and retail pharmacies

The following required items can be obtained from Roche:

- Infusion sets / cartridges
- Batteries
- Additional accessories – pouches, filling sets and cartridges
- In some areas the items listed above are available from your Diabetes Clinic

Guidelines for reverting from an insulin pump to insulin injections in case of an emergency

In the event of a pump failure where a back-up pump is not available, it is vital that the pump users administers insulin by an alternate method, (Insulin injection device) until the pump is up and running again. All pump users must have an agreed plan with their Healthcare Professional that they are ready and able to implement if required.

Short-term

Rapid acting insulin should be administered via an insulin injection device, as correction boluses, every 3 hours, until pump therapy is resumed. Meal boluses should be given in addition to cover carbohydrate intake. Blood glucose levels should be checked every 2-3 hours and ketones should be checked if blood glucose is greater than 14mmol/l.

Long-term

- If discontinuation of pump therapy is likely to go on for longer than 12-18 hours, a long acting/basal insulin should also be administered via an injection.
- Basal (long acting) insulin is required for longer term off the pump. Use the total basal pump dose as a guide for the basal dose injection via a pen. Consider increasing dose if returning to injections permanently or for several weeks. Titrate against blood glucose level.
- Depending on your back-up basal insulin, your Healthcare Professional will advise you on whether you need to inject the full basal dose once per day or twice per day divided into two injections (for example: either 12 units once or 6 units twice).
- Meal and correction boluses should be administered via an injection device in the same doses as would be given on the pump.
- Blood glucose levels should continue to be measured 3 hourly until stable. If your blood glucose is greater than 14mmol/l, a ketone test should be performed.

Date of pump start: **Insulin dose pre pump:**

My personal back up plan is:

_____

_____

_____

_____

Insulin pumps and consumables

What must be replaced and how often?

- Cannula/infusion set
  - Steel cannula every 1-2 days
  - Teflon cannula every 2-3 days
  - Tubing should be changed at least every 6 days
- Cartridges
  - Changed weekly or otherwise with every tube change
- Battery
  - As indicated in your pump manual
  - Battery cover changed with every battery change
  - Cartridge adaptor changed with every battery change

Your own plan

Target BG: _____

CHO: Insulin ratio: _____

Correction ratio: _____

_____

_____

For more information contact the following:

United Kingdom

Accu-Chek Pump Careline Tel – 0800 731 2291
Fax – 0808 100 8060
E-mail – burgesshill.insulinpumps@roche.com
Web – www.accu-chek.co.uk

Republic of Ireland

Accu-Chek Pump Careline Tel – 1800 882 351
Fax – 1800 509 109
E-mail – burgesshill.insulinpumps@roche.com
Web – www.accu-chek.ie

Personal notes

Personal notes

Accu-Chek Pump Care Line

UK Tel: **0800 731 22 91**
Fax: 0808 100 80 60
ROI Tel: **1800 88 23 51**
Fax: 1800 50 91 09
Email: burgesshill.insulinpumps@roche.com

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