T Slim X2 with Control IQ

This is my booklet

Weight in kg

Contents

Session 1:

- 5 Expectations
- 7 Pump Therapy vs injections
- 13 Highs, lows, sick day rules

Session 2:

- 21 Setting up the pump
- 24 Starting CGM
- 26 Starting insulin
- 34 Exercise management Control-IQ

Sessions 3 & 4:

- 41 Reviewing control by downloads Making settings changes
- 48 Mealtime insulin guide
- 50 GAME SET MATCH
- 51 Activity to lower highs



Tasks to complete

C

Click to watch the video

Top Tips Look out for these

Numbers and useful websites

Dexcom

Dexcom technical support number: 0800 0315763 Mon – Friday – 07:00-18:00hrs, Sat & Sun – 8:30- 16:30hrs

Dexcom replacement sensors Online: www.dexcom.com/UKIETechsupport

Dexcom Customer services – 0800 0315761

Air Liquide

Air Liquide customer support number to order your supplies: 0800 012 1560 Mon – Friday – 07:00-18:00hrs, Sat & Sun – 8:30- 16:30hrs

alhomecare.diabetes@nhs.net

Session 1

Aim of this session:

To learn about Automated Insulin Delivery therapy and what's required to be successful.

What we will work through:

- 1. Expectations
- 2. What is Automated Insulin Delivery therapy
- 3. Infusion site management
- 4. Accuracy of Continuous Glucose monitoring and when to calibrate
- 5. Treating and preventing low glucose levels (hypoglycaemia)
- 6. Managing high glucose levels (hyperglycaemia)
- 7. Sick day rules
- 8. Homework to be ready for the next session





Young person's expectation

1.

2.

3.

Parent/guardian expectations

1.

2.

3.

Diabetes Team Expectations

- 1. Attend all sessions and bring this workbook.
- 2. Be on time and be ready to learn.
- 3. We work through together at one pace.
- 4. Ask questions if you do not understand.
- 5. Set up a Glooko account for downloading and be linked to the Diabetes Team.
- 6. Have actioned your GP supplies and have them ready for the insulin start
- 7. Contact Dexcom or Air Liquide if technical issues.
- 8. Share your experience during the sessions.
- 9. Be prepared to try new strategies.
- 10. We expect you to make some mistakes and learn from them.
- 11. We know everything will not work perfectly first time.

Setting goals for continuation

Outcome goals to be achieved at 6 months:

- Reduction in hypoglycaemia:
 - o Target % less than 4.0mmol/l
- HbA1c goal:

=

- o Current Time in Range =
- o Target Time in Range =

Process goals to be achieved at all times:

- 1. Auto mode more then 90% of time
- 2. Respond appropriately to high and low glucose alerts.
- 3. Review download information and make proactive adjustments to therapy every two weeks.
- 4. Try new skills and learn from real life practice and making mistakes.

		Ζ	
	V		

Time in range 3.9 - 10.0 mmol/L	HbA1c mmol/mol Clinic 3 month new measurement	HbA1c % Clinic 3 month old measurement	Diabetes effect on energy & mood	Diabetes effect on future health
90%	37	5.5%	\odot \odot \odot \odot \odot	\odot \odot \odot \odot \odot
85%	42	6.0%	\odot \odot \odot	\odot \odot \odot
80%	48	6.5%	\odot	
60%	58	7.5%	\odot	\odot
50%	64	8.0%	(i)	;;;
45%	70	8.5%	\odot	$\overline{\ensuremath{\mathfrak{S}}}$
35%	80	9.5%	8	88
25%	91	10.5%	88	88
15%	>102	>11.5%		8888

What is Type 1 Diabetes? Where do Pumps fit in?



The body digests and coverts food into nutrients including glucose



Injections versus Pumps So what are the differences? Basal Insulin



The pancreas produces tiny amounts of basal insulin every few minutes, 24 hours a day (above).

- Lantus/Levemir/Tresiba (graph above) cannot speed up or slow down the insulin like the pancreas does.
- Basal insulin from a standard pump can be set to speed up and slow down at different times of the day (see settings). However, the insulin delivery cannot respond to changing glucose levels
- Basal insulin from a **Automated Insulin Delivery (advanced hybrid closed loop) pump** speeds up when the glucose level is rising and slows down when the glucose is falling, exactly like the pancreas!



Bolus insulin



The pancreas also produces larger (bolus) amounts of insulin when you eat.



Your mealtime, rapid acting insulin injection or the bolus on pump mimics the pancreas based on your insulin to carbohydrate ratio.

You will need to enter the carbohydrate into the pump bolus calculator at all meal and snack times. The **automated insulin delivery cannot cope with carbohydrates from meals without a bolus of insulin** given following at meal and snack time. This is with they are called hybrid closed loops and not fully closed loops.

You will also still need to give the bolus 15 minutes before eating.

Insulin start Infusion site management





Choosing a site

Recommended sites

- Abdomen
 - Not on the belt line
 - Away from belly button
- Hips and Buttocks
- Outer thigh
- Backs of arms

Safety and choosing a site ensures prevention of:

- Infection
- Scarring
- Lipodystrophy

Tip

<u>DO NOT</u> change your cannula directly after a shower or bath

Tip

Keep the current vial of Insulin that you are using in your blood glucose wallet/ kit. Ensure it's only kept for a maximum of 28 days and then throw it away

Тір

Use a wipe clean tray for your equipment

SAFETY

- Always wash hands before a cannula/set change
- Ensure Insulin is at room temperature before use to reduce risk of bubbles
- Ensure you have a clean space to prepare for the cannula set change
- Ensure you clean and dry the insertion site before any change

Cannula/reservoir change

You need to change the cannula and reservoir/infusion set every 2 – 3 days

If you leave a cannula in longer than 3 days you will get lipohypertrophy (fatty lumps) and insulin will not be absorbed

Changing the cannula and reservoir/infusion set improves

1. Blood glucose control

At 3-5 days

Blood glucose can increase by 33% therefore more time out of target blood glucose range

2. Insulin activity

At 3-5 days

Insulin requirement increases by 14% due to insulin binding to the reservoir/tubing and reduced absorption

When to change?



You will need to test your blood glucose 2-3 hours after the change.

WARNING!

Not Before Bed

If you change your cannula at night and do not test your blood glucose until morning, you may wake up with ketones!



Top Tips

- Set a routine for changing three times a week
 Example
 Monday and Wednesday before evening meal
 Saturday before breakfast
- You can use Tea Tree cream or Calendula cream to help heal infusion sites
- If taking off your cannula hurts or leaves a sticky residue, you could try lift plus which is available on GP prescription
- If your cannula comes off easily, try applying an adhesive agent prior to insertion such as Cavilon. This is available on GP prescription. Deodorant works also!!



Anti-perspirant deodorant sprayed onto the new infusion site helps the cannula to stick when inserted



Preventing or treating hypoglycaemia flow chart

('Hypo' or Low 'Blood Glucose')

In any of the below circumstances please refer to the Mild Hypo green box (as long as the child is conscious & cooperative):

- 1. Low glucose alarm sounds
- 2. Glucose value below 4.0mmol/L

3. Glucose 4.0-6.0mmol/L with a downward trending arrow at usual times of checking e.g. break-time, lunch, mid afternoon

Step 1:



Step 2: Look at CGM in 20 minutes .

Step 3: If CGM is still below 4.0mmol/L after 20 minutes, repeat 1& 2



How do pumps work ?
The pump delivers quick acting insulin in tiny drops, all day, every day
This is called the
The basal rate can be a different amount each hour of the day
The basal rate is instead of your injection
The insulin is delivered through a which sits in the fatty layer under the skin
The cannula can be put in your tummy, leg or top of your
The cannula is changed every
When you eat, you do a bolus of insulin to cover the carbohydrate you have eaten or drunk
A bolus is like your mealtime or snack injection.
Answers
Cannula Basal Rate Bottom
Novorapid / Humalog 2-3 days Lantus / Levemir

Hyperglycaemia (high blood glucose) Troubleshooting high blood glucose levels & ketones

High blood glucose levels (hyperglycaemia) happen for lots of reasons not only if you are not having enough insulin. See if you can list some other reasons below:

	6
1	· · · · · · · · · · · · · · · · · · ·
2	
2	
3.	
4.	

When you are getting your insulin from an insulin pump it is important to remember that hyperglycaemia can become a problem more rapidly than when using insulin injections.

This is because after 4 hours of no pump delivery there is no active insulin in your body and therefore there is a risk of developing ketones rapidly.

On injections as long as basal insulin (Lantus or Levemir) has been given there is active insulin in your body for 24 hours. However a lack of boluses (Novorapid or Humalog) will mean ketones will develop.



Hyperglycaemia will occur due to problems with insulin delivery from the pump or due to problems with the insulin in the pump. Can you think of some of these problems?

PROBLEMS DUE WITH INSULIN DELIVERY FROM THE PUMP	PROBLEMS WITH THE INSULIN IN THE PUMP
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.



If YES to any of the above you must change the infusion set and insulin immediately

Hyperglycaemia Flowchart

('Hyper' or 'High blood glucose')

Step 1: Notified CGM above **14.0** mmol/l by first alert– clear the alarm & take action:

• Give a correction dose using the bolus calculator.

Step 2: Wait 90 minutes

Step 3: If alarm goes off again after 90 minutes and above 14.0mmo/l - Check for Ketones



What to do with a a raised ketone level at or above 0.6mmol/l AND my blood glucose level is over 14mmol/l?

Step 1: You need to know your Total Daily Dose (TDD).

Add these two together:

- 1. Your background insulin (Lantus or Levemir) dose or your total daily basal insulin if on a pump.
- 2. All of your mealtime insulin (Novorapid or Humalog)

Example

On injections: Tom is 14 years old. He takes 34 units of Lantus. Yesterday he had 10 units of Novorapid insulin with breakfast, 7 with lunch, 3 with a snack and 12 units with his evening meal, this totals 22 units. Adding all of this together 34 + 22 gives 56 units TDD

On a pump: Go int o the pump history to find total daily dose (TDD) and look at the average over the last 7-14 days. In our example 56 units





To work out how much extra insulin he needs, he needs to know his ketone level.

Between 0.6 – 1.5mmol/l	10% of his TDD: 56 x 0.1 = 5.6 units (closest to 5.5 units)
Higher than 1.5mmol/l	20% of his TDD: 56 x 0.2 = 11.2 (closest to 11 units)
Now work out your own TDD	so you are prepared in case this happens to you
Background insulin dose	
Typical Breakfast dose	
Typical Snack dose (if eaten)	
Typical Lunchtime dose	
Typical Snack dose (if eaten)	
Typical Teatime dose	
Typical Snack dose (if eaten)	
Total daily dose (TDD)	
10% of TDD: TDD x 0.1 =	
20% of TDD: TDD x 0.2 =	

Sick day rules

If your blood glucose is above 14mmol, or you feel unwell, remember to test for ketones.

If ketones are above 0.6mmol with high blood glucose, you generally need more insulin.

Use the high blood glucose flow chart but if you need help contact Diabetes Home Care on 0121 333 9272 in office hours or 0121 333 9999 out of hours and we will help you calculate your sickness dose.

If you are vomiting or have diarrhoea you need to check your blood glucose and ketones more often, typically every 1-2 hours.

You need to replace lost fluid by sipping water and/or fluid containing glucose regularly. Do not drink lots of fluid quickly as this can make you vomit again.

It is important to take on carbohydrate. Remember to **SIP** frequently from one of the following: Sports drinks, Lucozade, full sugar Coca cola, full sugar squash.

Remember also to drink plenty of sugar free fluids and check blood glucose/ketone levels regularly.

You need to try to eat carbohydrate when you are not well, useful carbohydrates to have if you cannot eat properly are: Soup, Toast, Boiled rice, Banana, Yoghurt, Milk, Ice cream, Jelly.



Homework







Set up Pump downloading facility at home.

Make sure you have made a note of all the education session dates and times.

DO NOT FORGET TO GET YOPUR GP SUPPLIES AND BRING YOUR INSULIN.



Review and assess your Carbohydrate Counting

Insure insulin pump for £3,350:

Quote from current house insurance

OR

http://insurance4insulinpumps.co.uk/ or call 01494 853 750

Create a Glooko account to be able to upload your pump if not already done.

You will need a computer or laptop to be able to upload your pump. If you cannot access a computer please let us know below.

- a. <u>https://join.glooko.com</u>
- b. Create username and add other details
- c. ProConnect Code =
- d. Install the uploader to your computer: Top right (Settings) Apps & Devices Get Glooko Uploader - Install the uploader
- e. Open the Desktop "Glooko" icon, plug in the pump, upload and enter username and password

Practice on the the T:simulator and practice on the simulator whilst completing the video tasks below – Choose the first option "With Control-IQ Technology"

Apple - https://apps.apple.com/us/app/t-simulator-app/id955568377

Android - https://play.google.com/store/apps/detailsid=com.tandemdiabetes.slimjim&hl=en_GB&gl=US&pli=1

Session 2

Aim of this session:

To successfully start Automated Insulin Delivery therapy

What we will work through:

- 1. Setting up the pump
- 2. Programming personal settings
- 3. Starting on insulin
- 4. Linking the Dexcom to the pump
- 5. Starting Control-IQ
- 6. Top tips for success
- 7. Travel
- 8. Training checklist
- 9. Ready for the next session
 - Open accessories box and get out charging cable, reservoir tool



- Identify the user guide
- Get out pump and one reservoir, one syringe ad one cannula
- Write down the serial number of your pump with your name and pass it to the educator



- 1. Time and Date Display: Displays the current time and date.
- Alert Icon: Indicates a reminder, alert or alarm is active behind the lock screen.
- BATTERY Level: Displays the level of battery power remaining. When connected for charging, the charging icon (lightning bolt) will display.
- INSULIN ON BOARD (IOB): Amount and time remaining of any active insulin on board.

- Active Bolus Icon: Indicates a bolus is active.
- Status: Displays current pump settings and insulin delivery status.
- INSULIN Level: Displays the current amount of insulin in the cartridge.
- 8. Tandem Logo: Returns to the Home Screen.

Top Tips

- 5-7 days battery life on a full charge.
- Best to put on charge daily to keep topped up. For example, when in the bath or shower, or in the car or working on the computer via the USB port.
- Keep a charging cable in your supplies bag



Top Tips

- The T logo returns back to the home screen.
- Use the pump clip or a waist belt for your pump.
- Avoid putting in a pocket as it creates a tubing loop that gets caught on door handles

- BATTERY Level: Displays the level of battery power remaining. When connected for charging, the charging icon (lightning bolt) will display.
- 2. USB Port: Port to charge your t:slim Pump battery. Close the cover when not in use.
- 3. BOLUS: Program and deliver a bolus.
- OPTIONS: Stop/Resume insulin delivery, manage Pump Settings, Load cartridge, program a Temp Rate, and view History.
- INSULIN ON BOARD (IOB): Amount and time remaining of any active insulin on board.
- Time and Date Display: Displays the current time and date.

- Status: Displays current pump settings and insulin delivery status.
- INSULIN Level: Displays the current amount of insulin in the cartridge.
- 9. Tandem Logo: Returns to the Home Screen.
- 10. Cartridge Tubing: Tubing that is attached to the cartridge.
- Luer-Lock Connection: Connects the cartridge tubing to the infusion set tubing.
- Screen On/Quick Bolus Button: Turns the t:slim Pump screen on/off or programs a Quick Bolus (if activated).
- LED Indicator: Illuminates when connected to a power supply and indicates proper functionality.



Display Settings	Screen Timeout	120 sec
Time and Date	Set Time and date	24-hour time ON and set date
Sound Settings	Type of alerts	Set according to preference

View Status 🕑

The instructions below are provided as an additional quick reference, following **t:slim X2^{**} Insulin Pump** training. Not all screens are shown. For more detailed information on the operation of t:slim X2^{**} Insulin Pump, please visit: www.airliquidehealthcare.co.uk/diabetes-support

1	100%	10:20 14 Nov	B 235 u
		BOLUS	
	Q.	OPTIONS	
	INSUL	IN ON BOARD (IOB)	
	Units	1.1 u Time Remaining	1:09 hrs

Tap the insulin level icon in the upper right corner of the Home Screen.

2	+	Curr	ent Status	
	P Wee	kday		
	B Basa	al Rate	0.625 u/hr	
	💧 Last	Bolus	3 u 14/11 - 11:55	
	🚸 Basa	al-IQ	ON	

Your t:slim X2 Pump will display the name of your active profile, your current basal rate, the time and amount of your last bolus, and whether or not you are entering boluses based on carbohydrates.

If you have an active Extended Bolus, this screen will show how much insulin has been delivered out of the total amount requested.



Tap the **Down Arrow** to display your current Correction Factor, Carb Ratio, Target BG, and Insulin Duration.

Explanation of Icons The following icons may appear in the areas to the left or right of the time and date on your t:slim X2 Pump's Home Screen. A system reminder, alert, error, or alarm is active. Unlock screen to view. 10:20 All insulin deliveries A bolus is being delivered. are stopped. Basal insulin is programmed A basal rate of 0 u/hr OPTIONS B and being delivered. is active. INSULIN ON BOARD (IOB) A temporary basal rate is A temporary basal 1.1 u Time Remaining 1:09 hrs Units active. rate of 0 u/hr is active. Indicates the Basal-IQ[™] Indicates that all feature is turned on. When insulin delivery has been suspended insulin is suspended, the when Basal-IQ[™] bottom half of the diamond technology is turned will turn red. on.

23

Air Liquide t:slim X2[™] HEALTHCARE





Personal Profiles



Set personal profile using your setting sheets

The instructions below are provided as an additional quick reference, following **t:slim X2[™] Insulin Pump** training. Not all screens are shown. For more detailed information on the operation of t:slim X2[™] Insulin Pump, please visit: www.airliquidehealthcare.co.uk/diabetes-support

1	100%	1	0:20 4 Nov	B 235 u
		BOLUS		
	¢	OPTION	S	
	INSUL	IN ON BOARD	(IOB)	
	Units	1.1 u 1	Time Remainir	ng 1:09 hrs

Tap **OPTIONS**.

-STOP INSULIN Load Temp Rate	
Load Temp Rate	
Temp Rate	
My Pump	

Tap My Pump.

3	(My Pump
	Person	al Profiles
	Alerts	& Reminders
	Pump S	Settings
	Pump I	nfo

Tap Personal Profiles.



Tap the name of the Personal Profile to view or edit.



Tap **Edit** to edit or view your settings.



Tap your current settings to see the other segments of your day.



Tap the time segment you wish to edit.

If not all segments are visible, tap the **Down Arrow**.



Tap **Basal**, **Correction Factor**, Carb Ratio, or Target BG to make changes, then tap . When you are finished, tap .



Confirm settings. Recent changes appear in orange. Tap 🕶 to confirm.



Personal Profile	Bolus & Basal limit	Enter the amounts on your settings sheet
Alerts & reminders	Pump reminders	Low 3.9 &15 mins, High 14.0 & 2 hrs
Alerts && reminders	Pump Alerts	Low insulin = Settings sheet, Auto-Off = 0ff



To connect your CGM transmitter and pump:

EVERY 3 MONTHS 👖 🔁



Locate the ID on the bottom of your transmitter before attaching it to a sensor.





In the Options menu, tap the Down Arrow, then: **My CGM** > **Transmitter ID**.

Tap Press to Set Up.



Enter transmitter ID and tap You will be prompted to enter the ID again to verify accuracy, after which your transmitter will be connected.

To start a new sensor session:



Locate the sensor code on the adhesive strip found on the bottom of the applicator.

	E	inter Cod	e	>
. <u> </u>		Sensor Code		
1		2		3
4		5		6
7		8		9
		0		+

In the Options menu, tap: My CGM > START SENSOR > CODE and enter sensor code.

If you intend to calibrate your sensor using a blood glucose meter, or have already entered a code using a separate CGM mobile app, tap **My CGM** > **START SENSOR** > **SKIP**.

EVERY 10 DAYS



Tap to confirm the start of a new CGM sensor session.



A screen will appear to indicate the two-hour startup process has begun. During this time, you will not receive sensor data or be able to use Basal-IQ technology.

NOTE: The countdown symbol fills in over time to show how much time is left before the system is ready to display current CGM reading. If a sensor code is not entered prior to starting a sensor session, the t:slim X2 Insulin Pump will prompt you to calibrate using a blood glucose meter at regular intervals. By entering your sensor code, you will not be prompted to calibrate your sensor.

If your glucose alerts and readings do not match symptoms or expectations, use a blood glucose meter to make diabetes treatment decisions.



CGM Alerts	High Alert	14.0 mmol/L/ or as you desire - 2hr repeat
CGM Alerts	Low Alert	3.9 mmol/L or as you desire - 30 min repeat
CGM Alerts	Out of Range	20 minutes

Instructions for Drawing Insulin from Vial into Syringe

Use proper clean technique while performing the following:

- 1. Inspect the needle and syringe package for any signs of damage. Discard any damaged product.
- 2. Wash your hands thoroughly.
- 3. Wipe the rubber septum of the insulin vial with an alcohol swab.
- 4. Remove the needle and syringe from their packaging. Securely twist needle onto syringe. Safely remove protective cap from needle by pulling outward.
- 5. Draw air into syringe up to the amount of insulin desired (see image A).
- 6. With insulin vial upright, insert needle into vial. Inject air from syringe into vial. Maintain pressure on syringe plunger (see image B).
- 7. With needle still inserted into vial, turn vial and syringe upside down. Release syringe plunger. Insulin will begin to flow from the vial into the syringe.
- 8. Slowly pull back the plunger to the desired amount of insulin (see image C).
- 9. While the filling needle is still in the vial and upside down, tap the syringe so that any air bubbles rise to the top (see image D). Then slowly push the plunger upwards, forcing any air bubbles back into the vial.
- 10. Check the syringe for air bubbles and do one of the following:
 - If there are air bubbles present, repeat step 9.
 - If no air bubbles are present, remove the filling needle from the vial.

Instructions for Filling the Cartridge

- 1. Inspect the cartridge package for any signs of damage. Discard any damaged product.
- 2. Open the package and remove the cartridge.
- 3. Hold the cartridge upright and gently insert the needle into the white insulin fill port on the cartridge (see image E). The needle is not intended to go all the way in, so do not force it.
- 4. Keeping the syringe vertically aligned with the cartridge, and the needle inside the fill port, pull back on the plunger until it is fully retracted (see image F). This will remove any residual air from the cartridge. Bubbles will rise toward the plunger.
- 5. Make sure the needle is still in the fill port and release the plunger. Pressure will pull the plunger to its neutral position but it will NOT push any air back inside the cartridge (see image G).
- 6. Withdraw the needle from the fill port.
- 7. Turn the syringe upright and pull down on the plunger (see image H). Flick the barrel to make sure that any air bubbles rise to the top.
- 8. Gently press on the plunger to remove air bubbles until insulin fills the needle hub and you see a drop of insulin at the tip of the needle (see image I).
- 9. Re-insert the needle in the fill port and slowly fill the cartridge with insulin (see image J). It is normal to feel some back pressure as you slowly press on the plunger.
- 10. Maintain pressure on the plunger while you remove the needle from the cartridge. Check the cartridge for leaks. If you detect insulin leaking, discard the cartridge and repeat entire process with a new cartridge.
- 11. Always dispose of used needles, syringes, cartridges, and infusion sets following your community's regulation.

Top Tips

- Fill the first syringe to 3ml = 300 units
- Once you know your total daily dose, fill to four times that. For example, if daily insulin is 50 units, fill to 2ml = 200 units
- MAke sure all bubbles are out of the neck of the syringe









G







Air Liquide I t:slim X2^T HEALTHCARE



Load a Cartridge

The instructions below are provided as an additional quick reference, following **t:slim X2[™] Insulin Pump** training. Not all screens are shown. For more detailed information on the operation of t:slim X2[™] Insulin Pump, please visit: www.airliguidehealthcare.co.uk/diabetes-support

1		
	Options	
STOPI	NSULIN	
Load		
Temp R	Rate	
My Pun	np	

From the Options menu, tap Load.



Tap Change Cartridge. A screen will appear to confirm that all insulin deliveries will be stopped. Tap 🔽 to continue.

Fill Tubing

0 u



Disconnect the infusion set from your body and tap 💌 to continue.



Remove the used cartridge. Install filled cartridge. Tap the unlock icon when completed. Tap 🚾 to continue.



Make sure the set is disconnected from your body and securely connect the tubing to your cartridge.

On the next screen you will fill your tubing with insulin.

ок

Verify that the infusion set is disconnected from your body.

Connect the infusion set tubing to the tubing connector on the cartridge. Tap



0.3 ml fo t

6

Fill Tubing

Hold the pump vertically to ensure any air in the cartridge will be dispelled first.
Tap START . The pump will beep and vibrate regularly while the tubing is filled.
r 90 degree auto sof



Tap **STOP** after three drops of insulin are seen at the end of the infusion set tubing, or after a minimum of 10 u have been filled. Verify that drops are seen and tap **DONE**.



From the load menu, tap Fill Cannula. Insert a new infusion set and connect filled tubing to site, then tap

NOTE: If you are using a steel needle infusion set, there is no cannula, Skip this section

9			
\leftarrow	Fill Canr	nula	
Edit Fill	Edit Fill Amount 0.7 u		
Fill Cannula		START	
Amount Filled		0 u	

Tap Edit Fill Amount.

Select amount needed for cannula fill. Refer to your infusion set instructions for use for proper cannula fill amount.



10

-	Site Remino	ler 🗸
Site Rem	ninder	
		Friday
		5:00 PM
Edit Rem	ninder	

After the cannula fill is complete, you can set a Site Change reminder.

Tap 🛃 if correct. Tap Edit Reminder if settings need to be changed.



A confirmation screen is displayed.

Tap . A reminder to test BG in 1-2 hours will display.



12



The **RESUMING INSULIN** screen will appear.



Top Tips

- Do not put the tubing the groove until you pulled back the inserter
- Make sure you can see the needle above the cannula before inserting
- Do not put the cannula on your belt line





Stop and Resume Insulin Delivery 🕑 🥑

The instructions below are provided as an additional quick reference, following **t:slim X2[™] Insulin Pump** training. Not all screens are shown. For more detailed information on the operation of t:slim X2[™] Insulin Pump, please visit: www.airliquidehealthcare.co.uk/diabetes-support

X Stop Insulin Delive	ry	
1 100% 10:20 14 Nov 235 u Delus Delus Delus Delus Delus Delus Delus Delus 14 Nov 235 u 235 u 235 u	2 Options STOP INSULIN Load Temp Rate My Pump Tap STOP INSULIN.	3 This will stop all insulin deliveries. Stop all deliveries now? X Tap X
Resume Insulin De	livery	
4 10:20 100% 10:20 235 u EDUUS EDUUS EDUUS DPTIONS AL DELIVERIES STOPPED INSULIN ON BOARD (IOB) Units 1.1 u Time Remaining 1:09 hrs Tap OPTIONS.	5 BACK Options RESUME INSULIN Load Tomp Rate My Pump Tap RESUME INSULIN.	6 This will resume all deliveries. Resume insulin now? ★ ★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★
Top TipsAlways suspend when havin	g a shower	

- Always suspend when the pump is removed for sports or other activities
- Remember to resume upon reconnecting





Control-IQ Technology

Control-IQ Technology

For the t:slim X2 Insulin Pump

How does Control-IQ technology work?

Control-IQ[™] technology is designed to help increase time in range (3.9-10.0 mmol/L)* using Dexcom G6 continuous glucose monitoring

(CGM) insulind boluses	values to predict glucose levels 30 minutes ahead and adjust lelivery accordingly, including delivery of automatic correction ;† (up to one per hour).	Enabled	Sleep Activity Enabled	Exercise Activity Enabled
	Delivers an automatic correction bolus if sensor glucose is predicted to be above mmol/L	10.0	N/A	10.0
	B Increases basal insulin delivery if sensor glucose is predicted to be above mmol/L	8.9	6.7	8.9
\diamond	Maintains active Personal Profile settings when sensor glucose is between mmol/L	6.25 - 8.9	6.25 - 6.7	7.8 - 8.9
	B Decreases basal insulin delivery if sensor glucose is predicted to be below mmol/L	6.25	6.25	7.8
	Stops basal insulin delivery if sensor glucose is predicted to be below mmol/L	3.9	3.9	4.4

Control-IQ Technology Pump Icons

Symbol	Meaning	Symbol	Meaning
\$	Control-IQ technology is enabled but not actively increasing or decreasing basal insulin delivery	В	Basal insulin is programmed and being delivered.
	Control-IQ technology is increasing basal	В	Control-IQ technology is increasing basal insulin delivery.
	Control-IQ technology is decreasing basal	В	Control-IQ technology is decreasing basal insulin delivery.
	Control-IQ technology has stopped basal	0	Basal insulin delivery is stopped and a basa rate of 0 u/hr is active.
222	The Sleep Activity is enabled.		Control-IQ technology is delivering an automatic correction bolus. [†]
-₹×	The Exercise Activity is enabled.	BOLUS • • • Control-IQ: 2.8 u	Control-IQ technology is delivering an automatic correction bolus. [†]

TO TURN CONTROL-IQ TECHNOLOGY ON





From the Options menu, tap **My Pump**.

2	My Pump	
	Personal Profiles	
	Control-IQ	
	Alerts & Reminders	
	Pump Info	

Tap Control-IQ.



From this screen, Control-IQ technology can be toggled on or off.

NOTE: In order to turn Control-IQ technology on, patient must have an active Personal Profile with CARBS turned on and an active CGM session.

4	Control	-IQ
	Control-IQ	
	Weight	Press to Set Up
	Total Daily Insulin	Press to Set Up

Next, enter the user's weight and average daily insulin use in units.

NOTE: Control-IQ technology cannot be enabled unless both Weight and Total Daily Insulin are entered.

NOTE: Total Daily Insulin should be an estimate of total basal and bolus insulin the user requires in a 24-hour period. Existing t.slim X2 users can find their average Total Daily Insulin under Options > History > Pump History > Delivery Summary > 14-day Average.

5	Control	-IQ 💙
	Control-IQ	
	Weight	68 kg
	Total Daily Insulin	34 u

Tap .to save the settings. Control-IQ technology is now on.



• Turn Control-IQ on

- Enter weight the minimum is 25kg
- Enter total daily insulin the minimum is 10 units

Accuracy of CGM



- The finger prick measures the glucose in the blood.
- The CGM measures the glucose in the fat tissue (interstitial space).
- The CGM reading will be 5-10 minutes behind the blood glucose.
- The CGM reading and blood glucose reading will never be the exactly the same.
- The usual difference depends on the CGM level:

The below table shows what the usual difference is 90% of the time. Occasionally the difference will be larger, but this should only be less than 10% of the time.

If the sensor is more than 20% different to the blood glucose, you may need to calibrate the sensor

CGM	Blood glucose	Accuracy
3.5mmol/l	3.0 - 4.0mmol/l	usually within 0.5mmol/l
7.0mmol/l	5.5 - 8.5mmol/l	usually within 1.5mmol/l
10.0mmol/l	8.0 - 12.0mmol/l	usually within 2.0mmol/l
15.0mmol/l	12.0 - 18.0mmol/l	usually within 3.0mmol/l
20.0mmol/l	16.0 - 24.0mmol/l	usually within 4.0mmol/l
This level of a second second sec	anale to nonland the model to do bl	

This level of accuracy is good enough to replace the need to do blood glucose readings

Sensors and meters measure glucose in different places



What do the trend arrows mean?

- The CGM device will tell you how fast the glucose is moving by trend arrows
- The trend arrows allow you to predict where the glucose will be in 10 minutes
- You can use the trend arrows to:
 - o Predict and prevent hypos.
 - o Change carbohydrate amounts for exercise.
 - o Give peace of mind that no highs are lows are coming up.
 - o Decide when to give meal-time insulin.
 - o And much more.

Trend arrow APP	Description	Where the glucose will be in 10 minutes
	Rapidly rising	more than 2.0mmol/l higher
^	Rising	1.5mmol/l higher
N	Slowly rising	1mmol/l higher
\rightarrow	Stable	Same
И	Slowly falling	1 mmol/l lower
	Falling	1.5 mmol/l lower
↓ ↓	Rapidly falling	more than 2.0mmol/I lower

Top Tips for accurate CGM readings

- Place the sensor on a clean and dry area where there is enough fat to prevent inserting into the muscle.
- Avoid using an area that gets banged a lot e.g. side of arm on door frames.
- Avoid using an area you sleep on e.g. back of buttocks if back sleeper, or right arm if a right side sleeper
- The sensor is taped down if required
- Calibrate if more than 20% different from blood glucose, BUT;
 - o Make sure the blood glucose test was obtained using a meter that's accurate
 - o Hands were clean and dry
 - o The arrows on the CGM are steady on only slowly rising or falling
 - o Consider a second blood glucose test just to be sure there os more than a 20% difference





Sleep and Exercise Activities



For the t:slim X2 Insulin Pump With Control-IQ Technology

Control-IQ technology offers optional settings for Sleep that will change the treatment values when enabled.

Using Sleep Schedules is recommended. Within the Activity menu, users can set up to two Sleep Schedules, which will automatically turn Sleep on and off at pre-programmed times. For example, one might be set up for weekdays and the other for weekends. If preprogrammed Sleep Schedules are not used, Sleep must be manually turned on and off.

NOTES:

- No automatic correction boluses will be delivered while the Sleep Activity is enabled.
- If you have a Sleep Schedule set and go to bed earlier/later it will still turn off at the programmed time.
- If Exercise is enabled at the time Sleep is scheduled to start, Sleep will not begin. Once Exercise is turned off, the user will need to manually start Sleep or wait until the next scheduled sleep cycle.

TO SET SLEEP SCHEDULES



From the Options menu tap **Activity**.



Tap **Sleep Schedules**. Then, select one of the two Sleep Schedules to set it up.



Select any or all days of the week. Set the time that the Sleep function will start and end on those days. These times should reflect the time the user generally goes to sleep and wakes up.

Tap 🗠 to save the settings.



Sleep Schedules are now enabled. Tap the Tandem logo on the face of the pump to return to the Home Screen.

TO MANUALLY ENABLE SLEEP



From the Options menu tap **Activity.**



Tap **START** next to Sleep. **NOTE:** Sleep and Exercise cannot be enabled at the same time.

SLEEP STARTED

Sleep is now enabled.

3



To disable Sleep Activity, from the Options menu tap **Activity**, and tap **STOP** next to Sleep.

Top Tips

- \checkmark
- Set 23:00 06:00 to allow for auto corrections after evening meal
- Set a later wake up time on the weekend via a schedule if you sleep in

Exercise Activity

Control-IQ technology offers optional settings for Exercise that will change the treatment values when enabled.

→ TO ENABLE EXERCISE



From the Options menu tap **Activity**.



Tap **START** next to Exercise. **NOTE:** Sleep and Exercise cannot be enabled at the same time.





Exercise is now enabled.



To disable Exercise Activity, from the Options menu tap **Activity**, and tap **STOP** next to Exercise.

Top Tips:

- Start 90-120 minutes before activity if you can
- If you forget to set before, start Activity mode as you start the activity
- Remember to turn it off after the activity to make the running man disappear



Practice Starting and stopping Exercise Mode

Activity and exercise management



Children and adolescents should do:

- 60 min per day of activity equivalent to fast walking
- 3 days a week of activities that strengthen the muscles and bones e.g., sports and PE.
- Limit screen time to two hours per day

This table guides how to make insulin and carbohydrate adjustments for activities and exercise.

Start by using the "Starting plan" suggestions in grey for before, during and after exercise

Adapt the plan if the glucose level goes less than 5.0mmol/L or above 15.0mmol/L during or after exercise, using the chart below for activity and exercise managment.

	Before activity & exercise		During	After activi	ty & exercise
	Mealtime insulin	Exercise Activity	Carbohydrate	Exercise Activity	Post exercise meal insulin
Plan execution	If meal is consumed within 2 hours of exercise, adjust amount of carbohydrate entered into the bolus calculator	Ideally start 90-120 minutes before exercise BUT start just before if 90-120 mins is not possible	Consume quickly absorbed carbohydrate based on sensor value and trend arrow every 20-30 minutes		
>15.0mmol/L using starting plan	100% of carbohydrate eaten	Off	20-30 minutes Follow carbohydrate	Off	100% of carbohydrate eaten
Starting plan	75% of carbohydrate eaten	On	chart and only have enough for	Off	75% of carbohydrate eaten
<5.0mmol/L using starting plan	50% of carbohydrate eaten	On	avoid sending the glucose too high	On for 6 hours	50% of carbohydrate eaten

How to work out 75% of carbs to be eaten? carbs x 0.75 e.g. 50g x 0.75 = 40g

How to work out 50% of carbs to be eaten? carbs x 0.5 e.g. 50g x 0.5 = 25g

Please remember to suspend the pump if taking off for to exercise, such as swimming or contact sports. Furthermore, resume the pump and re-attach on completion.

Contact the Diabetes Dietitians if planning exercise this way does not work for you. We will be able to create more individualised plans to meet the needs of any sports or activities.

Carbohydrate Guide for Control IQ

- 1. Start Exercise Activity before activity, ideally 90 minutes before.
- Check glucose just before and every 20-30 minutes during exercise and follow the chart below



3. Stop Exercise Activity after activity

Sensor glucose Levels	Rate of glocose change trend arrow & action to take	Carbohydrate needed for 20-30 minutes (g)		
less than 4.0 mmol/l	No exercise: Treat hypoglycaemia			
4.0 - 6.4 mmol/l	$\checkmark \checkmark \checkmark$			
	↓			
	Й			
	\rightarrow \rightarrow			
	<u> </u>			
6.5 - 9.9 mmol/l	○ ↓ ↓			
	↓			
	Й			
	\rightarrow			
				
10.0 - 13.9 mmol/l	Ok to exercise with any arrow			
>14.0mmol/l	Check ketones: If less than 0.6mmol/l	Ok to exercise		
Chck ketones: If 0.6mmol/l or above		No exercise until the ketones have been corrected and are less than 0.6mmol/l		

Air Liquide | t:slim X2" HEALTHCARE





The instructions below are provided as an additional quick reference, following **t:slim X2[™] Insulin Pump** training. Not all screens are shown. For more detailed information on the operation of t:slim X2[™] Insulin Pump, please visit: www.airliguidehealthcare.co.uk/diabetes-support

Insulin Pump



Tap **O Grams** to enter the carbs for your bolus. NOTE: If this reads "units," the carb feature is turned off in the active profile.



Enter desired value. Be sure 'mmol/L' is displayed above keypad when entering BG values.



Verify the dose and tap 🗠 to confirm.

NOTE: Calculations above are based on preset insulin-to-carb ratios and correction factors, which may be set in Personal Profiles.



Enter desired value. Be sure 'grams' is displayed above keypad for food boluses. Tap **to** continue.



If a BG is entered that is below the target, but above or 3.9 mmol/L, you will be offered the option to reduce the bolus amount. To accept that reduction tap otherwise, tap ×



Tap 🗠 to deliver the food bolus immediately.

The BOLUS INITIATED screen will appear to confirm delivery has started.



Tap Add BG to enter your blood glucose (BG).

NOTE: If you have a CGM session active, and if there is both a CGM value and a CGM trend arrow available on the CGM Home Screen, your glucose value is autopopulated in the GI UCOSF field.



Tap 🔽 to continue. Tap the calculated units value to manually adjust recommended dose.



To cancel the undelivered portion of the bolus, tap the white X next to BOLUS on the Home Screen, then tap 🚾 to confirm canceled bolus.



Practice giving a bolus on the simulator on your phone

Questions

Use the **survive and thrive guide** to answer these questions

- On waking the glucose is 16.0 and has been for 4 hours and ketones are 0.2, what should you do?
- Breakfast is at 09:00 and after breakfast at 10:00 the glucose is 15.2, with ketones 0.1 what should you do?
 - Then the Glucose at 12:00 is 22.2 with ketones 0.3, what should you do?
- Glucose at 14:00 is 16.5 with ketones of 0.9, what should you do?
- Glucose at 17:00 is 17.5 with ketones of 2.4, what should you do?
- Ketones are 2.4 and you need advice from the diabetes nurses and its 7pm:
 - How do you contact the nurses?
- If a sensor does not last the full life what should you do?
- If there is an issue with the pump who should you contact?
- Do you need to take background insulin whilst using the pump?

Homework





Make sure you have made a note of all the education session dates and times.



Create a Glooko account to be able to upload your pump if not already done.

You will need a computer or laptop to be able to upload your pump. If you cannot access a computer please let us know below.

- a. <u>https://join.glooko.com</u>
- b. Create username and add other details
- c. Code = enbchpaed
- d. Install the uploader to your computer: Top right (Settings) Apps & Devices Get Glooko Uploader - Install the uploader
- e. Open the Desktop "Glooko" icon, plug in the pump, upload and enter username and password
- a. Survive and Thrive Guide Review this guide
 - i. Check the QR codes for the videos
 - ii. Put on the fridge
 - iii. Have the PDF saved on yoru phone

υΓ

Upload the pump to Glooko before the next session and all clinic visits

Session 3 & 4

Aim of this session:

To successfully review progress and update sesstings

What we will work through:

- 1. Reviewing control with download reports
- 2. Setting a Time in Range target
- 3. Making changes to settings
- 4. Check following top tips
- 5. Exercise management
- 6. Using GAME SET MATCH
- 7. Mealtime Insulin Guide

INSTRUCTIONS FOR USE

1 Download user's device to Glooko.com

2 Follow this worksheet for step-by-step guidance on clinical assessment, user education and insulin dose adjustments. STEP 1 **BIG PICTURE** (PATTERNS) → STEP 2 **SMALL PICTURE** (REASONS) → STEP 3 **PLAN** (SOLUTIONS)

3 Give the After Visit Summary to the Control-IQ user after visit

PANTHERTOOL[™] for

CONTROL-IQ

t:slim X2 insulin pump with Control-IQ technology



OVERVIEW using CARES Framework

C How it CALCULATES

- A hybrid closed-loop system that uses CGM glucose data to adjust the basal insulin delivery by increasing, decreasing or suspending programmed basal rates
- Algorithm targets glucose levels 6.1-8.3mmol/L
- Automatic correction boluses up to once per hour, 60% of a calculated correction dose

A What you can ADJUST

- Can change basal rates, I:C ratios, correction factors
- CANNOT change active insulin time (5 hours) or correction bolus target (6.1 mmol/L)
- •"Exercise Activity" targets glucose 7.8-8.9 mmol/L (to reduce insulin delivery)
- •"Sleep Activity" narrows glucose target to 6.1-6.3 mmol/L and prevents automated correction doses overnight.

R When to **REVERT** to open-loop

The system stays in hybrid closed-loop all the time except when CGM data is not available. Users must turn off Control-IQ if they want to use temporary basal rates.

E How to EDUCATE

See PANTHER**POINTERS** below as well as EDUCATEbullets found under STEP 3.

S SENSOR/SHARE characteristics

- Dexcom G6 sensor and transmitter: 10 day sensor life, factory calibrated, can be used for diabetes management decisions without BG check.
- User can connect Dexcom transmitter to the Dexcom G6 app on a phone and share data with others using Dexcom Follow app.
- Sensor glucose levels auto-populate into bolus calculator



Focus on behavior: Wearing the CGM consistently, giving all boluses, etc.



Set the Sleep Schedule for every night.



Make sure user is bolusing before all meals and snacks.

When adjusting insulin pump settings, focus primarily on I:C ratios and correction factors.

STEP 1 **BIG PICTURE** (PATTERNS)

Is the person using the CGM and Control-IQ system? The goal is to use Control-IQ as much as possible.

CGM Active (Time using CGM):

Aim for > 90%. If less, ASSESS why.

Control-IQ (How often Control-IQ is in use): Aim for > 90%. If less, ASSESS why.

Activity—Sleep (For tighter glucose targets overnight)

Make sure this averages at least 25% (6 hours) or more per day

- →If not, check pump settings to turn on "Sleep Schedule" and select all days
- Skin problems or difficulty wearing sensor on body?
 - →Rotate sensor insertion sites (arms, hips, buttocks, abdomen)
 - →Use barrier preps, tackifiers, overtapes, or adhesive remover wipes as necessary
- Problems getting CGM data on pump?
 - →Wear pump on same side of body as CGM transmitter (to improve line of sight of Bluetooth)
 - →Carry pump with screen facing outward (away from body)

B Is the user giving meal boluses?

Number of Diet Entries/Day?

Is the user giving at least 3 "Diet Entries/Day" (boluses with CHO added)?

→If not, ASSESS for missed meal boluses

PANTHER**POINTERS**[™] FOR CLINICIANS

The goal of this therapy review is to increase Time in Range (3.9-10.0 mmol/L) while minimizing Time Below Range (<3.9 mmol/L)

1	
Ĺ	(ک
1	\sim

Is the Time Below Range **more** than 4%? If **YES**, focus on fixing patterns of **hypoglycemia** If **NO**, focus on fixing patterns of **hyperglycemia**



C Is the user meeting Glycemic Targets?

Time in Range (TIR) 3.9-10mmol/L "Target Range"		Goal is >70%
Time Below Range (TBR) <3.9mmol/L "Low" + "Very Low"		Goal is <4%
Time Above Range (TAR) >10.0mmol/L >) "High" + "Very Hig	h"	Goal is <25%

What are their patterns of hyperglycemia and/or hypoglycemia?

Hyperglycemia patterns: (eg: high glycemia at bedtime)

Hypoglycemia patterns:

Use the **Week View** and discussion with the user to identify causes of the glycemic patterns identified in STEP 1 (hypoglycemia or hyperglycemia).



Identify the predominant 1-2 causes of the hypo- or hyperglycemia pattern.

Is the hypoglycemia pattern occurring:	Is the hyperglycemia pattern occurring:
Fasting/Overnight?	Fasting/Overnight?
Around mealtime?(1-3 hours after meals)	Around mealtime? (1-3 hours after meals)
Where low glucose levels follow high glucose levels?	Where high glucose levels follow low glucose levels?
Around or after exercise?	After a correction bolus was given? (1-3 hours after correction bolus)

Hypoglycemia		Hyperglycemia
SOLUTION	PATTERN	SOLUTION
Reduce basal rates 10-20% in 1-2 hours prior to hypoglycemia	Fasting / Overnight	Make sure Sleep Schedule is turned on every night Increase basal rates 10-20% in
Assess carb counting accuracy, bolus timing, and meal composition. Weaken I:C Ratios by 10-20% (e.g. if 1:10, change to 1:12)	Around mealtime (1-3 hours after meals)	1-2 hours prior to hyperglycemia Assess if meal bolus was missed. If yes, educate to give all meal boluses prior to eating. Assess carb counting accuracy, bolus timing, and meal composition. Strengthen I:C Ratios by 10-20% (e.g. from 1:10 to 1:8)
If due to bolus calculator over- rides: Educate user to follow the bolus calculator and avoid overriding to give more than recommended. There may be a lot of IOB from AID that user is not aware of. Bolus calculator factors in IOB from increased AID when calculating correction bolus dose. Weaken correction factor by 10- 20% (e.g. if 50, change to 60) if hypos 2-3 hours after correction bolus. This will impact both user-given and auto-correction boluses.	 Where low glucose follows high glucose Where high glucose follows low glucose Image: State of the state of th	Educate to treat mild hypoglycemia with fewer grams of carbs (5-10g)
Use the Exercise Activity feature 1-2 hours before exercise begins. This will temporarily reduce insulin delivery aiming to reduce risk of hypoglycemia. To use Exercise Activity, go to: Main Menu → Activity → Exercise → start	Around or after exercise	
	After a correction bolus was given (1-3 hours after correction bolus)	Strengthen correction factor (e.g. from 50 to 40). This will impact both user-given and auto-correction boluses

ADJUST insulin pump settings and EDUCATE.

Most impactful insulin dose settings to change:

- 1. I:C Ratios It is common to need stronger I:C Ratios with AID
- 2. Correction Factor Will affect both user-given correction boluses and auto-correction doses given by the system
- 3. Basal Rates Will affect fasting glucose levels

NOTE: Cannot change BG Target Range (fixed at 6.1mmol/L) or Active Insulin time when Control-IQ is active

EDUCATE ON BOLUS BEHAVIOR

- **Do not override boluses** to give more insulin than the pump recommends (may cause hypoglycemia due to automated insulin delivery).
- **Bolus before eating**. If bolusing after a meal, the user should reduce bolus as system has already been increasing insulin for hyperglycemia.
- **Give correction boluses** for hyperglycemia if recommended by the bolus calculator.

OTHER EDUCATION

- Treat hypoglycemia with 5-10 g CHO since insulin may have been reduced/suspended for a period of time before hypoglycemia occurs.
- **Disconnecting**: If disconnected from the pump, SUSPEND insulin so Control-IQ calculates insulin-onboard accurately
- Infusion set failure: Change infusion set if unexplained persistent hyperglycemia. (i.e.,>14.0mmol/L for >90 min)

AFTER VISIT SUMMARY

Great job using Control-IQ!

Using systems like this can help you achieve better glucose control. Aim for more than **70%** of your CGM glucose levels to be between **3.9-10.0mmol/L**. This is the goal for MOST people with type 1 diabetes. This is about the same as having an HbA1c level of 7% (52 mmol/mol).



TIPS for using Control-IQ

- HYPERGLYCEMIA > 14.0mmol/L for 1.5–2 hours? Check ketones first! If ketones, give a syringe injection of insulin and turn off "Control-IQ" feature for 3 hours. Change infusion set.
- **Do not override boluses** to give more insulin than the pump recommends (may cause hypoglycemia due to automated insulin delivery).
- **Bolus before eating**. If bolusing after a meal, the user should reduce bolus as system has already been increasing insulin for hyperglycemia.
- Give correction boluses for hypergylcemia.
- **Read bolus prompts carefully**. If it states "Your BG is Below Target. Reduce Bolus Calculation?", press "NO" (or R) to get full amount of insulin for carbohydrates. Press "Yes" (or A) to subtract insulin.
- Try treating hypoglycemia with 5-10g CHO since insulin may have been reduced/suspended for a while before hypoglycemia occurs. Treating hypoglycemia with more than 5-10g may result in rebound hyperglycemia
- If disconnected from the pump, SUSPEND insulin so Control-IQ calculates insulin-on-board accurately.
- Check "Auto-off" settings. Turn off or extend to 16 hours or longer.
- CHANGE INFUSION SET every 2-3 days, or as needed for persistent hyperglycemia.

Mealtime Insulin Guide



Air Liquide I t:slim X2[™] HEALTHCARE I Insulin Pump



Extended Bolus 🕒

The instructions below are provided as an additional quick reference, following **t:slim X2[™] Insulin Pump** training. Not all screens are shown. For more detailed information on the operation of t:slim X2[™] Insulin Pump, please visit: www.airliquidehealthcare.co.uk/diabetes-support



Tap **O Grams** to enter the carbs for your bolus. **NOTE:** If this reads 'units', the carb feature is turned off in the active profile.



Tap **EXTENDED** to toggle the extended bolus feature on or off. Tap **v** to continue.



The delivery screen will confirm how much insulin will be delivered up front, how much will be delivered over time, and the delivery duration. Tap to start the bolus.



Enter desired value. Be sure 'grams' is displayed above keypad for food boluses. Tap 🕶 to continue.



Tap < to use default settings or tap **DELIVER NOW** and **DURATION** and set your desired values, then tap < to continue.



The **BOLUS INITIATED** screen will appear to confirm delivery has started.



Tap 🔽 to continue, then tap 🔽 to confirm.

NOTE: If an above-target blood glucose (BG) is entered, the correction bolus will not be extended.

NOTE: If you have a CGM session active, and if there is both a CGM value and a CGM trend arrow available on the CGM Home Screen, your glucose value is autopopulated in the GLUCOSE field.



Tap 🔽 to confirm.



To cancel the undelivered portion of the bolus, tap the **white X** next to **BOLUS** on the Home Screen, then tap **v** to confirm canceled bolus.

Dynamic Glucose Management GAME-SET-MATCH

Combine glucose values and trend arrows with proactive diabetes management



- **G** = Glucose time in range desired
- A = Alert on high set accordingly

Time in range desired? 4.0-10.0mmol/L	Set high alert mmol/L	Predicted HbA1c mmol/mol (%)	Daily energy & future health
50%	No alert	64 (8.0)	\odot
60%	14.0	58 (7.5)	
70%	12.0	52 (7.0)	\odot
75%	11.0	50 (6.8)	\odot
80%	10.0	48 (6.5)	\odot
85%	9.0	45 (6.2)	\odot
90+%	8.0	42 (6.0)	$\odot\odot\odot\odot\odot\odot$

- **M** = Mode of exercise that can be done
- **E** = Exercise when high alert sounds

Glucose	Trend arrow			How many	
mmoi/L	Libre	Dexcom	Medtronic	minutes	
	7		1	5	
8.0 - 9.9	↑	Ô	↑↑	10	
		\bigcirc	$\uparrow\uparrow\uparrow$	15	
	\rightarrow	\bigcirc		15	
10.0 - 14.0	7		1	20	
	↑	Ô	↑↑	25	
		٢	$\uparrow\uparrow\uparrow$	30	
	\downarrow	\bigcirc	$\downarrow\downarrow$	15	
More than	Ŕ		\downarrow	20	
14.0	\rightarrow	\bigcirc		25	
	7	Ő	1	30	
	1	Ô	↑ ↑	40	
		·			



S = Start insulin before eating

Glucose	Trend arrow			Minutes to bolus	
mmoi/L	Libre	Dexcom	Medtronic	before meal	
		\bigcirc	$\downarrow \downarrow \downarrow$	Prevent hypo	
	\downarrow	Ó	$\uparrow \uparrow$	Prevent hypo	
	Ŕ	Q	\downarrow	Prevent hypo	
4.0 - 5.9	\rightarrow			15	
	7		1	20	
	1	Ô	$\uparrow\uparrow$	25	
		٢	$\uparrow\uparrow\uparrow$	30	
		\bigcirc	$\downarrow \downarrow \downarrow$	0	
	\downarrow	\bigcirc	$\downarrow\downarrow$	10	
	Ŕ	Q	\downarrow	15	
6.0 - 9.9	\rightarrow	\bigcirc		20	
	7		↑	25	
	1	٢	$\uparrow\uparrow$	30	
		٢	$\uparrow\uparrow\uparrow$	35	
		\bigcirc	$\downarrow \downarrow \downarrow$	15	
	\downarrow	\bigcirc	$\downarrow\downarrow$	20	
	Ŕ		\downarrow	25	
10.0 - 14.0	\rightarrow			30	
	7		↑	35	
	1	Ô	$\uparrow\uparrow$	40	
		٢	$\uparrow\uparrow\uparrow$	45	
	\downarrow		$\downarrow\downarrow$	25	
More than	Ŕ	Q	\downarrow	30	
14.0	\rightarrow	\bigcirc		40	
	7	Ø	1	45	
	1	Ô	$\uparrow\uparrow$	50	

E = Eat three balanced meals

T = Ten minutes activity after eating



M = Measure weight to calculate hypo treatment

Weight (kg)	Grams of glucose	Dextrose 3g tablets
10	3	1
20	6	2
30	9	3
40	12	4
50	15	5
60+	18	6

- A = Always use glucose only, not sugar
- T = Try to prevent lows
- C = Change amount according to glucose value & arrow

Glucose	Trend arrow			Percent	
mmoi/L	Libre	Dexcom	Medtronic	treatment	
	\downarrow	\bigcirc	$\uparrow\uparrow\uparrow$	100%	
4.0 - 6.0		\bigcirc	$\uparrow\downarrow$	75%	
	Ŕ		\downarrow	50%	
	\downarrow	\bigcirc	$\uparrow\uparrow\uparrow$	125%	
Loss than		\bigcirc	$\uparrow\downarrow$	100%	
4.0	Ŕ		\downarrow	75%	
	\rightarrow	\bigcirc		50%	
	7	\bigcirc	Ŷ	25%	

H = Have patience and wait 20 mins



G = Glucose time in range desired

A = Alert on high set accordingly

Time in range 4.0-10.0mmol/L	Set high alert mmol/L	Predicted HbA1c mmol/mol (%)	Daily energy & future health
50%	No alert	64 (8.0)	\odot
60%	14.0	58 (7.5)	
70%	12.0	52 (7.0)	\odot
75%	11.0	50 (6.8)	\odot
80%	10.0	48 (6.5)	$\odot \odot \odot \odot$
85%	9.0	45 (6.2)	\odot
90+%	8.0	42 (6.0)	$\bigcirc \bigcirc $



E = Exercise when high alert sounds

Glucose	Trend arrow			How many
mmoi/L	Libre	Dexcom	Medtronic	minutes
	7	O	1	5
8.0 - 9.9	↑	Ô	$\uparrow\uparrow$	10
		٢	$\uparrow\uparrow\uparrow$	15
	\rightarrow	\bigcirc		15
	7		1	20
10.0 - 14.0	↑	Ô	$\uparrow\uparrow$	25
		٢	$\uparrow\uparrow\uparrow$	30
	\downarrow	\bigcirc	$\downarrow\downarrow$	15
More than	Ŕ		\downarrow	20
14.0	\rightarrow			25
	7	\bigcirc	1	30
	↑	Ô	$\uparrow\uparrow$	40





Resting = Blood moving slow



Files

Exercise make insulin STRONGER



Glucose

Exercise makes insulin last longer LONGER





Setting a Temp Basal Rate

The instructions below are provided as an additional quick reference, following **t:slim X2[™] Insulin Pump** training. Not all screens are shown. For more detailed information on the operation of t:slim X2[™] Insulin Pump, please visit: www.airliguidehealthcare.co.uk/diabetes-support

1	100%	10:20 14 Nov	B 235 u	
		BOLUS		
	INSULIN ON BOARD (IOB)			
	Units	1.1 u Time Remaining	1:09 hrs	



Tap **OPTIONS**.



Tap Temp Rate.



Tap Temp Rate.



Using the onscreen keypad enter desired percentage. Tap NOTE: Current rate is 100%. An increase is greater than 100% and a decrease is less than 100%.



Tap **Duration**. Using the onscreen keypad enter desired length of time for Temp Rate. Tap



Verify settings and tap NOTE: To see the actual units to be delivered, tap View Units



The TEMP RATE STARTED screen will appear to confirm the Temp Rate has started.



The Screen Lock screen will appear with the orange T icon indicating a Temp Rate is active. NOTE: If a Temp Rate of 0% is currently active, the orange T icon will be replaced with a red T icon.



To stop Temp Rate at any time, tap **OPTIONS**, then tap the **white X**.

A confirmation screen will appear. Tap × .





If you plan to travel by air with your insulin pump, some advance planning may make your security screening go smoother.

Your device is safe for use during air travel and complies with FAA wireless transmission standards. It is also designed to withstand common electromagnetic interference and can be safely carried through metal detectors.

However, your Tandem Diabetes Care insulin pump should NOT be put through machines that use X-rays, including airline luggage X-ray machines and full-body scanners. We recommend disconnecting at the infusion site and asking the security agent for an alternative screening method. If you prefer to stay connected, you can notify the agent about your pump and request to go through a standard metal detector wearing your pump.

It may be helpful to provide a printout of the information below to the security agent during the screening.

If you have any questions about traveling with your insulin pump, please visit <u>https://www.makingdiabeteseasier.com/uk/</u> or call 0800 012 1560 for Air Liquide

old Here

Show this document to the TSA or airport representative

Dear TSA or airport representative,

This is an insulin pump from Tandem Diabetes Care, a life-sustaining medical device prescribed by a physician. It is designed to withstand common electromagnetic interference and can be safely carried through metal detectors, but it should not be exposed to any form of X-rays. This includes airline luggage X-ray machines and fullbody scanners.

Please provide a screening method other than X-ray for this insulin pump.

Sincerely, Tandem Diabetes Care Metal detectors

X-rays, including full body scanners and luggage screening machines

100%	10:20 AM 14 Nov	B	235 u	
u		400 350 300 250 200	120 mg/dL	G
INSULIN ON BOA	RD 1.1 u	150 100 100 50	3 HRS	
🔅 ΟΡΤΙΟ	NS	BOLU	IS	



Insulin Pump Training Checklist

For use with t:slim X2[™] Insulin Pump

Felephone 0800 012 1560 Air Liquide Healthcare is an authorised Tandem Diabetes Care distributor.					
PATIENT'S NAME:		DATE OF BIRTH:	BG BEFORE TRAINING:		
ADDRESS:					
		EMAIL:			
TRAINING DATE:	HEALTHCARE PROVIDER (HCP):		PUMP SERIAL NUMBER:		
KNOWLEDGE ASSESSMEN	ſ				
MOST RECENT DIABETES EDU	CATION PROVIDED BY:		DATE:		
Pump therapy basic concepts: Ba Rechargeable lithium polymer ba Type of Insulin:NovoRapi t:slim X2 [™] Insulin Pump User Guid Aseptic/Clean Technique Set Time and Date on pump (imp	isal/Bolus, Insulin to Carb Ratio, Correc ttery, best battery charging practices, a d° (72 hours)Humalog° (48 hou e prtance for accuracy of settings and da	tion Factor, Insulin on Board, sin nd initial message and charge ırs) ta)	gle patient use only		
UNDERSTANDING AND USIN	G THE T:SLIM X2 INSULIN PUM	P			
 Pump Overview: Touch screen and Screen On/Quick Bolus Button Touch Screen - turns off after 3 action Screen Lock - turns off pump screet Screen Options: Timeout, Feature Home Screen and home "T" buttor Status, Bolus and Options Screet My Pump Screen Keypad Screens: Numbers and L Importance of Active Confirmation Review the icons and symbols on Personal Profiles Creating a New Personal Profile: resttings Edit (Review), Activate, Duplicate, Profile O.1 unit/hr minimum basal (0.001 in 25 unit maximum bolus 	and general navigation cidental screen taps een after each interaction a Lock on a etters n Screens touchscreen mame, timed settings, and bolus Delete, and Rename a Personal horements)	Delivering Boluses Standard food bolus, adding 0.05 unit minimum bolus (0.0 Entering BG value, correction Extended bolus Quick bolus Above/Below BG Target and Alert Settings Reminders: Low BG, High BG Alerts: Low Insulin, Auto-off (of Pump Settings Quick Bolus: grams or units, in Sound Volume: Low, Medium Display Settings: Screen Tim Bluetooth Settings: On/Off Time and Date (importance for Review History: Insulin Delive Alarms and CGM (t:slim X2")	multiple carbs, cancelling bolus 1 increments) 1 bolus, food bolus with correction 1 IOB — Bolus Calculator Algorithm 6, After Bolus BG, Missed Meal Bolus default ON) Increments 1, High or Vibrate e out, Feature Lock, Language or accuracy of settings and data) ury, Bolus, Basal, Load, BG, Alerts and with Dexcom G6° only)		
Loading Cartridge Change Cartridge- removal and c Use of room temperature insulin Filling syringe Fill Cartridge –Minimum/Maximu troubleshooting air bubbles 300 unit cartridge capacity Minimum fill of 95 units plus tubing Fill Tubing, Fill Cannula, Site Remi Fill estimate volume Do not add or remove insulin after Infusion Sets Type/Cannula length: Proper set selection and site place Change every 2-3 days as directed Avoid changing infusion set at bee Check BG 2 hours after site chan	lisposal of used cartridges m cartridge fill, removing air, nder the Load Sequence ement td by HCP dtime ge re issue, redness, absorption)	Temporary Basal Rate Start and Stop a Temp Rate Safety Aseptic/Clean Technique Hazards associated with sma Exposure to electromagnetic Pump Info: t:slim X2 Insulin Pu information, warranty reviewe Program Customer Care into Stop and Resume Insulin Del My CGM (if applicable) Start/Stop Sensor, calibrate (CGM graph- change display CGM alerts: High/Low, Rise/ Settings: Transmitter ID, Volur Link to online training module Optimising connection betwe facing out)	all parts (asphyxiation) c radiation or MRI ump Serial Number, Customer Care conta o phone if available ivery CGM timeline, trend arrows Fall, Out of Range me es een pump and sensor (pump screen	act	

UNDERSTANDING AND USING THE T:SLIM X2 INSULIN PUMP (cont)

Control-IQ[™] Technology

- Uses CGM values (current and predicted within 30 min) to adjust insulin delivery rates and amounts. Target ranges are not customisable
- Decreases or suspends insulin when CGM falls, increases basal insulin and delivers correction boluses when CGM rises. Auto correction boluses are based on CGM and correction factor. 60% of the calculated correction bolus will be delivered if at least 60 min have passed since the last bolus (manual or auto). Maximum frequency of auto-correction boluses is every 60 min. Can be manually cancelled
- Personal Profile and Control-IQ settings required: Basal rate, Correction Factor, Carb Ratio, Weight, Total Daily Insulin. Control-IQ feature can be enabled after required settings are entered
- Turn Control-IQ on: OPTIONS > My Pump > Control IQ (tap ON). An active temporary basal rate or extended bolus will be cancelled following a notification. The diamond icon will be visible in the upper left corner of the Home Screen
- Review all Control-IQ icons and visual indicators. Control-IQ diamond icon: Blue on the top indicates basal is increasing; orange on the bottom indicates basal is decreasing; red on the bottom indicates basal is suspended
- Control-IQ Alerts: Low Alert, High Alert, 2 Hr Max Alert
- Manually start or stop sleep or exercise: OPTIONS > Activity > START or STOP. Respective icons will be visible on the Home Screen. Sleep schedule setting is recommended and will activate automatically once set
- OUT OF RANGE: OUT OF RANGE alert and icon will appear on the home screen when the CGM transmitter and pump are not able to communicate. Control-IQ will continue to adjust basal rates and deliver correction boluses for the first 15 min, after which Control-IQ will stop and the pump will revert to delivery per open-loop settings. Control-IQ will automatically resume when the two devices are within range
- Avoid manual injections or inhaled insulin while using Control-IQ
- Stopping insulin when disconnecting from the pump

ADDITIONAL INFORMATION

Responding to Reminders, Alerts and Alarms

- Malfunction call Customer Service: 0800 012 1560
- Reminders: Low BG and High BG (retest), Site Change, After Bolus BG, Missed Meal Bolus
- Alerts: Low Power, Resume Pump, Max Hourly Bolus, Pump Stopped, Incomplete Bolus, Incomplete Profile, Incomplete Cartridge Load, Incomplete Cannula Fill, Incomplete Tubing Fill
- Alarms: Low Power, Shutdown, Empty Cartridge, Cartridge Error, Temperature, Altitude, Occlusion. Alarms will stop insulin delivery
- Respond to alarm quickly and appropriately. Disconnect from insulin pump if malfunction or damage occurs
- Diasend[®] set up, download regularly
- IPX7 (tested up to 3 feet/ 0.9 meters for 30 minutes)
- Backup plan (injections) discussed with HCP
- Back-up supplies to carry daily and for travel
- Ordering insulin pump supplies
- X-ray, extreme temperatures, airport travel, and hospital precautions
- Regular maintenance and cleaning (Storage/Shelf Mode)
- Review all Warning/Precautions and Safety Tips (See product User Guide)

IMPORTANT TIPS

 When wearing the t:slim X2 Insulin Pump, never disconnect from the tubing connector At regular intervals, check tubing for air and connector for tight connection. Tighten connector and then twist again Always disconnect at site before tightening tlock Call HCP for dosing issues or BG questions 	 Troubleshooting and treating hyperglycaemia – occlusions, site issues, air in tubing, loose connections, sickness, pumps settings per HCP guidelines Troubleshooting and treating hypoglycaemia per HCP guidelines Verified that pump settings are correct and in accordance with the Transfer Pump Settings Worksheet Consider IOB and follow HCP recommendations prior to first t:slim X2[™] Pump bolus Clips, cases, and wearing the t:slim X2[™] Pump
---	---

PARTICIPANT SIGNATURE

(I certify that I have been provided with education on, and have a clear understanding of, the items checked above.)

SIGNATURE	DATE:

INSULIN PUMP TRAINER SIGNATURE

(I certify that I have provided education on the items checked above and have accurately documented the details of this training session.)

SIGNATURE	DATE:

Tips on proper bolus technique, cancelling a bolus

Diasend[®] setup, downloads and reports

Importance of a back-up plan (per HCP guidelines) and supplies

REMINDER TIPS

Infusion set trouble shooting/changing cartridge

- Importance of confirmation screens, placement of decimal points
- Importance of verification of accurate current pump settings
- Alerts/Alarms Occlusion, Auto Off, setting Max Bolus

PATIENT CONSENT STATEMENT

You are giving your consent that we are able to contact you in relation to our products and services, at any time, unless you advise otherwise and choose to withdraw your consent. You may withdraw your consent in writing or verbally; through contact with our Customer Service team on $0800\ 012\ 1560$, or through contact with any one of our colleagues. Please note we will only use your contact details for the express purpose of contacting you to discuss the t:slim X2[°] Insulin Pump and related services. We will not share any of your details with any other third party without your consent.

For more information on privacy, and how we process personal data please visit https://www.airliquidehealthcare.co.uk/privacy-notice.

NAME:		DATE:
SIGNATURE	EMAIL:	

Homework

- 1. Download the pump before the next session
- 2. Arrange time for the next session
- 3. Change Display settings Screen Timeout = 30 seconds

CONGRATULATIONS

You have completed all the education. These things will help you stay in control.

- 1. Download your pump every 2 weeks and review time in range, aiming for 70% or more
- 2. Download your pump prior to clinic or any other diabetes appointments
- 3. If you have made changes to your settings then make a note of them and the dates they were made
- 4. Make a list of questions from the events that have affected control and you need a solution for.



Glossary of Terms

Automated Insulin Delivery (Advanced hybrid closed loop) An insulin pump that automatically speeds up or slows down insulin delivery based on continuous glucose monitoring readings and trend arrows.

Background/basal insulin: is needed to keep blood glucose levels under control, and to allow the cells to take in glucose for energy. It is usually taken once or twice a day depending on the insulin, or delivered hourly from an insulin pump as a basal rate.

Blood glucose: the main sugar found in the blood and the body's source of energy.

Bolus: an amount of insulin taken to cover a rise in blood glucose from a meal or snack, and may also include a correction dose.

Continuous Glucose Monitoring (CGM): Glucose monitored continuously in the interstitial space, measured by an indwelling sensor.

Correction dose: The amount of insulin required to bring the blood glucose from a high level back to target and is determined by the insulin sensitivity/correction factor.

Dynamic glucose management(DynamicGM): Combining glucose and trend arrow information with proactive diabetes management strategies to maximise time in range.

HBA1c: a test that measures your average blood glucose level over the last 2-3 months. Also called Haemoglobin A1C.

Hyperglycaemia: higher than normal blood glucose. Fasting hyperglycaemia is blood glucose above a desirable level after not eating for at least 8 hours. Postprandial hyperglycaemia is blood glucose above a desirable level 1 to 2 hours after eating.

Hypoglycaemia: also called low blood glucose, a condition that occurs when one's blood glucose is lower than normal. Signs include hunger, nervousness, shakiness, perspiration, dizziness or light-headedness, sleepiness, and confusion. If left untreated, hypoglycaemia may lead to unconsciousness.

Interstitial space: The space between the cells of the fat tissues where the indwelling sensor measures the glucose level.

Insulin to carbohydrate ratio: A ratio that specifies the number of grams of carbohydrate covered by each 1 unit of rapid- or short-acting insulin.

Insulin sensitivity/correction factor: refers to the number of mmol/l 1 unit of rapid acting insulin lowers your blood glucose.