



Workshop 4

Making the complex simple

Goal of workshop

Insulin commencement – making the complex simple

Ensure participants are confident with

★ **Selecting and using devices**

★ **Troubleshooting injection issues**

★ **Knowing what key information to impart
*when starting someone on insulin***

Patient point 2: Hypoglycaemia

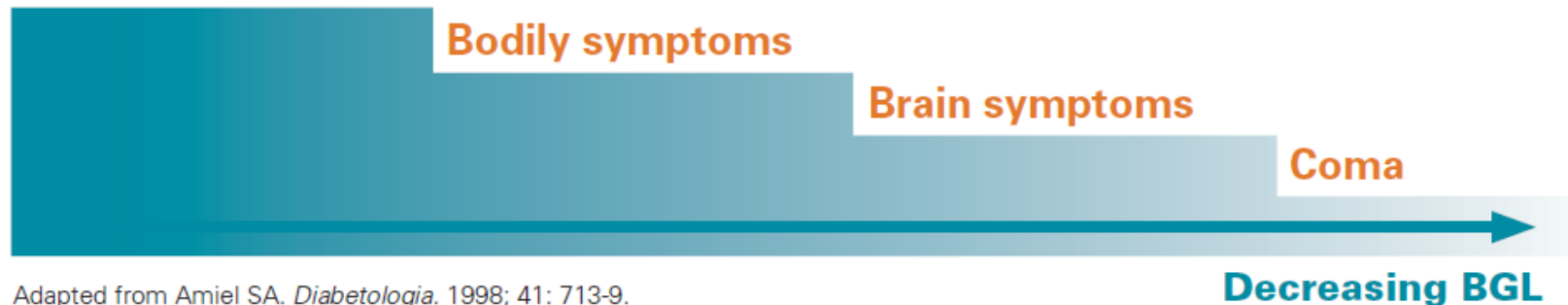
- ☆ What is it?
- ☆ How will it feel?
- ☆ Does it matter?
- ☆ How is it treated?
- ☆ Physiology

Patient point 2: Hypoglycaemia

- ☆ When BGL falls low enough to cause symptoms
- ☆ Usually defined as < 4 mmol/L (people develop symptoms at different levels)

Body and brain reactions as BGL decreases

Hormones activated



Adapted from Amiel SA. *Diabetologia*. 1998; 41: 713-9.

Patient point 2: Hypoglycaemia

Caused by the body's initial reaction
(trying to increase BGL)



Irritability

Anxiety

Hunger/ feeling sick

Paleness

Shakiness

Heart pounding

Sweating

Numbness – fingers, lips, toes

From the brain



Inability to concentrate

Weakness, dizziness

Headache

Confusion

Blurred or double vision

Odd behaviour

Slurred speech

Lack of coordination/ unsteady

Lapses in consciousness

Convulsions

Causes of Hypoglycaemia .

- ❖ Taking too much Insulin, timing too early before eating, or double dose.
- ❖ Unexpected exercise ,running for Bus ,mowing lawn ,playing soccer ,walking dog ,moving house ,chopping wood etc Don't forget Bedroom activity!!!!
- ❖ Not enough Carbs in meals ,i.e having one piece of toast for breakfast when usually has 4 Weetbix.
- ❖ Missing a meal or instead of lunch at 1 pm left until 3 pm
- ❖ Alcoholic beverages on empty stomach
- ❖ Delayed hypos !!!Exercise!!!
- ❖ Poor Injection technique?? Injecting in muscle instead of subcut tissue
- ❖ Taking wrong Insulin,!!!!

Patient point 2: Hypoglycaemia treatment



1. 15g fast acting carbohydrate

- Preferably glucose-based cool drink
- Normal Coca Cola, fizzy drinks ,Powerade 200 mls
- Jelly beans (6-7)
- Glucose tablets

2. 15g slow acting carbohydrate

- Healthy snacks such as a piece of fruit, slice of bread, two plain biscuits
- Test BS again in about 15 mins

3. Glucose is always the best choice...

- Why?
 - Acarbose slows down absorption of Starch /carbs therefore needs dextrose or Glucose itself to treat Hypos
- Fast action**

Patient point 3: Blood Glucose Testing

★ Why?

★ Safety

★ Titration of dose

★ Patient education



Relationship Between HbA1c and BGL's

$$\text{Av BGL} = (2 \times \text{A1c}) - 6$$

<u>HbA1c (Current DCCT aligned units %)</u>	<u>Average BGL</u>	<u>New Units (mmol/mol)</u>
6.0	6.0	42
6.5	7.0	48
7.0	8.0	53
7.5	9.0	59
8.0	10.0	64
8.5	11.0	69
9.0	13	75

To work out Hba1c in % to mmol/mol:

 Hba1c of 8% = 8 - 2 = **6** - 2 = **4** SO its **64 mmol/mol**

Patient point 3: Blood Glucose Testing

★ When?

- ★ Depends on insulin type and purpose

- ★ Aim to capture peak and duration of insulin dose

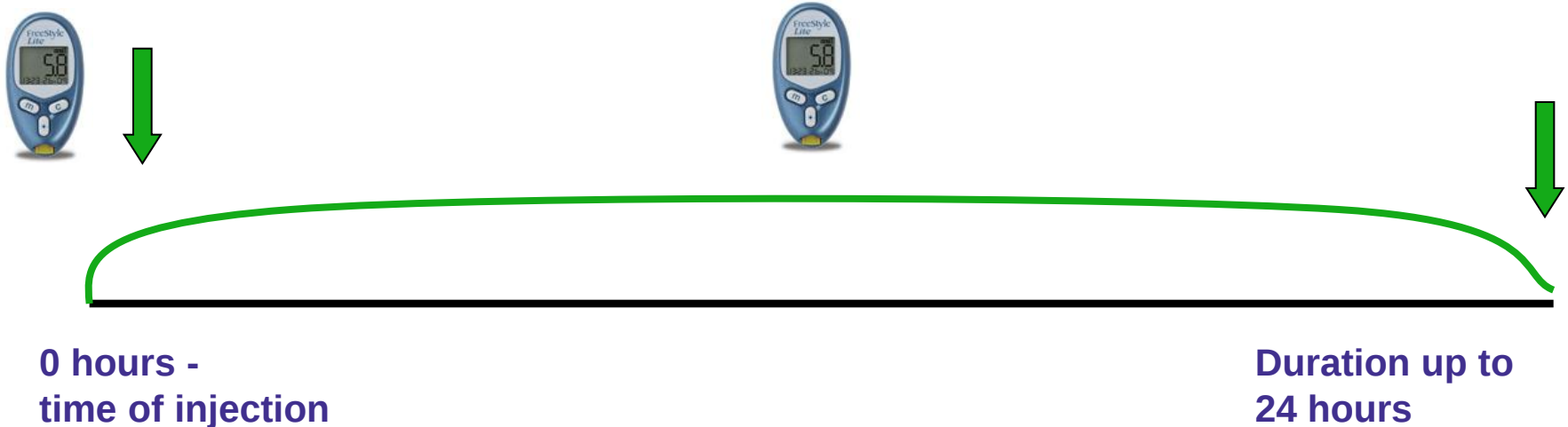
- ★ Value of fasting BG and post prandial BG

Patient point 3: Blood Glucose Testing

When?

For example

☆ Patient commencing insulin glargine in the evening



Patient point 5: Insulin doses in T2D

- ☆ Requirements depend on insulin resistance and deficiency
- ☆ Duration of DM will affect remaining beta cell function
- ☆ Maximum dose of insulin is when you are having hypos consistently at the same time of day

Patient point 5: Insulin doses in T2D

When might changes need to be made?

- ☆ **BGLs low overnight**
- ☆ **BGLs consistently > 15 mmol/L**
- ☆ **Illness with glucose excursions**
- ☆ **Prescribed steroids or some other medications that are known to affect BGLs**
- ☆ **When HbA1c target is not achieved**

When to test ????

[illegible]

Patient point 6: Storage

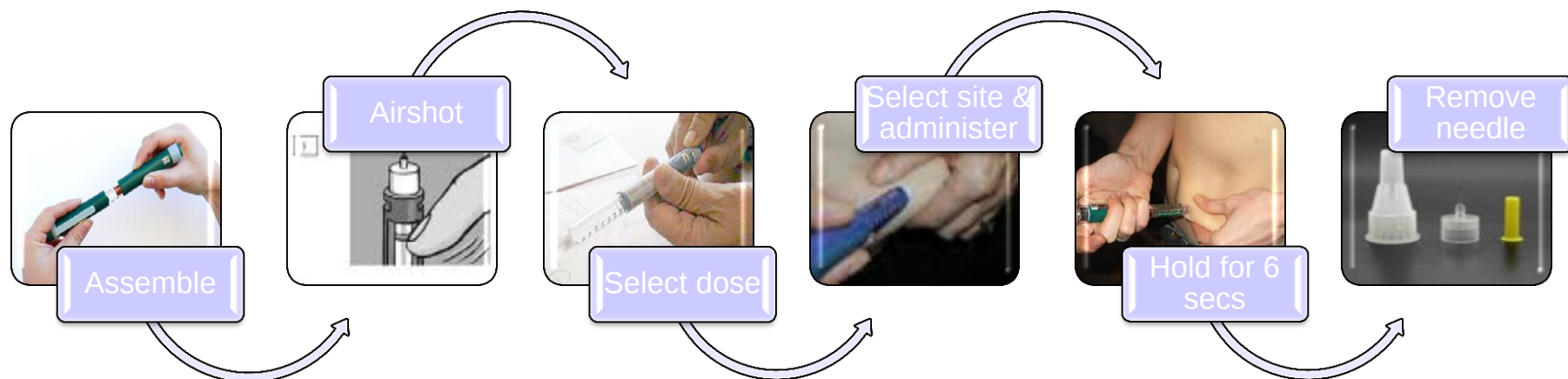


☆ **“Spare insulin”
in fridge**

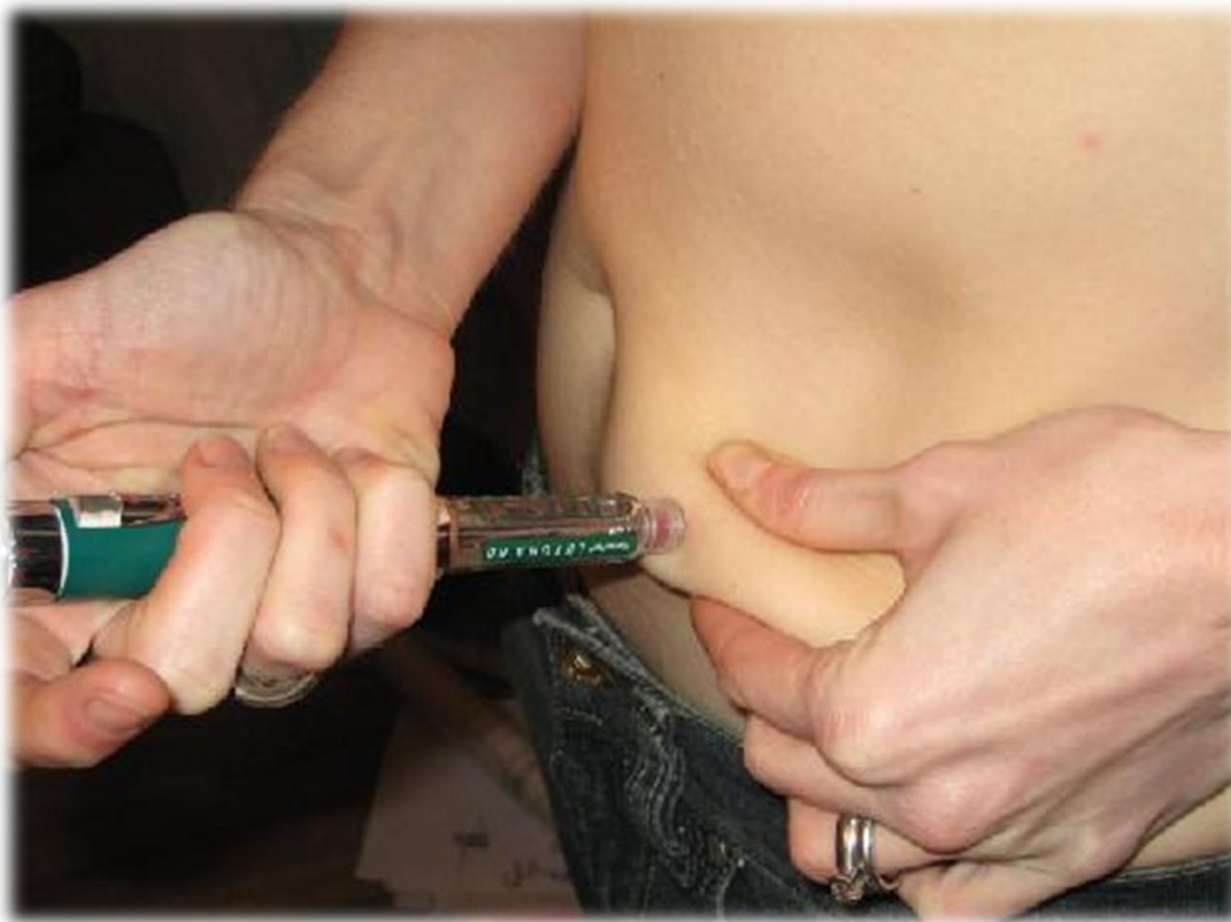
☆ **Preferably kept in its
original packaging**

☆ **“In use insulin”
< 30° C for 28 days**

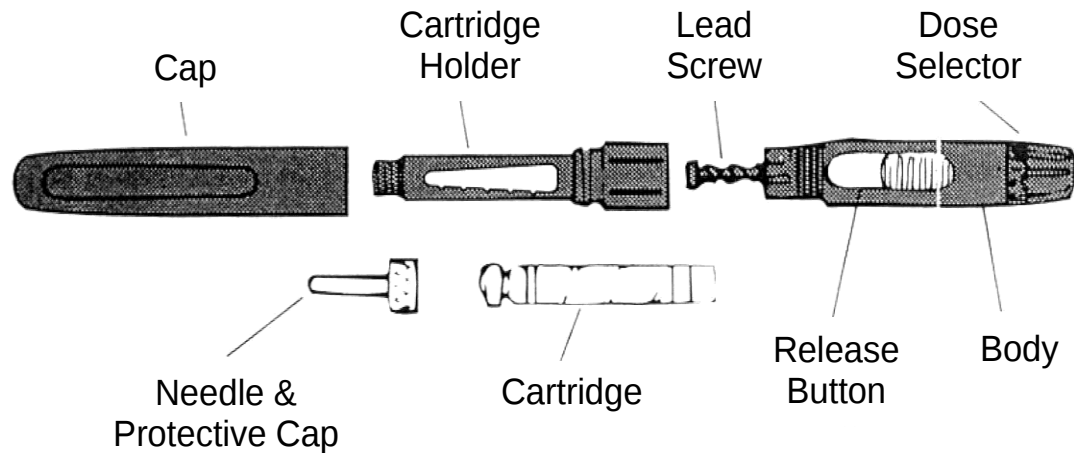
Patient point 7: Device instruction



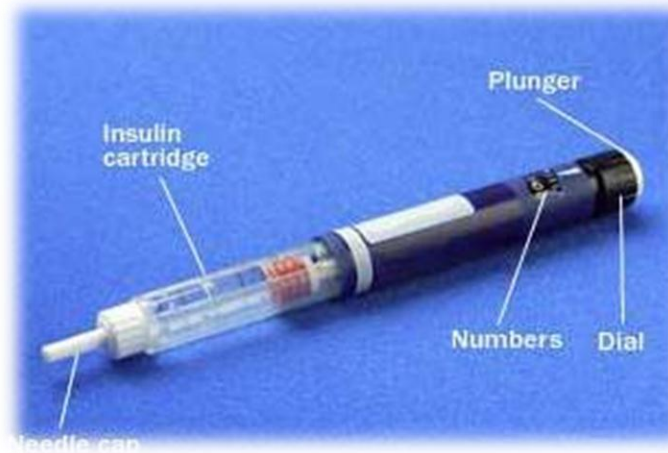
Let's have a go



Reusable insulin pens



Disposable insulin pens



Some of the current injection devices

Prefilled insulin pens



Reusable devices for use with cartridges



Patient point 7: Device instruction

Checklist

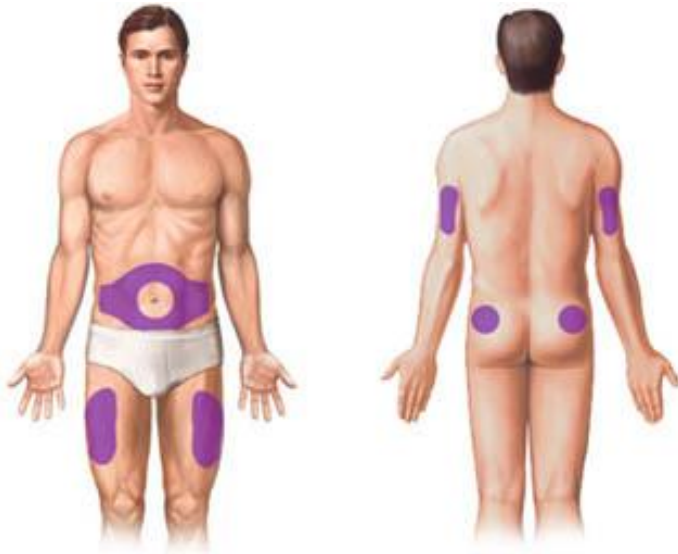
☆ **Technical skills**

- ☆ **Written support materials**
- ☆ **Demonstration of accurate dose dialling**
- ☆ **Demonstration of device use/safety**
- ☆ **Documentation**

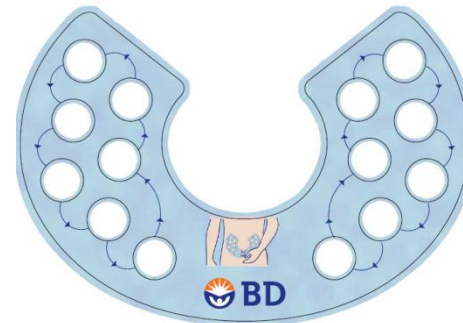
☆ **Support**

- ☆ **Carer**
- ☆ **Domiciliary services**

Patient point 8: Injection sites



- ☆ **Abdo - fast**
- ☆ **Thighs - slow**
- ☆ **Buttocks - slow to medium**
- ☆ **Arms- medium (if placed correctly!!!)**



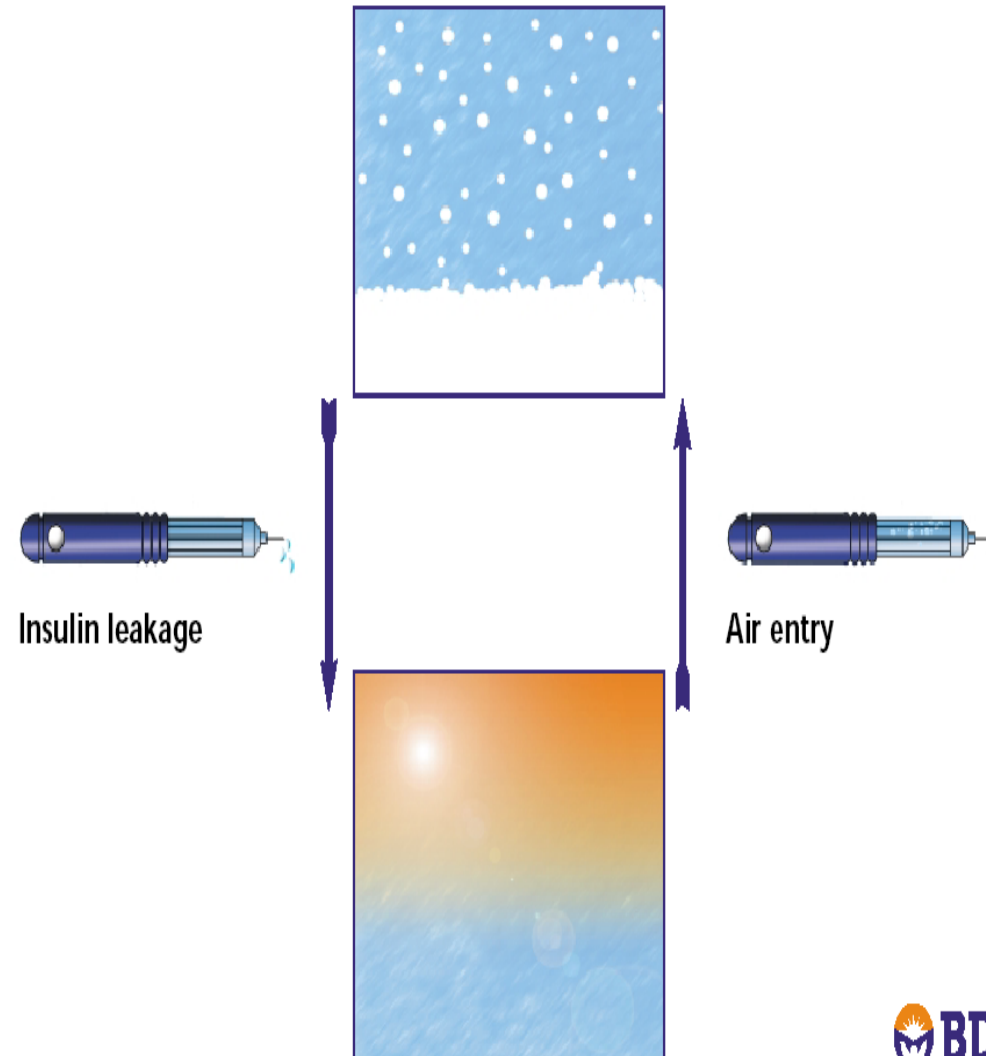
Needle reuse and dosage accuracy

Insulin leakage

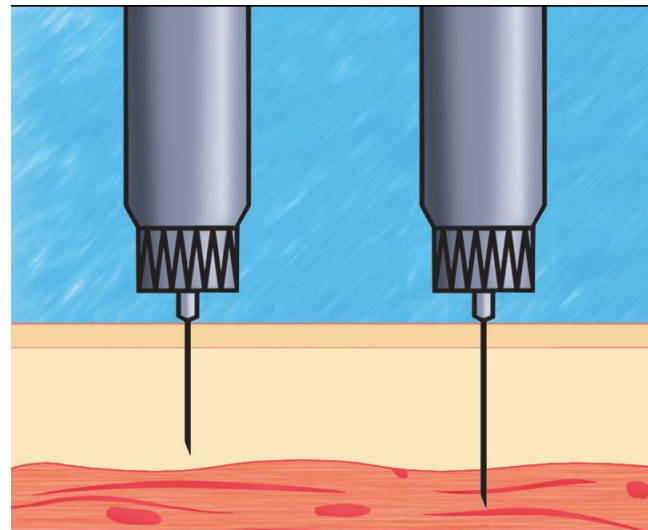
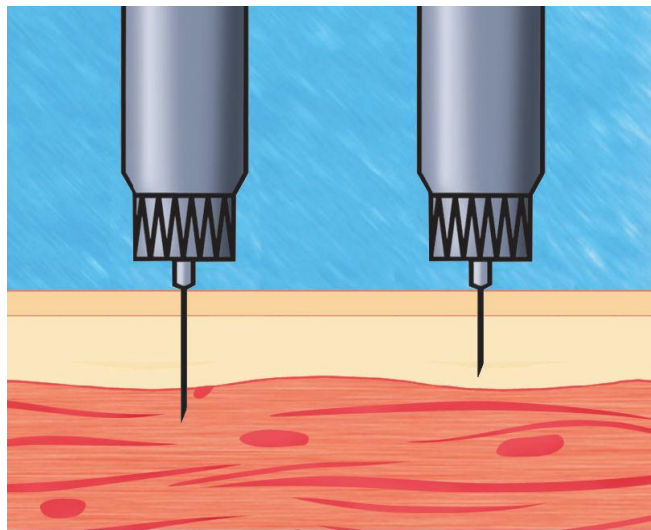
Air entry

EFFECT OF CHANGES IN TEMPERATURE

- ☆ Needle reuse and dosage accuracy
- ☆ Insulin contained in pen cartridges is exposed to temperature changes when insulin pens are carried around. Keeping the needle on the insulin pen between injections leaves an open passage to the insulin, allowing insulin to leak out of the cartridge and/or air to be drawn in through a mechanism related to temperature changes.



Patient point 9: Pen needles

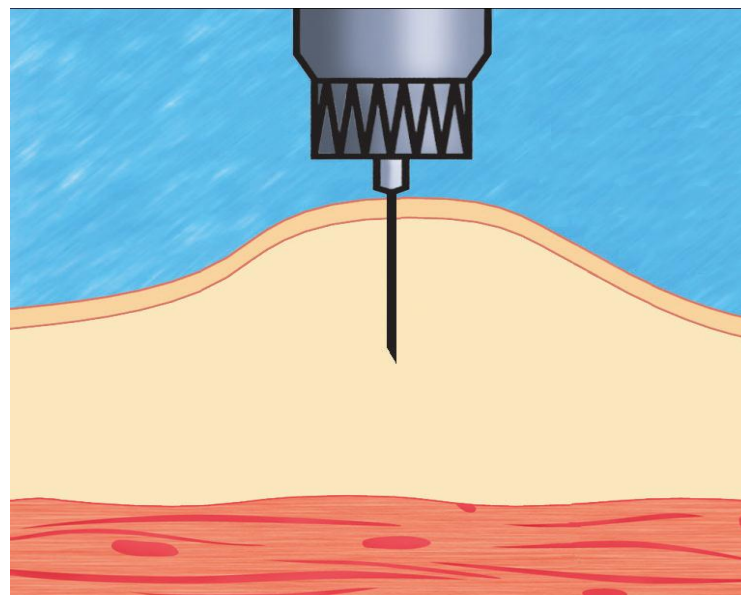
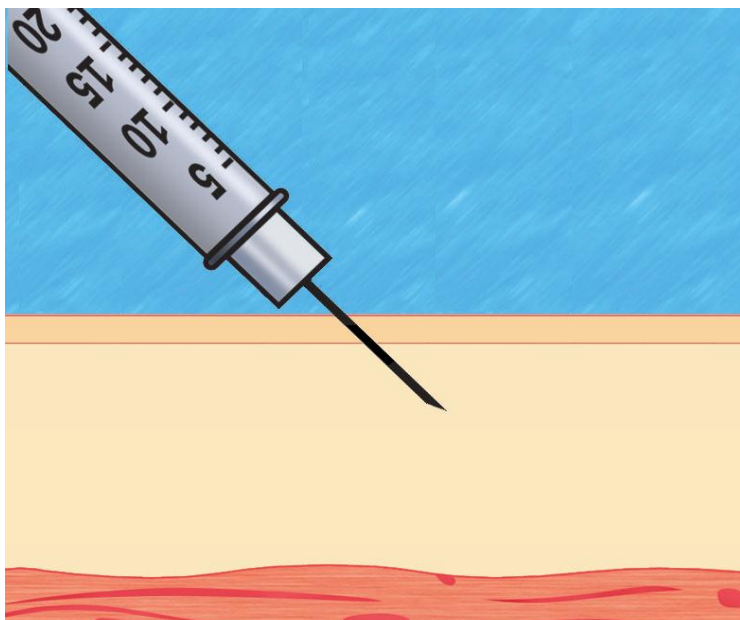


★ **4-5 mm**

- ★ **Children**
- ★ **Adults**
- ★ **No pinch technique**

Patient point 9: Pen needles

Angle of Insertion:



Needle Reuse and injection pain

- ☆ In order to significantly reduce the discomfort of the injection, thinner, shorter and sharper insulin needles have been developed. Repeated use however can impact the performance and safety of the needle by:
- ☆ → Removing the lubricant primarily responsible for painless or near painless injections
- ☆ → Damaging the needle tip, from mild bending to hook-like distortion of the entire tip
- ☆ *Photographs showing the type of damage that can occur with needle reuse:**



New needle at x370 magnification



Reused needle at x370 magnification

- ☆ Both loss of lubricant and tip damage will result in pain and discomfort during the injection.

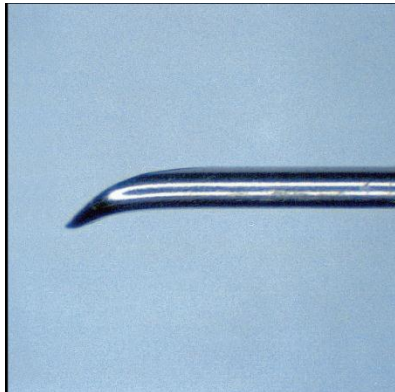
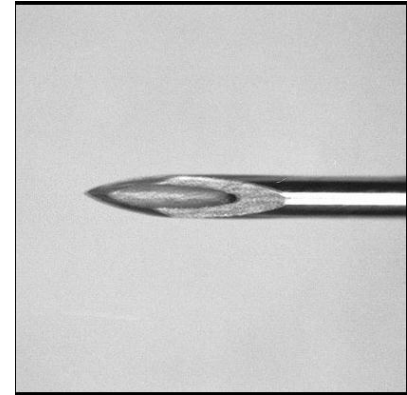
*Photographs from Dieter Look and Kenneth Strauss study: "Nadeln mehrfach verwenden?" Diabetes Journal 1998, 10:S. 31-34

Patient point 9: Pen needles

Pen Needles:

☆ **Needles should never be reused**

☆ **100 needles for 3 months**



After 2nd Use

☆ **First use: Lubricant removed**

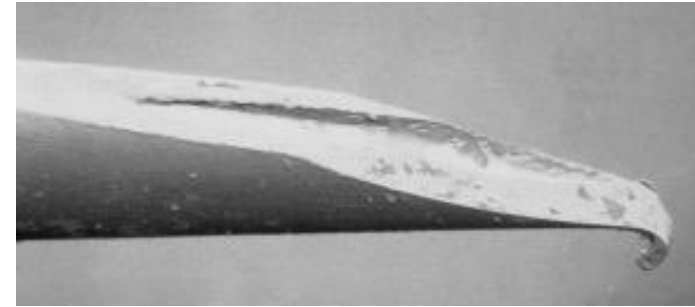
☆ **Needle hooking second time**

☆ **After 6 uses~**

☆ **fishing anyone?**

Needle reuse and lipodystrophy

- ☆ With reuse, the needle tip can bend into the shape of a hook causing bleeding, bruising and laceration at injection sites. There is increasing evidence that this micro-trauma is involved in the development of lumpy nodules also called “lipodystrophy”.
- ☆ Injecting into lipodystrophy can affect the absorption of your insulin and lead to
- ☆ erratic glycaemic control.



Lower abdomen



• *Flanks*



Patient point 10: Sharps

Community Sharps Disposal



☆ **Lancets, pen needles and syringes – must be secured in strong plastic container**

To Locate your local sharps disposal facility call Diabetes New Zealand or your local council or see www.diabetes.org.nz at 623 Valley Road Mount Eden

CcCollect a Plastic container when its full with used needles you can take it back there with \$2 Donation to Diabetes Auckland ,they will dispose of it .

or Put used needle in an empty Plastic Janola/Bleach Bottle when full cellotape the lid and put in normal rubbish bin.

DIABETES CAN GET OUT OF CONTROL RAPIDLY DURING SICKNESS.

FLUIDS ARE LOST FROM THE BODY AND MUST BE REPLACED

WHAT TO DO?

1.	TEST YOUR BLOOD GLUCOSE 3-4 times daily	If your tests are continually higher than 15mmol/L then contact your doctor.
2.	Continue to take your usual diabetes tablets/insulin However do not take Metformin while you have vomiting or diarrhoea.	Your blood glucose may rise during illness so you will still need your diabetes tablets/insulin.
3.	Have plenty to DRINK	Dehydration can develop quickly especially if you are vomiting or have diarrhoea. Try and take one drink each hour. See questions on back page.
4.	Find the cause of the illness	Seek early treatment of any illness or injury as it can easily upset diabetes control.
5.	CONTACT the Doctor, Practice Nurse, or the Diabetes Team	If you have any of the following:- - Vomiting or diarrhoea - Blood glucose levels continually above 15mmol/L - Infection or fever.
6.	CONTACT FAMILY or friends	Family and friends can lend support and practical help with food and shopping.

NOTE:

It is sensible to have a small store of tinned and packet foods for emergencies.
This is especially important if you live alone.

DON'T FORGET

- Continue your usual diabetes tablet(s)/insulin, but remember **NOT** to take Metformin if you cannot eat, are vomiting or have diarrhoea.
- **DRINK** at least 1 glass of fluid every hour especially if you have diarrhoea or fever or are vomiting.
- Replace food with drinks or soft foods. (see back page)
- Contact your doctor, practice nurse or the Diabetes team for further help.

Sick Day advice for people with Type 2 Diabetes

Illness such as colds, flu, infections, vomiting or diarrhoea may create special problems for people with diabetes as illness tends to worsen diabetes control.

When you feel sick you may not feel like worrying about your diabetes, but, this is just the time to take special care to prevent more serious problems developing.

WHAT TO EAT WHEN YOU DON'T FEEL LIKE EATING

1. DRINK FLUIDS FREQUENTLY

Sip one glass (200ml) every 1 – 2 hours

If your blood glucose level is less than 8:

Fruit juice – fresh, canned or in cartons

(Not Just Juice)

Fizzy drinks – containing sugar. Best if left to go flat, e.g. ginger ale, lemonade, coke, tonic water

If your blood glucose level is higher than 8: **Diet drinks (i.e. water, soda water, or mineral water) are suitable.**

2. IF YOU HAVE DIARRHOEA, be sure to use:

- (i) **Oxo cubes, or Beef stock, Chicken cubes or stock, or Vegemite/Marmite or bovril as a drink.**
- (ii) **Commercial packet or tinned soup these are all good with dry toast or bread.**

3. If you have a sore mouth, or cannot chew usual foods try:

Egg flip – 1 cup milk, 1 egg, sweetner to taste, vanilla

Custard – 1 cup milk, 1T custard powder, sweetener.

Fruit Yoghurt – or junket

Milk, with Milo if liked

& Biscuits – crackers, crispbread, litebread

Ice cream – 1 scoop

Ordinary Jelly – ½ cup

Sick day management guidelines – Type 2

Patient education points:

☆ Contact Diabetes Nurse if:

- BGL > 15 mmol/L for more than 24h or BGL rises despite 2 extra insulin doses

Go to Hospital if :

- Feeling drowsy, confused, difficulty breathing, severe abdominal pain
- Persistent vomiting, esp if frequent for more than 2-4 hours
- Hypoglycaemia is severe or BGL can't be kept > 4 mmol/L
- Too unwell

☆ Make a sick day management kit including sick day action plan

MOH Free get Checked

**IF YOU HAVE DIABETES MAKE AN APPOINTMENT WITH
YOUR DOCTOR OR YOUR NURSE**

FOR YOUR FREE CHECK.

THEY WILL CHECK:

- your weight
- your feet
- your general health
- your blood pressure
- your plan to stay well
- that your blood and urine tests are up-to-date
- that your eye checks are up-to-date



TIPS FOR STAYING HEALTHY

- Eat healthy food
- Keep physically active
- Have regular health checks
- Check your feet regularly
- Eat at regular times
- Stay a healthy weight
- Be smokefree



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Key information for patients to know

- ☆ Starting doses are always low doses and will need to be increased
- ☆ Dose will be as much insulin as is needed to control BGL's adequately, there is no maximum dose
- ☆ Some people notice a temporary visual disturbance
- ☆ BGL's within target range give better organ protection and longevity of life – BG vs A1c (UKPDS)
- ☆ We will assist you to get the correct dose/s for your own BG control
- ☆ Adjusting insulin doses comes with practice
- ☆ Titrating can be done by phone ,fax or e-mails.
- ☆ There is always someone there to help you

Key practice points

- 1. Refer to dietitian to help patients understand 'food'**
- 2. Choose insulin to match patient's lifestyle**
- 3. Suit device to patient**
- 4. Create expectation that dose will increase**
- 5. Constantly review...**