

New Zealand Addison's Network

www.addisons.org.nz

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Guidelines for Intra-Muscular Injection of Hydrocortisone (Solu-Cortef) version 3*

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*Section 3b now correctly states that the cost of Solu-Cortef for an Addisonian's emergency injection kit is not covered by Pharmac. That is the only change from Version 2.

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1. It is important to keep Solu-Cortef injection kits on hand, and to know how to use them

When individuals with Addison's disease become deficient in cortisol [= hydrocortisone], injection of hydrocortisone ["Solu-Cortef" in New Zealand] is imperative, to prevent progression to life-threatening Addison's Crisis.

An Addison's crisis is a state where a person becomes very deficient in cortisol (and fludrocortisone) and may collapse with low blood pressure, weakness, dizziness, nausea on some occasions, and, if severe, progress into a semiconscious or unconscious state.

Having a Solu-Cortef injection kit at hand, and being confident about how to use it, is empowering for an individual with Addison's disease. It reduces your vulnerability, and may save your life.

Injecting hydrocortisone yourself into a muscle (usually the mid outer thigh), or having a companion do it, cannot do harm. The injection starts to work within minutes, giving high blood levels of cortisol in about half an hour. It stabilises your condition while you wait for appropriate medical help.

Addisonians low on cortisol do not think clearly, tend not to take action, and are not good advocates for themselves. It's important to understand that matters won't improve on their own, and may deteriorate rapidly. It is wise to err on the side of caution – inject hydrocortisone when you suspect there is a deteriorating situation – don't wait to see how bad it can get! An injection that may possibly not have been needed, can do no harm.

You might carry injectable hydrocortisone for many years, and not need it. But if crunch time comes, two things are certain:

- You won't be thinking at your sharpest.
- You or someone with you may be faced with doing an intra-muscular injection for the first time.

The likelihood that you or a companion or family member will proceed without delay, to give you what could be a life-saving injection of hydrocortisone, depends in large part on the clarity and completeness of the written instructions you carry with the injection materials.

Note:

- In an emergency, even in your familiar home territory, there may be delays before you can get appropriate medical help. In unfamiliar territory, self-labelling (Medic-Alert bracelet) and doctors' letters hopefully speak for you, but ambulance staff, triage nurses, and emergency medical personnel may not at first recognize the severity of your condition, and may not get you a hydrocortisone injection with the urgency you need.
- Ambulance officers don't carry injectable hydrocortisone. They are, however, expected to use a person's own medication if the underlying problem and rationale is explained to them. If in doubt, they can call their designated medical authority to get direction. In big cities that should take less than 10 minutes, but in smaller places that might take longer. It is much simpler to do it yourself!

2. When to give an injection? - These circumstances can be emergencies for a person with Addison's disease

Common emergencies which are a signal for Solu-Cortef injection include:

1. Vomiting and/or diarrhea as the result of catching 'a bug going around', or food poisoning. Usually, if you have vomited more than once, have an injection!
2. Progression of flu or other illness, especially involving fever.
3. Serious accident.
4. Significant blood loss.
5. Unexpected trauma undergoing a medical or dental procedure, but no extra hydrocortisone or prednisone tablets taken beforehand.

Individuals whose dosages of hydrocortisone or prednisone have recently been reduced, or whose daily dosage is in the lower part of the typical range, may be more susceptible.

3. How to obtain a Solu-Cortef injection kit

a) The key components of an injection kit are

- **injectible hydrocortisone** [Solu-Cortef * 100mg]
- **disposable syringe to hold 2ml of solution** [3ml or 5ml capacity],
- **needles suitable for intra-muscular injection** [the minimum is one 1-inch 23G, or 1½ inch 22G for a large person - see (e) below]
- **cotton wool or gauze**— for applying gentle pressure to the injection site afterwards to stem bleeding.

The following are optional:

- **sterile alcohol swab,**
- **a sticking plaster.**

Plus - the instructions on the summary page (page 8), personalized for you!

* The usual steroid in New Zealand is Solu-Cortef (hydrocortisone sodium succinate) 100mg supplied in a two-compartment mix-o-vial which contains 2ml of liquid.

We recommend that you confirm with your doctor or practice nurse the best needle gauge and length for your body build, and the best injection site(s) – and write this into your instructions in the box on the summary back page, preferably adding a sketch where "X marks the spot"! For an adult, **it is usual to give the whole dose (2ml)**. If less is recommended for you, write it in!

b). Who prescribes Solu-Cortef?

You need a prescription, from either your GP or your endocrinologist. The drug charge is not covered by Pharmac. The cost per vial is about \$13 - varies between pharmacies. [It's a bit confusing, because Solu-Cortef obtained by a GP on a PSO form is fully subsidised.]

It's best to have an expiry date at least one year away, preferably two years or more. We suggest you state that preference to the pharmacist when you hand in your prescription.

To minimize risk of confusion, the prescription should state the brand name (Solu-Cortef). As with all pharmaceuticals, check that you receive the right product. [There have been cases overseas of people receiving from their pharmacy by mistake, hydrocortisone acetate, which is a slow acting product used for treating conditions such as arthritis, and not suitable for treating or preventing an Addison's Crisis.]

c). How to get syringes and needles:

Syringes and needles don't come with the pack of Solu-Cortef obtained on prescription in New Zealand. Some pharmacies do supply syringes and needles, but most people get them from their GP, or their hospital endocrinology clinic. Syringes and needles usually come separately.

d). What size of syringe is best?

A 5ml syringe works well, and is less fiddly for most people to use than a 3ml syringe. But a 3ml syringe is also OK. Avoid a 2ml syringe if possible, which would be almost completely filled by the liquid, and therefore more difficult to handle.

e). What needles are best?**Needle gauge (hole size)**

The size of the hole in a syringe needle is described by the term "gauge". The sizing system may seem "reverse logic": the *bigger* the G (gauge) number, the *smaller* the hole. Most (but not all) brands have the same hub colour coding for each gauge size.

The usual needles for intra-muscular injection are one inch long, with a hole size 0.5mm (25 G, orange hub) or 0.6mm (23 G, blue hub). 22G (black hub, 0.7mm hole) is OK too, if you don't have a choice.

The same needle can be used to fill the syringe, and to give the injection. However, pushing it through the rubber stopper blunts it a bit, which means it needs a bit more force when it goes through the skin, and may hurt a little bit more.

That's why some nurses prefer to use two needles. One is to draw the solution into the syringe. The other is for injecting into the muscle. These two needles can both be the same size. But it is convenient to fill the syringe using a needle with a bigger hole, 20G (= 0.9mm hole, usually yellow hub – easy to remember, yellow hub and yellow plastic top on the vial).

Needle length

For injection into the thigh or buttock muscles of an *adult of average build*, the usual needle length is 1 inch. This can safely be inserted up to the coloured plastic hub, without having to think about how far to put it in. *The ½ inch needle on disposable syringes used by diabetics is not suitable – it is designed to stop short of the muscle. Injecting into the fat under the skin is not dangerous for the Addisonian – rather, the hydrocortisone won't be absorbed into the body very effectively, so the benefit of the injection will be much less. Needles that are 5/8 inches long are also unsuitable.*

For a big person who has a lot of fat under the skin, a 1½ inch needle may be needed to get the medication into the muscle, and not just into the subcutaneous tissue.

4. Storing and maintaining your injection kits

We recommend you keep one kit in your home, and have another one that you take with you, when you travel away from your home patch.

If you are traveling away from doctors who know you, especially overseas, take two kits, and keep them with you, not in luggage you can't access.

Store the Solu-Cortef and syringe and needles (and alcohol wipe, gauze and plaster) in a container that protects them from damage that could break the sterility. We also suggest that you put a copy of page 8 of this booklet inside too, and keep this booklet near the kit you keep at home.

Write the expiry date of the Solu-Cortef on the front of the package so you can easily check it - and keep a record of it somewhere (in your diary?) so that you will replace the Solu-Cortef before it expires. Check the expiry before you take off on holiday!

Solu-Cortef is best stored at room temperature, 20-25 C. It shouldn't be kept at higher temperatures for long periods – if you leave a kit in the car, put it in an insulated container so it won't bake. It is fine stored at lower temperatures (eg the butter compartment of the fridge, at warmest setting). But it should be warmed up before use, eg by rubbing between the hands, so that the powder will dissolve faster, and because cold injections hurt more.

Ambulance officers called to a home usually have a scout around looking for medications or lists of medications, if there isn't someone there able to show them. This usually starts in the kitchen, so on the fridge is a good place to leave details of the meds you take, and where the Solu-Cortef kit is.

When you replace your Solu-Cortef because your current packs are about to time-expire, is a good opportunity for you (and your family and friends) to read through and remind yourself how to give an injection. Dissolve the old Solu-Cortef, suck the liquid into the syringe, and inject it into an orange!

5. Giving the Injection - Tips and frequently asked questions

a). Tip for easily mixing the liquid and powder

The instructions on the package say to press down on the plastic top of the bottle to force the liquid (in top) to mix with powder (in bottom compartment). This needs quite a bit of thumb pressure! It is easier to turn the bottle upside down, stand it on a hard surface [such as a table] with one hand, and give the glass bottom a thump with the other hand – and then invert the bottle right way up again. Shake gently to mix, and wait about a minute for air bubbles to disappear. The solution should be clear, not cloudy.

b). Tip for easy opening of the syringe and needle packaging.

It's quicker and easier to push the syringe tip and needle hubs through the paper backing, rather than trying to peel paper and plastic apart from the end.

c). Remember safety with needles.

Put the cap on used needles before removing them from the syringe – and put them in an opaque "sharps container", for safe disposal.

d) Does it matter to inject some air?

There is no need to worry if some air is injected into the muscle. It is best to remove any large air bubbles, by tapping the filled syringe barrel, with needle pointing upwards – then push gently on plunger until a drop forms at the end of the needle.

e). Which injection site is best?

In most situations, the easiest and best site for most people is the **front outer thigh** (a few cm out from the imaginary midline, mid-way between knee and hip).

If the person is wearing tight jeans, for example, the upper outer buttock (gluteus muscle) may be more accessible; or the hip (side, just below hip bone). If the upper leg muscles are not accessible, the upper outer arm near the shoulder (deltoid muscle) can be used. Here it is best to bunch the muscle between thumb and index finger, and don't put the needle in the whole way, as there is not much fat in this area.

We recommend you talk with your doctor, practice nurse, or endocrine clinic nurse to confirm what is best for your situation – and write it in the box on Summary Page 8.

f). What about sterilizing the injection site?

It's common sense to have the injection site as clean as possible. At home, a bathroom wash-cloth is fine.

A sterile alcohol swab can be used too - start on the spot where the needle will go, and wipe the skin with an increasing circular motion. However wiping with a swab does not instantly sterilize the skin around the injection site. Strict attention to sterility is only important in a hospital setting where there are likely to be many bugs around.

If necessary, inject through clothing (eg, pantyhose, trousers) – that's better than not at all.

g). Will the injection hurt?

Most people who do a practice injection when they are well, are surprised to find that it doesn't hurt!.

Tip to minimise pain: put the needle fast through the skin, then inject slowly through the tissue (see m below)

The injection may hurt more if the liquid is cold – so warm the liquid in the bottle by rolling it between your hands, before drawing the liquid into the syringe.

h). Tip: Get plenty of muscle by bunching (pinching) the tissue around the injection site

Bunch (pinch) the tissue around the injection site by spreading fingers and thumb as wide as possible, and then closing them together. It is a useful thing to do with the other hand! The needle goes in at the peak.

Bunching is especially relevant if the person is thin or small, or if the upper arm muscle which has little fat around it is being used - in these circumstances one can also put the needle in just halfway, or at an angle between 45 and 90 degrees.

Bunching the muscle helps provide added reassurance that hitting bone is unlikely.

i) Tip - Insert the needle fast

The usual practice is to hold the syringe like a pencil or a dart (in your right hand, if you are right-handed), stab quickly and decisively at a 90 degree angle, and insert the needle all the way to the hub. Doing this fast makes it painless – the nerves don't have time to figure out anything is happening!

Once the needle is in, transfer the hand that was bunching the muscle to hold steady the hub of the needle which is now against the skin.

As said above, If necessary, inject through clothing (eg, pantyhose, trousers) – that's better than not at all.

j). Tip - Check for blood before injecting

Pull back slightly on the plunger to check for blood. It's very unlikely, but it is possible to hit a vein. If you see you have sucked up blood, withdraw the needle, and put pressure on the site for about a minute. Change the needle if you have a spare (it will be sharper), or use the same needle and re-inject nearby.

k). What if I hit bone??

It's very unlikely using the needles, sites, and procedure described. Even if one did hit bone, there is no danger or lasting damage – just pull back the syringe into the muscle before injecting, or pull it out and re-inject.

l). What if I hit nerves?

This is very unlikely using the injection sites described.

m) Inject the hydrocortisone

Take about 5-10 seconds for the 2ml volume. Choose your own pace, slow down if it hurts.

n). What if someone faints!

Just in case it happens! A person who faints (you or your partner!), should lie flat on the ground, and not be propped up in a chair.

o). After the injection – then what?

Withdraw the needle, and put the cap on it for safety reasons. Put pressure on the injection site for up to a minute with cotton wool or gauze (or any clean fabric) to stop any bleeding. If possible, drink plenty of fluids to replace those lost due to vomiting and/or diarrhoea.

Then, in most circumstances, even if you are feeling fine, it is best to seek medical help. The Solu-Cortef self-injection is not a replacement for medical care. You will benefit from medical monitoring, and you may need intravenous saline to stabilise your condition.

If you are not confident that you, or your partner, could inject Solu-Cortef in an emergency, we strongly recommend that you ask your doctor or practice nurse to supervise a dummy run with some sterile saline solution.

Practising self-injection got rave reviews at the Northern Regional Meeting in May 2003! (see NZAN Newsletter No.19 July-August 03 – and photo below of NZAN member Karen, and endocrine nurse specialist Karen Unwin)

We will continue self-injection training at NZAN Meetings when we have appropriate health professionals present.

As one of our members said – “I think the most important thing my husband and I learnt was that ‘emergency’ injection is a bit of a misnomer - the word emergency conjures up life and death, whereas now we would now be inclined to use the injection after I had vomited a couple of times or if I was vomiting and feeling like I was going downhill - definitely sooner rather than later.”



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To give an IM Injection of Hydrocortisone from a Solu-Cortef "Mix-o-Vial" bottle

1. DISLODGE INTERNAL STOPPER separating the liquid and powder compartments, by turning the bottle upside down on a table or similar surface, holding it with one hand, and firmly tapping the glass bottom with the other hand as a fist. [This is usually easier than pressing down on the top of the mix-o-vial, which is the instruction on the packet.]
2. TURN BOTTLE UPRIGHT, SHAKE GENTLY to dissolve powder, then WAIT UNTIL CLEAR AND BUBBLES DISPERSE, about 1 minute.
3. FLICK yellow TOP off bottle.
4. UNWRAP NEEDLE with biggest hole (20G = yellow hub), AND SYRINGE, by pushing through paper backing.
5. ATTACH NEEDLE to syringe, and remove cap.
6. PULL OUT PLUNGER of syringe to about the 2ml mark.
7. INSERT SYRINGE into bottle and push plunger down to insert air into bottle.
8. TURN bottle and syringe UPSIDE-DOWN, with end of needle in the solution.
9. PULL BACK (down) on plunger to LOAD ALL SOLUTION into the syringe.
10. WITHDRAW THE BOTTLE away from the syringe.
11. IF you have a second needle: CAP NEEDLE already on syringe, REMOVE it (put in sharps container). UNWRAP NEW NEEDLE with smaller hole (25G or 23G), PUT ONTO SYRINGE, and REMOVE CAP.
12. With needle pointing upwards, TAP SYRINGE to remove air bubbles. PUSH GENTLY on plunger until a drop forms.
13. [Put cap back on needle, put syringe down, and prepare the injection site.]
14. CLEAN THE INJECTION SITE: best choice is usually front outer THIGH (midway between knee and hip); other options are DELTOID (upper arm near shoulder); GLUTEUS (buttock, upper outer quarter)
15. BUNCH MUSCLE and INSERT NEEDLE (hold syringe like a dart, stab quickly 90 degree angle, insert all the way.)
16. PULL BACK on plunger slightly to check for blood. (It rarely happens, but if you see blood, withdraw needle and re-insert nearby.)
17. PUSH DOWN ON PLUNGER to deliver solution (for adults the full 2ml) – taking 5-10 seconds.
18. WITHDRAW needle, put PRESSURE on site for about 1 minute to stop bleeding.
19. SEEK MEDICAL HELP for further treatment. Appropriate fluid replacement is very important.

<i>Details for me: Syringe size:</i>	<i>Needle sizes:</i>	<i>Dosage per injection (if not 2ml):</i>
<i>Injection site(s):</i>		