Guidance for Stroke Services regarding the use of Intermittent Pneumatic Compression in stroke patients based on the results of the CLOTS 3 trial.

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The CLOTS 3 trial was a multicentre RCT testing the effect of applying Intermittent Pneumatic Compression (IPC). The results were published in the Lancet on 31st May 2013. The paper, and related media clips can be accessed at www.clotstrial.com by pressing the Results button.

In summary, the trial showed that IPC was feasible, safe and was associated with a 30% relative reduction in DVT (p<0.001) and, more importantly, a 14% improvement in overall survival to six months (p=0.042). Although low molecular weight heparin reduces the risk of DVT, it is associated with a greater risk of serious bleeding and NO improvement in survival or functional outcomes. Moreover, apart from stroke unit care, and decompressive hemicraniectomy, it is the only acute stroke treatment which has been shown to improve survival. It seems very likely that future editions of SIGN and RCPE stroke guidelines will recommend IPC for immobile stroke patients admitted to hospital.

Which patients should be treated?

Patients with acute ischaemic or haemorrhagic stroke who are:

1. for active treatment (i.e. not simply for palliation)
2. immobile (unable to walk independently to the toilet)
3. willing to wear compression sleeves
4. not suffering contraindications to IPC
   a. severe congestive heart failure
   b. severe skin problems on legs
   c. severe peripheral vascular disease
When and for how long?

IPC should be applied as soon as possible after admission and definitely within the first 3 days.

IPC should be taken off (whichever comes first)
- when the patient becomes independently mobile
- at discharge from hospital
- if the patient develops any adverse effects
- by 30 days

We do not recommend sending patients home or to nursing homes with equipment

What sort of IPC?

There are many different types of IPC (calf or thigh-length, single or sequential, asymmetric or circumferential, fixed or variable frequency, rapid or slow inflation). However, we can only be confident that the system used in the CLOTS 3 trial will be effective. The CLOTS 3 trial tested the Kendall SCD™ Express compression system for use in their stroke unit. This provides thigh-length, sequential, circumferential, slow inflation compression at a frequency determined by the venous refill time. This is available through a national contract in Scotland.

The system comprises a pump or controller, reusable tubing and single patient use compression sleeves. The supplier provides hospitals with the Controller and tubing free of charge but the sleeves need to be purchased. Covidien also provide staff training and maintenance of the devices. However, the devices need to be checked by the local medical physics department before use, and will require the annual PAT test for all electrical items

Which sleeves?

Only thigh-length sleeves were tested in CLOTS 3.

Two types of sleeve were used in CLOTS 3, the “Original” sleeves and the “Comfort” sleeves, the latter introduced to enhance patient adherence. Although
the differences were not huge, there was definite trend towards better adherence and effectiveness with the Comfort sleeve. Given the differences in cost are small, we would recommend purchasing the “Comfort” sleeve.

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<th>Comfort sleeves</th>
<th>Original sleeves</th>
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**Application**

The sleeves can be applied to patients’ bare legs, or over pyjama trousers or stockings. They should not be used in combination with graduated compression (TED) stockings which will increase the risk of skin problems and are not associated with any reduced risk of DVT.

The sleeves should be kept on for as much of the time as possible.

Day and night – but if patients are unable to adhere to this, intermittent use is probably better than none. If the patient is not willing to wear the sleeves on both legs, a single sleeve can be applied, most effectively to the weaker leg in which DVT is more likely to develop.

Patients can wear sleeves in bed, when sitting or standing, during physio or transfers. If taken off during physio or bathing they should be replaced as soon as possible. If they are accidentally left off for a day or two, there appears to be no risk in re-applying them.

Patients who are immobile may also be incontinent. The sleeves are low down on the thigh so patients who are incontinent should not require changing sleeves every morning because of urinary incontinence.
Monitoring its use

We would recommend that Intermittent Pneumatic compression is written on the patient’s medication chart, with three times ringed/ticked to remind nurses to check that it is applied each day. This will also allow monitoring/auditing of the use of IPC in the unit. This might be done as a local audit by adding a question regarding whether IPC was used, and the date started to the local SSCA data collection.

If a patient develops a DVT

It is unclear whether to take the sleeves off or not. If the patient finds them uncomfortable it is reasonable to remove them.

How many pumps and sleeves?

This will of course depend on the numbers of acute admissions, the proportion who are immobile and the duration of use. However, based on our experience in the CLOTS 3 trial about 50% of stroke patients are immobile on admission and they will use the IPC for about two weeks on average. Each patient might use two pairs of sleeves, allowing for replacement of soiled sleeves.

For example, a unit admitting a total of 350 stroke patients per year might need

10 Controllers
5 boxes of replacement tubing (to cover losses)

It is important that Controllers are used and charged regularly – therefore having too many might mean they don’t work! You may need to have a rota and shelving space allocated to ensure the pumps are used and charged. Of course the pumps will be charged when in use.

Covidien produce sleeves in four sizes, based on patient’s thigh circumference (at the level of the top of the sleeve). We would recommend ordering (boxes) in the following ratio in the first instance:

- Extra small (boxes of 5 pairs) - 1
- Small (boxes of 5 pairs) - 3
- Medium (boxes of 5 pairs) -3
- Large (boxes of 3 pairs) -1

How do we obtain the Kendall SCD Express devices and sleeves?
Contact your local Covidien sales representative who can organise supplies and training. See separate contact list