

Clinical Staff Guide To Forming New Buttonhole Tracks And Using The Xtra-Med Buttonhole Fistula Needle In Line With The British Renal Society / VASBI Clinical Practice Recommendations For Needling Of Arteriovenous Fistulae And Grafts For Haemodialysis

A: Staff and Patient Involvement

Track development should ideally involve one cannulator. If this is not feasible, up to 3 cannulators can be involved in developing tracks on an individual patient however communication systems (e.g. explanatory notes, diagrams, pictures and if possible patient involvement to oversee consistency) should be in place to ensure each cannulator implements the same technique, using the same angle and depth each time.

If the patient is to self-cannulate, which we encourage (for consistency as the patient is obviously there at every cannulation and has the benefit of an additional sense, that being feeling if the needle is entering in the correct direction) then he/she should be supported during the track development phase.

B: Timing of buttonhole track formation

Buttonhole track development should ideally occur with established arteriovenous fistulae only, to ensure the vein does not change over time. The period of time between first cannulation and established arteriovenous fistulae is not set and should be decided on an individual basis. Factors that can indicate an established arteriovenous fistula ready for track development include:

- i) The vein length, depth and diameter is not expected to mature and change rapidly.
- ii) There is adequate vein length to insert 2 needles at a reasonable distance apart – what this distance is will vary dependant on the fistula type, but further maturing of the vein to allow cannulation higher up the vein should not be expected at this stage. As a minimum, each needle should be 5cm apart and at least 5cm from the anastomosis.
- iii) Both needle sites adhere to the 'Rule of 6' (flow greater than 600mls/min, diameter of 0.6cm and no deeper than 0.6cm (32).
- iv) Ability to cannulate both sites without problem, allowing the needle to enter the vein in one uninterrupted movement.
- v) Both sites can be cannulated with the needle gauge required to provide the desired blood flow rate.

Please note that track development on the arterial and venous needle site can occur at different times, dependant on the maturity of each site.

C: Siting of new buttonhole tracks

Avoid dips, curves, aneurysms on the fistula and area with abnormal skin integrity.

If the patient is to self-cannulate, discuss sites that will be accessible to him/her.

Please note that if required, patients can have 3-4 active buttonhole sites at one time, to allow rotation of sites. This may be useful for patients who dialyse more than 3 times a week.

Ensure the buttonhole siting plan is clearly documented in the patients needling plan.

D: First cannulation to develop buttonhole tracks

This should be done by the cannulator (or one of the cannulators) who will be consistent in the track formation for this patient for the next 2-4 weeks, or the patient themselves.

Follow the good needling technique principles to: minimise damage to the AV access during needling, minimise complications from needling, minimise pain and anxiety related to needling.

- i) Prior to needle insertion, documentation of previous needling should be reviewed along with the documented buttonhole needling plan.
- ii) If needle insertion is not performed by the patient, prior to needle insertion, the 'needler' should discuss previous needling attempts with the patient. The decision on where and how to insert the needle should again be discussed with the patient and be in line with documented buttonhole needling plan.
- iii) Prior to needle insertion, a good assessment of the vessel should provide a clear idea of the depth and direction of the needle insertion which will result in the correct position of the needle in line with documented buttonhole needling plan.
- iv) Ensure the patient has washed their hands and fistula limb.
- v) Position the patient's arm in a position that can be easily recalled and replicated. Ask the patient to remember this position and ensure that is replicated during each subsequent cannulation.
- vi) Clean the cannulation sites using the disinfectant solution recommended by your hospital. Ensure you follow the manufacturer specific instructions for **contact and drying time** by timing your activity.
- vii) Position and activate the tourniquet in a manner that can be easily recalled and replicated. Ask the patient to remember this position and compression intensity and ensure that it is replicated during each subsequent cannulation.
- viii) Insert the pre-specified (correct gauge and length) fistula needle bevel up in an accurate, considered, gentle and continuous manner, minimising pain and discomfort for the patient. The needle insertion is a balance between prompt insertion of the needle and a gentle technique, so whilst insertion should not be rapid, it also should not be unnecessarily prolonged. The needle insertion should aim to finish with the tip of the needle in the centre of the AV access vessel.
- ix) Do not rotate the needle.
- x) Secure the needle in place ensuring that the needle position is not altered during this step.
- xi) Repeat steps i - x for the second site.

E:Subsequent 2-12 cannulations of tracks

These steps are critical to ensure the formation of one consistent collagen track and to avoid multiple false tracks being developed

Follow in exactly the same manner steps i – x in section D, paying particular attention to:

Replication of the position of the fistula limb, the tourniquet position and level of compression of the tourniquet.

The angle and direction of the needle being exactly the same as the previous cannulation.

Take note (visually and in the patient's records), how easily the sharp needle is entering the fistula.

If scabs are starting to develop at the cannulation site, these will need to be removed prior to cannulation and additional disinfection steps will need to be followed as below:

1. Clean the cannulation sites using the disinfectant solution recommended by your hospital. Ensure you follow the manufacturers specific instructions for **cleaning time** and **drying time**. This is essential to allow the cleaning solution to do its job properly. It is a good idea to time yourself during the cleaning step and also time the drying step to make sure you adhere to the instructions.
2. Remove the sterile scab pick from the first buttonhole needle cover by sliding it upwards.
3. Very carefully remove the scab from the first cannulation / buttonhole site by utilising the bevel of the pick to get underneath the edge of the scab and remove it in one piece. Avoid invasive digging or scraping of the buttonhole site to protect it from damage which could cause problems in the future.
4. Remove the sterile pick from the second needle and repeat step 3 on the second cannulation / buttonhole site.

5. Clean the cannulation / buttonhole sites for a second time, now that both scabs are removed using the disinfectant solution recommended by your hospital. Again, ensure you follow the manufacturer specific instructions for **cleaning time** and **drying time**. This is essential to allow the cleaning solution to do its job properly this second time too. It is a good idea to time yourself again during this second cleaning step and also time the drying step to make sure you adhere to the instructions.

At a point in time between between 6-12 cannulations, you should start to feel the sharp needle beginning to glide into place with less resistance. When this occurs, dull/blunt needles can be attempted.

F: Cannulation with a blunt needle should be conducted as follows:

Gently glide the needle into the buttonhole track, avoiding excessive force. The force applied during needling can be minimised by holding the tubing rather than the needle wings during needling. Whilst doing this, ask the patient for feedback to determine if the needle feels as it should when it is being glided in.

The external steel shaft of the needle should never be 'wetted' with sterile or non-sterile solutions prior to insertion, as this practice increases the risk of contamination leading to a potential infection.

Ensure that 1 - 2mm of the steel shaft of the needle is visible at the mouth of the buttonhole site to avoid hubbing (stretching of the mouth of the buttonhole by pushing the needle in too far up to the hub or neck of the needle).

Do not rotate the needle.

If gliding this first needle in is not successful, take a second new buttonhole needle and attempt to glide it into the track, it is important to avoid multiple attempts with the same needle as this could introduce infection into your buttonhole track.

Secure the needle in place ensuring that the needle position is not altered during this step.

If the track is not established and blunt needles are unable to be inserted after 12 sessions of sharp needle insertion, further assessment of the buttonhole sites should occur with consideration as to whether different sites need to be developed.

Difficult track development, especially with deep tracks with a lot of subcutaneous tissue, can be supported by insertion of polycarbonate pegs.

F: On going cannulation of the buttonhole sites

See separate guide entitled Clinical Staff Guide To Using The Xtra-Med Buttonhole Fistula Needle In Line With The British Renal Society Clinical Practice Recommendations For Buttonhole Cannulation