

# Clinical Practice Recommendations on Buttonhole Cannulation

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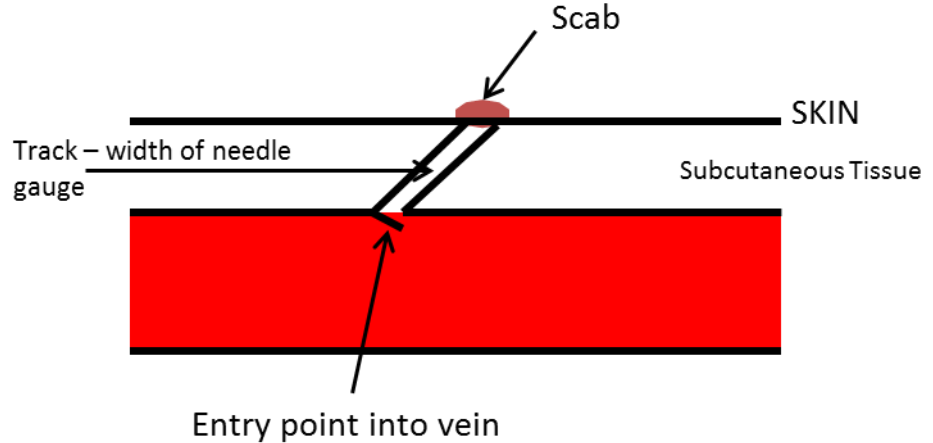


British Renal Society

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# What is Buttonhole Technique?

- Cannulate A-V Fistula vein in exactly the same place, each cannulation
  - Enter the skin through the same site
  - Enter the vein in same direction and depth
- Remove the scab prior to cannulation
- Track development phase
  - Develop a track of scar tissue and entry point on vein
  - Using sharp needle with same cannulator over number of sessions
- Once track developed, use blunt needles to cannulate



# Benefits of Buttonhole Cannulation

- Prolonging A-V fistula lifespan
  - Less stenosis formation
- Prevention and reduction of aneurysm development
- Reduction of infiltrations and haematoma formation
- Promotes self-cannulation
- Feasible on tortuous and short AVF veins
- ? Less painful
- ? Shorter bleeding times
  
- Higher infection risk
- More missed cannulations



# Background to the Recommendation Development

- Concerns related to higher infection risk with buttonhole technique
  - Case studies at conference
  - RA-BRS Patient Safety
  - Published experience
- Some units able to utilise without higher infection risk



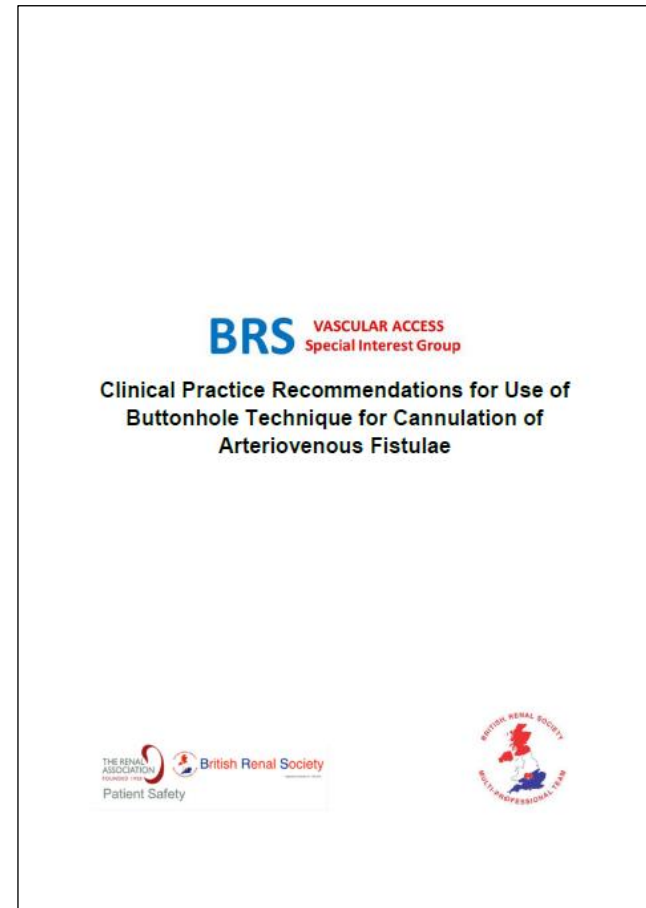
# Why the Contradiction?

- Surveyed renal units in UK
  - Small number of responses
  - All positive
  - Similar practices
- Meeting in Manchester – March 2015
  - Units who had success / persevered and over-come infection spikes
  - Decided to create recommendations
  - This group later became BRS VA SIG



# Clinical Practice Recommendations

- Collated between:
  - Evidence from research / expert opinion
  - Experience of units – success with BH / overcome challenges
- 10 units involved
- 6 sections
  - Key aspects of care
- Each section consists of:
  - Recommendations
  - Rationale for recommendations, with reference to evidence
  - Points for future consideration
    - Require clarification



# Contributors - Recommendations

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# A) Screening and Selection of Patients

- Screen for MRSA & MSSA
- Decolonise for MRSA
- Risk assess patients for use of buttonhole
  - Exclude patients with high infection risk
  - Screening tool from Royal Berkshire
- Points for clarification
  - Decolonise for MSSA?
  - What is decolonisation?
  - How many times should you decolonise?
  - What risk factors should be included in a risk assessment?



**Recommendation A: Screening and Selection of Patients to Undergo Buttonhole Cannulation**

- 1) All patient undergoing buttonhole cannulation should undergo screening for MRSA and MSSA including their arteriovenous fistula site, a minimum of every 3 months.
- 2) Decolonisation should occur for patients who are positive for MRSA.
- 3) Patients should be individually risk assessed by the renal team before undertaking buttonhole cannulation. The following factors should be considered as to whether buttonhole technique is safe to use or should be avoided:
  - i. MSSA and MRSA positive patients (until negative from decolonisation)
  - ii. Patients with mupirocin-resistant strains of *Staphylococcus Aureus*
  - iii. Patients with a history of reoccurring infections, particularly vascular access infections
  - iv. Patients with a prosthetic heart valve, pacemaker or history of endocarditis
  - v. Patients on immunosuppressive agents
  - vi. Patients with poor personal hygiene





# Further Developments

- Follow local decolonisation protocols
  - Renal patients are no different, except for repetitive nature
  - Need to be pragmatic to ensure patient adherence
- Compiling Risk Screening Tool
  - Identify patients more at risk of infection
- Exclusion includes clinical judgement

## Infection Risk Screening Tool

Criteria/checklist for use of buttonhole technique in AV fistulae

The following risk factors can help you determine whether this patient is suitable for buttonhole needling. However, the final decision should be based on clinical judgement and assessment of individual patients.

Patient Name	Date	Completed by:
Criteria present* (Please tick)	Yes	No
Metallic Heart Valve		
Pacemaker		
Previous MSSA / MRSA infection		
Previous endocarditis		
Significant structural valvular heart disease		
MSSA / MRSA / Mupirocin resistant MSSA		
Skin disorders causes itching / skin integrity issues around AVF		
Poor adherence to hygiene recommendations		
Clinical judgement (Other)		

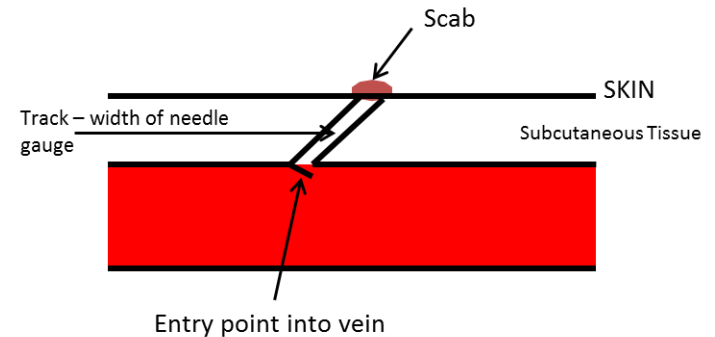
On the basis of the above this patient is / is not (delete as applicable) suitable for using buttonhole needling technique.

Based on Screening Tool produced by Reading Renal Unit



# B) Track Development and Cannulation

- Need single, good track to:
  - Perform BH Cannulation correctly
  - Minimise infections
- Track development is key part of the process
  - 1-3 'buddy' cannulators over max. 12 sessions on a mature AVF
- Need to maintain track once developed
  - Blunt needles
  - Consistent cannulation
- Communicate how to cannulate BH sites
  - Images, information, inform patient
- Points for Clarification
  - Why missed cannulations
  - What helps aid blunt needle cannulation



# C) Disinfection and Scab Removal

- Remove scab completely
  - Prevents bacteraemias
- Wash arm and hands with soap and water
  - ? Changing to Octenisin
- Disinfect before and after scab removal
- 0.5-2% chlorhexidene & 70% isopropyl alcohol to disinfect
  - Povidone Iodine or Octenilin if allergic
- Points for clarification
  - What is correct cleaning solution?
  - Should sites be soaked in disinfectant for 1-2 minutes?

- 1) All patients should wash their hands and fistula limb with soap and water prior to cannulation.
- 2) 0.5% - 2% chlorhexidine gluconate with 70% isopropyl alcohol should be used to clean the cannulation sites. If the patient is allergic to chlorhexidine, then Povidone Iodine solutions or Octenilin should be used to disinfect prior to cannulation.
- 3) The recommended contact and drying time for the disinfectant following cleaning, should always be strictly adhered to.
- 4) Cannulation sites should be disinfected immediately before and after scab removal.
- 5) Softening of scabs prior to removal is not recommended.
- 6) Sterile tweezers or sterile picks which are supplied with the dull/blunt needles or separately should be used to remove the scab.
- 7) To prevent infectious complications, the complete scab should be removed prior to cannulation of the buttonhole site.

## Rationale for Recommendation C

The first line of defence to prevent access infections is proper preparation of the sites prior to cannulation. With buttonhole technique the key points need to be good disinfection of the cannulation sites pre and post scab removal and the correct and careful removal of the scab at the buttonhole site (13,15,16). Washing of the arm prior to cannulation (13,15,16, 31) and disinfection of the cannulation site before and after scab removal (1,13,15,16) is thought to reduce infectious complications, although no research has been conducted to clarify this.

The solution used to disinfect cannulation sites is also believed to be important in



# D) Mupirocin Use

- Use mupirocin on cannulation sites post dialysis for patients with high infection risk
- Screen for mupirocin resistance and discontinue positive patients
- Points for clarification
  - Should this be used on all patients?
  - Are there alternatives?
    - Naseptin, inadine, octenilin etc.

## Points for Future Consideration

The following aspects are not yet clarified and could be points for further investigation, consideration or basis for further projects:

- Nesrallah et al (14) recommend the use of topical 2% mupirocin cream use for all patients undergoing buttonhole technique. However, it is unclear whether long term use will lead to problematic mupirocin resistance. This risk needs to be assessed and until ascertained, use for all patients cannot be recommended.
- Whilst mupirocin use can be justified for high risk patients, definition of which patients are considered high risk requires further work. This could partially be ascertained through the screening process recommended in 'Screening and Selection of Patients to Undergo Buttonhole Cannulation'. However, causes of

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# E) Patient Engagement

- Facilitate self care and self cannulation
  - Patient ownership will lead to better outcomes
- Make them equal partners
- Inform and involve patients
- Knowledgeable patients
- Involved in decision making



# Practical Patient Engagement

- Patient information
- Involve from the start of the process
- AV fistula and cannulation sites in areas patient's could cannulate
- Patient to develop track (if self cannulate)
- Separate education packages for patients
  
- Points for clarification
  - What is the best way to support patients?
  - Training / Troubleshooting / Maintaining procedures



# F) Staff Training and Assessment

- Education package for all cannulators
- Supervised practice and competency assessment
- Staff procedures will 'slip' unintentionally
  - Human factors
  - How do we maintain procedures?
- Reassessment every 2 years
- Annual theoretical update
- Monthly audits of practice



# Dissemination

- Launched at UK Kidney Week 2016
- Available on:
  - BRS website  
<http://www.britishrenal.org/NewsLinks/Buttonhole-Technique-Cannulation-Clinical-Practice.aspx>
  - RA-BRS Patient Safety Website  
[www.renal.org/clinical/renal-association-british-renal-society-patient-safety](http://www.renal.org/clinical/renal-association-british-renal-society-patient-safety)
- Email Shot

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# The Future

- Combined into 'Cannulation Recommendations'
- Joint with VASBI SIG
- Practical and relevant to practice



## Covers:

- Rope ladder, buttonhole and area puncture
- Defines techniques
- How to decide on techniques
- Assessing AVF / AVG and assessment tools
- Good cannulation techniques



# Cannulation Change Package

- Based on best practice identified in recommendations
- ELearning – BRS Education Committee
- Further information
- Awareness posters
- Education events
- Measuring vascular access outcomes
- National cannulation competency package

# Life Threatening Haemorrhage Recommendations

- Released September 2016
- No evidence available
- Amalgamation of expert advice
- Available at <http://www.britishrenal.org/NewsLinks/HHD-Guidance/Recommendations-for-Managing-Life-Threatening-Haem.aspx>

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## Recommendations for Managing Life-Threatening Haemorrhages from AV Fistulae / Grafts

Due to several reported incidents of life-threatening haemorrhages (LTH) from arteriovenous fistulae (AVF) and grafts (AVG), the British Renal Society Vascular Access Special Interest Group has compiled the following recommendations.

This work is related to LTH that do not resolve with 'normal' pressure applied to the bleeding site. These recommendations are not related to minor bleeds from cannulation sites or venous needle dislodgement. LTH can develop from cannulation sites or other areas on the AVF / AVG and can become rapidly life threatening due to the volume of blood lost. It is a traumatic incident for patients, their family, friends and renal unit staff alike.

The main aims are to prevent LTH and manage it effectively when it occurs, so that it does not result in catastrophic harm to patients.



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# Prevention and Management

## Prevention

- Detect and escalate early warning signs
  - Non-healing wound
  - Aneurysms increasing in size
  - Signs of infection
  - Prolonged bleeding post HD
  - Shiny thin skin
  - Skin integrity issues
- Awareness of early warning signs
  - HC staff, patients and carers

## Management


- Dial 999 immediately
- Attempt to stop bleeding
  - Use flat, small rigid object
  - Not a towel

## Measure number of incidents

- Mortality
- Near – misses
- Warning signs



# Thank you!

- Members of BRS VA SIG and their renal units
- Xtramed and Richard Cole 
- BRS Council and Karen Jenkins
- Derby Teaching Hospitals NHS Foundation Trust

THANK YOU

