



**BRS** VASCULAR ACCESS  
Special Interest Group



# **Cannulation Skills for Haemodialysis: VASBI and BRS Competency Education Pack**

**A competency workbook to support haemodialysis nurses  
in the development of cannulation skills of arteriovenous  
access for haemodialysis**

## Introduction

Welcome to your Competency Education Pack for the cannulation of arteriovenous (AV) fistulae and grafts. This document is designed to support assessment of haemodialysis nurses' cannulation skills. It will allow transference of cannulation skills between haemodialysis units that use this package, ensuring consistent cannulation skills in your haemodialysis unit and across the UK.

This competency document has been endorsed by the Vascular Access Society of Britain and Ireland (VASBI) and British Renal Society (BRS). It is based on a pack designed by Sarah Dixon from the Oxford Kidney Unit, Oxford University Hospitals NHS Foundation Trust, with contribution from members of VASBI's nurses group and the BRS Vascular Access special interest group (BRS VA). The content of this package reflects the best practice recommendations in the 'BRS and VASBI Clinical Practice Recommendations for the Needling of Arteriovenous Fistulae and Grafts for Haemodialysis. It is envisioned that this document reflects a national pack and will be adopted by renal units across the UK.

The competency document is divided into three parts;

**Part One: Explains how you use this competency pack**

**Part Two: Assessing your knowledge**

**Part Three: Needling Competency Framework**

It is linked to the expected competency required of haemodialysis nurses when cannulating AV access, providing evidence for individual's to use both at appraisal and as part of revalidation (Nursing Midwifery Council 2015).

Completion of this document can be used as evidence against the following **NMC statements and are essential for revalidation:**

- Treat people with kindness, respect and compassion
- Work in partnership with people to make sure you deliver care effectively
- Act in the best interests of people at all times
- Always practise in line with the best available evidence, maintain the knowledge and skills you need for safe and effective practice.
- Gather and reflect on feedback from a variety of sources, using it to improve your practice and performance

## Part One : How to Use this Competency Document

This set of competencies comes in three levels:

- Bronze – for beginners with 0-6 months experience
- Silver – for proficient practitioners with at least 6 months experience
- Gold – for expert practitioners with at least 12 months experience, which can be revisited for on-going development

As a general guide, staff new to the register or new to dialysis would be expected to start at beginner and move through to the expert competencies over the course of 18 months - 2 years. Staff with some experience of cannulation would start at proficient level. Expert level competencies would be used for staff in senior roles and who currently support junior staff. The above time frames are just a guide.

Please read through the competencies and decide where you think your current level of practice is. As an example, you may decide you are practicing at the proficient level with only 4 months experience. It is your responsibility to demonstrate evidence at this level of proficiency which needs to be presented to your mentor for review. In partnership, you and your mentor would agree current level of practice and set goals for developing your skills.

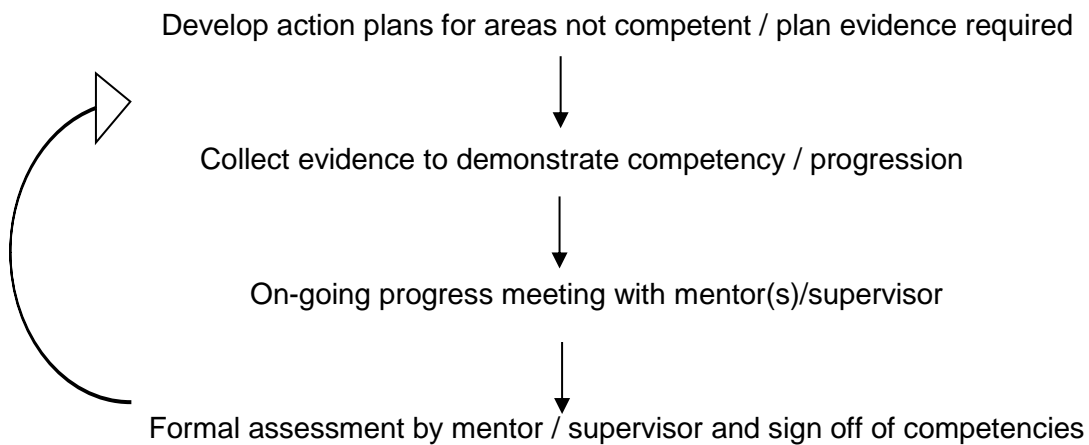
At the commencement of these competencies you are required to assess yourself using the 4 levels below and then together with your mentor/supervisor determine action plans to achieve competency required.

- 1. I have started to think about this:** However I have no or limited experience or knowledge to draw upon. I am not able to complete part 2 of this pack. I can produce no evidence to demonstrate that I am competent.
- 2. I have thought carefully about this:** I have had some experience doing it. However I can produce insufficient evidence to demonstrate that I have achieved the required competency. I have struggled with completing part 2, but know where to find out the answers.
- 3. I have thought carefully about this:** I have had experience of doing it. I can produce clear evidence that demonstrates that I have met the required learning competency. I am able to complete part 2.
- 4. I have thought carefully about this:** I have various experiences of doing it. I can produce a variety of evidence that demonstrates that I have achieved the required competency. This is an area in which I now wish to develop my professional expertise. I have completed part 2

Adapted from Rust, C., Jenkins, A., Jacques, D., Baume, C. (1994) Certificate in Teaching in Higher Education Handbook. OCSLD, Oxford Brookes University

**Please Note:** Level 3 as above is required to determine that you are competent bronze, silver and gold level (i.e. able to complete questions in part 2 and fulfil competency criteria to relevant level).

Within your clinical area you will work with your mentor/supervisor to support and assess your development for competency sign off.



## How to Demonstrate Achievement of the Competencies

Evidence can be collected and recorded in the following ways:

- Action Planning and reflective writing
- Direct observation from competent staff member
- Professional discussion/development
- Final assessment from supervisor / mentor

Recording of evidence can be done at the end of this document where you will find blank pages in the appendices.

Action Planning: You can use the action plan to focus on areas you may need to improve upon and sign once achieved.

Reflective writing: You can use the reflective writing paperwork to record your reflection. Competencies covered in the reflective writing need to be clearly signposted.

All evidence included must be clearly labelled to allow for cross referencing with the competency number it is being used as evidence against. (For example competencies for beginner bronze attitude could be labelled as BB1) Please ensure there are no patient identifiable markers used in your evidence either through photocopying of paperwork or reflective entries. If you are using names please ensure these are pseudonyms and state this to be the case.

**Signing of competencies: Competencies can only be signed off by a Gold level staff in AV Access Cannulation**

## Part Two: Assessing your Knowledge

Completion of the competency package can be supported by accessing the MAGIC ELearning. This can be accessed at:

<https://elearning.thinkkidneys.nhs.uk/course/index.php?categoryid=24>

A user name and password to provide access to the ELearning package can be obtained from:

[ThinkKidneys@renalregistry.nhs.uk](mailto:ThinkKidneys@renalregistry.nhs.uk)

We recommend completing the ELearning before starting this competency package.

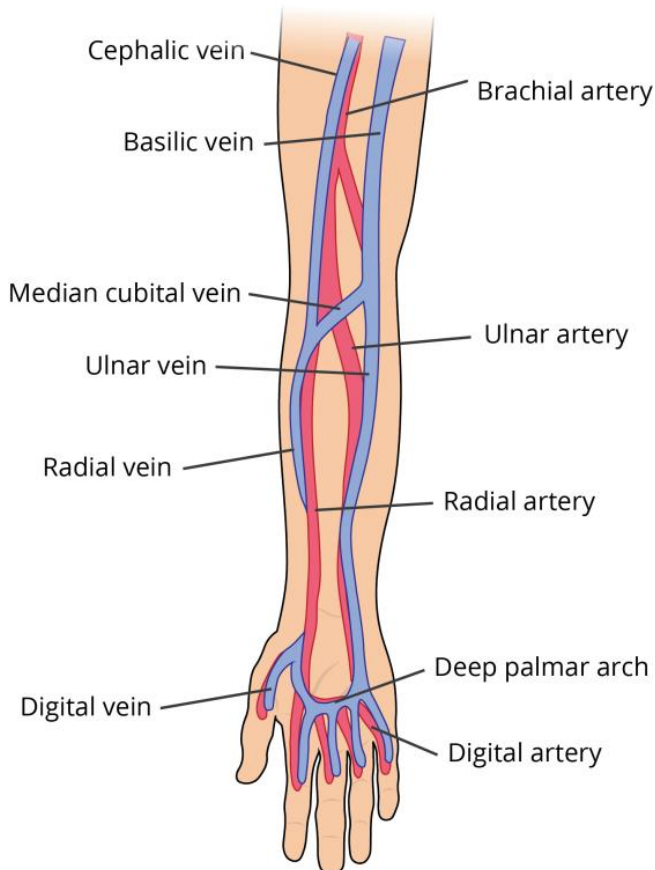
**Audio and Video clips** - to help you with your knowledge

<p>Helpful Resources</p>	<p>Renal Association - Guidelines for Vascular Access <a href="https://renal.org/wp-content/uploads/2017/06/vascular-access.pdf">https://renal.org/wp-content/uploads/2017/06/vascular-access.pdf</a></p> <p>UK Renal registry report <a href="https://www.renalreg.org/publications-reports/">https://www.renalreg.org/publications-reports/</a></p> <p>BRS &amp; VASBI Needling Recommendations <a href="http://vo2k0qci4747qecahf07gktt-wpengine.netdna-ssl.com/wp-content/uploads/2018/09/Clinical-Practice-Recommendations-for-Needling-of-Arteriovenous-Fistulae-and-Grafts-for-Haemodialysis.pdf">http://vo2k0qci4747qecahf07gktt-wpengine.netdna-ssl.com/wp-content/uploads/2018/09/Clinical-Practice-Recommendations-for-Needling-of-Arteriovenous-Fistulae-and-Grafts-for-Haemodialysis.pdf</a></p>
<p>Visual clips</p>	<p>Vascular access surgery as recorded by colleagues in Portsmouth. Please see link below for 13 videos relating to access including, fistula creation, banding of a fistula and insertion of an upper arm graft.</p> <p><a href="https://www.youtube.com/playlist?list=PLfJH-ldpkgp6_IG1lx3ui-TX0KCC3gxRu">https://www.youtube.com/playlist?list=PLfJH-ldpkgp6_IG1lx3ui-TX0KCC3gxRu</a></p>

We recommend you access local information you have on A–V fistula and graft cannulation and management. This can include teaching packages, policies, care plans, protocols, procedures and patient information leaflets. 11

## Anatomy and Physiology

The image below shows the position of major arteries and veins in the arm:



The arteries normally used in a fistula in the arm are:

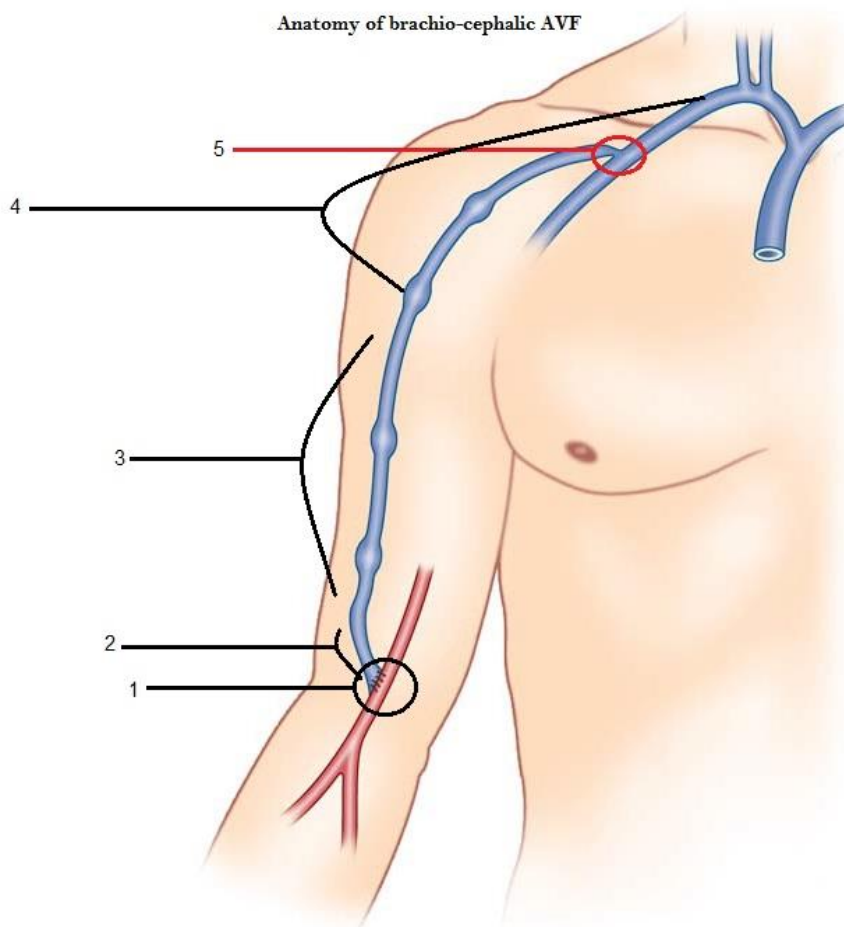
- Radial artery
- Brachial artery

The veins normally used in a fistula in the arm are:

- Cephalic vein
- Basilic vein

You normally cannulate the vein section and the type of fistula will determine which vein you cannulate.

The image below is a patient with a right brachiocephalic fistula. The points have been labelled with an explanation to help assist with your learning and development as a dialysis nurse.



	<b>Location</b>	<b>Explanation</b>
<b>1</b>	Anastomosis	This is where the vein is joined to the side of the artery. This is where you will notice the incision or scar.
<b>2</b>	Juxta-anastomosis	Also known as swing vein/swing point – this is just beyond the anastomosis.
<b>3</b>	Cannulation segment	Your needling sites for rope-laddering or button-hole
<b>4</b>	Proximal outflow vein	The area from upper arm to beyond the cephalic arch and central veins
<b>5</b>	Cephalic arch with identified stenosis	You may be able to see on the image that area of vein is slightly narrow. You may notice a drop in access flows on your transonic monitor and/or a rise in the venous pressures



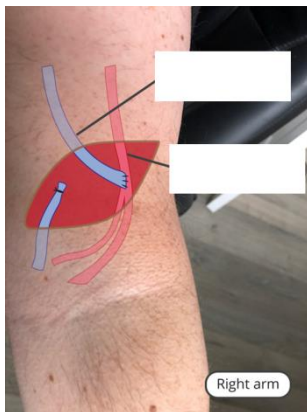
Please label each image with the artery and vein used and the name of fistula (normally dictated by the artery and vein used):

1)



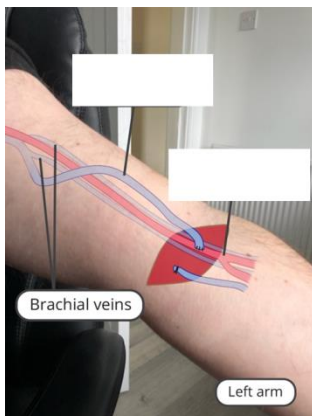
Fistula Name:

2)



Fistula Name

3)



Fistula Name:

## Assessment

The following questions are to help you with your learning and development of assessment of access.

1. Name the 3 assessment stages you should do before cannulation

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.....

2. Please describe a fully matured fistula?

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3. Name 4 qualities of a good cannulation site.

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4. What other structures in the arm could you unintentionally damage during cannulation of A-V fistula / graft?

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5. Please describe what a normal thrill feels like.

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6. Please describe what a normal bruit sounds like.

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7. How is a graft different to a fistula?

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**Cannulation**

1. How do you determine which angle and direction to insert the needle?

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2. Can you explain why the angle of needling is so important?

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3. How do you know the needle is in the correct position?

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4. What will happen if you think you have needled straight through the fistula vein?

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What should you do next?

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What might the impact be to the patient?

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5. Explain how you remove the needles (not a trick question).

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6. Which cannulation technique(s) does your unit recommend for A-V fistulae?

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7. Which cannulation technique(s) does your unit recommend for A-V grafts?

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8. Which cannulation technique should be avoided and why?

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## Progress

Please use this checklist below to evaluate your progress (use as appropriate to your level together with your welcome to the unit pack)

Have you.....?	Yes / No / N/A	Signature
Watched a fistula or graft being formed / inserted in theatre		
Watched different cannulation techniques within your unit		
Observed an experienced 'gold needler' cannulating a fistula and graft		
Watched the cannulation of an AV fistula / AV graft under ultrasound guidance		
Observed an experienced 'gold needler' cannulating a more challenging access and troubleshooting when things don't go so well		
Heard the term 'problematic fistula or graft' and understand the difference between a healthy fistula and an unhealthy fistula		
Completed your reflection and self-assessment		
Read through the needling competencies		
Completed the access quiz		

## Part Three: Needling Competency Framework

### Procedural checklist to help assist you in your cannulation practice

(Please see the competencies for more detail)

Task List	Tick when completed (comments)
Ensures patient washes arm before arriving at bed space	
Checks patient identity and ensures they are prepared for cannulation	
Reviews notes on previous cannulations and discusses previous cannulations with patient	
Assesses access using look, listen, feel If fistula, applies tourniquet for feel assessment	
Determines where to insert needles, including site, depth and direction	
Nurse washes hands with soap and water	
Prepare equipment and gel hands	
Clean patients arm (as per local units policy)	
Wait at least 30 seconds for arm to dry (as per local policy)	
Prepares needles for insertion (as per local policy)	
If cannulating a fistula, applies tourniquet Inserts needle in smooth and gentle movement	
Secures needles using appropriate taping technique If fistula, releases tourniquet	
Flushes needles to assess flow, identifying and correcting issues as required	

## **Bronze (Level 0-1 – Beginner) – For all new starters**

### **Supervised Cannulation Practice**

New cannulators who have not performed AV fistula or graft cannulation prior to starting this package, must complete a number of supervised cannulations on different AV fistulae and grafts prior to completing the bronze level.

The minimum number of supervised cannulations can be dictated by individual renal units but should be no less than 10 supervised cannulations. Supervision should occur through any registered nurse who has completed the bronze level of this package or previously deemed competent at AVF and AVG cannulation.

Number of supervised cannulations required: \*10 / ..... (number specified by unit)

The supervised practices should include:

- Assessment of the AVF / AVG prior to cannulation, using the look listen, feel approach
- Decision on where to cannulate the AVF / AVG
- Needle insertion
- Securing the needle after insertion and assessing adequate flow

The following procedures should be covered in the supervised cannulations:

- \*Sharp needle cannulation into AVF
- \*Blunt needle cannulation using buttonhole technique
- \*Sharp needle cannulation into AVG

\*(Please delete as appropriate to your units practice)



**Record of Supervised Cannulation (First 10)**

Date & Time	Type of Cannulation	Feedback	Cannulated Previously (Yes/No)	Name of Supervisor

Date & Time	Type of Cannulation	Feedback	Cannulated Previously (Yes/No)	Name of Supervisor

**Record of Supervised Cannulation (Further Cannulations as required)**

Date & Time	Type of Cannulation	Feedback	Cannulated Previously (Yes/No)	Name of Supervisor

Date & Time	Type of Cannulation	Feedback	Cannulated Previously (Yes/No)	Name of Supervisor

## Competencies

Competency	Bronze Beginner (BB) – Assessment	Self - assess	Supervisor
<b>Attitude 1.</b>	Introduces self to the patient adopting an appropriate manner, establishing name and checking procedure including gaining consent		
	Explains cannulation procedure to the patient, including the following; explaining aseptic technique and why, use of topical anaesthetic if required, which needle size to be used, taping and securing of dialysis lines		
	Respects patients' viewpoint by asking their input to determine whether there have been any issues with their access since last dialysis. Individual is able to vocalise their findings to their mentor.		
	Appreciates the importance of developing positive and therapeutic relationships		
	Challenges practice in a sensitive and constructive manner		
	Displays sensitivity to cultural and lifestyle diversity		
Competency	Bronze Beginner (BB) – Assessment	Self - assess	Supervisor
<b>Knowledge 2.</b>	Able to describe anatomy and physiology of a fistula		
	Able to describe the anatomy and physiology of a synthetic graft, and is able to identify the difference		
	By assessing the patient, is able to name and identify the type of fistula by looking at the patient's arm or legs or location of surgical incision		
	If individual has any doubt about the type of fistula, is able to locate the operation note, online patient access information		
	Can explain the rationale to their patient the importance of washing and drying their access arm with soap and water prior to cannulation		

	Is able to demonstrate inspection of new access by undertaking the following steps; ‘inspects, auscultates and palpates’		
	Is able to define ‘thrill’ and ‘bruit’		
	Able to assess and define a normal/abnormal bruit and thrill from the anastomosis up to the outflow vein		
	Evaluates quality and integrity of the skin and surrounding tissue		
	Is able to assess the access for signs of infection		
	Individual is able to recognise and vocalise when an access shouldn’t be needed i.e. skin integrity, access not working properly		
	Able to assess and demonstrate cannulation segments and provides a rationale for choosing appropriate sites		
	Is able to verbalise to mentor different needling techniques		
	Contributes to the timely upkeep of the patients access care plan		
<b>Competency</b>	<b>Bronze Beginner (BB) – Assessment</b>	<b>Self - assess</b>	<b>Supervisor</b>
<b>Skill 3.</b>	Individual is able to assemble and prepare appropriate cannulation equipment Prepares the equipment following ANTT		
	Individual inserts the needle in a gentle and continuous motion, minimising harm to the A-V fistula / graft and surrounding tissues during the cannulation		
	Individual is able to recognise the challenging access to cannulate and ask a more senior member of staff for assistance		
	Individual is able to recognise own limitations and will ask for assistance when they have had 2 attempts at cannulation without success		

	<p>Individual is able to secure dialysis lines and needles effectively and to ensure they are kept visible at all times in order to avoid venous needle dislodgment. Communicates these actions to mentor and to patient</p>		
	<p>Shows an understanding about blood flow rates and pressure parameters and describes appropriate action(s) required if there are abnormal findings. Documents as appropriate</p>		
	<p>Documents any issues relating to the patient's access and verbalises to a senior member of staff (eg. Problems with needling, transonic results, swollen access arm etc.)</p>		

	<p><b>Bronze Level Complete</b></p> <p><b>Sign</b>.....</p> <p><b>Supervisor</b> .....</p> <p><b>Date</b>.....</p>		
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### Silver - Proficient

The practitioner should have achieved everything at bronze level and demonstrate this achievement is current, plus the competencies below:

Competency	Silver Proficient (SP) - Assessment	Self - Assess	Supervisor
<b>Attitude 1.</b>	Determines whether there have been any issues with access since last dialysis and vocalises them, taking action as necessary		
	Individual able to recognise their limitations and begins to have a deeper level of awareness to ask for assistance when required.		
Competency	Silver Proficient (SP) - Assessment	Self – Assess	Supervisor
<b>Knowledge 2.</b>	Able to undertake an independent assessment of the AVF/AVG		
	Able to troubleshoot the problematic fistula, vocalise and refer to key people (e.g. abnormal findings from physical assessment ,reduction in access flow rates, elevated venous pressures, prolonged bleeding time, cannulation difficulties)		
	Prepare to needle new fistula or problematic access with supervision (two needling attempts only)		
	Can refer those patients with more problematic access to other members of dialysis staff for needling as required		
	Available and willing to teach and train others		
	Evaluates own performance and identifies learning needs		
Competency	Silver Proficient (SP) - Assessment	Self – Assess	Supervisor
<b>Skill 3.</b>	Demonstrates ability to cannulate independently, or with minimal assistance (two needling attempts only)		



	Identifies appropriate needle size in relation to patient's access and blood pump speed		
	Identifies appropriate needle position and commences cannulation technique with minimal assistance		
	Able to document and plan for future cannulations and document appropriately		

	<p><b>Silver Level Complete</b></p> <p><b>Sign</b>.....</p> <p><b>Supervisor</b> .....</p> <p><b>Date</b>.....</p>		
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### Gold – Expert

The practitioner should have achieved everything at bronze and silver level and demonstrate this achievement is current, plus the competencies below:

Competency	Gold Expert (GE) - Assessment	Self – Assess	Supervisor
<b>Attitude 1.</b>	Determines whether there have been any issues with access since last dialysis and vocalises them; refers to the Access Team if appropriate		
	Ability to recognise limitations and has a deeper level of self-awareness. Able to ask for assistance when required		
	Appreciates the value of assessing and re-assessing a patient’s access as part of their on-going access journey.		
	Demonstrates a commitment to a collaborative approach to decision-making in clinical practice		
	Displays a proactive, confident and competent attitude in managing care for patients		
	Works closely and in collaboration with members of the access team to minimise issues and to improve practice		
	Recognises ethical and legal implications for practice		
Competency	Gold Expert (GE) - Assessment	Self – Assess	Supervisor
<b>Knowledge 2.</b>	Demonstrates extensive knowledge of all different types of access		
	Makes autonomous decisions to commence cannulation(including referring those patients dialysing on a tunnelled line for a fistula and making appropriate referrals for the line to be removed)		
	Refers access issues to relevant personnel for review and ongoing management plan		

	Is aware of the patients' access journey; i.e.: if they have had surgical intervention, radiology and/or clinic review and knows who to contact if unsure		
	Evaluates own performance and identifies ongoing learning needs		
<b>Competency</b>	<b>Gold Expert (GE) – Assessment</b>	<b>Self – Assess</b>	<b>Supervisor</b>
<b>Skill 3.</b>	Individual is consistent in cannulation skills and always shows expertise in assessing more challenging fistulas and grafts. Individual provides a care plan for cannulation.		
	If individual encounters needling difficulties (two needling attempts only) shows initiative to ask for assistance.		
	Able to teach others and act as a point of assessment for Registrar and other nursing teams		
	Able to help co-ordinate mentoring system by working with other members of the team as appropriate		

	<p><b>Gold Level complete</b></p> <p><b>Sign</b>.....</p> <p><b>Supervisor</b>.....</p> <p><b>Date</b>.....</p>		
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## Reflective Account

Staff Name:	Clinical area:
Date:	Mentor:

Competency reference	Reflective statement

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**Staff signature:**

**Print name:**

**Supervisor Signature:**

**Print name:**

## Action Plan

Name:	Clinical area:
Date:	Mentor:

**You can use the action plan to focus on areas you may need to improve upon and sign once achieved.**

Action Plan	How will you achieve this action plan	Signature
<p><b>For example:</b> Would like to increase knowledge of anatomy and physiology</p>	<p><b>For example:</b> By week 6, will have observed creation of fistula or graft in theatre</p>	

**Staff signature:**

**Supervisor Signature:**

**Print name:**

**Print name:**

## Professional Discussions

Name:	Clinical area:
Date:	Mentor:

Use these spaces below to outline the professional discussions and corresponding competencies (e.g.: liaising with the on-call Surgeon at weekend)	Competency

**Staff signature:**

**Supervisor Signature:**



**Print name:**

**Print**

**name:**



## **Acknowledgements**

Thank you to Sarah Dixon, Catherine Fielding, Kristine Paule and Margaret Aitken for their input and support to develop and finalise this document, and to the other members of the VASBI nurses and BRS VA groups. A special mention to colleagues within the Oxford Kidney Unit for their help and support with this document.

## **Version 1.0**

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