From Landmarks to Ultrasound:

Elevating Vascular Access

Quality Improvement Project

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Background

Variation identified in cannulation practices and vascular access planning across the units.

Rope ladder cannulation is evidence-based and improves fistula longevity.

Ultrasound-guided cannulation improves success rates and reduces complications.

Education and competency programs are proven to improve vascular access outcomes.

Our aim: improve staff knowledge, confidence and skills while supporting patient understanding of their vascular access.

Project Aims

01

Improve vascular access knowledge

02

Improve planning and cannulation skills

03

Increase use of ultrasound for mapping, planning & cannulation

04

Improve patient knowledge regarding vascular access

What We Did

1. Staff baseline survey
2. Patient survey
3. Vascular access education development & delivery
4. Patient ultrasound information brochure
5. Review & update of online VA learning package
6. Cannulation education program & competency framework

Pre-Education Survey: Where We Started (n=38)

52.6%

Always assessed before cannulation

Look, Listen & Feel

21.9%

Low ultrasound confidence

Staff reporting difficulty

75%

Inconsistent VA chart use

Sometimes or Never

These gaps shaped our education priorities — assessment consistency, ultrasound confidence, and vascular access planning.

Education Delivered

EDUCATION TOPICS

- Vascular access assessment
- Rope ladder cannulation technique
- Development of new cannulation sites
- Prevention of aneurysm formation
- Ultrasound mapping
- Real-time ultrasound-guided cannulation
- Vascular access planning & documentation

SUPPORTING RESOURCES

- Updated online learning package
- Cannulation technique videos
- Patient vascular access brochure
- Ultrasound competency pathway

Patient Brochure

Fistula/Graft Care

Your fistula or graft is your **lifeline.**

Taking care of it helps it last longer and keeps your dialysis running smoothly.

1. **Check Your Fistula/Graft** Every Day, look at your fistula and tell your dialysis team if you see or hear anything strange
2. **Wash up** before you sit down at Dialysis, make sure to wash your hands and fistula/graft well
3. **Hold pressure** when nurses take out each needle, hold each spot for at least 10 minutes. This helps it heal and keeps you from bleeding.
4. **Go to your fistula/graft appointments**. Keep going to all your ultrasound and vascular doctor appointments. They help make sure everything is working well.
5. **Check up**. If you need an ultrasound of your fistula/graft, ask your nurse if it's time for a check-up.

Ultrasound for cannulation

Why is it important that nurses use the ultrasound machine when cannulating the fistula/graft?

- So large lumps (aneurysms) don't start and to help the fistula/graft to last, we need to make new areas using ultrasound
- The ultrasound helps staff find new areas to cannulate so they can choose the safest and best areas to put the needles in.
- The ultrasound helps the staff to see how deep your fistula/graft is, how wide it is, and what way the blood is going, and may alert us to any potential problems.

NSW GOVERNMENT

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Understanding AV Fistula/Graft Needle Cannulation

and

Why do we use ultrasound?

Keeping your AVF fistula/graft healthy and working well

NSW GOVERNMENT

Cannulation and ultrasound of your dialysis fistula/graft

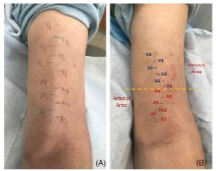
Cannulation, using different spots

The dialysis nurse needs to use a different spot each time needles are inserted along your fistula/graft.

This is called 'Rope ladder cannulation'

Why?- It allows healing between each dialysis session

- It stops big lumps (aneurysms)and scars to form.
- Less likely to get an infection
- Keeps the blood flowing well
- Helps keep the fistula healthy so it lasts longer



What is an Aneurysm?

Over time, if we put needles in the same spot, it can make that part weak and cause a bulge or lump. This is called an aneurysm. This may seem okay at first, but it can lead to big problems later on.

Here's why aneurysms can be a problem

- The wall of the fistula can become thin and shiny, which could lead to serious bleeding
- Blood flow might slow down: clots may form inside the fistula.
- The skin over the lump (aneurysm) can get thin or damaged, making it easier for bacteria to get in.
- Nurses may find it hard to find a good place to put the needles because of the lump



What about a graft?

Your graft needs special care to stay healthy and well

The graft is made of **synthetic material**, and if needles go in one area, lots of times, it can cause problems like:

- Leaks under the skin, forming a pseudoaneurysm (a bulge filled with blood outside the graft under the skin)
- The graft itself can get weak, tear or wear out. If it gets damaged, you could have serious bleeding.
- There is more chance of getting an infection and might need surgery.
- It can make it harder for your blood to flow, making dialysis not work as well



Results at a Glance

Post-education survey · n=24

+10%

Always assess before cannulation

52.6% → 62.5%

+13.4%

Very confident with ultrasound

34.4% → 47.8%

−17.6%

Low ultrasound confidence

21.9% → 4.3%

×2.3

Regular VA chart use

25% → 56.5%

Improvements observed across all measured areas

Improvement in Assessment Practices

Look, Listen & Feel Before Cannulation

BEFORE

52.6%

Always assessed

AFTER

62.5%

Always assessed

10%

increase in staff consistently performing pre-cannulation assessment

Supports earlier recognition of access problems and safer cannulation practices

Consistent vascular access assessment is foundational to safe cannulation and early problem detection.

Improvement in Ultrasound Confidence



+13.4%

more staff are Very Confident

−17.6%

reduction in Low Confidence

78%→96%

overall confidence

Zero respondents reported never using ultrasound following the education program.

Improvement in Vascular Access Planning

Use of Vascular Access Charts

BEFORE

25%

Often / Always used VA charts

AFTER

56.5%

Often / Always used VA charts

x2.3

more than doubled regular vascular access planning

No respondents reported never using VA charts after education

Structured vascular access planning supports proactive site management and fistula preservation.

Workforce Capability & Qualitative Improvements

Teaching Confidence

~66%

before

~85–90%

after

felt confident teaching colleagues

STAFF REPORTED IMPROVEMENTS

- Increased use of ultrasound for new fistulas
- Better identification of suitable cannulation sites
- More proactive access planning
- Greater awareness of vessel preservation
- Increased confidence developing new cannulation areas
- Ultrasound now used earlier — not only when problems occur
- Improved support and mentoring for junior staff

Ongoing Challenges & Opportunities

Time Pressures

Busy clinical environments make consistent application of new practices challenging. Embedding ultrasound into routine workflow is ongoing.

Staffing Constraints

Variability in rostering affects continuity of skill development and peer support opportunities.

Maintaining Ultrasound Skills

Limited practice opportunities; scheduled competency reviews and simulation sessions will address this.

Equipment Access

Equipment availability varies between units. Procurement planning underway to support equitable access.

Variability Between Units

Differences between Community and Acute units provide opportunity for shared learning and practice standardisation.

Next Steps

01 Continue regular vascular access education for all staff

02 Maintain ultrasound competency requirements across units

03 Monitor vascular access outcomes and review charts 6-monthly

04 Encourage ongoing ultrasound mapping and guided cannulation

05 Continue patient education using the vascular access brochure

06 Address identified barriers to standardise practice across units

Conclusion

- Staff confidence using ultrasound
- Vascular access planning practices
- Understanding of vessel preservation
- Pre-cannulation assessment consistency
- Confidence teaching and supporting colleagues

This project has strengthened our ability to deliver evidence-based vascular access care and support the long-term preservation of our patients' dialysis lifelines.

Thank you

Questions welcome