### Guidelines for the Monitoring of Vascular Access for Haemodialysis

**Author: Contact Name and Job Title**
- Charlotte Bebb, Consultant Nephrologist
- Simon Roe, Consultant Nephrologist

**Directorate & Speciality**
- Cancer and Associated Specialities (Renal/Transplant)

**Date of submission**
- July 2015

**Explicit definition of patient group to which it applies (e.g. inclusion and exclusion criteria, diagnosis)**
- Applies to: All patients under the care of the Nottingham Renal and Transplant Unit and with arteriovenous fistula or graft for haemodialysis (including patients dialysing at Kings Mill Hospital and Ilkeston Community Hospital and Lings Bar Dialysis Unit).
- Excludes: None

**Version**
- 3

**If this version supersedes another clinical guideline please be explicit about which guideline it replaces including version number.**
- Supersedes previous guideline of same name version 2 produced January 2013

**Statement of the evidence base of the guideline – has the guideline been peer reviewed by colleagues?**
- 5 – expert committee reports or opinions and/or clinical experiences of respected authorities
- 6 – recommended best practice based on the clinical experience of the guideline developer

**Evidence base: (1-6)**

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<tbody>
<tr>
<td>1</td>
<td>NICE Guidance, Royal College Guideline, SIGN (please state which source).</td>
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<tr>
<td>2a</td>
<td>meta analysis of randomised controlled trials</td>
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<tr>
<td>2b</td>
<td>at least one randomised controlled trial</td>
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<tr>
<td>3a</td>
<td>at least one well-designed controlled study without randomisation</td>
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<tr>
<td>3b</td>
<td>at least one other type of well-designed quasi-experimental study</td>
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<td>4</td>
<td>well–designed non-experimental descriptive studies (ie comparative / correlation and case studies)</td>
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<td>Consultation Process</td>
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<tr>
<td>Renal vascular access working group</td>
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<td>Medical and nursing staff within Renal and Transplant Unit, Interventional Radiologists, Vascular Surgeons</td>
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<td>They have been ratified at the Renal Unit Senior Staff Meeting.</td>
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<td>Renal Unit Senior Staff Meeting</td>
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<td>August 2015</td>
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<td>Target audience</td>
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<tr>
<td>Medical and nursing staff within Renal and Transplant Unit caring for haemodialysis patients with an arteriovenous fistula or graft</td>
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<tr>
<td>Review Date: (to be applied by the Integrated Governance Team)</td>
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<td>July 2020</td>
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This guideline has been registered with the trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

**Evidence base of policy**

These guidelines have been derived using the following evidence base

**Audit Plans**

% of patients having monthly transonic measurement

Patients with transonic measurement below 500ml/min or dropped by >25%

Patients having transonic measurement within 4 weeks of starting HD or first using access

Outcome following fistula thrombosis and rescue

**Training and implementation**

Ongoing, no change from previous guideline

**Changes from previous guidelines**

None
This guideline provides an overview of vascular access surveillance and intervention for haemodialysis patients dialysing via a native arterio-venous fistula or graft. It is presented as a series of 3 flowcharts:

1. Overview of the vascular access monitoring and surveillance process
2. Overview of access flow monitoring (using Transonic)
3. Management of AV fistula or graft thrombosis.
Nottingham Renal Unit – Vascular Access Monitoring & Surveillance Flow Chart

Functioning Access
- Physical Assessment every Treatment
  - Normal
  - Abnormal: Clots aspirated / Limb swelling/ Inability to cannulate / Loss of continuous bruit / Prolonged bleeding

Vascular Access
- K/U V (URR) every month
  - No change
  - Abnormal: Change observed >10% decrease after rule out other causes

Non-functioning Access
- Arterial/ Venous pressure every treatment
  - Normal
  - Abnormal: (first rule out needle position / other causes)
    - Trend of ↑ negative AP or > -200
    - Unable to achieve prescribed blood flows
    - Trend of ↑ positive VP > 150

Transonic Access Blood Flow measured according to protocol
- Recirculation study (with access flow measurement)
  - Normal ≤ 5% (by Transonic)
  - Abnormal > 5% (by Transonic)

Transonic access flow
- Discuss management with vascular access nurse specialist / vascular access MDT meeting
  - Normal
  - Abnormal

Fistulogram (± doppler US)
- Nephrologist/ Vascular Access Nurse to re-evaluate indicators of dysfunction / needling sites ± technique
- Abnormal

Surgeon (Revision / New Access)
- Technical Failure
- Interventional Radiology

Technical Success
- Re-assess surveillance indicators as per guidelines at next dialysis session
- Normal
- Abnormal

Loss of continuous bruit/thrill is often a sign of impending thrombosis and should be managed as for a clotted fistula / graft

Abnormal results from monitoring & surveillance should be recorded on vascular access / nursing assessment screen on Renal IT system

Guideline for the monitoring of vascular access for haemodialysis.

Overview of Transonic Flow Monitoring

1. Initial recirculation measurement
   - 0% recirculation
   - Recirculation Present?
     - Yes
       - Reverse blood lines and take third measurement
         - Reading now lower or 0% recirculation
           - Lines are now in correct position but were originally reversed
             - Take third recording to determine % recirculation
             - Document correct line placement and direction of access flow on HD prescription screen
             - Proceed to Access Flow Monitoring
             - Refer to Access Nurse Specialist if recirculation > 5%
     - No
       - Record second measurement
         - >0% recirculation confirmed?
           - Yes
             - Reverse blood lines and take third measurement
           - No
             - Proceed to Access Flow Monitoring

2. Having reversed lines proceed to Access Flow Monitoring
   - Take access flow reading
     - Is reading lower than 500ml/min for a fistula or 600ml/min for a graft or has access flow fallen by >25% in 3 months? Is reading greater than 2000ml/min?
       - Yes
         - Refer to Access Nurse Specialist or Renal SpR (HD)
           - For access flows below threshold, refer for fistulogram/plasty:
             - If above threshold but declining then duplex scan
             - MDT review of fistulogram and radiological intervention or refer for surgical revision / new access formation
             - Communicate results to MDT for further advice
             - Take new reading within 1 week of intervention, then routine monitoring
             - Continue to monitor monthly
       - No
         - Monthly monitoring for grafts and fistulas

Notes:
- New fistulas should undergo access flow and recirculation measurement within 1 month of initial cannulation or before Permcath is removed (ideally 2 readings)
- All transonic results should be documented on Emed (access management module)

Guideline for the monitoring of vascular access for haemodialysis.
Management of AV Fistula or Graft Thrombosis

Haemodialysis patient with thrombosed or impending thrombosis of fistula/graft.
Aim: to treat underlying cause within 48 hours of presentation

Arrange urgent review
Patient should be transferred to NUH – City campus
Contact dialysis unit SpR or on call Renal SpR immediately
Inform haemodialysis Consultant or on-call Consultant Nephrologist
Admit patient

Management
Obtain urgent FBC, U+E’s and clotting screen
Assess fluid balance

Can dialysis be postponed?

Yes

Management
Placement of temporary catheter with ultrasound guidance and urgent haemodialysis

No

Is it Monday – Friday 9am – 5pm?

Yes

Management
Contact Radiology Consultant of the Day (70816) immediately to discuss patient, arrange urgent duplex scan and plan subsequent intervention.
If interventional radiologist not available discuss surgical thrombectomy (contact on-call transplant surgeon or vascular surgeon).

Access declotted radiologically or surgically

No

• Insert/convert to tunneled permcath
• Surgical review as in-patient to evaluate for new access site

Assess for other causes of thrombosis
• Prolonged compression of puncture site
• Hypotension
• Hypercoagulability

Problem resolved? Access functioning?

No

• Inform usual dialysis unit of transfer back of patient with tunneled access
• Update dialysis prescription
• Refer to Renal Vascular team for future permanent access

Yes

• Discuss need for post-procedure heparin with radiologist/surgeon (usually 24-48 hours IV heparin)
• Dialyse with revised access
• Remove central venous catheter if present
• May need repeat duplex – discuss with radiologist
• Liaise with usual dialysis unit – need for post-intervention Transonic monitoring (next dialysis and monthly)
• Consider need for aspirin/dipyridamole or warfarin

SDR & CEB Jan 2008/Reviewed July 2015

Guideline for the monitoring of vascular access for haemodialysis.