

# Selection of Permanent Hemodialysis Vascular Access

The full version of this guideline is located on the BC Renal Agency website [www.bcrenalagency.ca](http://www.bcrenalagency.ca). "Guideline at a Glance" summarizes the highlights.

RECOMMENDATION		HA/HD CENTRE
1.	The preferred vascular access for patients requiring chronic HD is AV fistula, then AV graft, then catheter. <ul style="list-style-type: none"> <li>Refer for AVF creation when GFR &lt;15 mL/min/1.73m<sup>2</sup> or the GFR is 15-20 mL/min/1.73m<sup>2</sup> and the patient is expected to require dialysis within 12 – 18 months.</li> </ul>	<input type="checkbox"/>
2.	Target timelines for vascular access creation/placement are: <ul style="list-style-type: none"> <li>AVFs: &gt;3-4 months prior to the anticipated start of HD</li> <li>AVGs: 3 – 6 weeks prior to the anticipated start of HD</li> <li>Catheters: as close as possible to the anticipated start of HD</li> </ul>	<input type="checkbox"/>
3.	Prior to creation/placement of a vascular access, conduct (1) a thorough history and physical examination; and (2) vessel mapping in all patients using ultrasound and/or venography. <ul style="list-style-type: none"> <li>Preoperative vessel mapping (both arterial and venous) has been shown to increase the proportion of patients dialyzing with fistulae.</li> <li>Duplex ultrasound is the preferred method for vessel mapping, especially for complex cases. Such mapping is performed in radiology by trained radiologists and/or ultrasound technologists. At a minimum, vessel mapping via portable ultrasound is recommended, with duplex ultrasound being available as needed. Portable mapping is performed by trained nephrologists, vascular surgeons, and nurses that have been authorized to do so by the College of RNs of BC (CRNBC).</li> <li>Central veins may be assessed indirectly using duplex ultrasound or magnetic resonance angiography (MRA) or directly using venography. Compared with venography, duplex ultrasound had a specificity of 97% and sensitivity of 81% in detecting central vein occlusion (no statistics available for MRA). For patients not yet on dialysis, the benefits of venography must be weighed against the risks associated with exposure to contrast media.</li> </ul>	<input type="checkbox"/>
4.	If the vessels are adequate, use the non-dominant arm for creation/placement of a permanent HD access; if not, use the dominant arm.	<input type="checkbox"/>
5.	For AV fistulas, the preferred order of creation is: <ul style="list-style-type: none"> <li>(a) radio-cephalic fistula (RCF) (wrist, forearm or elbow)</li> <li>(b) brachio-cephalic fistula (BCF) (elbow)</li> </ul>	<input type="checkbox"/>
6.	If an AV fistula created in the wrist/forearm/elbow fails, attempt to move up the same arm for the second AV fistula if the vascular anatomy is favourable.	<input type="checkbox"/>

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7.	If a RCF or BCF is not possible, second line options are (in alphabetical order): (a) Radio-basilic with vein transposition (b) Transposed brachio-basilic fistula (tBBF) (c) Transposed brachio-cephalic fistula	<input type="checkbox"/>
8.	If a native fistula is not possible, an AV graft is acceptable and is preferred to a catheter.	<input type="checkbox"/>
9.	In patients with AV grafts, consider secondary AVF placement.	<input type="checkbox"/>
10.	Use tunnelled cuffed catheters as a last option; if used, the preferred site is the right internal jugular vein.	<input type="checkbox"/>
11.	<p>In patients with advanced kidney disease, make every effort to preserve forearm and upper arm veins.</p> <ul style="list-style-type: none"> <li>Start vein preservation in patients with progressive kidney disease and a GFR of &lt;30 mL/min.</li> <li>If peripheral venipuncture is required, the preferred location (in order) is:</li> </ul> <p>Access in place:</p> <ol style="list-style-type: none"> <li>Dorsal veins of the hand of the arm without the access.</li> <li>Dorsal veins of the hand of the arm with the access.</li> <li>Forearm veins of the arm without the access.</li> <li>Forearm veins of the arm with the access.</li> </ol> <p>No access in place:</p> <ol style="list-style-type: none"> <li>Dorsal veins of the dominant hand.</li> <li>Dorsal veins of the non-dominant hand.</li> <li>Forearm veins of the dominant arm.</li> <li>Forearm veins of the non-dominant arm.</li> </ol> <p>If a central line is required:</p> <ol style="list-style-type: none"> <li>Try to avoid the use of peripherally inserted central catheters (PICCs); PICCs are associated with high incidences of upper-extremity venous thrombosis.</li> <li>Try to avoid the use of the subclavian veins (associated with high incidences of central venous stenosis).</li> </ol>	<input type="checkbox"/>