Ultrasound ARTERIOVENOUS FISTULA (AVF)

Patient Position	**Patient positioning is most often supine, with the arm relaxed and extended out to the side with the area to be evaluated closest to the technologist. For patient comfort, support the arm on a table/pillow.**
Indications	Failure to mature, malfunction of access site, low blood flows, increased venous pressure, palpable mass, loss of thrill, arm swelling.
Contraindications	Open wounds, indwelling catheters, acoustic shadowing from calcification, dialysis or fistulogram performed the same day.
Special Notes:	1. A complete evaluation includes B-mode imaging, spectral Doppler analysis, and color Doppler imaging of all accessible portions of the hemodialysis access.
	2. Doppler spectral analysis is performed in the sagittal plane.
	3. Velocity measurements should be obtained from a longitudinal plane at an angle of 60 degrees parallel to the direction of the blood flow/vessel walls.
	4. Doppler angles less than 45 degrees may be necessary due to patient anatomy
	5. To obtain peak velocity, utilize color Doppler to note areas of concern and 'walk' the spectral Doppler cursor throughout these areas. Post-stentic turbulence should be documented when present.
	6. When a stenosis is identified, velocities should be documented proximal to, within, and distal to the stenosis.
	7. Flow volumes should be calculated and used to determine fistula maturation.
	8. Functional disorders can also be identified using flow volumes.
INFLOW ARTERY (AFFERENT)	Obtain peak systolic (PSV) and end diastolic (EDV) velocities at least 2 cm cephalad to the arteriovenous anastomosis.
	Measure flow volume, approximately 2cm cephalad to the arteriovenous anastomosis o Obtain diameter on B-Mode image o Optimize spectral window and obtain Time-Averaged Mean Velocity (TAMV) □ Open sample volume to include entire diameter of vessel □ Use a 60-degree angle □ Measure 2-3 cardiac cycles
ARTERIOVENOUS ANASTOMOSIS	Obtain PSV and EDV o Compare to the PSV obtained in the afferent artery
	Obtain diameter measurement on B-mode image o Note any areas of narrowing or abnormality
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Continued:	
OUTFLOW VEIN (EFFERENT)	Obtain transverse diameter measurements on B-mode image: o Proximal, mid, distal outflow vein □ Include additional measurements at areas of abnormality (e.g., narrowing, wall thickening) □ Note venous tributaries that may decrease fistula maturation
	Measure depth (skin line to top of vessel) when indicated for fistula maturation.
	Note any extrinsic findings (hematoma, seroma, aneurysm, pseudoaneurysm)
	Measure flow volume, approximately 2cm cephalad to the arteriovenous anastomosis: o Select the mid-portion of the vein in an area that is straight and non- tapering o Obtain diameter on B-Mode image o Optimize spectral window and obtain Time-Averaged Mean Velocity (TAMV) □ Open sample volume to include entire diameter of vessel □ Use a 60-degree angle □ Measure 2-3 cardiac cycles
	Significant stenosis along the efferent vein is indicated when PSV doubles along contiguous segments. o Obtain PSV and EDV proximal to, within, and distal to stenosis o Follow the venous outflow to its origin □ The cephalic and basilic vein confluence with the deep venous system