Publication Brief

A Primer on Hemodialysis from an Interventional Radiology Perspective.
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BACKGROUND
Interventional radiologists play a key role in the care of patients with end-stage renal disease who receive renal replacement therapy via hemodialysis. It is incumbent on interventional radiologists to ensure that a patient’s dialysis access remains suitable for high-quality dialysis in order to meet performance standards.

OBJECTIVE
To familiarize interventional radiologists with the mechanics of hemodialysis emphasizing the “breaking points” that trigger a patient’s referral to interventional radiology, and to familiarize interventional radiologists with the current “pay for performance” landscape where dialysis quality is increasingly linked with reimbursement.

CONTENTS
• Brief history of hemodialysis in the US and the increasing numbers of end-stage-renal disease patients;
• Basics of the Hemodialysis Machine;
• Dialysis Dosing, Measurements of Efficacy, and 2017 Performance Metrics
  • Kt/v (where K is urea clearance rate, t is the duration of dialysis and v is the total water volume in a patient’s body): (Kt/v >1.2 is necessary; average is 1.4); Blood flow (Q) must be >350 for effective dialysis;
  • 8 Clinical Indicator Performance Metrics: 2 relate to vascular access (increasing fistula use, reducing catheter use); 3 relate to dialysis adequacy and one relates to readmission rates. Centers can lose up to 2% of their reimbursement if they do not meet performance criteria.
• Deciphering Causes of Dialysis Malfunction through;
  • Pressures: Rule of thumb: at flow of 200 mL/min using a 16-gauge needle, a venous pressure of > 100 Hg indicates a venous outflow stenosis. “Static venous pressures are recommended by KDOQI for access surveillance.”
  • Intra-access Flow and Recirculation: How various methods (including conductivity dialysance) measure recirculation. Also included is “induced” recirculation by ultrasound dilution [Krivitski] method which they state is the gold standard.

CONCLUSIONS
An interventional radiologist needs to:
• Ensure that a patient receives high-quality dialysis;
• Ensure that the patient’s dialysis center meets its performance metrics.

TAKE HOME
• Valuable concise overview of important hemodialysis concepts;
• Ultrasound dilution acknowledged as the gold standard for measurement of intra-access flow.

Reference: