

## **BLOOD FLOW EARLY AFTER HEMODIALYSIS AV FISTULA CREATION AND RELATIONSHIP TO MATURATION**

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The arteriovenous fistula (AVF) is the preferred type of hemodialysis vascular access. However, up to 50% of new fistulas fail to mature. We are conducting a single center, prospective observational study to determine whether anatomic and functional characteristics of AVFs early after surgical creation predict fistula maturation. We are performing serial measurements of artery diameter and fistula blood flow with ultrasound at 2, 6 and 16 weeks after AVF creation. The primary outcome is fistula suitability for dialysis assessed during the 4<sup>th</sup> month after surgery.

Fifty subjects have been enrolled thus far. An interim analysis is presented. For upper arm AVFs there was no difference in artery diameter at 2 weeks between the suitable and unsuitable AVFs. However, at 6 weeks median artery diameters were 0.53 and 0.42 mm in the suitable and unsuitable AVFs, respectively, a difference that trends towards statistical significance ( $p=0.077$ ). In the suitable AVF group, the artery diameter increased between weeks 2 and 6 (median 0.03 mm;  $p=0.016$ ); in contrast, the median change for unsuitable AVFs between weeks 2 and 6 was 0 mm ( $p=0.63$ ). At 2 weeks the median blood flows in suitable and unsuitable AVFs were 1017 and 590 ml/min, respectively ( $p=0.54$ ); at 6 weeks, the median blood flows in the suitable and unsuitable groups were 1534 vs. 245 ml/min ( $p=0.03$ ). For subjects with a suitable AVF, the blood flow increased by a median of 634 ml/min between weeks 2 and 6 ( $p=0.03$ ). In contrast, for the unsuitable fistula group, there was no change in blood flow (median -75 ml/min) between 2 and 6 weeks ( $p=0.31$ ).

This interim analysis suggests that temporal patterns of blood flow differ between fistulas that have successful and unsuccessful maturation and that these differences are apparent early after surgery. Our ultimate goal is to determine whether there is a blood flow threshold at 2 or 6 weeks that is highly predictive of fistula suitability failure. Our preliminary analyses suggest that this goal is feasible.