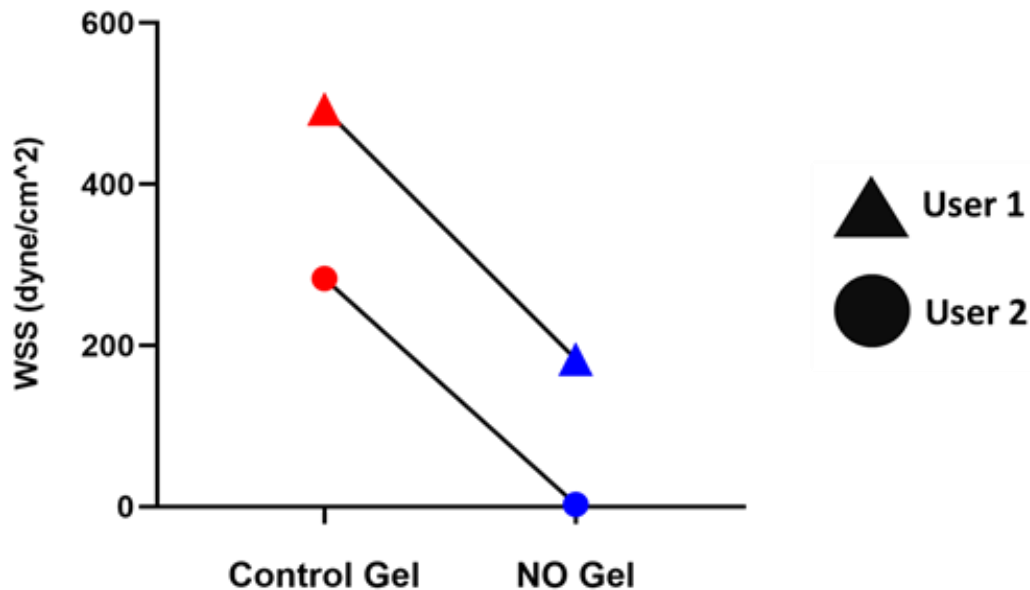




## HEMODYNAMIC ANALYSIS OF THE USE OF NITRIC OXIDE RELEASING GEL TO IMPROVE RAT ARTERIOVENOUS FISTULA MATURATION

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End stage kidney disease patients require kidney replacement treatment to survive, with the most common being hemodialysis [1]. Vascular access is considered a lifeline for hemodialysis patients due to how important it is for treatment. An arteriovenous fistula (AVF) is the preferred vascular access for hemodialysis patients. However, nearly 60% of AVFs fail to mature due to aggressive intimal hyperplasia and inadequate outward remodeling [2]. The AVF hemodynamics are a major factor in regulating AVF maturation, with turbulent blood flow and disturbed wall shear stress (WSS) being associated with intimal hyperplasia and AVF maturation failure [3]. The use of a nitric oxide-releasing gel to treat AVF maturation failure and improve rat AVF hemodynamics was analyzed using computational fluid dynamic simulations. To account for inter-user variability, the AVF hemodynamics were independently reanalyzed and compared with the initial analysis. Both analyses saw lower WSS in the NO gel treated AVF vein (Fig. 1). The NO gel treated AVF vein also had smoother blood flow velocity streamlines and a larger cross-sectional area than the control AVF. This provides support for the use of a NO-releasing gel to improve local AVF hemodynamics.



**Figure 1.** Inter-user variability of wall shear stress (WSS) in control and NO gel treated AVFs. The initial (User 1) and second (User 2) analysis found the WSS in NO gel treated AVF was lower than the control.

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