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Title:

**The LifeLine - Vascular Access for Hemodialysis**

**Abstract:**

When the kidneys fail to perform their functions to full capacity, one cannot live long without some form of renal replacement therapy, such as hemodialysis. In order to perform hemodialysis, the patient must have suitable vascular access to allow adequate flow of blood to the hemodialysis circuit. Hemodialysis vascular access complications due to progressive neointimal hyperplasia formation (narrowing of the blood vessel) remains the most common cause of morbidity/hospitalization among dialysis patients worldwide. In this talk I will show how mathematical modeling can be used to understand the influence of oxidative stress and turbulent flow on the hyperplasia formation, to predict access stenosis and to suggest interventions aimed at specific growth factors that may be successful in prolonging the life of the vascular access, while reducing the high costs of vascular access maintenance.