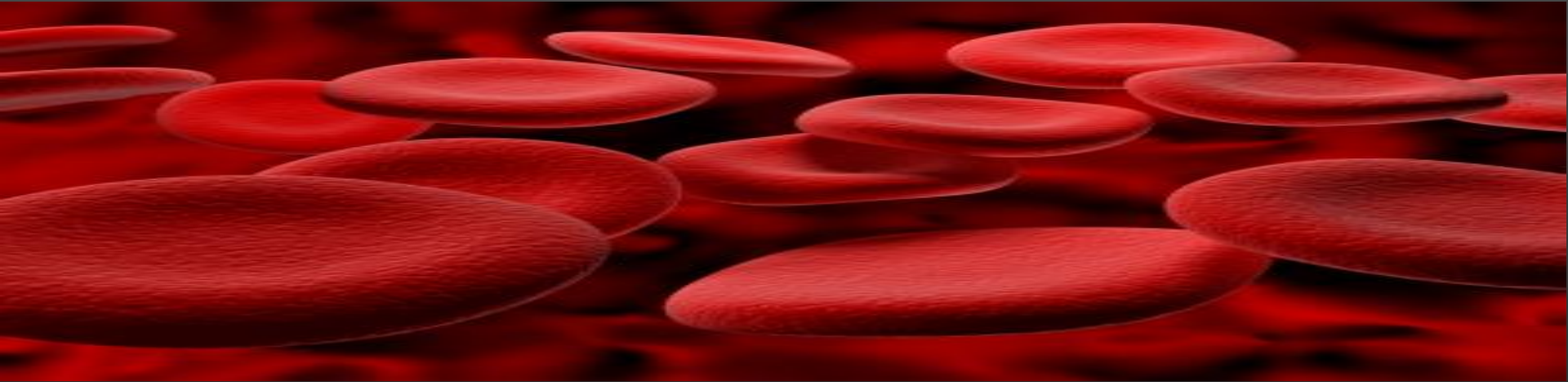


Team Aggregation Domination Oral Report 1



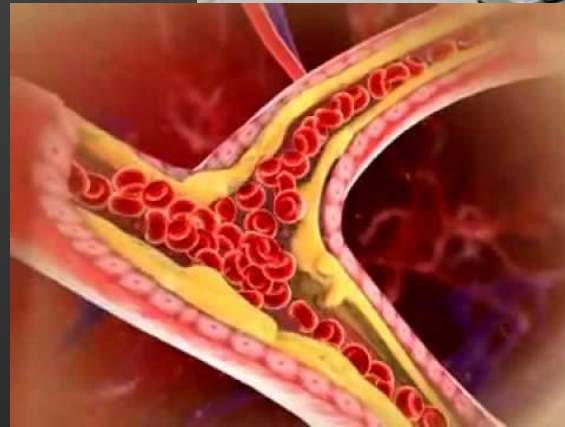
Cortnee Weinrich, Morgan Satterlee, Kevin Humphrey, and Kelly Hainline

Agenda

- ❖ Analysis and Design Components
- ❖ Goals
- ❖ Protocol for Developing Initial Prototype
- ❖ Results and Changes to Prototype
- ❖ Future Work



sissupply.com

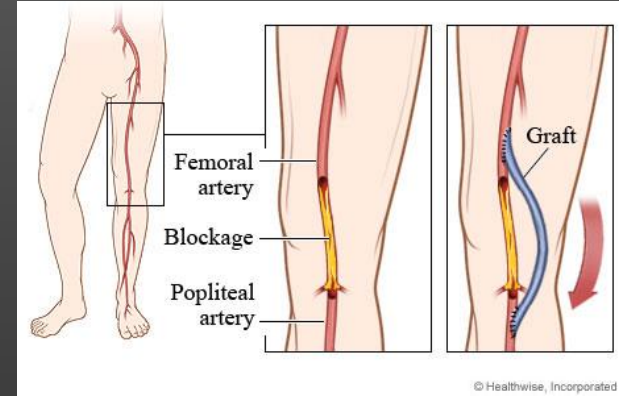


Youtube.com

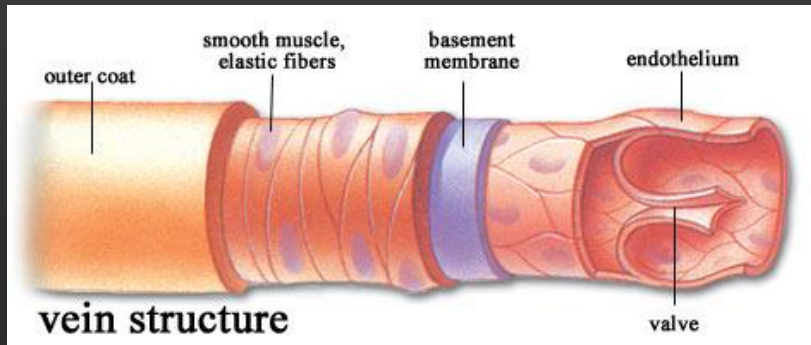
Analysis

Problem Statement: There is currently no efficient method for delivery of prophylactic drugs to vessels used in vascular bypass graft surgery.

Therapies focus on increasing the patency of veins but are limited by inherent diffusional barriers.



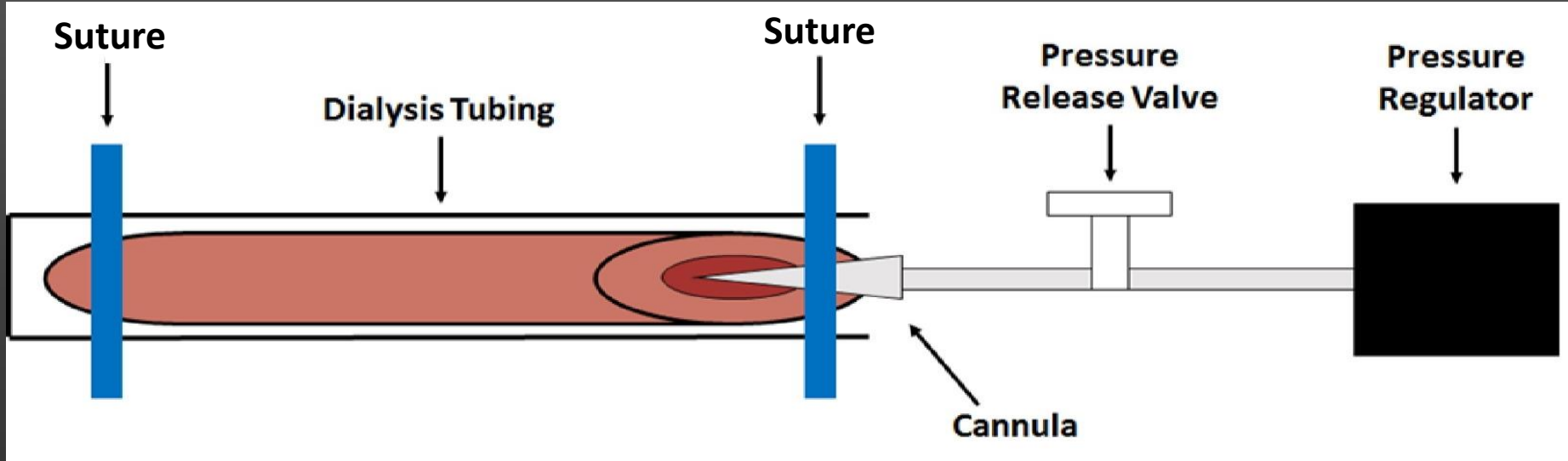
Myhealth.albert.ca



Flickr.com

Primary Objective: Develop a pressurized device that will deliver therapeutic drugs into the vessel used for graft transplant.

Design Components and Criteria



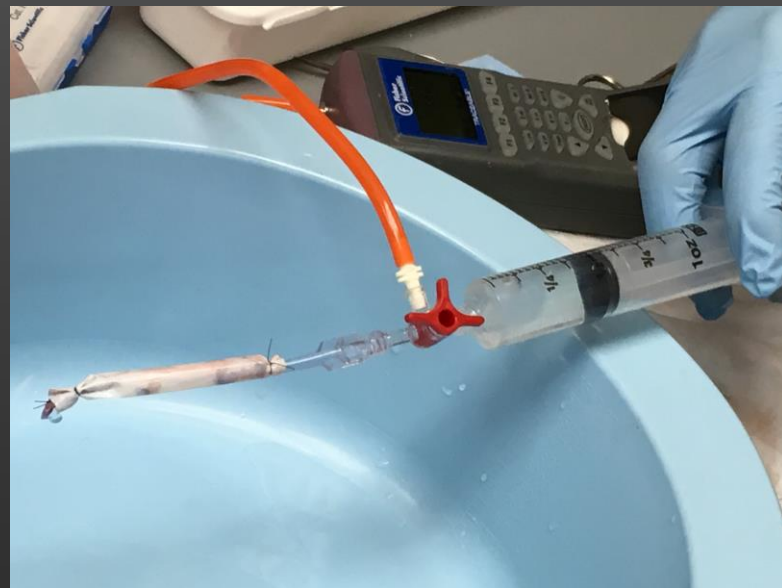
- ❖ max pressure 300 mmHg
- ❖ prevention of tissue damage
- ❖ no vein toxicity
- ❖ regulation of pressure

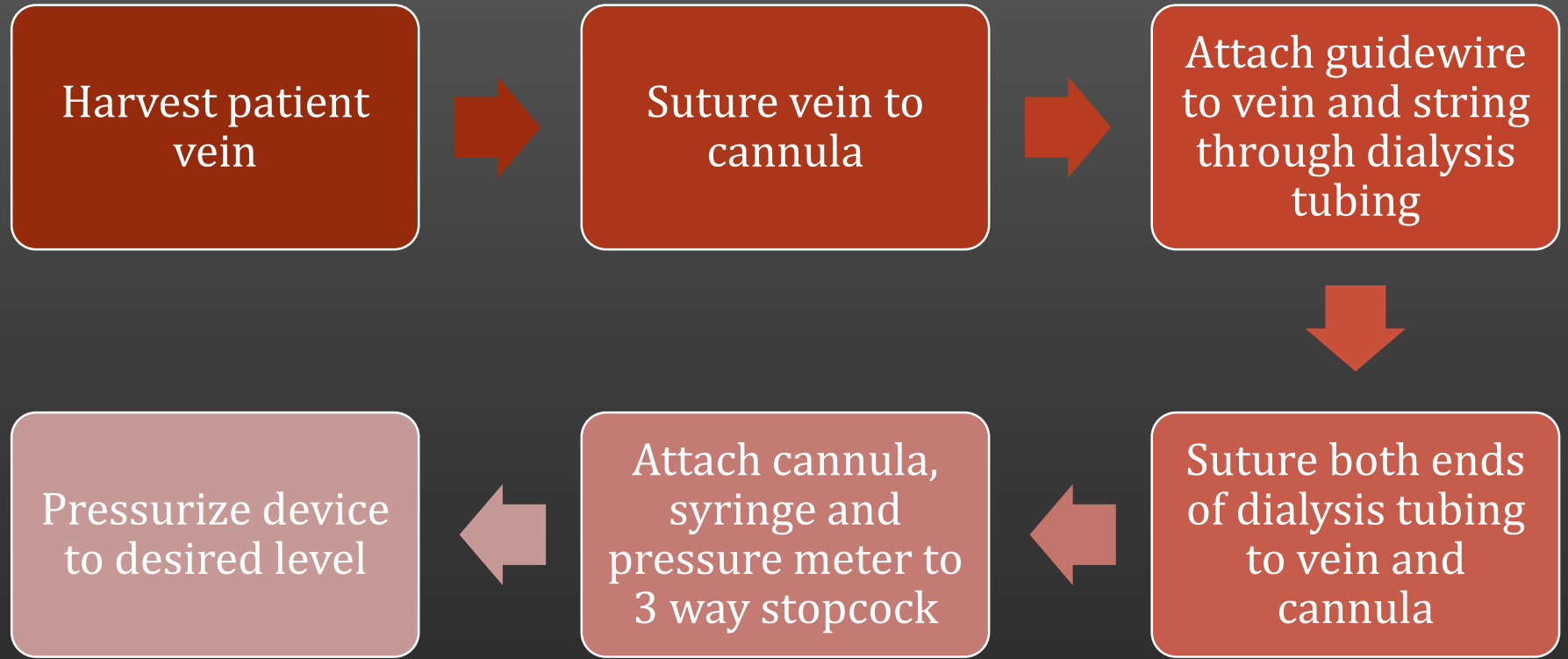
- ❖ cannula should be easily insertable
- ❖ simple user interface with therapy controls
- ❖ membrane needs to be permeable to MK2 inhibitor

Weekly Goals

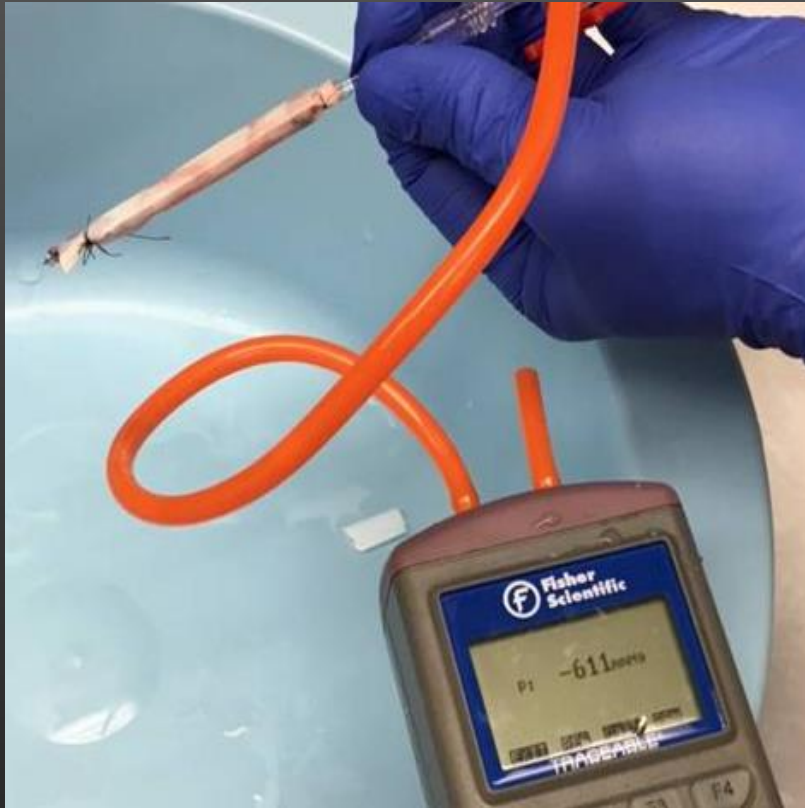
- ❖ Assemble first prototype
- ❖ Familiarize team with protocol before beginning experimentation
- ❖ Test device pressures (132, 300, 600 mmHg)
- ❖ Observe suture strength

Protocol





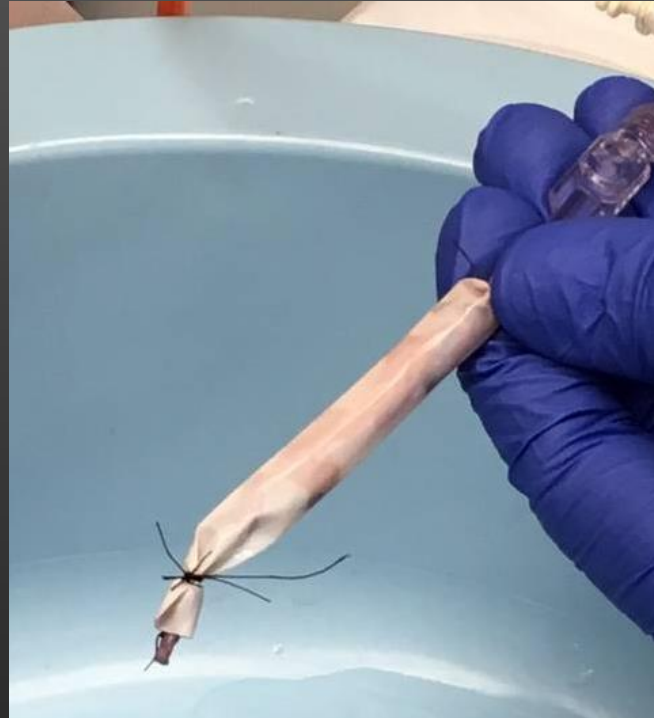
Results



- ❖ Successfully created first prototype
- ❖ Obtained a better idea of desired workflow
- ❖ Reached pressures of 132, 300, and 600 mmHg with minimal distension
- ❖ Suture strength leaked at 450 mmHg

Observations and Changes to Prototype

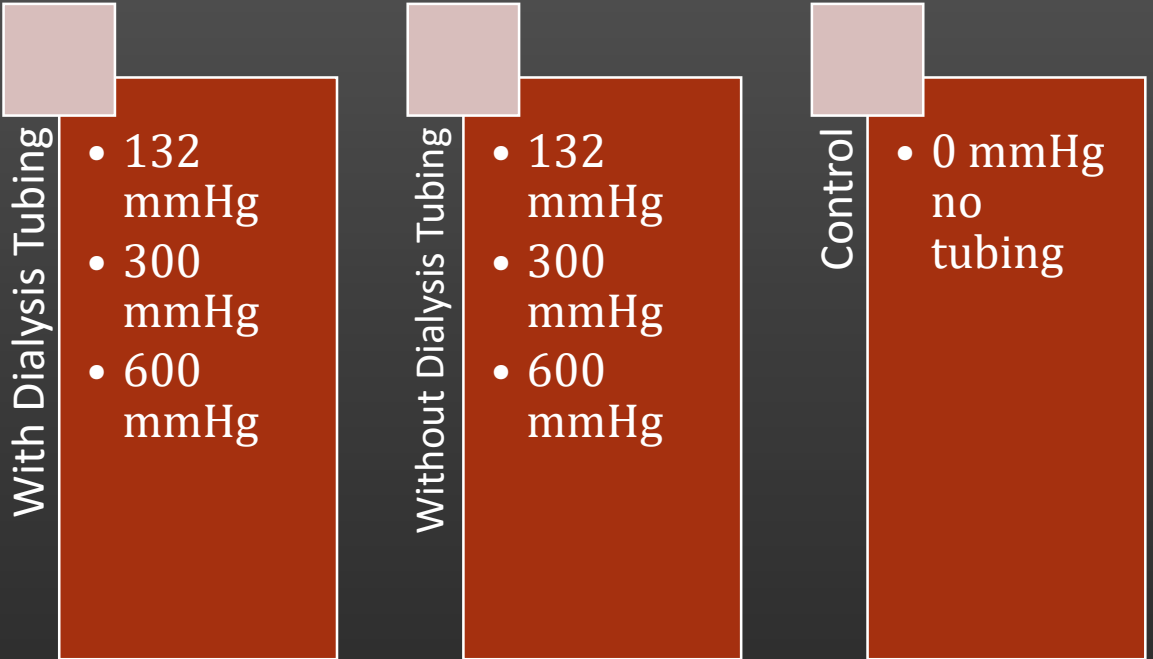
- ❖ Develop a better guidewire
- ❖ Add clamps to reduce leaks
- ❖ Reinforce dialysis tubing to account for patient customization
- ❖ Determine proper timing



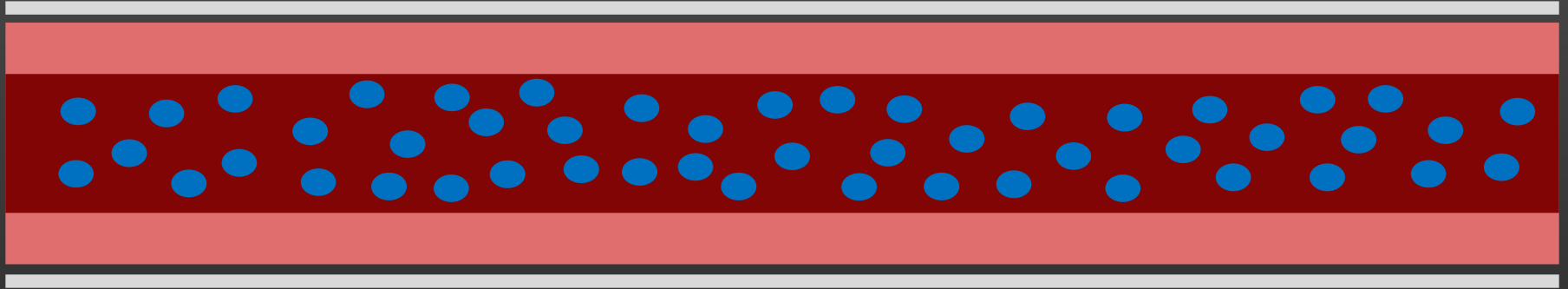
Future Tasks

Pressure-Induced Tissue Damage Assessment

- ❖ 7 trials using improved prototype design
- ❖ Immunohistochemistry to analyze tissue damage



Future Tasks – Flow Experiment



Questions