The Thrombectomers: Oral Report 1

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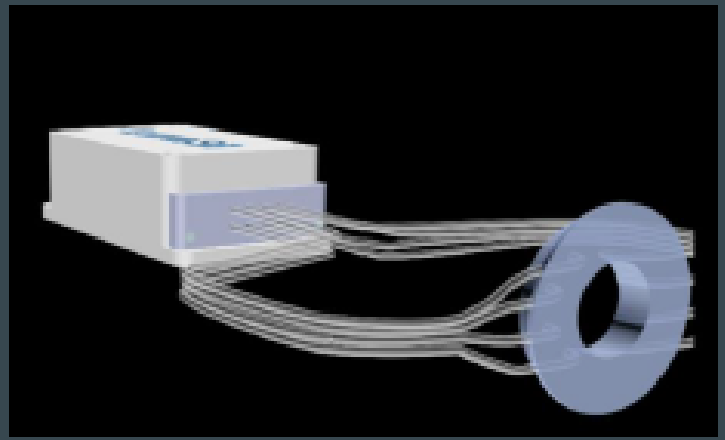
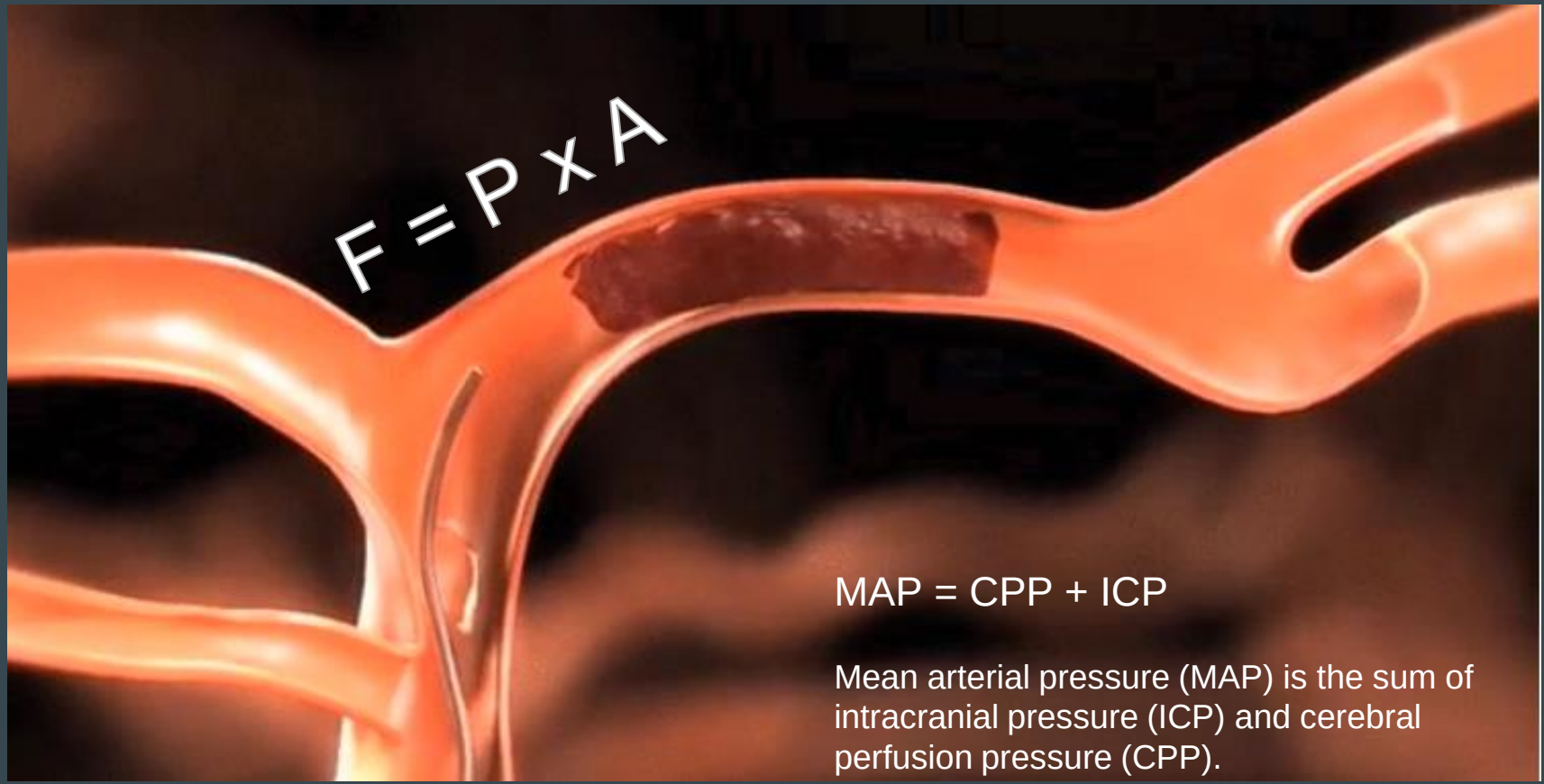
Original Project Assignment: Lumasil

- Met with project advisors John Mendoza and Siegfried Schlunk and began brainstorming how to improve the existing prototype.
- Switched with the team members of the Direct Aspiration Thrombectomy team who were more interested in the Lumasil project.



Model for Direct Aspiration Thrombectomy: Problem Statement

- Vacuum Thrombectomy: Procedure to remove thrombi using suction pressure
- There remains room for the procedure to be optimized.
- Need a physical model of the cranial cavity that accurately represents ICP, and allows pressure to be altered to determine the suction force at the tip of the catheter.



MAP = CPP + ICP

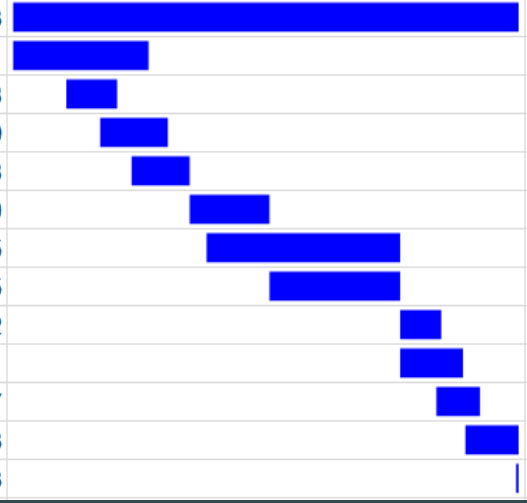
Mean arterial pressure (MAP) is the sum of intracranial pressure (ICP) and cerebral perfusion pressure (CPP).

Needs Assessment

- Model Efficacy
  - Must accurately model and measure intracranial pressure (ICP)
  - Must accurately model blood vessel shape and size in which the vacuum catheter will be inserted
  - Must respond to an increase in ICP in a manner that accurately replicates physiology and anatomy
  - Must accurately model blood flow through vessels in the brain during normal conditions as well as during elevated ICP conditions.
- Cost Efficacy
  - Should be made of cheap, obtainable, and abundant material
  - Should allow for the reuse of catheters without damage
- Medical Provider Compatibility
  - Should be simple enough for physicians to perform practice thrombectomies on
  - Must be safe to use in all settings, regardless of environmental burdens

Gantt Chart

Task	Start Date	End Date	Timeline	Hours
Overall time period	9/26	4/23		
Meet with Dr. Froehler weekly	9/26	4/23		160
Brainstorm ideas for model design	9/26	11/21		240
Settle on initial model design	10/18	11/8		30
Order Parts	11/1	11/29		12
Build first prototype	11/14	12/8		32
Evaluate efficacy of first model	12/8	1/10		40
Improve upon model	12/15	3/5		20
Iteratively improve model until it matches our desired function	1/10	3/5		30
Finalize model	3/5	3/22		10
Run experiments with direct aspiration catheter	3/5	3/31		10
Collect and analyze data	3/20	4/7		40
Put together poster for Design Day	4/1	4/23		40
Present at Design Day	4/22	4/23		15



Website Updates

A Model for Direct Aspiration Thrombectomy

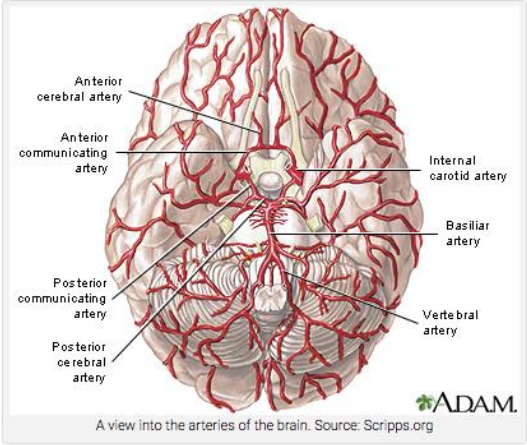
Project Specifications | Home Page | About Us | Contact Us | Venturewell BMEidea Application

On this page, you can find updates on what our team is up to as it designs its model, including component design and new changes in device creation.

Progress Report #1 (11/2/17)

Our team was initially assigned to the Lumasil project on match day. The Lumasil project was our third choice out of the three projects we submitted a needs assessment for, however, we were grateful to be assigned one of our top three. We set up a meeting with the project advisors, John Mendoza and Siegfried Schlunk. At the first meeting, we discussed the most pressing issues that needed to be addressed on the project, formed a plan of action, and met the computer engineer (Ben Perlin) who was assigned to the project.

Soon after, we realized that the team who was assigned to our first project choice (direct aspiration thrombectomy) had the Lumasil project as their third choice and the

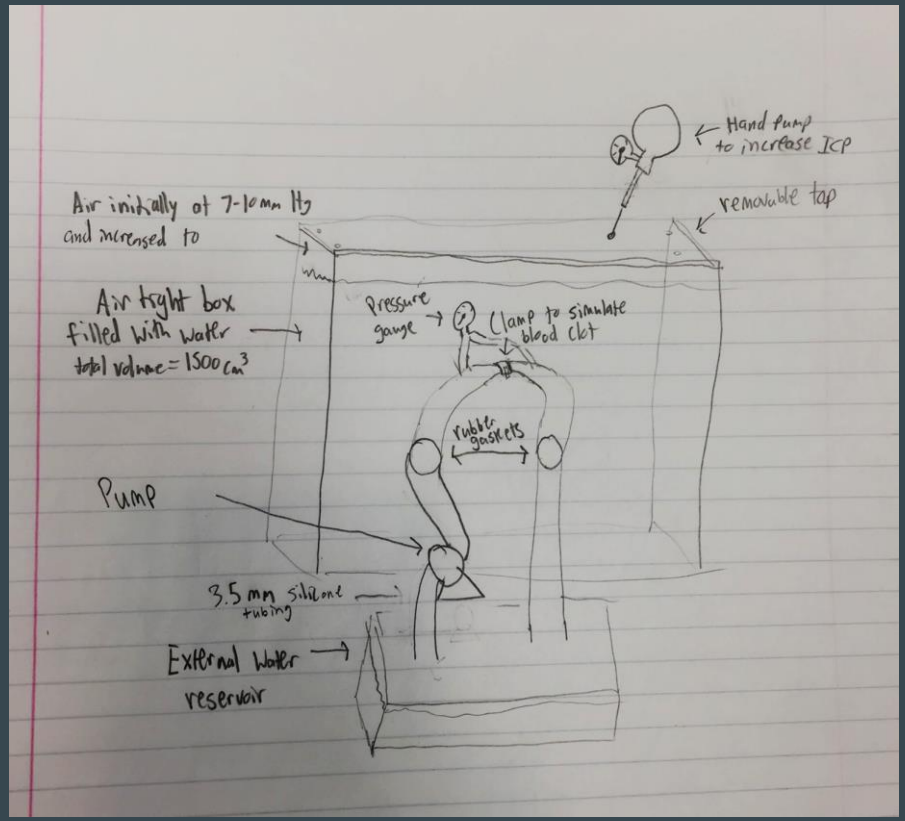


A view into the arteries of the brain. Source: Scripps.org

On behalf of our Senior Design Team, we welcome you to learning more about our model for direct aspiration thrombectomy! Using this site, you will be able to meet members of the team, look at our project updates, and learn about the specifications of the project, which could revolutionize the procedure of direct aspiration thrombectomy in the near future.

BMEIdeas Application Proposal

- Application included:
  - Potential Design
  - Manufacturing Costs
  - Potential Market



Design Updates

- First Prototype:
  - Uses 1.5 L Nalgene Water Bottle to mimic Cranial Cavity
  - Silicone Tubing (3.5 mm) to mimic cerebral arterial flow
  - Plastic Bag will mimic intracranial pressure with the help of syringe
  - Pressure gauges will measure values on each side of artificial clot.