IPFW Senior Design Project Proposal – Prototype Intra-operative Red Blood Cell Warmer
Dec 22, 2015

Background: Allogeneic red blood cell (RBC) transfusion is the most common hospital procedure. Current blood bank processes require RBCs to be stored refrigerated at 1-4°C until the time of transfusion. Blood warmers and incubators exist today. These devices are typically located within the blood bank setting or in the operating room. However operating room based blood warmers typically warm blood in-line as it passes the device, or in a static chamber.

Objectives: The goal of this design project will be to design and develop a portable RBC incubation chamber with the ability to agitate two (2) RBC units at once for one hour while maintaining a programmable and selectable temperature between 37 and 42°C. The device must be able to clamp to an IV pole and minimize the required footprint to accommodate space for adjacent devices.

Design team: Ideally the project team would consist of mechanical engineering, heat transfer, and electrical engineering
  - Mechanical Engineering - design of the chamber and mechanical agitation of the bags
  - Thermodynamic/Heat transfer – Optimize heat transfer to the RBC unit and minimize heat loss to the surrounding environment
  - Electrical Engineering – electrical engineering provide the electronic feedback and heating controls.

Budget: $5,000 for supplies and prototype equipment including 3D printing, motors, controllers, etc.

Matthew Landrigan, PhD
R&D Project Manager, Biologics
Zimmer Biomet
(o) 574 371 1115
(c) 574 933 4190
matt.landrigan@zimmerbiomet.com