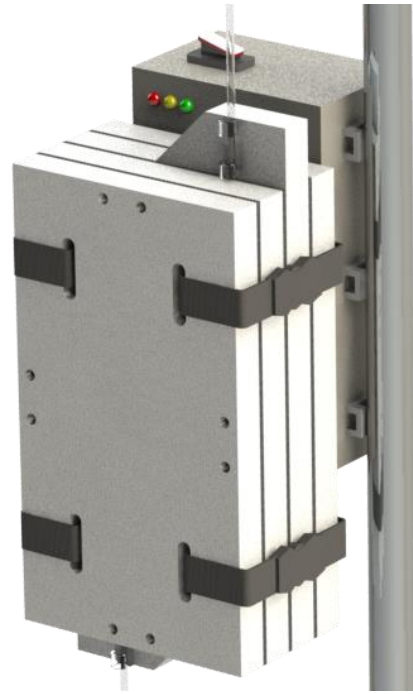


# OpenFluidWarmer



A New Future For Open-source Medical Devices

# Current State of Accessible Fluid Warming

"Commercial fluid warmers are either cost prohibitive in many contexts or not available for purchase" (Field Ready Fluid Warmer Open Challenge, Hackaday Prize 2020).

Hacked together, unproven designs are sometimes the only option.



\*Images of fluid warmer at Annapurna Neurological Institute from "Low Cost Fluid Warmer Thesis by Marjolein van der Male"

# OpenFluidWarmer Concept

- Industry standard safety features
- Common-off-the-shelf components
- Built using widely accessible manufacturing techniques
- Flexible design that can accept multiple alternative components
- Simple operation
- User feedback guided development
- Open-source

# OpenFluidWarmer Goal

An IV fluid warmer solution that incorporates all industry standard safety features and solves the difficult cost and sourcing challenges encountered when constructing this device anywhere in the world.

# Use-Cases

- Hospitals with few financial resources and/or medical device sourcing options
- Mobile medical care, provides a solution that can be maintained with only a few tools on hand
- Disaster zone medical care, provides a flexible solution that can work with locally available components

# Business Model

- Initial product development sprint is dependent on outside investment
- Customer preorders will fund the build and distribution of the first fifty units
- Continued field service support and design maintenance will be funded by training session, kit, preassembled unit, and custom feature sales.

# Potential Outcomes

- Best-Case
  - 1000+ devices in active use by medical organizations worldwide
  - Market pressure of a low-cost solution forces cost reduction of commercially available fluid warming solutions worldwide
  - Becomes a leader in the open-source medical device space
- Realistic
  - 100+ devices in active use by medical organizations
  - OpenFluidWarmer as preferred IV fluid warming solution in some hospitals
- Worst-Case
  - <50 devices in active use only with support of non-profits
  - Provides IV fluid warming capabilities in areas that need them the most

# Future Improvements

- Custom PCB option (with hardware faults)
- Selectable set point temperature
- Optimize cost with two models - high flow and low flow
- Assembler and operator training materials



# Progress to Date

- Working proof-of-concept prototype
- Design and development documented on [OpenFluidWarmer Hackaday.io page](#)

