PHILIPS Reusable Pacemaker Lead Extraction Device

Mechanical Engineering
University of Colorado Boulder

Hannah Niew — Project Manager
Claire Richards — Logistics Manager
Justin Won — Financial Manager
Imaan Sheikh — CAD Engineer
AJ Spencer — Manufacturing Engineer
Jamie Warren — Systems Engineer
Noah Johnson — Test Engineer

Background

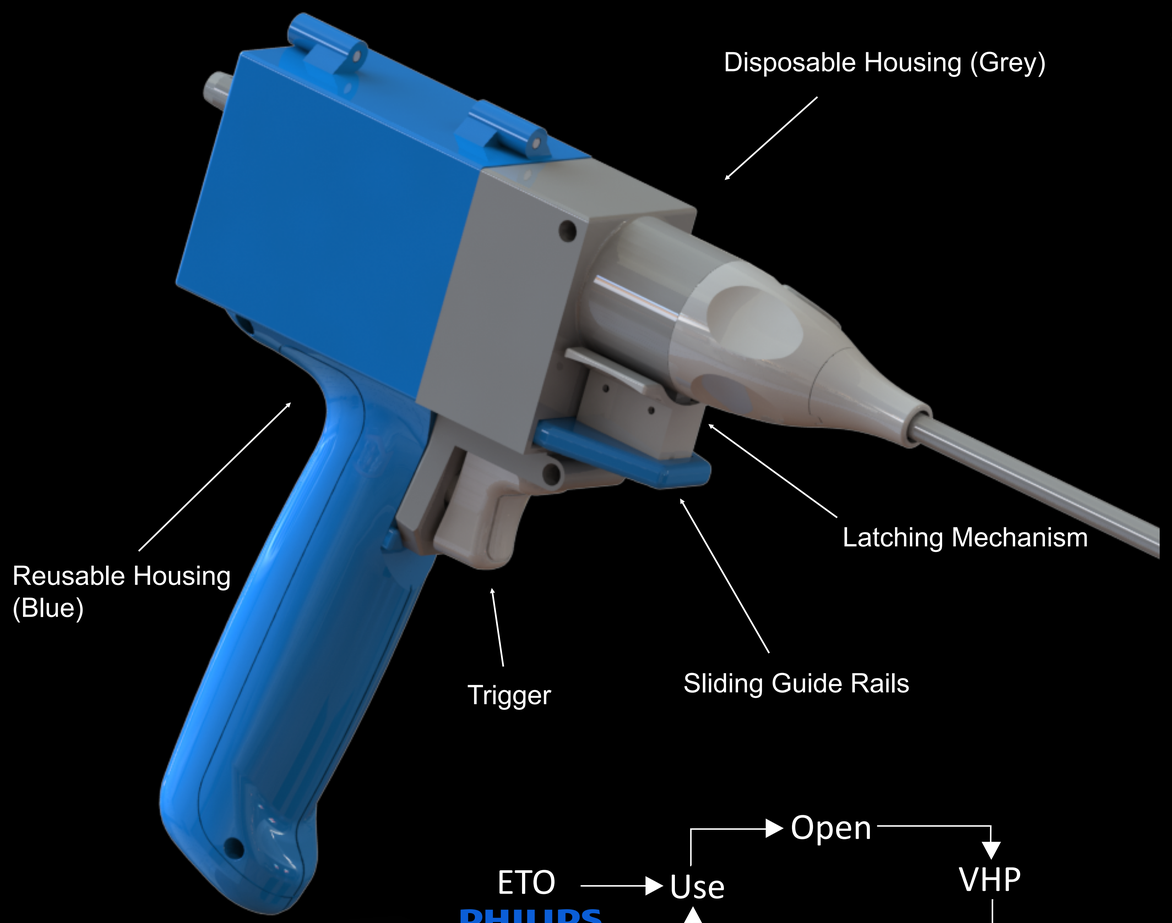
- Prior Technology → Expensive
- Current Device → Cheaper/Easy to Use
  Single Use
- Our Device → Reusable (Five Uses)
  Two Sections
  (Disposable & Reusable)

Procedure

- Enters vein to remove infected leads
- Cuts through calcification buildup around leads
- Switches to shielded mode around heart wall
- Pull leads out through driveshaft and out back of device

Project Requirements

1. Handle Reusability ✓
2. Functionality Maintained
3. Cost Reduction ✓
4. Retraining Time ✓
5. Tip Exchangeability
6. Weight ✓
7. Ergonomic
8. Sterilizability ✓
9. Sterilization Time ✓



Sterilization

Sterilization Method	ETO*	FI*	Autoclave	VHP*
Robustness	✓	×	✓	0
Availability	×	0	✓	✓
Materials	0	✓	×	0
Eco-Friendly	×	0	✓	✓
Heat	✓	✓	×	✓
Pressure	0	✓	×	0

*ETO: Ethylene Oxide
VHP: Hydrogen Peroxide Vapor
FI: Fluid Immersion

✓ : Desirable
0 : Moderate
× : Undesirable

Testing

- VHP Machine (Biological Indicators)
- Functionality - simulated fibrotic and calcified lesion models
- Fluorescent dye
- Pressure and Temperature (Injection Molded)

Impact/Future Work

- Testing will be pass or fail grade given performance
- More affordable, environmentally friendly, easy to use
- Redesign with smoother features for injection molding

Functionality / Features

Reusable Housing | Sliding Guide Rails | Disposable Housing | Electronics

Acknowledgements: Weston Lee | JT Brlansky | Dr. Daria Kotys-Schwartz | Dr. Julie Steinbrenner | Dr. Jianliang Xiao | Robert DuBois | Lauren Darling | Pat McGuire | Idea Forge & ITLL Staff | Design Center Colorado | PHILIPS