

Integrated Saw Guide for Redo Sternotomy

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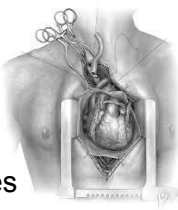
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Medical Need:



40,000

- **40,000 babies** are born with congenital heart defects
- **25%** require redo heart surgeries [1]
- Current sternum saws on market are not intended for redo sternotomies



Objective:

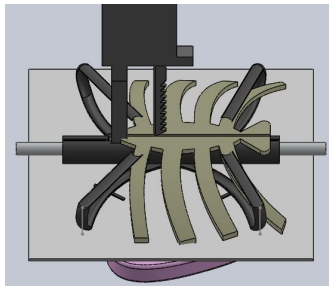
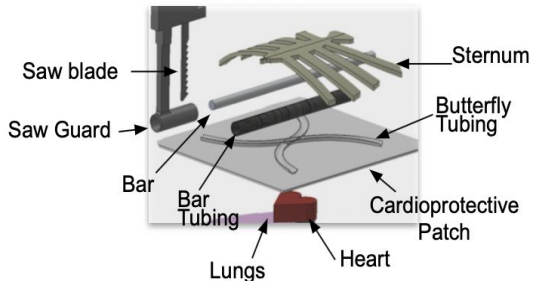
- Design a safe and fast saw guide for redo sternotomies

Design Input:

- Minimize sternum cut time less than 15 seconds
- Minimize deviation from centerline of the sternum, less than 2 mm
- Constraint: Create a guide track mechanism, Stryker compatible

Solution - Design:

- Bar inserted into bar tubing to create guide track
- Saw guard inserted to guide cut through center

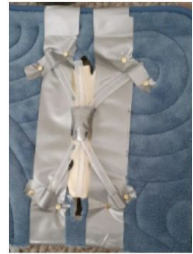
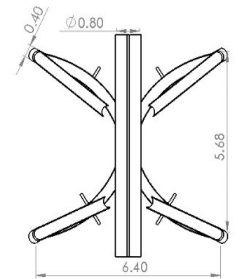


Solution - Build:

Saw Guard (to guide saw):



Butterfly Tubing (to anchor



Verification:

Requirement	Result
Emergency detachment time ≤ 15 sec.	4.5 \pm 1.3 sec. (n=15)
Cut time < 15 sec.	Pending
Deviation from the centerline < 2 mm	Pending

Impact / Future:

- Provides safer access to the heart
- Reduces anesthesia time and surgery complications
- Create adult size version of the saw guide, Customizable (cut to fit)
- Quicken emergency detachment by using magnetic release