

Universal Expandable Stem System for Use in Revision Hip and Knee Arthroplasty

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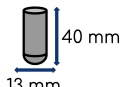

Need

- Stem used for load sharing when bone is defective or removed
- 22% of patients experience stem loosening
- 16% experience infection

Objective

Create a hip & knee compatible stem that **expands** to fit each patient's unique anatomy while minimizing inventory and OR time

Design Inputs

- Expandability ≥ 1 mm
 - Pull Out Load ≥ 3324 N
 - Collapsing Load ≥ 2500 N
 - Overall Strength ≥ 250 N
- 
 Starting Size
- 
 Titanium
Material

Solution

Stem + Tibial Tray

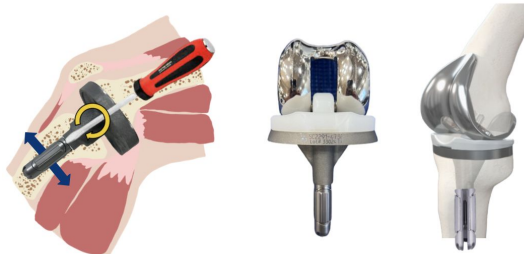


Collapsed
13mm

Expanded
14 mm

NDA w/Globus Medical prevents sharing of expansion mechanism

Intended Use

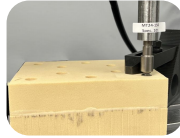


Surgeon inserts stem + tibial tray into IM canal and uses driver to mediate expansion

Verification Tests

↑
Tensile Load testing press-fit in bone block

Fail



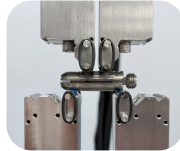
↓
Compression load testing weight bearing

Pass



↕
4 Point Bend testing overall strength

Pass



Impact & Future

- Reduces risk of re-revision surgeries
- Reduces inventory from 30 to 4 stem sizes
- Improve smooth expansion
- Edit internal geometry for increased loading capacity