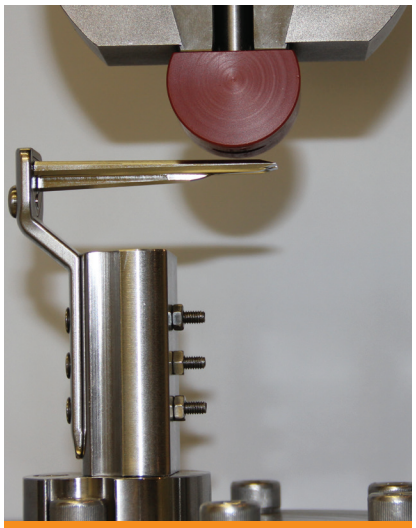
LolliPOP
The Locking Pediatric Osteotomy Plate system™

BIOMECHANICS

Biomechanical Performance of a Modular Blade-Plate

The Locking Pediatric Osteotomy Plate (LolliPOP™) System is a modular Blade-Plate intended for stable fixation of proximal femoral osteotomies (PFO) and fractures in the pediatric population. A modular design offers numerous advantages, including intra-operative flexibility, improved implant fixation, elimination of the chiseling step, superior accuracy, and a smaller incision, to name a few. However, does this modular design introduce a mechanical weak point?

Head-to-head biomechanics testing and finite element analysis (FEA) were conducted to compare the Pega Medical™ LolliPOP System to commonly used Plates on the market, namely the OrthoPediatrics PediLoc® and the Synthes CAPOS. The results demonstrated that the LolliPOP System had a bending strength equivalent to the CAPOS and 22% superior to the PediLoc. When loaded to failure, the LolliPOP breaks at the most proximal plate hole, similarly to the Pediloc, which is a preferred location since it facilitates implant removal. The CAPOS, on the other hand, failed at the blade section, making removal difficult. Testing also showed no damage to the LolliPOP Connector linking the Blade to the Plate.

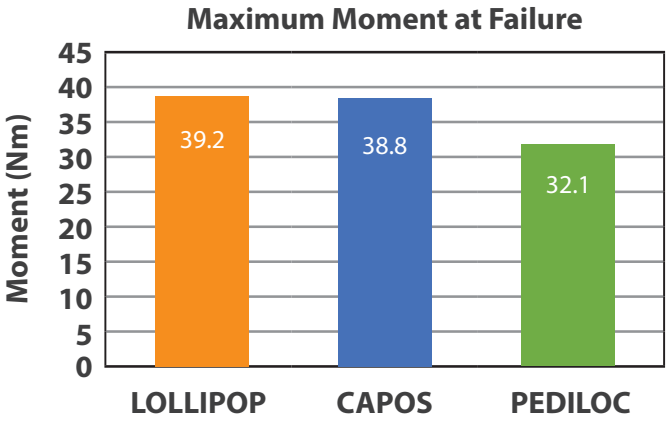


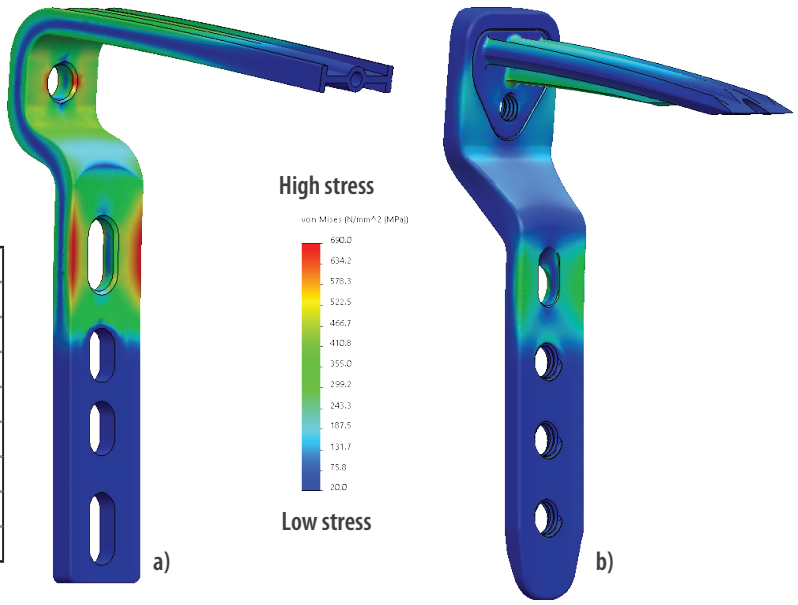
Test set-up

LolliPOP after testing

CAPOS after testing

As shown in the FEA, the LolliPOP system carries minimal load at the level of the Connector. The patented countersunk connection between Blade and Plate ensures a solid assembly with a smooth transfer of forces between components denoted by the blue color[1].





Finite element analysis comparison with identical loading between PEDILOC (a) and LolliPOP™ (b)

In the first series of 50 clinical cases[2], consolidation was present for all PFOs at 6 months follow-up with no loosening or disassembly of the components. The implant stability has also been demonstrated through cyclic fatigue testing of half a million cycles with no loosening or metal-on-metal fretting wear between the components.

Through mechanical testing, finite element analysis, and clinical validation, The LolliPOP modular Blade-Plate System has been shown to be a sound design that outperforms devices currently on the market while offering a wide range of advantages from its modular design.

1. Forthright Engineering, Raleigh, NC. Independent finite Element Analysis. **2.** Standard SC, Weber EW, (2018) IPOS annual meeting, Orlando, FL.

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