

THA in 2018: Modular Stems

by

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Attempting to predict ten years out what Modular THA will look like we must first review and know the past. There is a strong and long history of modularity in THA. What was once considered novel is now state-of-the art in design.

Modern day modularity of the femoral component comes from the European experience from the late 1940s' through the 1970s'. Modular heads did not become widely used in the U.S. until the mid 1980s'. Stem modularity made it into prime time with the introduction of the S-Rom® Stem in 1984. With the success of the S-Rom additional modular designs emerged.

Modularity Classification

- > Proximal
- > Mid-stem
- > Distal

Modular heads are now standard on every hip stem system.

Neck Extensions

Trunion sleeve offer increased neck length adjustments, however, tend to reduce range of motion.

Modular Necks

Allow for adjustments of hip mechanics in a mono-block stem.

Anterior / Posterior Pads

Allowed for adjustment in fit & fill in the A/P width of the implant. It was criticized for not having circumferential porous proximal coating and has been discontinued.

Modular Collars have come and gone.

Proximal Shoulders (bodies)

They have the design option of increasing their proximal body height, offset and version angle.

Stem Sleeves

Stem sleeves offer the advantage of fit & fill with adjustment of hip mechanics. Some designs like the SRom® require removal of the stem to correct offset or version, while newer designs allow for correction with the stem *in situ*.

Mid-Stem

These designs offer versatility in correction of sizing mismatch between proximal and distal femoral anatomy. The modular junction is located at a high bending moment and fractures have been reported. **Distal Sleeves**

These designs allow for distal stem fit with different distal style options (smooth, fluted, or porous).

Multi-Modularity

The RMS is the best example of excess modular sites for a cementless hip stem and has come and gone.

Summary

These stems represent some of the past and current trends in both design and marketing efforts. This tendency is no doubt due to both the clinical and market success of the S-Rom. Modular designs' goals have changed over the past 24 years. In the early 1980s fit & fill were the principal objectives. Today the reduction of particulate derbies and restoration of hip mechanics are the focal point.

Future Predictions

No one would argue that restoration of hip mechanics is critical to long-term successful clinical outcome and modular designs help restore hip mechanics. Today designs exist that allow the correction, or fine-tuning, of the hip mechanics after the stem has been implanted. The future will continue to be focused on modularity. There will however be a new focus with tissue sparing designs that save both hard and soft tissue. Example this neck sparing stem with a modular head and neck. Also, this novel bearing material Polycarbonate-urethane (PCU) The "Buffer" which reduces wear debris. Modularity is here to stay!

