



## Hip Disarticulation

<b>Ages:</b>	40-65 years
<b>Sex:</b>	Male
<b>Weight:</b>	Various
<b>Amputation Level:</b>	Hip disarticulation
<b>Previous Socket Design:</b>	Traditional hip sockets with Velcro straps
<b>Challenges Addressed:</b>	Heightened nerve sensitivity at amputation site. Desire for max breathability to decrease heat and sweat.

### Background:

Three various designs using RevoFit™, HP releasing guides, and straps.

### Patient Challenges:

(anatomical, physical, mental)

Challenges included the strength and range of motion required to get straps tight enough. Patients with traditional hip sockets must disrobe to adjust straps, which isn't possible when out in public. This forces them to choose between stability (making their socket tight and stable for walking) and comfort (loosening the socket for seated comfort and breathability). Heat and sweat also creates additional comfort issues.

### Protocol & Design:

**Design 1: Hip disarticulation socket** with dial for adjustable control of fit. Flexible insert used to contain tissue and provide comfort against the skin. This design used a RevoFit™ dial for micro-adjustability and a Velcro strap to fully open socket for easy on/off.



**Design 2: Rolled silicone insert.** RevoFit™ for macro- and micro-adjustability. This design used Click's Lacer HP Releasing Kit (SKU# OK0150-300-05) laminated to the frame for easy on/off. No dummies exist for HP guides, which you must clay up and laminate directly to frame.



**Design 3: Bikini-style socket** with HP releasing guides sewn directly to iliac crest pads and one RevoFit™ dial. Patient requested lightweight and maximum breathability.



## Patient Outcomes:

**Design 1 Outcome:** Patient able to easily put the prosthesis on and take it off with strap and then micro-adjust with a RevoFit™ dial. Patient ability to loosen socket while seated and tighten when up and walking was a major benefit. The patient was also able to sit more comfortably and breathe easier. When patient was walking and more active, he was able to tighten frame on the fly without having to expose the prosthesis.

**Design 2 Outcome:** Patient has nerve sensitivity at amputation site, so a custom rolled silicone insert was used as the interface for softness and maximum comfort. The silicone provided little resistance to compression, and the patient claimed that he could never get it that tight with his old strap system.

**Design 3 Outcome:** Open bikini-style frame allowed for maximum adjustability and breathability. Dial position was not ideal, but it was easy to operate and micro-adjustable, which was difficult to achieve with previous straps.

## Key Learnings:

**Design 1:** Place dial above the hip joint to conceal build height and operate easily. The anterior middle is not a good place for dial due to clothes restrictions. Can be used with plastic or rolled silicone inserts. HP releasing guides need to be prepped prior to lamination. Clay or wax was used with guides to create void for guide to lock into place.

Try using one or two QuickFit™ Straps w/magnetic buckles next time for on/off and adjustability. QuickFit Straps could also be used on existing sockets that currently have traditional straps.

**Design 2:** HP releasing guides do not have lamination dummies, so clay or silicone must be made to create void for release tab. Soft silicone provided little resistance to closure force and was easy to operate. Make sure dial location doesn't interfere with belt line.

**Design 3:** Dial should have been located anterior above the knee joint. Sewing release tabs into crest pads was challenging. Crest pads were able to move with the patient and maintain secure suspension. The small minimal frame created a lightweight device with maximum air flow.

Another recommendation for this design is to replace an existing traditional strap with a powered QF strap for easy one-handed operation. Add a magnetic QF buckle for easy on/off, as seen in the illustration to the right.

