Surgical Technique Guide
Introduction

The Xtract-All® Universal Hip Stem Extraction System is designed for the removal of hip implants during revision procedures.

Indications for Use

For use by, or as directed by, a surgeon during hip revision surgeries. Appropriate for removal of most hip implant types, including but not limited to tapered neck, monoblock, threaded, & modular stems.

Contraindications

The Xtract-All® Hip System includes multiple attachment methods specific to a variety of hip stem implant styles. All attachment configurations ultimately connect to the Extraction C-frame and require repeated strikes with a mallet to extract the implant. Therefore, when there is insufficient quality or quantity of bone, or any other condition that may result in fracture of the femur during extraction, the provided instrumentation should not be used.

Listed below are possible (not inclusive) scenarios in which the Xtract-All® Hip System should not be used:

• Fully porous-coated straight and bowed stems: Due to the excessive bone ingrowth on fully porous-coated straight and bowed stems, it is not recommended to use this system for removal of such implants.

• Foreign body sensitivity: Where material sensitivity is suspected, appropriate tests should be performed to rule out sensitivity prior to use.

Warning and Precautions

Preoperative

• The surgeon should be familiar with general principles of revision surgery and techniques for removal of implants.

• The instruments should be inspected for visible damage prior to use. Do not use the product if damage is suspected.

• Only validated cleaning and sterilization procedures should be used.

Operative

• Proper handling and storage of the instrumentation is mandatory. Damage to the instrumentation may produce stresses and cause defects, which could become a focal point for failure.

• The surgeon should be cautious with limb position change and/or excessive force when extracting implants with instrumentation provided in the tray.

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Xtract-All® Hip (104-00) Universal Hip Stem Extraction System

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*Extractor tips 104-11 through 104-30 are single-use only and must be discarded after use.

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**Parts not shown to scale**

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**Extractors**

- 104-00 Hip System: Level 1
- 104-04 Hip Stem Extractor
- 104-05 Femoral Head Disassembly Instrument
- 104-06 Hook Extractor
- 104-07 Monoblock Stem Extractor
- 104-08 Tray

**Accessories**

- 104-11 #12-24 Male Extractor Tip
- 104-12 #12-28 Male Extractor Tip
- 104-13 1/4-20 Male Extractor Tip
- 104-14 1/4-28 Male Extractor Tip
- 104-15 5/16-18 Male Extractor Tip
- 104-16 5/16-24 Male Extractor Tip
- 104-17 3/8-16 Male Extractor Tip
- 104-18 3/8-24 Male Extractor Tip
- 104-19 7/16-14 Male Extractor Tip
- 104-20 7/16-20 Male Extractor Tip
- 104-21 M5 X 0.8 - 6G Male Extractor Tip
- 104-22 M5 X 0.9 - 6G Male Extractor Tip
- 104-23 M6 X 0.75 - 6G Male Extractor Tip
- 104-24 M6 X 1.0 - 6G Male Extractor Tip
- 104-25 M7 X 1.0 - 6G Male Extractor Tip
- 104-26 M8 X 1.0 - 6G Male Extractor Tip
- 104-27 M8 X 1.25 - 6G Male Extractor Tip
- 104-28 M10 X 1.0 - 6G Male Extractor Tip
- 104-29 M10 X 1.25 - 6G Male Extractor Tip
- 104-30 M10 X 1.5 - 6G Male Extractor Tip

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**Extension Adapter**

- Driver Bit 3.0mm

**Lid**

- T-Handle 1/4" Square Drive

**Case**

- 1/2" & 11/16" Double Open End Wrench

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**Mallet**

- Mallet

**Extraction System (120-00)**

- Modular Hip System
- Extension Adapter

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**Hip System: Level 1**

- 104-00 Hip System: Level 1
- 104-04 Hip Stem Extractor
- 104-05 Femoral Head Disassembly Instrument
- 104-06 Hook Extractor
- 104-07 Monoblock Stem Extractor

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**Single-Use Only Extractor Tips**

- 104-11 #12-24 Male Extractor Tip
- 104-12 #12-28 Male Extractor Tip
- 104-13 1/4-20 Male Extractor Tip
- 104-14 1/4-28 Male Extractor Tip
- 104-15 5/16-18 Male Extractor Tip
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- 104-24 M6 X 1.0 - 6G Male Extractor Tip
- 104-25 M7 X 1.0 - 6G Male Extractor Tip
- 104-26 M8 X 1.0 - 6G Male Extractor Tip
- 104-27 M8 X 1.25 - 6G Male Extractor Tip
- 104-28 M10 X 1.0 - 6G Male Extractor Tip
- 104-29 M10 X 1.25 - 6G Male Extractor Tip
- 104-30 M10 X 1.5 - 6G Male Extractor Tip

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**Stryker Rejuvenate Clamping Pin**

- Stryker Rejuvenate Clamping Pin

**Wright Medical Clamping Pin**

- Wright Medical Clamping Pin

**Zimmer Clamping Pin**

- Zimmer Clamping Pin

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**Modular Hip System**

- Modular Hip System
- Extension Adapter

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**Shukla Medical**

- Xtract-All® Hip (104-00) Universal Hip Stem Extraction System
Surgical Technique

1. **Determine Stem Type**
   For the best possible surgical outcome of the Xtract-All® Universal Hip Stem Extraction System (104-00), it is necessary to preoperatively determine if the hip stem is a standard stem or a modular stem.

   Removal of a modular stem requires the Xtract-All® Modular Hip Stem Extraction System (120-00) in addition to the standard system (104-00). See page 9.

2. **Femoral Head Removal**
   1. Rotate knob in center of Femoral Head Disassembly Instrument (104-05) until the inner sleeve is fully descended, such that the inner and outer sleeves are nested together at the distal end.
   2. Slide the instrument onto the hip implant neck, with the femoral head inside the nested sleeves.
   3. Rotate knob to adjust sleeve spacing, raising the inner sleeve until it rests against the femoral head and the outer sleeve rests against the femoral neck (Fig. 2a).
   4. Press handle toward instrument body (Fig. 2b) to detach femoral head from neck.
   5. The femoral head is retained inside the inner sleeve for easy disposal.

3. **Tapered Neck Stem Removal**
   1. With handle in open position, slide Hip Stem Extractor (104-04) over implant neck as far down as possible. Rotate the extractor handle counter-clockwise to loosen the jaw if necessary (Fig 3a).
   2. Tighten jaw grip by rotating handle clockwise. Tighten as far as possible, then reverse 180° to close the handle.
   3. Press handle toward extractor body until it locks completely closed. Handle must close fully to ensure a secure grip on the implant neck. Confirm secure attachment by pulling slightly.
   4. With extractor aligned and securely locked onto hip stem, slide the Extraction C-Frame (MIWE) and a Hex Nut (MIWN) onto the proximal end. Tighten nut fully with the 11/16” Wrench (MIWW) while applying counter-torque with the 1/2” Wrench (WR140).
   5. Extract implant with repeated strikes of the Mallet (MMM5) on extraction C-frame strike plate (Fig. 3c). If implant resists removal after several strikes, loosen bone around implant prior to continuing.
   6. After implant is pulled free from the femur, open extractor & remove implant from extraction assembly.
Surgical Technique (Continued)

4 Monoblock Stem Removal
1. Thread Monoblock Stem Extractor (104-07) onto Shaft Driver (SH700).
2. Slide the Extraction C-Frame (MIWE) and a Hex Nut (MIWN) onto the proximal end. Tighten nut fully with the 11/16” Wrench (MIWW) while applying counter-torque with the 1/2” Wrench (WR140).
3. Hook Monoblock Stem Extractor around implant neck (Fig. 4).
4. Keeping impaction force in line with the axis of the implant, use repeated strikes of the Mallet (MMM5) on the extraction C-frame strike plate to extract stem. If implant resists removal after several strikes, loosen bone around implant prior to continuing.

5 Slotted or Cross Hole Stem Removal
1. Thread Hook Extractor (104-06) onto Shaft Driver (SH700).
2. Slide the Extraction C-Frame (MIWE) and a Hex Nut (MIWN) onto the proximal end. Tighten nut fully with the 11/16” Wrench (MIWW) while applying counter-torque with the 1/2” Wrench (WR140).
3. Hook the extractor through the cross hole shaft (Fig. 5).
4. Keeping impaction force in line with the axis of the implant, use repeated strikes of the Mallet (MMM5) on the extraction C-frame strike plate to extract stem. If implant resists removal after several strikes, loosen bone around implant prior to continuing.

6 Threaded Stem Removal
1. Determine size of threaded implant neck and select corresponding single-use Extractor Tip (104-11 through 104-30).
2. Screw selected Extractor Tip into Shaft Driver. Then attach Shaft Driver (SH700) to Hudson T-Handle (MM1222) by pulling handle shaft up, inserting & aligning the driver, & releasing handle to lock in place.
3. Use the T-handle to screw the Shaft Driver assembly tightly into implant neck (Fig. 6a).
4. Remove T-handle from Shaft Driver. Slide the Extraction C-Frame (MIWE) and a Hex Nut (MIWN) onto the proximal end. Tighten nut fully with the 11/16” Wrench (MIWW) while applying counter-torque with the 1/2” Wrench (WR140).
5. Extract implant with repeated strikes of the Mallet (MMM5) on extraction C-frame strike plate (Fig. 6b). If implant resists removal after several strikes, loosen bone around implant prior to continuing.
6. After extraction, use wrenches to remove Extractor Tip from assembly and discard.

Surgical Technique for Modular Stems

The Xtract-All® Modular Hip Stem Extraction System (120-00) should be used in conjunction with the Xtract-All® Hip System (104-00) when removing any modular hip stem.

1 Choose Clamping Pin (120-04 through 120-07) that corresponds to implant.

- 120-04 Stryker Rejuvenate (Fig. A)
- 120-05 Smith & Nephew (Fig. B)
- 120-06 Wright Medical (Fig. C)
- 120-07 Zimmer (Fig. D)

2 Screw Clamping Pin into Modular Hip Stem Extractor (120-03). Loosen extractor jaw to improve access if necessary.

- 120-04 may be tightened manually or with the 3.0mm Driver Bit (MBT130) (Fig. E).
- 120-05 should be tightened manually.
- 120-06 & 120-07 should be screwed in manually and will spin freely when fully engaged.

3 Align Clamping Pin with implant and fit extractor lever hook into vacated trunnion fitting (Fig. F, Fig. G).

4 Attach T-Handle (HD218-M01) to Clamping Screw (Fig. H) by pushing until you hear a click.

5 Tighten Clamping Screw with T-Handle until you begin to experience resistance. At this point, tighten the screw 1/2 to 1 full turn maximum past this point. Do not over-tighten. The extractor is now fully engaged (Fig. I).

6 Remove T-Handle from Clamping Screw. Screw Extension Adapter (120-08) into Extractor. Slide the Extraction C-Frame (MIWE) and a Hex Nut (MIWN) onto the proximal end. Tighten nut fully with the 11/16” Wrench (MIWW) while applying counter-torque with the 1/2” Wrench (WR140).

7 Extract implant with repeated strikes of the Mallet (MMM5) on extraction C-frame strike plate (Fig. J). If implant resists removal after several strikes, loosen bone around implant prior to continuing.
Cleaning and Sterilization


NOTE: All Shukla Medical surgical instruments require manual cleaning with a neutral pH cleanser. Open and disassemble all instruments, making sure to remove all contamination during cleaning. Instruments must be reassembled prior to sterilization. Machine washing is not recommended. Maintenance and care using an autoclavable lubricant on movable parts is required to preserve the life of the instrument. For more cleaning, inspection, maintenance, and care tips, contact Shukla Medical directly.

The instrument case must be sterilized following the parameters listed below:

**Sterilizer Type:** Pervacuum  
**Preconditioning Pulses:** 4  
**Temperature:** 132° C  
**Full Cycle Time:** 4 minutes  
**Dry Time:** 60 minutes  
**Open Door Time:** 15 minutes  
**Cool-down Time:** 30 Minutes outside of chamber on a wire rack.

Disassembly Instructions: 104-04 Hip Stem Extractor

Xtract-All® Universal Hip Stem Extractor Assembly (104-04) must be disassembled completely for cleaning. All contamination must be removed at this stage. The extractor must be reassembled prior to sterilization.

1. Unscrew the cam cap by lifting the cam handle & turning counterclockwise.  
2. Remove the push rod from inside the assembly.  
3. Grasp the curved jaw and slide out from the curved body.  
4. Unthread the cam cap screw from the pin using 3mm hex key (not included).  
5. Pull the cam handle free from the instrument.

Disassembled extractor should result in a total of seven (7) pieces:

A. Curved body (104-04-01)  
B. Curved jaw (104-04-02)  
C. Push rod (104-04-15)  
D. Cam handle (104-04-17)  
E. Screw (104-04-12)  
F. Thread pin (104-04-10)  
G. Cam Cap (104-04-07)

Reassembly Instructions: 104-04 Hip Stem Extractor

Once all contamination has been removed from the disassembled extractor, the instrument must be reassembled for sterilization.

1. Insert cam handle into cam cap, lining up holes.  
2. Insert threaded pin into holes.  
3. Insert screw into threaded pin; tighten using 3mm hex key (not included).  
4. Insert curved jaw into curved body. There is an arrow on the jaw to indicate direction.  
5. Insert push rod into the curved body, resting on top of the curved jaw. Use the arrow on the jaw as a directional guide.  
6. Connect the cam cap/handle assembly to the curved body/jaw assembly via the push rod.

Disassembly Instructions: 120-03 Modular Hip Stem Extractor

The Modular Hip Stem Extractor must be disassembled for cleaning.

1. Use T-handle to loosen extractor jaw and remove Clamping Screw.  
2. Unscrew the knurled pivoting screw (Fig. A-1) and remove pivoting body and lever (Fig. A-2).  
3. Unscrew Clamping Pin from Extractor tip.  
4. Clean extractor as normal.  
5. Reassemble prior to sterilization.
For more information on the Xtract-All® Hip (104-00) Universal Hip Stem Extraction System Call us at 888-4-SHUKLA (888-474-8552) or visit www.ShuklaMedical.com

...Because Every Minute Counts®