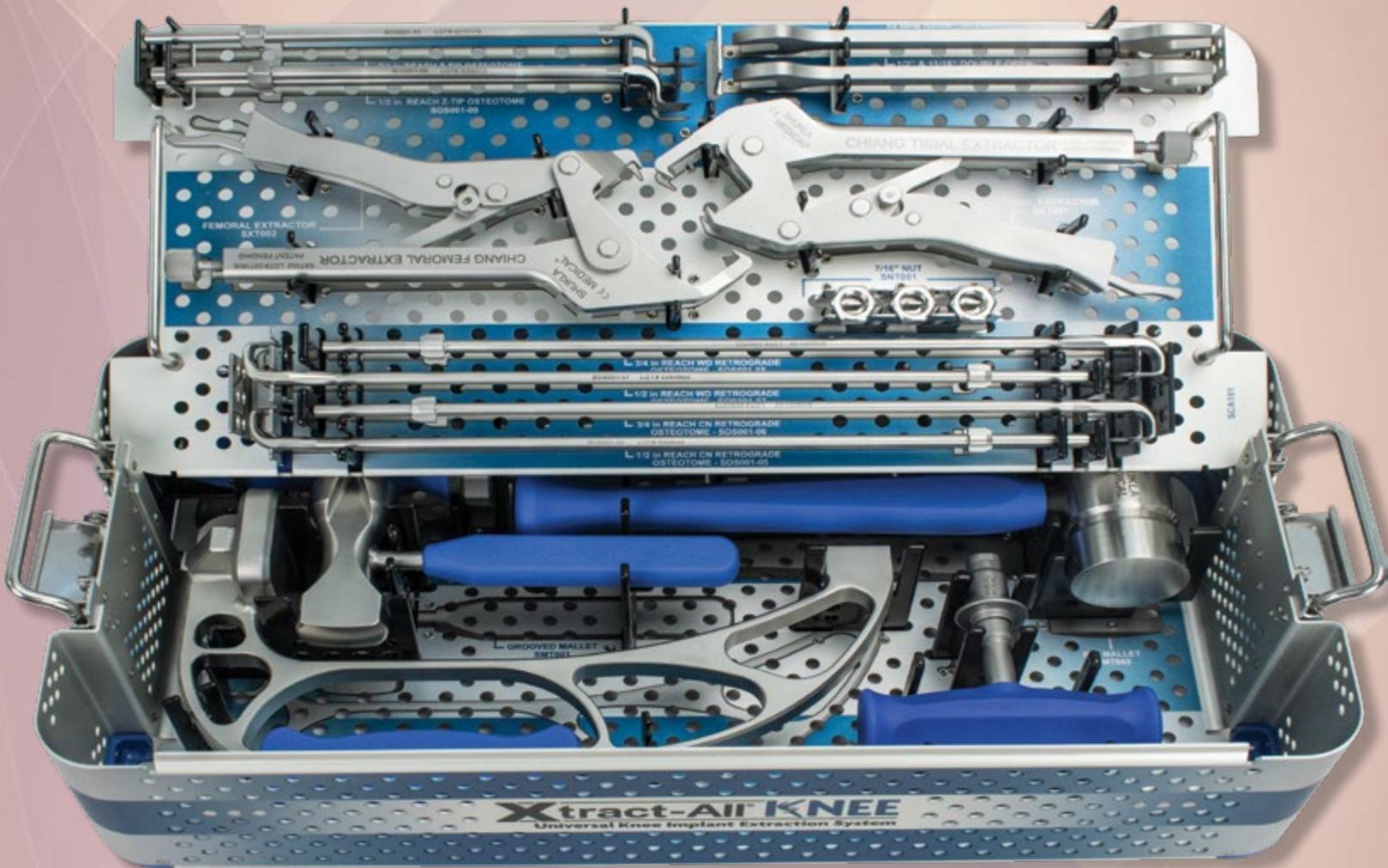


PRODUCT GUIDE

SHUKLA KNEE

Universal Knee Implant Extraction Solution

#7
System 7 of 15



SHUKLA MEDICAL®

Universal Orthopedic Extraction Technologies

Revolutionizing the Art of Revision Surgery

SHUKLA KNEE

Universal Knee Implant Extraction Solution

System Name: SHUKLA Knee v1

Primary Use

The SHUKLA Knee Universal Implant Extraction System is designed to efficiently remove any knee implant hardware with minimal bone loss to the patient and in a more efficient manner than other methods. The critical benefit of the SHUKLA Knee is minimizing bone loss during a surgery.



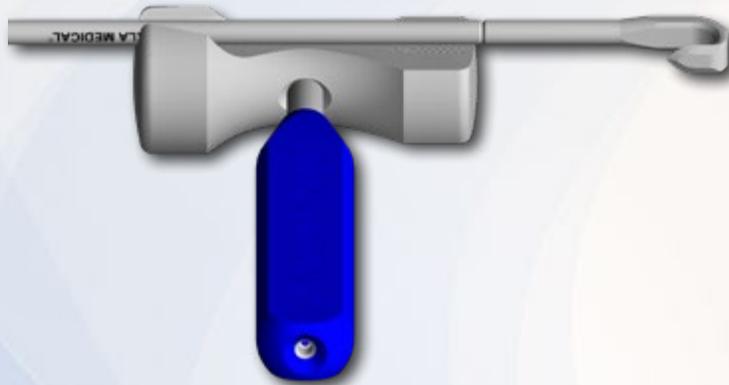
System History

The release of the SHUKLA Hip system in 2011 led to a meeting between Shukla Medical engineers and renowned surgeon Dr. Peter Chiang from Colorado's SCL Good Samaritan Hospital. Dr. Chiang had used our Hip systems extensively, and provided valuable feedback regarding the system's possible multipurpose potential for knee revisions. He demonstrated solutions by combining parts from our other sets. We then included our Hook Extractors from our Winquist/SHUKLA Nail system and designed several knee specific instruments to be used for knee revision surgery. With the benefit of expert feedback from Dr. Chiang, our engineering team created a truly universal Knee system that has no equal in the industry.

2015: Version 1 Introduced

Key Benefits

- The SHUKLA Knee system is primarily focused on minimizing bone loss during revision surgery.
- Vise Grip Style Extractors adjust to a wide range of styles and sizes of knee implants.
- Ergonomic Strike Plate Frame and Mallet give essential inline extraction force for easier removal of well-fixed components.
- Ratcheting twist-lock osteotome handle feels great to hold and is simple to use, reducing surgeon fatigue. The twist lock contains a safety button to prevent osteotome dislodging.
- Grooved Mallet allows for controlled osteotome impacts. The grooves allow the mallet to be guided up the osteotome shaft when delivering retrograde blows.



- Specialized osteotomes can disrupt difficult to reach bone-cement interfaces and minimize bone loss. Both Retrograde and Z tip options are included.



Universal Shukla System Benefits for Better Patient Outcomes

Less Time Spent in O.R.

- Reduces risk of infection to patient
- Reduces time spent under anesthesia
- Reduces cost to the hospital

Universal Designs

- Less prep time for surgeons
- Less space taken up in the O.R.
- Reduces need for other systems or tools

Ergonomic Design

- Reduces surgeon stress
- Reduces surgeon fatigue
- Better grip/reduces slippage

Comprehensive Design

- Addresses all known challenges
- Tools ensure surgery is a success
- Provides backup solutions during surgery

Alternative Method Comparison

Without our Vice Grip Extractors and Osteotomes, surgeons end up using a standard punch. While this would take the implant out eventually, a punch does not exert the pull-action inline with the implant. That greatly increases bone loss and potential damage to the knee itself. Punches often have to resort to the “teeter-totter” method, where off-axis force causes the implant to rock back and forth. This can cause native bone to “chunk” off and cause damage to the tibial plateau.



The “Teeter-Totter” method in action alongside loss of bone.

Return On Investment Justification

According to a study published in JAMA Surgery, the cost of one minute in an O.R. can vary anywhere from \$36 per minute to \$100 per minute. , with the average cost of a minute in the O.R. at a staggering \$66! Taking just the lowest estimate of time savings, the overall savings between minimal bone loss and efficient extraction, savings per surgery can be estimated at 60 minutes x \$36 per minute = \$2160. A SHUKLA Knee sells for \$25,000, meaning that even at the lowest cost per minute in the O.R. it would only take 11 uses to fully pay itself off.

When You Don't Have It

Preventing bone loss is always important, but it is especially important in knee revisions. But why is bone loss bad?

Preserving bone helps to prevent deviation in the patient's gait, which helps prevent a multitude of potential complications in the future. It also reduces the need for excess cement or biologics when implanting the new revision hardware, keeping costs down.

Bone loss is undesirable in all cases, but especially so for revision surgery. Excessive bone loss would make it difficult to secure the new implant without bone grafting. This introduces more time, cost, and risks for complications that don't need to be there in the first place. The SHUKLA Knee is uniquely designed with bone loss mitigation in mind.



Retrograde Osteotome Blade breaking up the interface between a tibial implant and the bone.

How We Compare

Most orthopaedic implant manufacturers provide revision/extraction tools suited *only* for their own implants. Even suppliers that claim to offer extraction sets basically have an assortment of tools thrown together as an afterthought. For Shukla Medical, **extraction is what we do**. Our engineers design truly universal tools to help remove any implant/hardware out there, making our competition essentially nonexistent. Our patented designs are revolutionizing the art of revision surgery; we proudly stand alone. We have still tried to provide a comparison to other systems on the market.

There are a handful of companies that make systems to extract knee implants but only a few of them make systems with capabilities *somewhat* similar to the SHUKLA Knee. Orthopaedic surgeons using such systems agree that getting under the tibial tray can be tricky and can result in heavy bone loss. Our specialized retrograde and Z-Blade osteotomes are designed specifically for such tasks minimizing the risk of bone loss.

The SHUKLA set only requires a few simple steps to connect the strike plate frame to the extractor, then a mallet can be used to exert much more in-line force to remove the implant. Compared to our competitor's slap-hammers there is no comparison; the SHUKLA Knee saves on both time and energy. The tibial extractor's replaceable jaw offers additional convenience.

PATENTS

- Vise Grip Extractor
- Tibial Extractor Modular Jaw
- Knee Osteotome Handle

The SHUKLA Knee system is flush with engineering ingenuity. Several of the components of the Knee system are patented by our team of product design and mechanical engineers.

Each tool is designed with bone preservation and ease of use in mind.

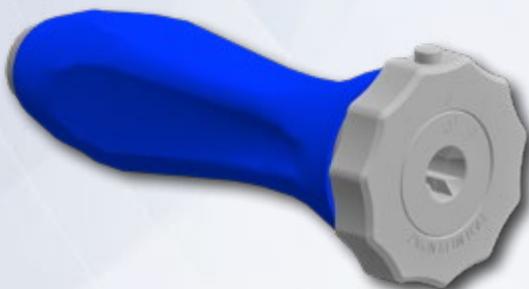


Tibial Extractor

Our extractors perfectly grip onto the tibial implant and connect to our Strike Plate Frame and Mallet for simple extraction in far less time than traditional methods.

Tibial Extractor Modular Jaw

Replaceable extractor jaw parts to ensure that every extraction has the maximum efficiency. If a jaw ever gets degraded or damaged, it can be swapped out for a fresh one in seconds.

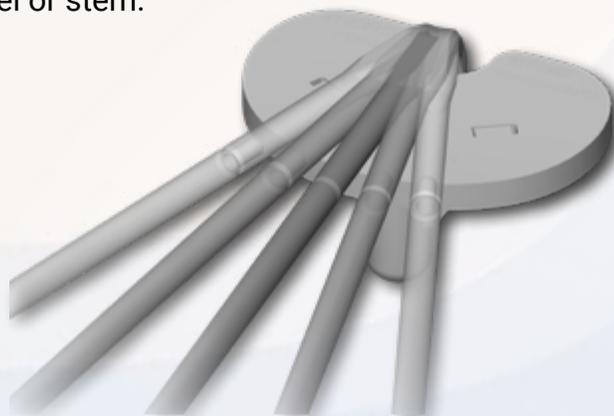


Knee Osteotome Handle

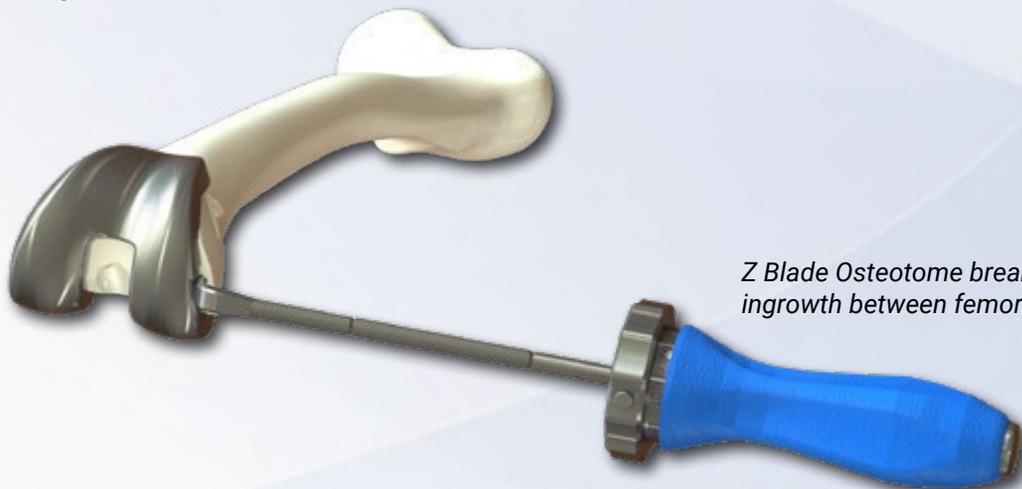
The handle is designed to have strike plates on both the front and the back of the handle. This allows osteotome blades to be tapped in or out. It has a locking button to prevent the blade from dislodging during a procedure. The ergonomic handle helps keep slippage to a minimum as well as reduces surgeon hand fatigue.

Attention to Detail

Our engineers' attention to detail led to one of the most efficient methods of bone preservation that the SHUKLA Knee set can perform. The "Windshield Wiper Method" clears out the posterior section of the tibial implant in and around the posterior notch. This is accomplished by driving the retrograde osteotome blade in and then pivoting it back and forth to remove almost all of the bone interface posterior to the keel or stem.

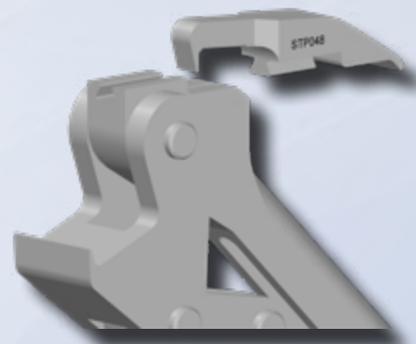


All Shukla osteotomes incorporate a single bevel cutting blade. This may sound like a small detail, but it makes all the difference when breaking up the bone interface. The bevel provides a directional force that pushes the osteotome towards the implant, eliminating the risk of the blades migrating away from the implant and taking away more bone than absolutely necessary. Whether getting in and around the femoral condyles or accessing the posterior lateral corner, the SHUKLA Knee has everything a surgeon would need.



Z Blade Osteotome breaking up bone ingrowth between femoral condyles.

We received feedback from top surgeons that the jaws on the extractor should have a thinner blade. Thinner blades would be more functional but also more likely to bend after several uses, which would require replacing the entire extractor. Our engineers came up with the clever idea of making the jaws on the tibial vise grip to be modular and swappable.



Components List

Component List		
Std Qty	Part Number	Description
1	SBD008	Strike Plate, Assy, Frame
1	SCA101	Case & Tray, Knee System
1	SCS011	Lid, Hip, Knee, Broken & Stripped, Blade Systems
1	SIN001	Handle Assy, Osteotome, Twist Lock
1	SMT001	Mallet Assy, Grooved
1	SMT002	Mallet Assy, Big
3	SNT001	Nut, Hex, 7/16-20 UNF-2B
2	SOS001-05	Osteotome Assy, Retrograde, 1/2" Reach, .313" Wide
1	SOS001-06	Osteotome Assy, Retrograde, 3/4" Reach, .313" Wide
1	SOS001-07	Osteotome Assy, Retrograde, 1/2" Reach, .500" Wide
1	SOS001-08	Osteotome Assy, Retrograde, 3/4" Reach, .500" Wide
2	SOS001-09	Osteotome Assy, Z Shaped, 1/2" Reach, .313" Wide
1	SOS001-10	Osteotome Assy, Z Shaped, 3/4" Reach, .313" Wide
2	SSH007	Connector Shaft for Strike Plate
2	SWR002	Wrench, Double Open End, 1/2" & 11/16"
1	SXT001	Extractor Assy, Tibial Component
1	SXT002	Extractor Assy, Femoral Component
1	STP048	Jaw Tip, Knee Tibial Extractor, Replaceable



Revolutionizing the Art of Revision Surgery

Shukla Medical designs and manufactures instrumentation for orthopedic implant extraction at our headquarters in St. Petersburg, Florida, USA. We are proud to be an *ISO 13485:2016* Certified company.

In 1998, aerospace component manufacturer S.S. White Technologies, Inc. acquired the Medical Products Division of Snap-On. S.S. White rebranded the medical division in 2007 to create Shukla Medical.

Today, Shukla Medical is the industry leader in orthopedic implant extraction tools. We are the only company to offer a comprehensive, truly universal orthopedic revision line for removing IM nails, hip and knee implants, spine hardware, and broken or stripped screws. Surgeons and industry leaders know: **If Shukla can't get it out, no one can.**

Contact us to learn more

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When you have tried all known techniques to extract an implant or remove a screw but determine you need suggestions for alternate techniques, help is only a phone call away. We will quickly put you in touch with our Technical Experts who will suggest other solutions to use our tools.



SHUKLA Medical offers the best warranty in the industry. Every component in a SHUKLA extraction system is designed and manufactured by us. Every component in our extraction systems that is not a single-use* or a wear* component is warranted against manufacturing defects for the life* of the system. All other parts are covered for as long as the purchased version of the system is actively marketed by SHUKLA Medical.

*Please see our website for the complete explanation of these terms and full details on our warranty.