

Arthroscopy Products Surgical Implants & Procedures

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A review of arthroscopic surgical implants, and the procedures utilizing those implants, where improved patient outcomes for knee, hip, elbow and shoulder repair have been demonstrated.

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Research Questions

1. **Arthroscopic Procedures for the Knee**
 - a. What are the different types of Arthroscopic procedures available for ACL repairs?
 - b. Does the evidence show different rates of success and/or risk for different ACL repair techniques: Patellar tendon autograft, Hamstring tendon autograft, Quadriceps tendon autograft, Allograft patellar tendon, Achilles tendon, semitendinosus, gracilis, or posterior tibialis tendon repair?
 - c. What are the different types of Arthroscopic procedures available for Meniscus tears and injury to other ligaments of the knee?
 - d. Which products/manufacturers are leading the industry for implants used in these types of arthroscopic knee surgery?
2. **Arthroscopic Procedures for the Hip**
 - a. What are the different types of Arthroscopic procedures available for arthroscopic hip surgery for: Femoroacetabular impingement (FAI), hip Dysplasia, or Loose bodies?
 - b. Does the evidence show different rates of success and/or risk for different arthroscopic hip procedures based on surgical product(s) used: Femoroacetabular impingement (FAI), hip Dysplasia, or Loose bodies?
 - c. Which products/manufacturers are leading the industry for implants used for these types of arthroscopic hip surgery?
3. **Arthroscopic Procedures for Elbows & Shoulders**
 - a. What are the different types of Arthroscopic procedures available for rotator cuff repair?
 - b. What are the different types of Arthroscopic procedures available for arthroscopic surgery on the elbow for treating golfer's elbow (medial epicondylitis), Repairing the collateral ligaments, and decompressing the ulnar nerve?
 - c. Which products/manufacturers are leading the industry for implants used for these types of arthroscopic elbow and shoulder surgery?
4. What would be considered alternatives to the above Arthroscopic procedures?
5. What is the cost-effectiveness and clinical-effectiveness of Arthroscopic implants and the procedures they're used for vs. the alternatives?
6. What clinical trials and research studies are currently ongoing related to Arthroscopic procedures for the knee, hips, elbows, and shoulders?
7. What are the best practices and clinical practice guidelines related to Arthroscopic surgical procedures for the knee, hips, elbows and shoulders?
8. What are the current industry trends related to Arthroscopic surgery for the knee, hips, elbows and shoulders?

Current clinical trials addressing arthroscopic implants and procedures include:

- Randomized controlled study seeking to observe patients with hamstring tendon injury, and compare patient outcomes who elect arthroscopy, and those who elect non-operative treatments in Sweden [25]
- Randomized clinical trial focused on improved “disease-specific quality of life” among patients in Canada who underwent shoulder arthroscopy, “at 1 year, post-operatively” [26]
- Randomized, controlled study seeking to evaluate the safety and efficacy of Q-Fix® all-suture anchors for arthroscopic shoulder procedures in China [27]

Among the manufacturers leading in arthroscopic implant production are Johnson and Johnson, AIMS Medical Group, and Medtronic. [28]

Moreover, while arthroscopic procedures come with more benefits than preceding procedures, i.e. “open repair” [8], Some of the more serious risks, complications, and side-effects related to arthroscopic procedures include, suture failure; bone loss; cartilage damage; graft injury and/or failure; implant osteolysis and/or migration; tendon rupture; soft tissue irritation, and increased risk of retears among patients with diabetes. [19, 21, 29, 37, 38]

Best practice for use of arthroscopic implants and the procedures which use them emphasize nonsteroidal anti-inflammatory medication for 3 weeks,” [15] and eventually incorporation of exercises to help regain range of motion. [14]

There are various trends in current arthroscopy practice, which the literature seeks to continue observing—this includes projection of steady international increase in the coming decades at greater rates than the United States, [12, 16] among knee arthroscopic procedures, and higher rates of MUCL injuries among male patients and 15-24 age group in the United States. [9]

Table 1: Quick Summary of Findings & Evidence from Literature Review

Research Question	Findings
Different types of Arthroscopic implants and or procedures available for knee/ACL repair, hip, shoulder/elbow	<ul style="list-style-type: none"> • Most common knee: [21, 38] <ul style="list-style-type: none"> ○ bone patellar tendon graft ○ hamstring tendon autograft arthroscopic procedures • Most common hip: [13, 19] <ul style="list-style-type: none"> ○ femoroacetabular impingement ○ dysplasia arthroscopic procedures • Most common shoulder/ elbow: [4, 37, 5, 9] <ul style="list-style-type: none"> ○ rotator cuff arthroscopic procedures ○ medial epicondylitis ○ medial ulnar collateral ligament arthroscopic repair procedures
Different rates of evidence-based success and/or risk for these different repair techniques	<ul style="list-style-type: none"> • Knee/ACL Repair <ul style="list-style-type: none"> ○ Traditional ACL repair has higher durability and patients experience a higher return rates to sport activities [38] ○ Hamstring tendon autografts associated with less pain, compared to bone patellar tendon graft procedure, though with increased risk of graft failure during medium term follow-up [38]

Research Question	Findings
	<ul style="list-style-type: none"> • soft tissue irritation • increased risk of retears among patients with diabetes
Best practices and clinical practice guidelines related to Arthroscopic implants and or procedures	<p>Among the various best practices and clinical practice guidelines related to arthroscopic implants are: [13, 15]</p> <ul style="list-style-type: none"> • patients for hip arthroscopic procedures are in supine position and injected with “intra-articular cortisone or platelet-rich plasma at the conclusion of the procedure.” • surgeons prescribing “nonsteroidal anti-inflammatory medication for 3 weeks.” • including physical therapy is also common practice following most orthoscopic procedures
Current industry trends related to Arthroscopic implants and or procedures	<p>Current industry trends related to arthroscopic implants and procedures include: [9, 12, 16]</p> <ul style="list-style-type: none"> • Increases in “proportion of patients undergoing meniscus repair” internationally, for example in Japan and France compared to the United States • Increases of arthroscopy, particularly knee arthroscopy projected for France • The incidence of Medial Ulnar Collateral Ligament (MUCL) repair in the United States increased during 2007 to 2014, particularly among individuals aged 15-24, however, as of 2017, the incidence rate has declined

Table 2: Clinical Practice Guidelines

Governing Body	Brief Overview	Link to Full Guidelines
American Academy of Orthopedic Surgeons	<p>Knee/ACL Repair: [35]</p> <ul style="list-style-type: none"> • Prior to the procedure, the primary care physician assesses the patient’s general health, and the orthopedic surgeon may order “pre-operative tests,” such as blood tests or an electrocardiogram (EKG) • Knee arthroscopy is often an outpatient procedure, meaning the patient does is not admitted overnight at the hospital, and the procedure can be performed under three types of different anesthesia: <ul style="list-style-type: none"> ○ Local anesthesia numbs the knee ○ Regional anesthesia numbs below the waist ○ General anesthesia puts the patient to sleep • The skin on the patient’s knee is then cleaned to prevent any infection, and the leg is covered with a “surgical draping,” but with the prepared incision site exposed • The surgeon makes a “few small incisions, in the patient’s knee, and a sterile solution will be used to fill the knee joint and rinse 	https://orthoinfo.aaos.org/en/treatment/knee-arthroscopy/