

## Surgical Approaches to the Hip

There are several different routes for getting to the hip joint for the purposes of performing hip replacement surgery. Most of the approaches have been around for several decades, although some of these methods may be touted as “new” or “less invasive.” Certain implant companies (Depuy in particular) attempt to drive patients toward surgeons who use their products by marketing some techniques as “better” than others. I have performed hip replacements with ALL the approaches available and based on my extensive experience over the last 30 years, along with the experience of many colleagues, I can certainly comment of the merits and problems associated with each technique. I would encourage the reader to spend more time reviewing larger published studies rather than marketing materials.

**Traditional hip replacement** surgery is done through a single incision, usually 6 inches or more in length. The hip joint can be approached from the front or the back of the joint. Approaching from the back damages the muscle that controls limping less, but leads to more dislocations, in which the ball comes out of the back part of the joint. Approaching from the front leads to fewer dislocations out the back of the joint, but also generally leads to a more persistent limp for several weeks after surgery, due to muscle damage. Dislocations out the front of the joint are uncommon but are uncommon. Unless the anatomy is very unusual, the traditional methods are no longer used for first-time (primary) hip surgery in major centers.

**Less Invasive Surgery (elsewhere marketed as Minimally Invasive)** can be performed through one or two incisions. The most commonly used options are described below. New names appear periodically but the methods are similar enough that it seemed redundant to cover more here.

**Single incision method:** The incision can be placed directly anterior, somewhat anterior, or lateral.

Direct Anterior: An incision is made on the front of the hip, between natural muscle intervals. The muscles are then moved aside to reach the joint and allow the prosthetic components to be placed. Shorter and small implants are required because of limited visualization. Cementing is challenging, making this approach contraindicated in the elderly. Recovery is faster compared with the traditional methods described above. However, several published studies have shown higher complication rates compared to the mini-posterior method, including more blood loss, nerve injuries, and unrecognized intraoperative femur fractures that can hinder recovery and potential require early revision surgery (see references below). Approximately 20-35% of patients can expect permanent lateral thigh numbness afterward.

Mini-posterior: A 3-inch incision is made on the side of the hip and a limited split of the gluteus maximus in line with the muscle is performed. The mini-posterior method works by dislocating the hip towards the back of the body, which is why “posterior” is in the name. This method is more versatile, in that straight, curved, uncemented and cemented femoral components can all be placed easily with this technique. This method has a decreased risk of postoperative limping, nerve damage, and other complications. The blood loss and surgical time is less than with the anterior method with equivalent outcomes (see references and links below). The dislocation rate is similar in each method, although our dislocation rate is lower than that reported using the

anterior approaches. We have shown a very low complication rate with this technique in over 7000 cases.

**Two-incision method:** In this technique, a small incision on the front on the hip is used to implant the socket portion of the hip prosthesis, and a second small incision on the side of the hip is used to placement the femoral component. This method requires fluoroscopic guidance to assist visualization, similar to the direct anterior method, and has a higher rate of complications, including fractures and nerve injury. Recent cadaveric studies have shown that the parts of this technique that are done without being able to directly see cause more muscle damage. Our data did not show improved recovery when compared with the single incision method, so we abandoned this technique.

## References:

Nambiar M, Cheng TE, Onggo JR, et al.: No Difference in Functional, Radiographic, and Survivorship Outcomes Between Direct Anterior or Posterior Approach THA: 5-Year Results of a Randomized Trial. *Clin Orthop Relat Res.* 479(12):2621-2629, 2021.

Summary: In a randomized trial, anterior and posterior approaches had identical functional outcomes. <https://pubmed.ncbi.nlm.nih.gov/34237041/>

Hoskins W, Bingham R, Lorimer M, et al.: Early Rate of Revision of Total Hip Arthroplasty Related to Surgical Approach: An Analysis of 122,345 Primary Total Hip Arthroplasties. *J Bone Joint Surg Am* 102(21):1874-1882, 2020.

Summary: Direct anterior has higher rate of early femoral revision compared with other approaches <https://pubmed.ncbi.nlm.nih.gov/32769807/>

Aggarwal VK, Elbuluk A, Dundon J, et al.: Surgical approach significantly affects the complication rates associated with total hip arthroplasty. *Bone Joint J.* 101-B(6):646-651, 2019.

Summary: Direct anterior has a higher complication rate with no added benefit [https://online.boneandjoint.org.uk/doi/abs/10.1302/0301-620X.101B6.BJJ-2018-1474.R1#\\_i2](https://online.boneandjoint.org.uk/doi/abs/10.1302/0301-620X.101B6.BJJ-2018-1474.R1#_i2)

Angerame MR, Fehring TK, Masonis JL, Mason JB, Odum SM, Springer BD. Early Failure of Primary Total Hip Arthroplasty: Is Surgical Approach a Risk Factor? *J Arthroplasty.* 2018 Jun;33(6):1780-1785.

Summary: The direct anterior approach had a 35.7% rate for femoral loosening <https://pubmed.ncbi.nlm.nih.gov/29439894/>

Cheng TE, Wallis JA, Taylor NF, et al.: A Prospective Randomized Clinical Trial in Total Hip Arthroplasty-Comparing Early Results Between the Direct Anterior Approach and the Posterior Approach. *J Arthroplasty.* Mar;32(3):883-890, 2017.

Summary: Standard posterior approach with better function and fewer complications than direct anterior in first 12 weeks. <https://pubmed.ncbi.nlm.nih.gov/27687805/>

Ramadanov N, Bueschges S, Liu K, Lazaru P, Marintshev I. Comparison of short-term outcomes between direct anterior approach (DAA) and SuperPATH in total hip replacement: a systematic

review and network meta-analysis of randomized controlled trials. *J Orthop Surg Res.* May 20;16(1):324, 2021.

Summary: Superpath superior to direct anterior approach.

<https://pubmed.ncbi.nlm.nih.gov/34016136/>

Meng W, Gao L, Huang Z, Wang H, Wang D, Luo Z, Bai Y, Wang G, Zhou Z. Supercapsular percutaneously-assisted total hip (SuperPath) versus mini-incision posterolateral total hip arthroplasty for hip osteoarthritis: a prospective randomized controlled trial. *Ann Transl Med.* Mar;9(5):392, 2021.

Summary: Mini-posterior outcome is similar to Superpath.

<https://pubmed.ncbi.nlm.nih.gov/33842613/>

Eto S, Hwang K, Huddleston JI, Amanatullah DF, Maloney WJ, Goodman SB. The Direct Anterior Approach is Associated With Early Revision Total Hip Arthroplasty. *J Arthroplasty.* Mar;32(3):1001-1005, 2017.

Summary: Direct anterior has a higher rate of early femoral loosening

<https://www.ncbi.nlm.nih.gov/pubmed/27843039>

Lee GC, Marconi D. Complications Following Direct Anterior Hip Procedures: Costs to Both Patients and Surgeons. *J Arthroplasty.* 2015 Sep;30(9 Suppl):98-101, 2015.

Summary: More complications with direct anterior approach

<https://www.ncbi.nlm.nih.gov/pubmed/26118568>

Christensen CP, Karthikeyan T, Jacobs CA: Greater Prevalence of Wound Complications Requiring Reoperation With Direct Anterior Approach Total Hip Arthroplasty. *J Arthroplasty.* 29(9):1839-41, 2014.

Summary: Direct anterior approach has more wound complications

<https://www.sciencedirect.com/science/article/abs/pii/S0883540314002940>

Woolson ST, Pouliot MA, Huddleston JI. Primary total hip arthroplasty using an anterior approach and a fracture table: short-term results from a community hospital. *J Arthroplasty.* 2009 Oct;24(7):999-1005, 2009

Summary: Direct anterior has more blood loss and complications than traditional approaches.

<https://www.sciencedirect.com/science/article/abs/pii/S0883540309001065>

Mjaaland KE, Kivle K, Svenningsen S, Nordsletten L. Do Postoperative Results Differ in a Randomized Trial Between a Direct Anterior and a Direct Lateral Approach in THA? *Clin Orthop Relat Res.* Jan;477(1):145-155, 2019.

Summary: Direct anterior has less postop limp than direct lateral but more complications.

<https://pubmed.ncbi.nlm.nih.gov/30179928/>