

How Is a Shoulder Replacement Planned?

Careful planning before shoulder replacement surgery helps your surgeon position the new joint as accurately as possible. Accurate positioning is important because it may help the shoulder work well and may contribute to the long-term performance of the replacement.

Planning usually begins with **X-rays** and may also include a **CT scan or MRI scan**. These images allow your surgeon to understand the shape of your shoulder, the amount of arthritis or bone loss present, and how best to position the new joint.

There are several different techniques that surgeons can use to help achieve accurate implant positioning.

Standard Surgical Instruments

Shoulder replacements have traditionally been performed using specialised instruments supplied with the shoulder implant.

During surgery, these instruments act as guides to help the surgeon position the components of the replacement correctly. This remains a well-established technique and has produced reliable and reproducible results.

Computer Navigation

Computer navigation is designed to provide the surgeon with additional information about the position of their instruments during the operation.

Before surgery, a **3D plan** of the shoulder is created using a CT scan. During the operation, small tracking devices allow a camera system to recognise the position of the shoulder and the surgeon's instruments.

The surgeon can then see on a screen how the instruments are positioned compared with the planned position of the shoulder replacement.

Augmented Reality – ARVIS

Augmented reality is another way of allowing the surgeon to see the pre-operative plan during the operation.

A 3D CT scan is used to plan the shoulder replacement before surgery. During the procedure, the surgeon wears specialised goggles that allow the surgical plan to be displayed over the operative field.

Special instruments recognised by the system can then help guide the surgeon when positioning guidewires and preparing the bone for the implant.

Patient-Specific Instrumentation (PSI)

Patient-Specific Instrumentation uses your own CT scan to create a surgical guide designed specifically for your shoulder.

Your shoulder replacement is first planned on a computer using a **3D CT scan**. Based on this plan, a personalised guide is then produced using 3D-printing technology.

The guide is sterilised and used during your operation to help reproduce the implant position that was planned before surgery.

Robotic-Assisted Shoulder Replacement

Robotic technology is already used in some hip and knee replacement operations.

Importantly, **the robot does not perform the operation by itself**. The surgeon remains in control. In hip and knee surgery, a surgeon-controlled robotic arm can be used to help improve the precision with which the joint replacement is performed.

Robotic-assisted shoulder replacement is still developing and has not yet been widely adopted. At present, the source document notes that it has **not been shown to produce better outcomes** than conventional shoulder replacement or the other planning techniques described above.

My Preferred Planning Technique

For many years, I have used **Patient-Specific Instrumentation (PSI)** when planning total shoulder replacements.

Using the patient's CT scan, I can plan the operation in three dimensions before surgery and have a personalised guide produced for that particular shoulder.

In my experience, this has helped me achieve accurate implant positioning while also allowing me to use a smaller incision and reduce operating time.

Questions?

There is no single planning technology that every patient needs. The most appropriate approach depends on your shoulder, the type of replacement being performed, and your surgeon's preferred technique.

If you have questions about how your shoulder replacement will be planned, I am very happy to discuss the options with you during your consultation. Planning Shoulder Replacement.pdfPDF