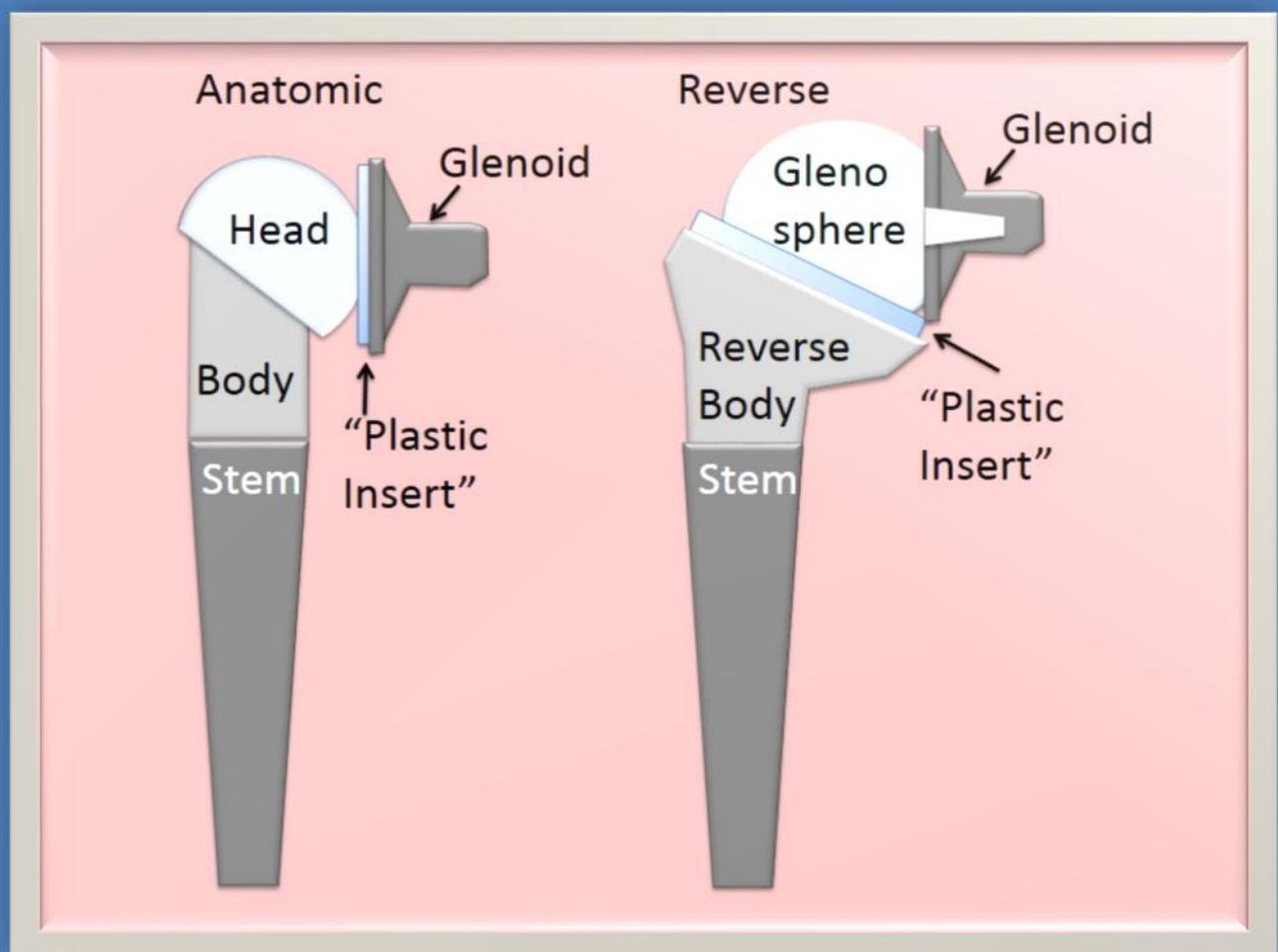


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The Total Shoulder Replacement



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The Shoulder Replacement

The first total shoulder replacement (TSR) was performed by Jules Emile Pean in 1893 for the purpose of treating tuberculous arthritis of the shoulder. Neer initially developed a humeral component for the treatment of fractures in 1955, and in the mid-1970s developed his components for the treatment of arthritis.



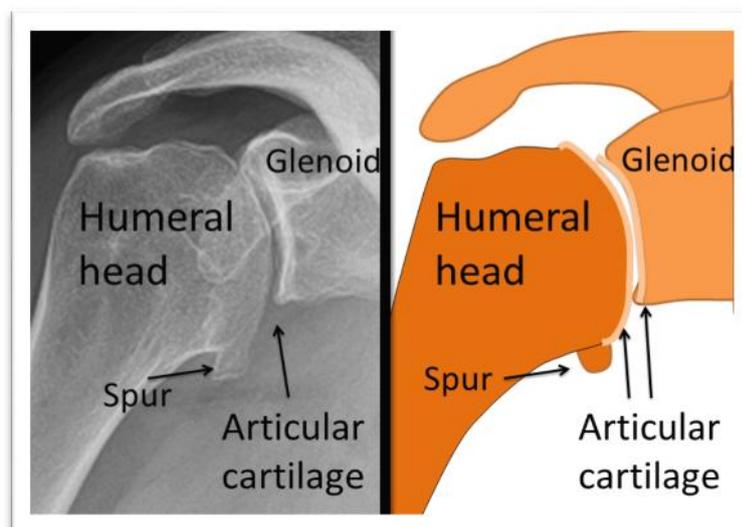
TSR is now an accepted treatment for patients with underlying advanced joint disease such as arthritis, cuff tear arthropathy and fractures of the humeral head. Over the last 25 years, surgical techniques and prostheses have advanced greatly. Overall reported outcomes for patients that have undergone TSA are very good. Results of individuals who have undergone TSR are comparable to those of individuals who have undergone a total hip replacements.

Indications for Shoulder Replacement

When conservative methods of treatment fail to provide adequate relief of your shoulder arthritis or irreparable rotator cuff tears, total shoulder replacement is considered.

The development of total shoulder replacement began over 40 years ago and has undergone significant improvements.

Total shoulder replacement is an effective procedure that has transformed the lives of many people. Many of those who once suffered from severe pain and can return to activities such as swimming and golf.



Advanced Arthritis

While osteoarthritis of the knee and hip (the weight bearing joint) are common, osteoarthritis of the shoulder joint is a relatively uncommon condition. Nevertheless when it does occur it is at least as painful and debilitating. You may know many friends who have undergone hip and knee replacements, yet have not heard of a shoulder replacement. This is because shoulder arthritis is much rarer. However, the results of shoulder replacement are at least as good as that for the knee or hip and is becoming a much more common procedure.

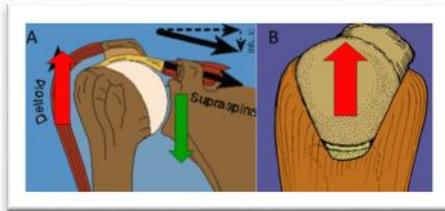
Other forms of arthritis which can damage the shoulder joint include a number of rheumatoid type conditions and post-traumatic arthritis which occurs after an injury to the joint such as a dislocation or fracture. Arthritis following long-term rotator cuff tears, called cuff tear arthropathy (CTA) is becoming a common reason you may require a shoulder replacement.

CUFF TEAR ARTHROPATHY

(CTA) Wear and tear of most joints result in the cartilage wear (osteoarthritis).

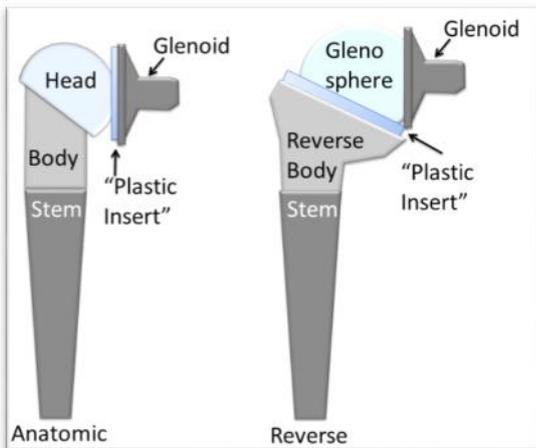
The shoulder joint differs in that wear and tear of the tendons around the joint is much more common. The tendons are called:

the rotator cuff tendons are commonly torn as a consequence of wear and tear and age. However, if the wear and tear is advanced, repair may not be



possible. Imagine the tear being like a worn sock which quickly develops a large hole. It is then not repairable. When the rotator cuff has a large tear, the shoulder migrates upwards because the tendons responsible for holding the joint in position (the rotator cuff) have failed. This results in pain and the inability to lift the arm up and arthritis of the joint develops, called a cuff tear arthropathy or CTA.

Types of Shoulder Replacement



If the surgeon only uses a metal humeral (upper arm bone) components and does not replace the socket (glenoid), the procedure is called a hemi-arthroplasty or half replacement. This is typically done only in the very young when there are concerns of premature wearing on the plastic component. Not replacing the socket can however compromise the result in terms of pain relief and range of motion.

There are two broad types of total shoulder replacement procedures. This is when both the humeral components and the glenoid socket prosthesis are inserted.

1. An **anatomic** replacement is for most types of arthritis.
2. The **reverse** was designed to treat massive rotator cuff tears with secondary damage to the shoulder joint (Cuff Tear Arthropathy) or CTA.

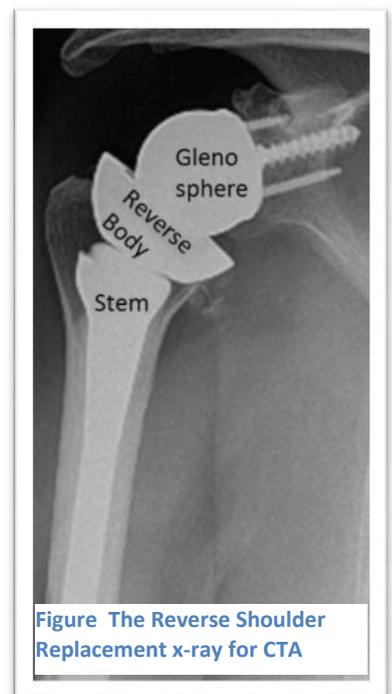


Figure The Reverse Shoulder Replacement x-ray for CTA

GENERAL INFORMATION ABOUT UNDERGOING SHOULDER REPLACEMENT SURGERY

MINOR SURGICAL PROCEDURES OR DENTAL CARE

Do not schedule any minor procedures such as urological manipulators or dental within two weeks of your scheduled surgery. If you have sustained even a minor injury to your skin please let us know.

SORE THROATS, COLDS AND FLU

If you develop a significant cold, sore throat or the flu within one week of your scheduled procedure, please call our rooms. These conditions may increase the operative and anesthetic risks, and your procedure may need to be rescheduled.

URINARY TRACT or CHEST INFECTIONS

If you develop any infection within two weeks of your scheduled procedure, contact your family doctor for treatment, and call our rooms. This condition may increase the risk of a postoperative infection, and your procedure may need to be rescheduled.

DENTURES AND CONTACT LENSES

Contact lenses, dentures and plates CANNOT be worn in the operating room. Be sure to bring your container and solutions to keep these devices protected while you are in surgery.

CLOTHING

Remember to bring comfortable, loose-fitting bed clothing. A robe and slippers are recommended.

MEDICATION

If you are taking any anti-inflammatory medications, your surgeon will probably advise you to stop taking them one week prior to surgery. This helps to minimize bleeding during your operation. Anti-inflammatory medications include any form of aspirin, including coated or buffered aspirin, Indocin, Clinoril, Naprosyn, Motrin, Feldene, Orudis, etc.

Exception: If you are taking aspirin under the order of a doctor because of a past history of stroke, heart disease or other vascular problem, you should continue to take your medication unless you have been advised it is OK to stop it. If you have any questions as to whether you should continue to take your medication, please discuss this with your specialist or family doctor.

If you are taking other medications on a regular basis, you should bring them with you to the hospital. The doctors will advise you as to their continued use. If you are taking blood thinners, such as *aspirin*, clopidogrel (Iscover, Plavix) or Warfarin, please let us know as they will need to be ceased if it is safe to do so. We made need to consult your specialist physician so please let us know as soon as possible.

LENGTH OF STAY and WHAT TO BRING TO THE HOSPITAL

The normal length of stay varies from three to five days in hospital, although it may be longer or shorter depending on your individual case. You may benefit from time in a rehabilitation hospital also.

WHAT TO EXPECT PRIOR TO SURGERY

You will be seen and examined by an anaesthetist.

The nursing staff will take your temperature, pulse, respiration and blood pressure.

You will be seen by a members of the surgical team when you are in the operating theatre.

In the operating room, you will be transferred from the stretcher to a special operating room table. The room is equipped with special overhead surgical lights and anesthesia equipment.

RECOVERY ROOM

When the procedure is completed, your surgeon will contact your family or friends to update them on the success of your surgery if this was requested and organized before the surgery. You will awaken after surgery in the post-anesthesia recovery room, probably feeling as though you were only away from your hospital room for a few minutes. You will remain there for an hour or so, or until you have recovered from the anesthesia, are breathing well, and your blood pressure and pulse are stable. If you have pain, the nurses will administer medication. Your arm will be supported in a sling.

WHAT TO EXPECT AFTER SURGERY

Your dressing will probably be changed on the first or second postoperative day, and cold compresses may be applied for up to two days.

The IV will remain in your arm for one to two days to administer fluids and antibiotics. This helps prevent infection and gives you proper nourishment until you are eating and drinking comfortably. It is normal to feel pain and discomfort after surgery. Be sure to inform your nurse of your pain, and medication will be ordered. You may be able to administer your pain medication through a push button attached to your bed. This system is called "Patient Controlled Anesthesia" (PCA). The nurses will show you how to use this system, which is designed to prevent over-dosage of the pain medication. You will begin taking oral pain medications as soon as you are able.

Your arm will be in a shoulder immobilizer, which protects and positions your shoulder. Keeping a small pillow or folded blanket under your elbow while sitting or lying down will prevent the arm from falling back and straining the area of your operation.

On the day after your surgery, the physiotherapist may remove the sling and gently move your operated arm. They will give you instructions on how much you can or should move your arm.

The nurses and physiotherapists will encourage and help you to stand, walk and do your exercises on the day after surgery.

EXERCISES/PHYSIOTHERAPY

The postoperative rehabilitation program depends on the type of procedure performed. It normally begins the day after surgery. It consists of stretching exercises and normal, gentle daily activities. The postoperative rehabilitation program is critical, and it is important that you cooperate, follow your surgeon's instructions.

Pain medication may be taken prior to your therapy as you request. A physiotherapist will gently move your arm and shoulder through various positions while you relax. These early movements and exercises will help prevent stiffness and will help you regain shoulder motion. You will also work on tightening the muscles of your hand and arm by flexing your hand, wrist and elbow.

Your therapist will teach you the safest methods for getting in and out of bed or a chair, and on and off the toilet. You will be allowed to go to the bathroom and sit in a chair on the first day after surgery. Your therapist will check your progress daily and will keep your surgeon informed.

PROGRESS

Depending on your progress, you will gain independence about one week after surgery. You will continue strengthening yourself in preparation of your return home. It is important for you to adhere to precautions and proper positioning techniques throughout your rehabilitation. Your dressings will be removed seven to ten days after surgery. It is not uncommon to still experience pain at the surgical site. Your recovery period may last three to six months.

PREPARING TO GO HOME

Just before your discharge, you will receive instructions for your at-home recovery, including how and when to wear your shoulder sling, changing your bandage and bathing and showering. The staff will also give you directions and the necessary equipment to continue your rehabilitation program at home, any prescriptions for medication and a date for your return appointment.

AT HOME

Until you see your surgeon for your follow-up visit, you must take certain activity precautions. Look for any changes around your incision. Contact our rooms or the hospital if after hours if you develop any of the following:

- Drainage and/or foul odor from the incision.
- Fever (38 degrees C) for two days.
- Increased swelling, tenderness, redness and/or pain.

Take time to adjust to your home environment - it is okay to take it easy. You may need help with your daily activities, so it is a good idea to have family and friends prepare to help you. It is normal to feel frustrated.

RESUMING ACTIVITIES

- Walk as much as you like, but do not tire yourself.
- With the help of family or friends, you will need to do the exercises you learned in the hospital four to six times daily. These exercises will gradually increase the movement in your joint, so it is important to do them as scheduled. Do not skip your stretching exercises.
- As necessary, rest in bed. But be sure to get out of bed and walk a bit at least every hour during the day to prevent blood clots forming in your legs (DVTs). Be sure to rest on your back.
- For bathing, wash your armpit with warm water and dry the area **thoroughly**. Four days after surgery, you may take a shower. To do this, you should remove the bandage, but leave the sutures in place. After the shower, you may apply a clean bandage. It is OK to leave the wound uncovered. Use only roll-on or stick deodorants. Avoid spray deodorants because they may irritate your incision.
- Your surgeon will tell you when you can begin driving a car.

- You may return to work when authorized by your surgeon.

You are encouraged to return to your normal eating and sleeping patterns as soon as possible, and to be as active as possible in order to control your weight and muscle tone. But remember to increase your activity level or exercises only as your surgeon has directed. Increasing activity too quickly may cause injury and damage to the healing tissue. Avoid activities that could cause stress on your shoulder, especially those that may result in a collision or fall such as contact sports or skiing. During your follow-up visits, your surgeon will discuss your progress with you.

MEDICATION/PAIN CONTROL

It is normal for you to have some discomfort. You will receive a prescription for pain medication before you leave the hospital. If a refill is needed, please call your local doctor. Remember to call your surgeon if you have a sudden significant increase in pain.

FOLLOW-UP

You are routinely seen 10 days, six weeks, six months and twelve months after your surgery.

Note for the future: You should always tell your dentist or physician that you have an artificial joint. If you are having dental work performed, please notify your dentist or physician so that they can give you antibiotics on the day of your dental care. Antibiotics must be used before and after any medical or dental procedure. This precaution must be taken for the rest of your life. Any infection must be promptly treated with proper antibiotics because infection can spread from one area to another through the blood stream. Every effort must be made to prevent infection in your artificial joint.

RISKS OF SURGERY

Joint replacement in general is highly successful and has a low rate of complications. However, it is important for patients to be well informed about the possible risks. The risks of this procedure include but are not limited to the following: infection, injury to nerves and blood vessels blood clots, bleeding, fracture, stiffness or instability of the joint and dislocation of the new joint, loosening of the artificial parts, failure of the rotator cuff, pain, and the need for additional surgeries.

There are also risks of anesthesia, which you should discuss with the Anesthesia Team.

Blood transfusions are occasionally necessary.

In the post-surgical period blood clots may form in the calf or thigh. To reduce the number of clots and the chance that they will migrate to the lungs, surgeons employ medications to reduce clotting and mechanical devices that encourage blood flow in the legs. Bleeding during surgery may result in the need for a transfusion. Patients may donate their own blood ahead of time in case this becomes necessary. However transfusions are only very rarely required.

Infection may occur any time after the surgery and may require removal of the prosthesis. Antibiotics are employed to help prevent infections during the surgery and for the first day following the surgery.

Dislocation may occur and require revision surgery.

Finally, the new joint might fail or become loose. Most joint replacements are expected to last 10 to 20 years but some fail sooner and may require revision surgery.

SHOULDER REPLACEMENT REHABILITATION

Shoulder replacement requires an individualized rehab programme. There are two broad categories of total shoulder replacement.

The anatomic replacement (for most types of arthritis)

The reverse replacement for rotator cuff tears

Unlike knee and hip replacement surgery, a major tendon needs to be divided to access the shoulder joint.

Also the shoulder is the most unstable joint in the body and therefore the rehabilitation plan has to prevent stress on the repaired tendon (subscapularis) and prevent dislocation.

You may come out of your sling to shower and do your exercises after 48 hours unless specified by your surgeon after your surgery.

You should wear your sling at night.

You should use your hand for eating, etc as soon as comfortable.

Expect to go home three days after surgery. You may stay longer if needed.

PRECAUTIONS

You should get up and walk around as much as possible and avoid prolonged periods lying in bed after surgery to prevent clots forming in your legs (DVT's)

For the first 6 weeks you should wear your sling at night.

You should not drive.

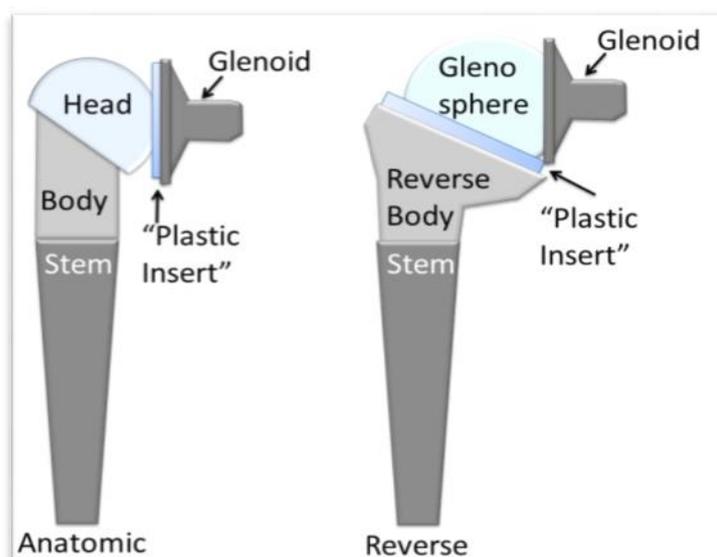
You should not turn your shoulder outwards beyond the neutral position or *actively* turn your shoulder inwards past your hip.

An anatomic **total** shoulder replacement requires a rehabilitation plan which protects your subscapularis repair. Stiffness is however a problem when the shoulder is not moved early

A **reverse total** shoulder replacement. Sometimes the bone can be quite soft (osteoporotic) and require a few weeks of relative immobilization before the shoulder is moved to allow the components of the shoulder to knit. Stiffness is less common.

Often no tendon repairs are performed and therefore gentle passive movements are safe.

The rehabilitation plan therefore needs to be specified for the particular procedure.



Physiotherapy Protocol

Formal Physiotherapy will commence 3 to 4 weeks post surgery.
Note this protocol should be given to your physiotherapist.

REHABILITATION AFTER TOTAL SHOULDER REPLACEMENT FOR OSTEOARTHRITIS

After **total** shoulder replacement associated with a rotator cuff repair, a fracture or other complicating factors particular care must be exercised and will be **specified**. **See rotator cuff repair protocol**

Shoulder immobilizer to be worn except when doing physiotherapy

Active range of motion exercises of the elbow, wrist and hand should be commenced immediately after surgery. use of the hand for eating encouraged soon after surgery.

Very gentle pendulum exercises and passive range of motion can start the day after surgery. Only a few repetitions of these should be performed three times per day.

External rotation to the **neutral only** unless stated otherwise to protect the subscapularis repair. Forward flexion to 90 degrees initially

Patients with a total shoulder replacement may do active shoulder flexion in front of the plane of the scapula as pain allows after 4 weeks

Patient can generally use arm to eat, read, etc. in front of body (anterior to plane of scapula) when feels comfortable lifts nothing heavier than a coffee cup.

At **Week 3** begin rope and pulley exercise. Aerobic exercises can commence as soon as possible after surgery.

After 6 weeks, gently increase external rotation as tolerated beyond the neutral. There is no limit to active forward flexion. Assisted active internal rotation, restricted by pain.

Wall walking. Active elbow flexion and extension

Scapular strengthening exercises.

Goal: elevation to 120 degrees, external rotation or 25 degrees.

After 12 weeks

Continue range of motion exercises and strengthening exercises to full movement as tolerated.

CONSERVATIVE REHABILITATION PLAN

If specified after surgery, for example, revision surgery.

Shoulder immobilizer to be worn except when doing physiotherapy

Active range of motion exercises of the elbow, wrist and hand should be commenced immediately after surgery.

No shoulder movements for the first 3 weeks unless specified. The sling is to remain on at all times.

After the 3 weeks unless specified, return to standard rehabilitation plan.

REVERSE TOTAL SHOULDER REPLACEMENT REHABILITATION PLAN

Shoulder replacements for cuff tear arthropathy have very different bone quality than for osteoarthritis. The bone is usually far more osteoporotic than compared to total shoulder replacement for osteoarthritis. The shoulder also lacks the rotator cuff which provides a significant stabilizing effect on conventional total shoulder replacement.

Pull-out of the components from the bone and dislocations are therefore at increased risk than conventional total shoulder replacement for osteoarthritis. Stiffness is often less of a problem.

Therefore very gentle only range of movements can start early and at three weeks active use of the shoulder can commence **if no rotator cuff repair** was performed. If repairs were performed **see rotator cuff repair protocol**