

# Enhanced Recovery

## In patients undergoing Hip and Knee Replacement

Over the last few years the process of 'enhanced recovery' has become very topical on a national level but has also been promoted to an advanced level in our local health region.

Because of its very characteristics it has been predominantly applied to hip and knee replacement surgery. In England and Wales, about 150,000 total hip and knee replacements are done each year.

Total hip replacements (THR) became popular in the late 60's and total knee replacements (TKRs) were performed in greater numbers, in the late 70's. Over recent years, large incremental improvements have been made in the design of the surgical procedure, the prosthesis, the anaesthetic techniques and the method by which a patient is prepared for surgery.

Some of these developments have allowed the pathways that are used for patients undergoing total joint replacement to undergo a multidisciplinary optimisation process. The implementation of these improvements, which sit under the umbrella 'enhanced recovery', are believed to improve patient outcomes and speed up the patients recovery following joint replacement surgery.

### Surgical technique

The pioneers of joint replacement surgery certainly were keen to visualise the joints that they were operating on. The 'shark bite' size incision was commonplace. It was often said that if you required an operation in a strange town, you would seek out the surgeon that made the largest incision, as he or she was the one you could trust to do a good operation. We know now that it is desirable to keep soft tissue trauma to a minimum. In the last 10 years or so, this has led to a reduction in the size of incisions, which after a brief episode of being extremely small, in the form of minimally invasive incisions (MIS), has since been

moderated to, a more sensible, least invasive incision (LIS). Although some patients are concerned about the size of the incision it should be as small as possible but large enough to perform the procedure safely.

The cosmetic appearance of the wound has also been improved by the use of more modern suture materials and techniques. The use of sub-cuticular absorbable sutures and skin glue leave a much more acceptable quality scar.

It would seem intuitive that the surgeon should make every effort to make sure that the replaced hip or knee joint is in a very similar position to the original that it is replacing. It is equally reasonable to assume that this would lead to a better and more natural functioning of the replaced joint.

The fairly recent popularisation of patient specific instrumentation (PSI) may be a contribution to making accurate positioning of a TKR and to a lesser extent a THR, more likely. (Ref 1).

PSI uses imaging obtained from the patient. This can be an x-ray, a MRI scan, or a CT scan. These are then processed using specific computer software and together with an engineer, a patient specific cutting block is manufactured. This allows the prosthesis to be placed in a predetermined position which could be considered optimal for that patient.

Other techniques, such as 'soft tissue balancing' which are performed during total hip and knee replacement are also getting more refined and may be partially responsible for more rapid recovery post-surgery. (Ref 2).

Hip replacements can be performed through lateral (side), posterior (back) or anterior (front) approach (wounds). The posterior approach is the most common approach used by most surgeons. Traditionally this used to be more often associated with hip dislocation. Modern intra-operative

reconstructive techniques have made dislocation risk almost equal to other approaches. Because the posterior approach does avoid damaging the very important abductor muscles it allows for quicker mobilisation and is useful in the enhanced recovery process.

### Prosthetic design

In the world of medical implants, new developments happen and advances in material science occur. Materials used in joint replacement surgery have undergone a considerable evolution. The extensive use of stainless steel in the early days of joint replacement has been superseded by the use of titanium, cobalt chrome and ceramics.

Subtle alterations to the instrumentation used to insert joint replacements and also modifications to the components themselves have made it possible for the surgeon to use smaller incisions and reduce soft tissue trauma. One of the early pioneers of total hip replacement, Sir John Charnley, used femoral head replacements measuring 7/8 of an inch (22.225mm).

With such small heads, dislocation of the hip was not that infrequent. These days with the use of much larger femoral head components, the most common of which are 28, 32 or 36mm in diameter, the risk of dislocation is much lower and patients can be mobilised much more aggressively with reduced concern for hip dislocation. In the world of hip replacement the

femoral stem can either be cemented or cementless. The longevity of either stem is very similar. The gold standard of an uncemented stem is the titanium tapered stem. (Ref 3).

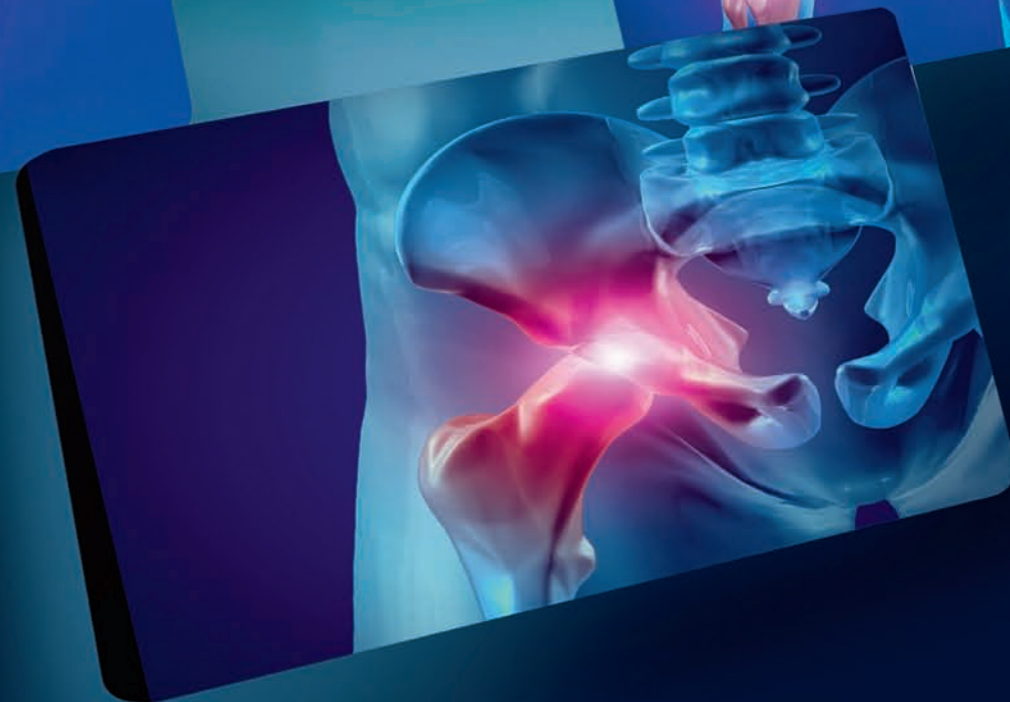
One of the advantages of not using cement is that the operating time is reduced which has a marginal benefit on reducing perioperative infection. Cemented stems are however commonly used and the decision of which type of stem would be more appropriate is often made on a patient by patient basis.

There has been a revolution in the bearing materials - the bearing is the articulation between the artificial femoral head and the socket. The quality of the plastic bearing material (polyethylene) has been improved

in joint replacement surgery. In hip replacement surgery, the use of metal on metal bearings has fallen out of favour as some bearings were subject to catastrophic failure. The use of ceramics and ceramised metals have become more popular with very good medium to long term results.

Hip replacement is one of the best types of surgery that can be performed out of all known surgical procedures. Total knee replacement is not far behind.

The various joint registries around the world have shown very positive medium to long term outcomes of a number of prosthesis that are currently being used.







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Consultant Profile:

**Mr Constant Busch**  
MBBS BSc (Hons)  
FRCS (Tr & Ortho)

**Consultant  
Orthopaedic Surgeon**

This has meant that the orthopaedic community feels more confident in offering total hip and knee replacement to younger patients.

#### Anaesthetic techniques

It is without doubt that the major contribution made to 'enhanced recovery' pathways have been the advances in anaesthetic techniques.

The use of general anaesthetics has been gradually declining as they are more often associated with a slightly slower recovery. The use of a regional anaesthetic, such as a spinal anaesthetic, have become more popular and present many benefits such as improved pain relief, reduced blood loss and earlier mobilisation.

Patients undergoing total hip or knee replacement, in the majority of cases, are fit and well when they enter hospital. The premise has been to ensure the patient undergoes the least possible physiological disturbance from the anaesthetic and the surgery so that he or she can be returned to normal activity as quickly as possible.

More judicious management of intra-operative fluid administration has been helpful in that respect. The use of specialist and carefully timed regimes of administering painkillers and pain modifying medication before, during and after surgery has also been a breakthrough development.

The technique of periarticular infiltration of a cocktail of painkilling agents around the joint replacement at the time of surgery has been very helpful to achieve good early post-operative pain relief and allow for early mobilisation. (Ref 4 and 5).

Other, more complex techniques, of blocking the nerves around the area of the joint replacement are becoming more commonplace. The use of indwelling catheters, releasing painkilling medication to the surgical area using pump controlled systems are under evaluation at present.

#### Patient preparation

It was not all that many years ago that patients were asked to be on bed rest for a few weeks following their surgery, followed by the start of rehabilitation and they would be

released home at 3 to 4 weeks after their operation. This traditional form of post-operative recovery has now been completely abandoned and exactly the opposite is being practised nowadays.

The new approach consists of giving ample preoperative advice and information to the patient. The team who looks after the patient in the enhanced recovery program is quite extensive. It involves the multidisciplinary action of the consultant, the anaesthetist, the preoperative clinic nurse, the theatre/recovery nurse, physiotherapist, occupational therapist, the ward staff, discharge coordinator, the dieticians and the enhanced recovery team.

Early mobilisation has benefits for improved functioning of the joint, it reduces the risk of deep vein thrombosis and subsequent pulmonary embolism.

Attention is paid to the nutritional state of the patient before and after surgery.

Hospitals are still a place where a patient can attract an infection, although it is quite rare these days. Of course no patient should be expected to leave hospital before it is safe to do so.

The second most important factor which has moved the enhanced recovery program forward has been the preparation of the patient prior to surgery.

Providing the patient with an exact outline of the events surrounding his or her operation is very helpful in setting expectations.

The patient needs to know that they may be mobilised 4-6 hours after return to the ward following their operation.

Often the use of a step wise program of timed achievements may be very helpful. The help of a well-trained physiotherapist is invaluable in both educating the patient and also making sure he or she, safely achieves the proposed targets.

The use of pre-operative physiotherapy has been shown to have some benefit. If the patient is

able to be in as good a physical shape as possible prior to surgery then recovery following surgery is going to be much accelerated and functional outcome may be improved.

Enhanced recovery programmes are being rolled out on a national and regional level. Optimisation of the surgical pathway by a multidisciplinary team will help the patient undergoing total hip and knee replacement towards a more speedy recovery and should result in an improved functional outcome overall.

**For more information  
please contact: [www.thesurreyhipandkneeclinic.com](http://www.thesurreyhipandkneeclinic.com)**

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