WHAT IS STATE OF THE ART HIP AND KNEE REPLACEMENT?

The goal of joint replacement surgery is an excellent result in a high percent of the cases. The most important ingredient is the surgeon. There is considerable hype today regarding the approach to a joint, the length of an incision, and the rapidity of recovery. I will address both the hip and the knee separately.

**KNEE REPLACEMENT:** Over the last 15 to 20 years, instrumentation has improved dramatically with several companies. There is no one best implant. There are better choices for some patients, depending upon age, weight, activity and lifestyle, and size of the bone structure. Rotating platform may be best for younger, heavier, more demanding individuals, but the traditional prosthesis, which may include the Gender, satisfy most clinical results.

In recent years, customization of the implants to the patient's size, alignment, and rotation of the knee has become more popular. All of the companies have this capability. This so called "custom approach" can lead to a shorter incision, less bleeding, and more accurate implantation. Both the instruments and the customized approach still require the experience of the surgeon. The plastic spacer between the chrome, cobalt and titanium metal has improved with all companies to the point that with excellent implantation, life expectancy should be 20 to 30 years in my experience. In high usage patients, the plastic may need to be changed sooner than 20 years.
The general health, physical capability, pre-surgical exercise regimen, and fortitude of the individual patient may all lead to a more rapid and successful result.

There are surgical innovations that are quite important to a quicker and successful surgery result. Smaller incisions, limited or no involvement of the muscle, cautious handling of the tissues and shorter operating time are all extremely important. Studies have shown that decreased operating time leads to lower incidences of infections.

There are other intraoperative modalities such as high-frequency coagulation of the bleeding tissue and certain chemicals that help reduce swelling and bleeding post-surgery. This not only reduces pain and swelling, but along with frequent elevation of the leg, increases activity, and return of motion of the knee. In recent years, customization of the implants to the patient's size, alignment, and rotation of the knee has become more popular. All the companies have this capability, but in recent polls, only 10% of surgeons are exploiting this technology.

The partial or hemi-knee is still performed in a small percentage of cases, and may also be used with the customized or pre-scan approach. This is more likely to eliminate any surgical miscalculation. Partial knee has been very successful in the hands of experienced surgeons. The patient needs a very thorough explanation of the difference between this and the traditional total knee.

Timeline on hospitalization and recovery from knee replacements is as follows:
1. Total knee: 2 to 3 days in hospital. Hemi knee: One day.
2. Ambulation with walker and progression to a cane: As soon as possible. Most patients are independent by the 2nd or 3rd day, if not sooner.
3. 5 to 6 days with home health and elevation of the leg and continued therapy. Some patients may go directly from the hospital to outpatient therapy. CPM is optional and should only be used 30 minutes twice a day.
4. Outpatient physical therapy may be necessary 3 to 5 weeks postoperative. Occasionally, one may be prolonged on the partial or hemi knee, and certain chemicals.
5. Some patients may return to an easy job in 10 to 14 days and a difficult job 6 to 8 weeks. Driving may be started a week after a left knee procedure, and 2 to 3 weeks after a right knee.
6. It is important for the patient to understand during recovery that majority of the swelling is not going to disappear until 3 to 4 months after the operation. Improved bending of the knee and overall function of the knee also continues to improve up to 6 months to a year.

Pre-surgical and intraoperative computer usage may improve the patient’s and the surgeon’s success.

In conclusion, knee replacement is an art, and it can involve smaller or "less invasive" incisions, or those with less invasion of the muscle above the joint, but success hinges on good balance of the knee, soft tissue and correct alignment. Presurgical and intraoperative computer usage does improve the patient's and the surgeon's success.

**HIP REPLACEMENT:** The majority of surgeons in the US continue using a posterior or back approach to the hip joint for replacement. The front or anterior incision was started 40 to 50 years ago and most orthopedic surgeons in the 60s and 70s learned that approach. It is not new. There has been considerable marketing involved with it. A number of studies have shown that there is no difference in the outcome between these two approaches at the second and third week.
Pending studies and some in the future may show that there are still some muscle problems with the anterior approach. There is also a difficulty in installing the usual stem length into the thigh, and there are special "short stems" for the anterior approach. There may also be a difficult learning curve with the anterior approach.

Bearing services have gone through several transitions over the last 15 to 20 years. Metal-on-metal ball and socket was instituted because of the threat of plastic disease, which can cause damage to the bone and loosening of the implants. Ceramic-on-ceramic has also been shown to be successful. Twenty years ago ceramic-on-plastic was the most recommended by engineers in many of the companies. Now with metal-on-metal we are seeing problems in some cases which have caused surgeons and engineers to reconsider.

I started the small incision, or minimal invasive, approach to the hip over 25 years ago. At that time it was not a marketing topic. Standard or complex sockets, along with standard or long stem femoral prosthetics, can be inserted through this incision. There should be no muscle damage with this approach, and surgical time and complications should be less frequent in almost all cases performing press fit or non-cemented type of joints. These have not only stood the test of time, which in my experience is over 28 years, but may well be permanent for the lifetime of an individual patient. The bearing surface, particularly if it is plastic or polyethylene may need to be changed at 15 to 25 years.

The state of the art in hip replacement is as follows;

1. Cementless titanium stem, cementless socket with polyethylene (plastic) or ceramic liner. The ball may be ceramic or chrome cobalt.
2. In special short stems, results of the individual patient may vary, especially in females.
3. A posterior incision is the approach of the majority of surgeons, although anterior is acceptable with an experienced surgeon. Height should not be a decision basis.
4. Small or less invasive skin incision for experienced surgeons. My experience has shown over 99% ingrowth.
5. Some companies apparently have had higher percentage ingrowth of hip implants through the years, but this remains an elusive statistic and still a surgeon preference.
Recovery and Return to Activity:
1. Hospitalization: 2 days, with older patients, 3 days.
2. Weight Bearing: As tolerated with a walker, crutch and progress to cane as soon as physically capable.
4. Patients may return to work 10 days to 6 weeks post-surgery depending upon job description and physical capability.

SUMMARY: Both the hip and the knee have special applications to their surgical replacement, including less invasive incisions, approaches, and materials used. Pre and intra-surgical computer use may be helping to increase the success rate. Further follow up is necessary. The surgeon is still first and these accessories second. There is no substitute for experience.