

## **Total Knee Replacement In The New Millennium By Steven J. Lancaster, M.D.**

Orthopaedic surgical techniques and technology, like all aspects of science and technology, have continued to undergo advancements and improvements over the years. Total knee replacement or total knee arthroplasty, (TKA) as it is known, specifically has continued to improve with time. There are currently over 225,000 total knee replacements performed in the United States of America each year. Total knee replacement is one of the most successful procedures in orthopaedics and medicine in general due to the high success rate and high patient satisfaction rate. Total knee replacement can improve function, motion and decrease pain such that the individual can continue to function actively in their later years. It maintains and improves an exercise tolerance which enables them to remain active and improves their overall life style. Frequently, patients with degenerative joint disease or arthritis will be forced to reduce their activity due to pain, which may result in progressive weight gain and subsequent depression from the inability to perform their normal daily activities and activities that give them satisfaction. When the deterioration of the joint surfaces is significant enough and all nonoperative treatments have failed, a total knee replacement will be recommended. In the later years of the "past millennium" or reasonably the 1970s and 1980s, a total knee replacement was commonly thought to last five years, according to the lay public. In reality they were not far off, as in the early years this was due to mechanical loosening of the cement (or grout) and prosthe-



sis (or metal implant). With improved metallurgy, biophysics and better techniques, the 1990s have improved that technology and the track record became much better. As we improved with the technology, the "weak link" has increasingly become the plastics. As the longevity of the knee implant improves, we have found that the plastics or polyethylene has had increased wear rates over the years and the debris has led to some cases of loosening. The improved implants are minimizing this problem.

The other drawback in the 1980s and 1990s in total knee replacements has been the lack of complete improvement in motion of the knee. A total knee replacement will reproducibly and consistently improve pain and function about the knee, but will not always significantly improve motion about the knee. Most arthritics have already developed a significant stiffness about the knee by the time they come to surgery due to their increased pain and as a result of the natural progression of their disease. A total knee replacement will improve this motion but not fully return it to the "normal" range of motion. Newer concepts in total knee replacement have improved both the wear rates or destruction of the plastics, and have improved the motion about the knee. Normal knees move not only in a forward-backward plane termed flexion and extension, but also will rotate to some degree with such activities as swinging a golf club, swinging a racquet or pivoting as with exercises. The knees of the "last millennium" for the most part recreated only the forward-backward motion and were referred to as "fixed bearing" knees. A revival of an old concept, coupled with improved kinematics (motion studies) and improved plastics has produced the "mobile bearing" knee of the new millennium. It allows motion both in the flexion-extension (or forward-backward) plane and also allows movement in rotation. As such, it improves overall motion and function. The mobile bearing knee coupled with the new ideas and studies on the sacrifice of the posterior cruciate ligament has led to results of improved function and motion of the knee, replicating close or equal to the normal knee motion.