

New Knees: GETTING THE RIGHT BALANCE

The average American has nearly a fifty percent chance of developing symptomatic knee arthritis. Fortunately, mild to moderate arthritis often responds to non-operative treatments: therapy, injections (cortisone and visco-supplementation), anti-inflammatories, activity modification. However, when the arthritis is severe and the symptoms are recalcitrant to those modalities, patients may consider joint replacement surgery (partial or total) to improve their condition.

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Equally paramount to knee function is balance: that is balanced tension of the soft-tissues that support the knee (ligaments and capsule). The knee joint operates like the hinge on a door. It needs to be stable through the whole arc of motion (from completely straight to fully bent) but not so tight that the hinge is stiff or limits motion. Ideally, the soft tissue tension on both the inside and outside of the knee is balanced (or equal) at all bending positions. If one or both sides are too loose at any given position, the knee will not feel stable, may give way and adverse stress may be imparted to the surrounding structures. If too tight, motion may be impaired.

Historically, the “art” of knee surgery has been the process by which the knee surgeon properly balances the knee. Typically this requires relaxing the tight structures of the abnormal arthritic knee to match the length/tension of the more normal side/structures. For example, the typical bowlegged patient’s knee will have tighter structures on the inner side of the knee from the chronic, shortened position of the tissues on that side of the knee. Conversely, knock-kneed patients are tighter on the outside of the knee.

Two devices (Synvasive & Orthosensor) have been developed to assist the surgeon balance the knee more “scientifically” than “artfully.” Both devices are trial components that have sensors to measure the forces on both sides of the knee. The surgeon checks these forces at different bent positions of the knee and uses “numbers” instead of “feel” to balance the soft-tissue tension on both sides of the knee. The information can also assist with the tracking or relative position of the components as the knee moves. The result is a stable knee with maximized range of motion.

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