

Why Do Total Hip & Knee Replacements Eventually Require Revision?

Total hip and knee replacements are mechanical devices, and as with all such devices they ultimately fail. Failure comes as a result of wearing of the components or their loosening from the host bone.

Total hip replacements have been blessed with an evolution in materials design that has allowed for the abandonment of ultra high molecular weight polyethylene (“plastic”) from the articular mechanism of the joint. This plastic still inhabits the weight bearing interface of **total knee replacements** and serves as the weak link in the system. In addition there are still many older **total hip and knee replacements** with plastic components still functioning in patients.

The plastic is slowly worn down as millions of gait cycles compress and abrade the metal surfaces against the plastic. Obesity and over-activity can increase stresses in the joint that accelerate such wear. Two mechanisms of failure are at work in such joints. The wear of the plastic can actually lead to complete wear-through and mechanical failure of the prosthesis. In addition the microscopic plastic particles generated by wear are phagocytized by macrophages with the resultant release of enzymes that lead to periprosthetic osteolysis and loosening of the prosthesis from the bone.

Physiologic change in bone mass over time (osteopenia) is a natural occurrence with advancing age. Such osteopenic bone may eventually be unable to support the prosthesis which can lead to failure of the bone prosthesis interface and loosening of the prosthesis. Advances in the treatment of osteopenia hold promise in the treatment of this unwanted complication in the **total hip and knee replacement** patient.