



by Michael Kimball, MD

IMPROVED TECHNOLOGY LEADS TO PATIENT CHOICE

As the demographics of knee replacement patients become younger, technology faces a challenge. The trend of younger, more active patients receiving total joint replacements increases the need for joints with better, longer-lasting performance. Traditional materials and components often wear out and require another replacement within 10 years or so. New technology and more durable materials create more choices for the patient and better long-term outcomes.

The “wear” of knee placements determines how long the joint lasts before the patient may require another repeat surgery years after the original procedure. As the surfaces of the implant rub together, tiny fragments of plastic and metal material wear off. The effect — similar to what takes place inside a car’s engine — causes the knee to fail. Knee replacements currently last an average of between 10 and 15 years before wear becomes an issue.

Recent technological advancements more than double the life of the knee. For example, one company on the forefront of new technology, Smith & Nephew, developed a technology tested to simulate 30 years of wear performance. Using a metal alloy

and a “cross-linked” plastic component, the new technology doubles the wear of the company’s cruciate-retaining knee replacement.

Each of these new materials offers several advantages. Similar to a high thread-count fabric, cross-linked plastic uses a denser, lower-friction plastic, creating a tighter weave of particles at the microscopic level. This reduces the amount of wear experienced when the metal component moves across it.

The new, patented metal alloy replaces a metal called cobalt chrome. The metal alloy undergoes a heating process that transforms the surface into a hard, smooth ceramic — yet it still retains the strength of the underlying metal. It won’t fracture like ceramic, yet its ceramic-like surface is 4,900 times more resistant to the kind of scratching that wears out a cobalt chrome implant before its time. In addition, the lighter cobalt chrome does not contain detectable amounts of nickel, making it safe for patients with metal allergies and sensitivities.

Keep in mind, however, that better wear alone may not improve joint durability and performance. Other factors — including bone structure, for example — can affect joint durability and performance and may cause medical conditions that may result in the need for additional surgery. (Research on these factors was not part of the testing.)

Plus, too much activity too soon can cause problems. High-impact activities such as running and jumping should not be performed until your doctor determines the bone is sufficiently healed and gives the go-ahead for these activities. Returning to activity too soon can cause breakage or loosening of the device.

Overall, new technologies boost the average lifespan of joint replacements to 30 years of actual use under typical conditions, making them more attractive to younger patients with active lifestyles.

