

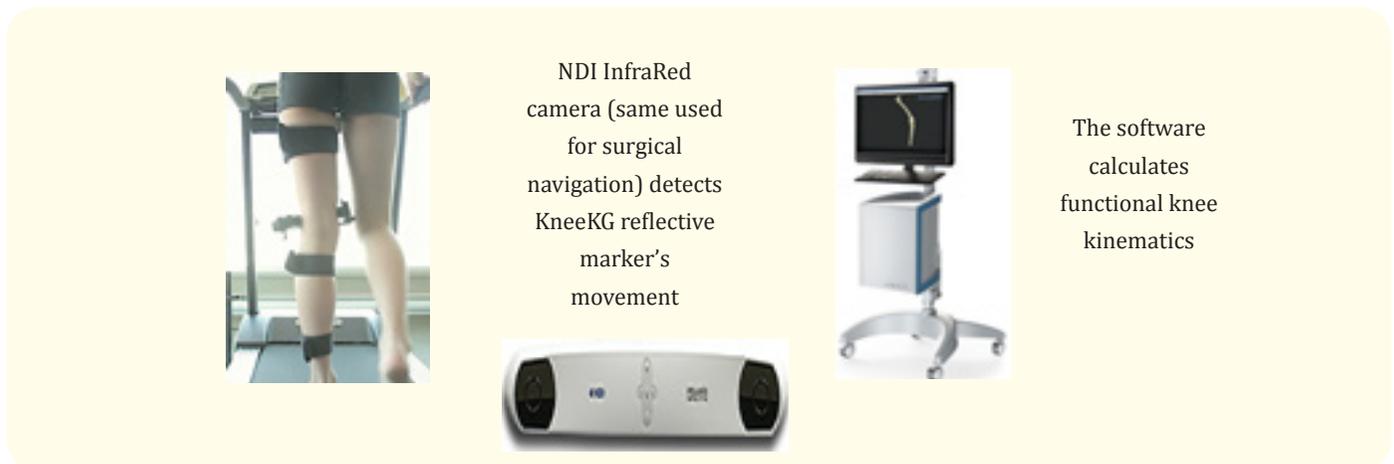
Knee KGTM- Introducing 4th Dimension in Orthopedic Care. “Evidence-based Ortho Knee Care Through-out the Continuum of Care”

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When one considers the potential impact of Knee KG in orthopedic knee care, one just has to look at two examples that clearly brings to light the newest technology's potential. The first is the electrocardiogram (EKG). How can a heart specialist truly assess the heart's condition without documenting how it functions? EKG testing is now standard testing protocol with patients with heart issues. The other example, although outside the medical field but nonetheless, highlights the tie-in with Knee KG. GPS technology provides crucial information to pilots (speed, position, etc.) They are mandatory to fly planes since they provide accurate objective data allowing reducing piloting errors.

The same approach can now apply to knee assessments with the introduction of the Knee KG. Let's first discuss current imaging technologies including: X-rays, CT, and MRI. All provide a stationary image of the problem site and are very valuable in defining the extent of the injury and confirming the doctor's diagnostic impression. However, in most cases it does not identify possible root cause of symptoms and does not give adequate information to define the best treatment approach to take. That is where the Knee KG can provide additional valuable data and insights on how the knee is actually performing. The Knee KG provides measurable, quantifiable, and scientifically proven accurate data of a patient's knee 3D kinematics (movements) while walking on a treadmill (loading-bearing dynamic activity). Tie this back to the GPS example where a visual assessment is subjective, but a GPS will provide accurate data to plan the adequate course of action. The same applies to the knee. The Knee KG demonstrated through various validation studies to measure knee flexion/ extension, Varus/ valgus, axial rotation, and anterior posterior translation with a very high level of accuracy, reliability and reproducibility. The accuracy for tibia extension is 0.4°, 2.3° tibia internal/ external rotation, and 2.4 mm AP translation.

Continuum of Care

Now let's move on to how the Knee KG can positively impact a knee patient throughout the continuum of care from baseline testing all the way through total knee replacement (TKA).

A number of clinical articles have been published on how faulty kinematics can lead to knee pain, knee degradation and injury. One of the biggest challenges faced by orthopedic surgeons is that this specialty has not traditionally been a proactive specialty as they typically only see patients once pain or injury has evolved significantly. Furthermore, there was a significant gap in available technology in that, none were able to assess and quantify accurately knee function in the clinical setting. That is, before the Knee KG was introduced.

I will now walk through some continuum of care examples and how the Knee KG can radically influence how orthopedists approach clinical cases, first starting with baseline testing. It is widely recognized in the orthopedic literature that female athletes experience a significantly higher incidence of ACL tears due to anatomical and functional differences between males and females. Baseline testing female athletes with Knee KG and for that matter all athletes, can help identify patient’s that may have a higher risk of injury. Perhaps personalized physical training or specialized bracing could then be prescribed that may minimize risk exposure. Additionally, baseline testing applies to non-athletes as well in that faulty kinematics can lead to osteoarthritis and ultimately TKA down the road. Lastly, baseline testing with the Knee KG can expand an orthopedist’s potential patient pool from patients with pain or injuries to everyone.

The next step in the continuum of care process is a patient consulting for knee pain. Current medical approaches focus on treating symptoms through medications and injections (HA or corticosteroid) and not trying to address the potential root cause of symptoms and disease progression such as faulty kinematics. Identification of kinematics deficiencies allows health care professionals to not only personalized care pathway, but also leads to better patient education on the source of their symptoms, which turns, into better treatment compliance and clinical outcomes. Indeed, integrating a Knee KG assessment in patient management has been shown to improve patient reported outcomes (KOOS scores) in a statistically and clinically significant manner. Lastly, it also equips orthopedists with a holistic alternative for patients that prefer that approach versus injections and medications.

Next up is soft tissue related injuries for which surgery is required in many cases. The Knee KG technology ties in for these injury types by first measuring the consequence of the injury on knee function and second demonstrating the benefits of the surgical treatment. The Knee KG allows identifying post-surgical residual kinematic issues that could lead to further post-surgery complications and secondary injuries.

Lastly, let’s assume patients are at the point of needing TKA. Here we will address how Knee KG plays into the equation both pre and post-surgery. Faulty gait issues pre-surgery does not necessarily mean they will be corrected after TKA and could be a cause the high percentage of patients unsatisfied post-TKA (about 20%). With faulty gait issues identified pre-surgery, an opportunity is created to have this situation corrected before surgery takes place. This supports the old adage, faulty in, faulty out. A surgeon can also gather pre-surgery bench mark data that can then be compared post-operatively. This data supports the industry’s trend towards evidenced-based data.

Post-TKA, a surgeon now has an outcomes measurement tool in the Knee KG. Since faulty joint mechanic’s post-surgery has been linked to poorer functional outcomes, Knee KG provides valuable data to orthopedist to ensure optimal post-surgery management. The Knee KG technology also now enables a surgeon to better understand causes of post-TKA knee pain while also prescribing specific rehab plan addressing specific patient needs.

In conclusion, the Knee KG represents a new opportunity for all orthopedic specialists to expand their patient care all along the continuum of care. It can also enhance the communications among Ortho providers by creating a patient data history that can provide much needed insights into a patient’s history. This includes general orthopedists, pain management specialists, sports medicine, and ultimately total joint replacement surgeons. Data is power and if the Knee KG is being utilized and managed within an orthopedic group practice, surgeons will be more empowered in patient care than ever before. Lastly, it is a data-driven technology that can track and measure outcomes, assist in clinical decision-making, while also focusing on identifying root causes of knee issues. Technology advancements are a good thing and the Knee KG is clearly the 4th dimension in orthopedic care.

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