# Patient Satisfaction with Total Knee Replacements: Complexities of Outcomes Assessment

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The amount of bend in a knee, its ability to bear weight, and its stability and appearance in an X-ray image are well-accepted parameters for surgeons to judge the success of a joint replacement.

Each can be reliably measured and are well defined, but they also miss something fundamental – the experience of the patient themselves.

There are significant differences between what a surgeon considers to be a success compared to a patient. This is perhaps more pronounced in total knee arthroplasty than in total hip replacements.

> *Fewer than two of every 100 total knee replacements are considered to be a failure when using surgeon-led outcome measures.[1]*

Clinicians can see it is situated in the right location and the patient can bend and straighten it (Figure 1). Ask the same patient how they feel and the success of the procedure can look very different. They will say it does not feel like their own knee: that during the day it gets hot and in the winter it gets cold. They cannot kneel at times and their knee feels unusually heavy.

> *In fact, one out of every five patients will say they are unhappy with their knee replacement.[2]*

This disparity between patients and surgeons highlights just how important it is to measure outcomes in the right way.

*Figure 1: Surgeon-led outcome measure – Goniometer assessment for range of motion*

## Current Patient-Led Outcome Measures

Countries and institutions have different systems in place to score patient reported knee replacement outcomes. For instance, the Oxford Knee Score (OKS) is used in the UK, while the Knee Society Score (KSS) is used in the US and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) is used in Canada. None of these systems are standardized or comparable, as they each use different sets of questions. These questionnaires rely upon patients understanding and answering all the questions in the way they were intended. In most cases the questions are not sensitive enough to pick up some of the subtleties that can affect what the surgeon might be trying to determine. For example, a patient might have other ailments, such as back pain, or pain in their healthy limb, which may affect their ability to walk up or down a flight of stairs. Similarly, they may say they cannot kneel, but this could be due to a skin rash rather than a problem with their knee itself. Pain tolerance can also vary a great deal between patients, which makes it difficult to judge quantitatively what one patient is feeling compared to another.

Patients are given these questionnaires throughout the surgical process, both to help determine whether they need an operation in the first place and then post-operatively to help measure the success of the joint replacement. Yet knowing how much weight to give such patient-led outcome measures is tricky. There is a huge discrepancy between what can be observed in an X-ray image and the patient's symptoms, especially in terms of a knee replacement where a patient might present with arthritis in the knee, but it may not affect them much because they limit their activities.

## The Challenge of Developing New Outcome Measures

This complex relationship between surgical-led outcomes and patient-led outcomes suggests new methods may be needed to ensure assessments are picking up the issues that matter.

Currently, there are knee replacement products on the market that are close to being 99% successful when using clinical measures.[3] At this level, it becomes difficult to compare one type of implant to another and it becomes necessary to measure other more subtle aspects. This is exactly where patient-led measures could have more of a

role to play. However, producing methods of measuring these patient-led outcomes is not a trivial task.

Developing a validated questionnaire like this can take 1.5-2 years of drawing up questions, testing them and validating them. A seemingly simple question can produce a range of different answers. For example, asking a patient if their knee feels hot could give a very different answer from asking them if there is a temperature difference between their two knees. Once completed, integrating these new assessment tools into the existing outcome measures will also be a challenge. They will need to be given the correct level of weighting alongside those that are already used by clinicians. Patients too, who are already bombarded with forms to fill in, will need to be convinced their answers matter so they spend the time completing them. Clinicians will also need to be convinced as they prefer to use objective measures rather than subjective ones – it is easy to see if a knee bends by a certain amount, but it is much harder to tell if a patient only has mild pain, or if their knee feels hot. This will require large scale trials before these new measures can be fully trusted. But patients and patient-led organizations will also be crucial, as these engagement groups can influence hospitals and health systems to adopt these new ways of measuring outcomes.

## Benefits to the Orthopedics Industry

For those in the orthopedic industry developing new knee replacement products, this could be an important step. Persuading clinicians to use their new products is a difficult task if surgical measures show they offer little benefit over existing knee joint replacements. By using more nuanced patient-led outcomes, the benefits offered by innovative new products, can be clarified in more detail. For instance, a non-metal knee joint should be lighter than existing knee replacements that contain metal, meaning the patient should feel a benefit. However, using current measures, this difference would not be picked up, but it could be important for distinguishing new products if it gives a measurable benefit to the patient. Similarly, polymer knee joints should also help to eliminate metal sensitivity and temperature differences that some patients report, but are also missed by current outcome measures.

If companies like Invibio Biomaterial Solutions™ can show that their PEEK-OPTIMA™ Knee** is safe, has good clinical outcomes and is cost effective compared to products already on the market, then this sort of patient satisfaction could provide the edge it needs to differentiate itself in the market. ▲

## ABOUT THE AUTHOR


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Professor Hemant Pandit is the Deputy Director of the Leeds Institute of Rheumatic and Musculoskeletal Medicine and the Chair in Elective Orthopaedics at the University of Leeds. He completed his DPhil in knee kinematics at the University of Oxford and was the first to describe the problems associated with metal-on-metal hips (pseudotumours). He has since pursued a career in translational research in orthopedics and is now based at Chapel Allerton Hospital in Leeds while also serving as Professor of Orthopaedic Surgery at the University of Oxford.



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* Since 2018, Hemant Pandit, MBBS, MS(Orth), DNB 9rth), FRCS (Orth), DPhil (Oxon) has provided ad hoc consultancy services to Invibio Ltd.

* The testimonial presented has been provided by a practicing orthopedic surgeon. His view and experiences are his own and do not necessarily reflect those of others. "Invibio" disclaims any liabilities or loss in connection with the information herein.

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