Learning from the experience of over 40 years of total knee development, Unity Knee™ is the latest evolution in total knee arthroplasty, unifying key design technologies with advanced knee kinematics, soft tissue preservation concepts and modern surgical principles.

- **Balancing the MCL**
  Utilising modern knee kinematic principles to help facilitate medial joint line preservation and collateral ligament stability\(^2,3\).

- **Balancing the patella**
  Incorporating advanced design technologies to help optimise patellofemoral joint balance.

- **Balancing the soft tissue envelope**
  Facilitating the preservation of proprioception and mechanical function of the knee soft tissue envelope\(^4\).

**Think isometry Feel balance™**
Evidence based innovation
Balancing the MCL

Studies show that anatomic knee designs with a single centre of rotation in the active flexion arc have the potential to facilitate collateral ligament isometry, minimising paradoxical anterior glide seen in traditional ‘J’ curve systems\(^1\). However, if the joint line is not preserved, a single radius femur can still lead to mid-flexion ligament laxity, resulting in instability and loss of function\(^2,3\).

**The challenge:** As joint line orientation is not maintained in total knee replacement (TKR), most instruments provide a central pivoting rotational alignment mechanism which elevates the medial joint line, resulting in mid-flexion laxity of the MCL followed by tensioning in deep flexion\(^2,4\).

**Our innovation:** Taking into consideration the importance of the MCL in knee stability post TKR, Unity utilises advanced kinematic and design principles with the aim of optimising medial joint stability, providing an optimal synergy between implant and instrument designs.

Balancing the patella

Studies of the native patella show lateral articulation against the trochlea throughout range of motion (ROM)\(^5,6,7\). Whilst traditional prostheses tend to track from a medial position in flexion to a lateral position in extension, resulting in increased patella constraint and extensor mechanism forces in mid-flexion\(^8\), Unity incorporates an...
And we didn’t just stop there......

Utilising advanced design technologies, modern kinematic principles and anthropometric data analysis, Unity incorporates:

- **Rotational freedom principles** to accommodate variable knee kinematics, aimed to minimise soft tissue conflict\(^9,10\).
- **Size-specific tibial tray geometries** with changing cortical profiles\(^11\), designed to enhanced cortical fit, minimising implant overhang and soft tissue irritation\(^11,12\).
- **Safe high flexion principles** with a 3° anterior slope posterior condylar resection, designed to allow safe high flexion without additional bone resection\(^13\), in contrast to traditional high-flexion designs\(^14\).
- **Difficult primary instrumentation** offering the unique ability to stem a primary PS femur and tibia.

Balancing the soft tissue envelope

To avoid sensory disturbances due to ligament releases during surgery, the Unity implant design, combined with EquiBalance™ instrumentation, is designed to facilitate ligament balancing and MCL isometry throughout ROM.

![Unity patella track](image1)
- Unity patella track
- Traditional patella track

![Unity Knee™](image2)
- Traditional high-flex knee

![Applied force](image3)
- Shear force
- Compressive force
References:


2. Luyckx T, Victor J, Bellemans J. Effect of femoral component position and joint line changes on ligament isometry and kinematics in single radius TKA. Presented at European Knee Association Congress 2013, Florence, Italy.


