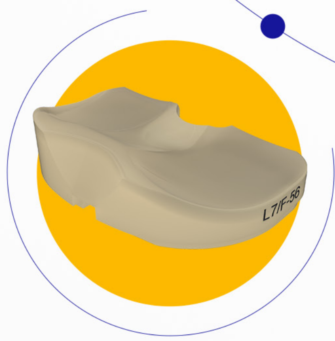
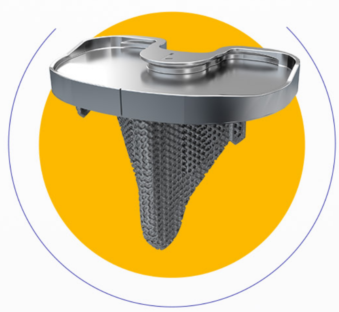
ORTHOVASIVE®
Freedom to move

CONCOR
Cementless MPK design





Introducing

Next-Gen 3D Printed Cementless TKA System

Total Knee Implants with long term biological fixation increased longevity of prosthesis.

bioradmedisys™
science for people

Why Change?

Limitations of Traditional Cemented Knee Implants

While cemented implants have long been the gold standard, there have been limitations to ***oit***

- **Cement Debonding:** Long-term loosening due to cement degradation.
- **Reduced Bone Integration:** Cement acts as a barrier to biological fixation.
- **Surgical Variability:** Cement technique inconsistency can impact implant longevity.
- **Time-Sensitive Procedure:** Cement working time limits surgical flexibility.
- **Risk of Cement-Related Complications:** Fat embolism, thermal necrosis, and difficulty in revision.
- **Allergic** to Methyl methacrilate.
- **Carcinogenic fumes** harmful to the staff & operative surgeons.
- **Time limitation** of cement setting time.

A Brief History

40 years of Cementless TKA Implants

1980s

- First-generation cementless implants introduced with basic porous coatings. Mixed outcomes due to suboptimal designs and materials.

2000s

- Improved metallurgy and porous coatings showed better results.

Now

- 3D printing revolutionizes cementless implants by enabling controlled porous structures for bone in-growth.
- Customized geometries for patient-specific fit.
- Enhanced initial stability through precise surface topography.

Survivorship & Clinical Evidence

- **Modern cementless TKA implants show 10-year survivorship of over 95%**, comparable or superior to cemented designs.
- **Registry Data** (e.g., AJRR, National Joint Registry UK):
- Lower revision rates in younger patients.
- Reduced aseptic loosening in properly indicated cases.
- Clinical trials confirm improved early fixation and long-term durability when biologic fixation is achieved.

Key Indications for Cementless TKA Surgery

Cementless TKA is especially suited for:

- **Younger, active patients (<65 years)**
- **Good bone quality (e.g., Dorr Type A or B)**
- **Patients desiring bone preservation for potential future revision**
- **Cases requiring minimal bone cement interface (e.g., allergy concerns)**
- **BMD < 2.5**

Not recommended for:

- Severe osteoporosis
- Major bone defects or poor bone stock
- Compromised bony conditions
- BMI > 35
- Blood related issues - Haemophilic patients

Knee implant with Lattice structure: -

Lattice (Trabecular 3D structure) or porous structures are increasingly integrated into cementless knee replacement implants to support biological fixation through bone ingrowth. These advanced designs aim to enhance longevity, stability, and functional integration of knee prostheses, particularly in younger or active patients.

Clinical Evidence:

1. Mechanical behavior of titanium alloy scaffold mimicking trabecular structure

Highlights the mechanical compatibility of trabecular titanium scaffolds, showing optimized strength and stiffness that closely mimic natural bone, enabling better load transfer and reducing implant failure risks.

Ref: Mechanical behavior of titanium alloy scaffold mimicking trabecular structure. *Josr-online.biomedcentral.com* (2019).

2. Additive manufacturing of porous titanium implants: Effect of process parameters on mechanical and biological properties

Reviews how AM parameters influence the design and performance of porous titanium implants, emphasizing that controlled lattice structures improve osseointegration and mechanical matching with bone.

Ref: Additive manufacturing of porous titanium implants: Effect of process parameters on mechanical and biological properties. *ScienceDirect.com* (2021).

3. Use of Porous Titanium Trabecular as a Bone Defect Regenerator: In Vivo Study

Demonstrates that porous trabecular titanium implants enhance bone ingrowth and vascularization, reducing stress shielding and promoting implant stabilization in vivo.

Ref: Use of Porous Titanium Trabecular as a Bone Defect Regenerator: In Vivo Study. *MDPI.com* (2022).

4. Characterization of bone ingrowth and interface mechanics of a new porous 3D printed biomaterial

Shows 3D-printed porous Ti6Al4V implants support substantial bone ingrowth and strong mechanical fixation, confirming their suitability for biological fixation without the need for additional coatings.

Ref: Characterization of bone ingrowth and interface mechanics of a new porous 3D printed biomaterial. *ResearchGate.net* (2019).

5. Clinical and radiological outcomes of acetabular revision surgery with trabecular titanium cups

Reports favorable mid-term clinical outcomes using trabecular titanium cups for acetabular revision, indicating excellent implant survival and functional improvements in patients with severe bone defects.

Ref: Clinical and radiological outcomes of acetabular revision surgery with trabecular titanium cups. *PubMed.ncbi.nlm.nih.gov* (2021).

6. Analytical relationships for the mechanical properties of additively manufactured open-cell metallic foams

Provides analytical models linking lattice design parameters with mechanical properties, enabling tailored scaffold designs for optimized strength and stiffness.

Ref: Analytical relationships for the mechanical properties of additively manufactured open-cell metallic foams. *ScienceDirect.com* (2017).

7. Synergistic effect of Si-hydroxyapatite coating and VEGF adsorption on Ti6Al4V-ELI scaffolds for bone regeneration

Finds that bioactive coatings combined with growth factors significantly enhance bone regeneration on titanium scaffolds, offering improved osteogenesis and angiogenesis especially in osteoporotic bone.

Ref: Synergistic effect of Si-hydroxyapatite coating and VEGF adsorption on Ti6Al4V-ELI scaffolds for bone regeneration. *ScienceDirect.com* (2017).

The 3D Printed Advantage

Benefits to Patients

- **Faster Bone Integration**
  Advanced porous surface promotes faster and stronger biological fixation.
- **Improved Longevity**
  No cement degradation means reduced risk of loosening and revision.
- **Reduced OR Time & Consistency**
  No need for cement mixing and application, simplifying the procedure.
- **Preserved Bone Stock**
  Helpful for future revisions or younger patients with longer life expectancy.
- **Reduced Risk of Cement-Related Complications**
  Eliminates risks like embolism or thermal damage.

Cementless MPK TKA System Features

- **Trabecular lattice design** mimicking cancellous bone, 690 micro porous structure having up to 75% porosity.
- **Optimized press-fit geometry** for immediate stability
- **CoCrMo alloy & Ti6Al4V alloy** for biocompatibility and fatigue strength.
- **Option for robotic or manual instrumentation**
- **Available in multiple sizes with anatomical fit**
- **Instrument options suitable for quality of bones for optimum bony fixation**

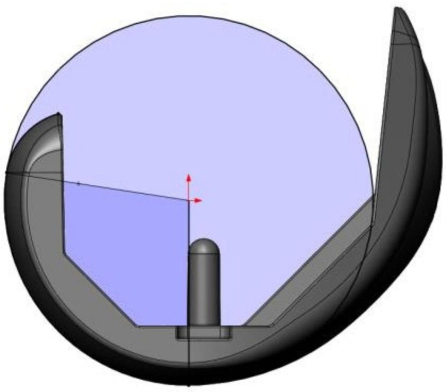
Instructions for Use (IFU) Highlights

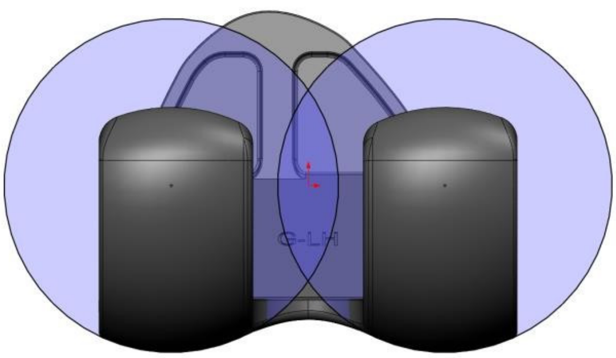
- **Ensure proper bone preparation and bone quality assessment.**
- Use the press-fit technique per surgical guide; avoid undersizing.
- Post-op weight-bearing protocol as per standard TKA rehab.
- Follow standard infection control and implant handling practices.

About Proven
Excel MPK design

Designed to restore the sagittal curvature of the femur with constant radii from 0° to 90°, which delivers constant contact area in flexion and extension.

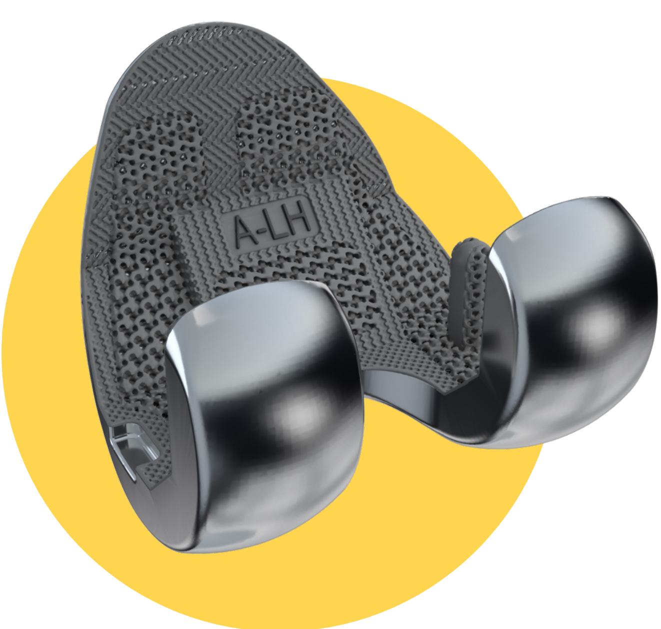
The single radius of curvature extends from 0° to 90° on the medial and lateral condyle. Additionally, the coronal radius is equal to the sagittal radius. These features provide the “ball” in the “ball-in-socket” design and create an extension geometry on the medial condyle that is equal to the flexion geometry. Coupled with the spherical medial side of the tibia, this feature prevents “paradoxical motion” (anterior translation of the femur on the tibia as the knee goes into flexion) but also maintains contact area and prevents laxity throughout the range of motion.

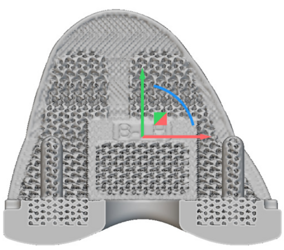


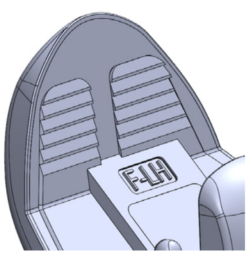


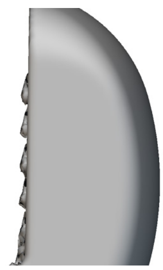
CONCOR Uncemented Femoral component: -

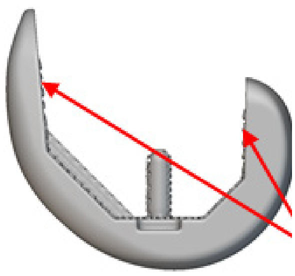
- **Material:** Co-Cr-Mo-alloy
- Available in **8 Sizes** - from Size A-H
- Reduced Anterior Flange, reducing patellar impingement
- Deeper patellar groove for better patellar tracking
- Single Radius of curvature in Sagittal and frontal planes from 0 to 115°
- Reduced radius of curvature of posterior condyle for increased flexion
- Bone-conserving design with respect to PS knee
- **Wide Q Angle- 7 to 10 Degree**
- **ROM -155 Degree**
- More than 1mm depth is provided for the lattice structure. Which provides bone ingrowth.
- Enhanced gripping for Anterior & Posterior flanges is provided for ultra grip.
- Pegs with a lattice structure will provide stability and bone ingrowth.





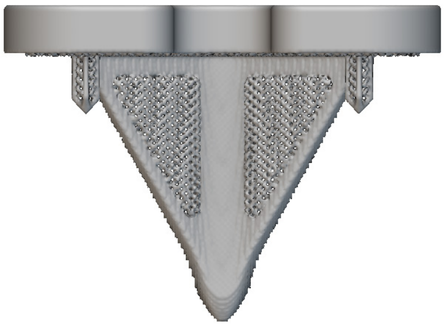


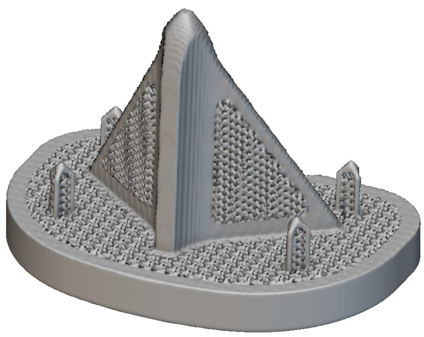




CONCOR Uncemented Tibial Component: -

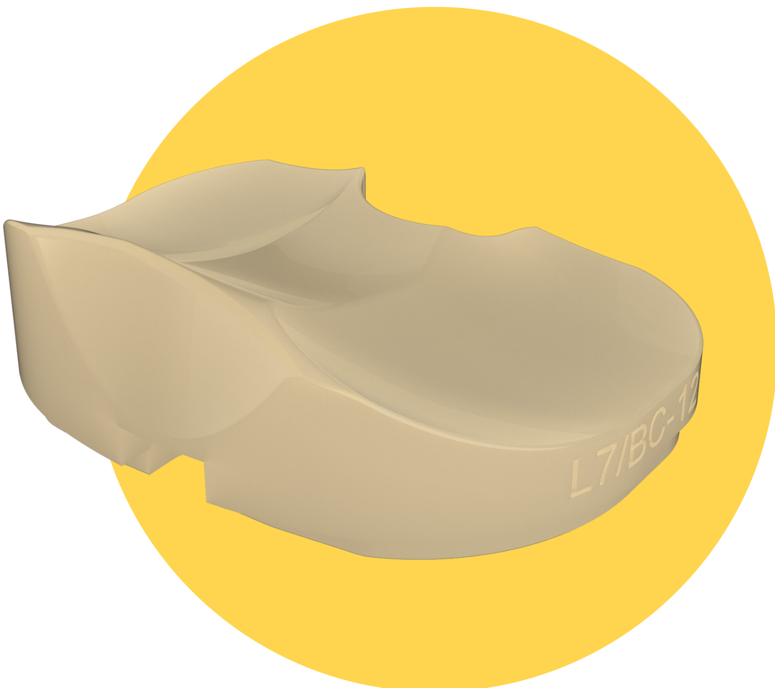
- **Material:** Ti6Al4V.
- Available in **7 sizes** - Size Tray 1-Tray 7
- Dove tail locking mechanism results in reducing micromotion & ultimately backside wear of poly.
- Continuous peripheral rim offers a better locking mechanism & stability
- The **tibial stem base angle of 3°** has been provided.
- Bullet nose feature helps better implant position with respect to the posterior wall.
- Keel with ultra-grip bone interlocking feature facilitates excellent bone ingrowth.
- A lattice structure is provided on the tibial plateau for stability and fixation with bone. It helps with bone ingrowth & stability of the tibia implant.
- 4 pegs with trabecular structure on the anterior & posterior side of the tibia base, which helps in more stability and fixation.
- 2 options for Tibial Keel preparation suitable for bone quality and optimal fixation in cancellos bed.





Excel Medial Pivot Tibial Insert: -

- Insert with Vit–E poly with higher longevity
- Available in **11 sizes** with thicknesses are 7, 8, 9, 10, 11, 13, 15, 17 mm.
- Asymmetric anatomic inserts. Raised anterior medial lip to provide medial stability, with Lateral condyle arcuate Path for natural knee function. Which facilitates rotation of the lateral condyle about the medial condyle and provides Natural knee kinematics.
- The medial side acts as a partial **"Ball and Socket Joint"** to avoid Paradoxial motion.
- Medial Ball and Socket design addresses Mid- Flexion to high flexion stability
- Chamfered posterior edge of the tibial poly avoids impingement during deep flexion
- Biocompatible with good mechanical & oxidative properties
- Higher oxidative strength compared to UHMWPE.
- Improved mechanical strength compared to UHMWPE.
- Reduction in formation debris
- Reduces bacterial adhesion to implant surfaces, lowering infection risks.



Size Compatibility Chart:

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<tr><th colspan="2" rowspan="2"></th><th colspan="7">TIBIAL TRAY SIZE</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td rowspan="8">FEMUR SIZE</td><td>A</td><td colspan="2">A-12</td><td colspan="2">A-34</td><td></td><td></td><td></td></tr>
<tr><td>B</td><td colspan="2" rowspan="2">BC-12</td><td colspan="2" rowspan="2">BC-34</td><td></td><td></td><td></td></tr>
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<tr><td>D</td><td></td><td rowspan="2">DE-2</td><td colspan="2" rowspan="2">DE-34</td><td colspan="2" rowspan="2">DE-56</td><td></td></tr>
<tr><td>E</td><td></td><td></td></tr>
<tr><td>F</td><td></td><td></td><td></td><td>F-4</td><td colspan="2">F-56</td><td></td></tr>
<tr><td>G</td><td></td><td></td><td></td><td></td><td colspan="2" rowspan="2">GH-56</td><td rowspan="2">GH7</td></tr>
<tr><td>H</td><td></td><td></td><td></td><td></td></tr>
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