

What happened to PS and CR, What's all this other stuff?

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UCSF Napa Meeting

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Disclosures

- Consultant
 - Depuy
 - Zimmer Biomet

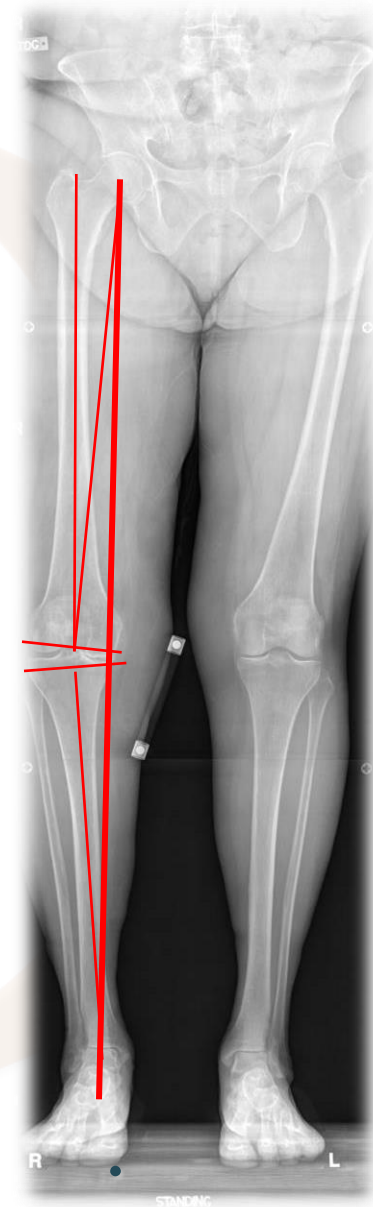
Goals for TKA in 2024: Still the Same

- Eliminate pain
- Maximize range of motion
- Provide stability through the gait cycle



TKA Goals: How to Get there

- Restoration of Mechanical Axis
- Symmetric ligament balance
- Same Regardless of Technique and Design
 - Measured resection
 - Gap Balanced



What's the Difference Between a Good Knee and a Great Knee?

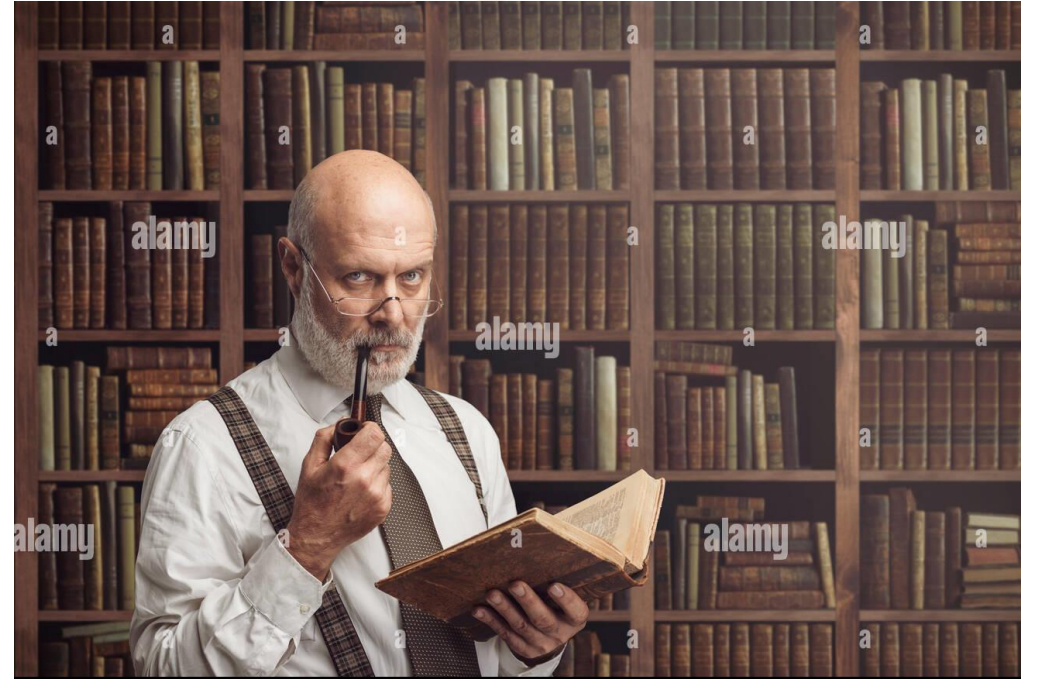


Soft tissue balancing and restoration of knee kinematics!



Literature

- Are Patients Satisfied after TKA?



Are 20% of Patients Actually Dissatisfied Following Total Knee Arthroplasty? A Systematic Review of the Literature



Review > Bone

I Discordance between patient and surgeon re satisfaction after total joint arthroplasty

Ian A Harris¹, Anita M Harris, Justine M Naylor, Sam Adie, Rajat Mittal, Alan T Dao

Patient Satisfaction

Patient satisfaction after total knee arthroplasty: who is satisfied and who is not?

[Cynthia A. Katz](#)

[Michael B. Cross](#)

[Robert B Bourne](#)¹, [Bert M Chesworth](#), [Aileen M Davis](#), [Nizar N Mahomed](#), [Kory D J Charron](#), [Kwaku](#), MD, MBA, [Alexander S. McLawhorn](#), MD, MBA, [Well](#), MD, and [Douglas E. Padgett](#), MD

Comment: A Systematic Review

Patient Satisfaction after Total Knee Arthroplasty

Who is Satisfied and Who is Not?

**Robert B. Bourne MD, FRCSC, Bert M. Chesworth PhD,
Aileen M. Davis PhD, Nizar N. Mahomed MD, MPH, FRCSC,
Kory D. J. Charron Dipl. MET**

, London, ON



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- 19% of patients not satisfied after TKA
- 72-86% satisfied with pain control
- 70-84% satisfied with function following TKA

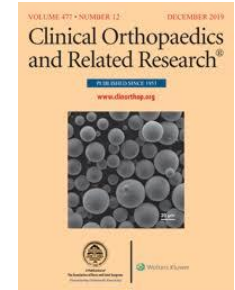
The John Insall Award: Patient expectations affect satisfaction with total knee arthroplasty

Philip C Noble ¹, Michael A Conditt, Karon F Cook, Kenneth B Mathis

Baylor College of Medicine, Houston, TX, USA.

- 253 patients survey
- 75% satisfied
- 14% dissatisfied

Why are they dissatisfied?



Patient Dissatisfaction Following Total Knee Arthroplasty: A Systematic Review of the Literature

Rajitha Gunaratne, MBBS ^{a, b, *}, Dylan N. Pratt, BEng ^{a, b}, Joseph Banda, BEng ^{a, b}, Daniel P. Fick, MBBS (Hons), FRACS, ARGG ^{a, b, c, d, e}, Riaz J.K. Khan, BSc (Hons), MBBS, FRCS (Tr & Orth) ^{a, b, c, d, e, f}, Brett W. Robertson, PhD ^{a, b, d, e}



AJRR 2021 Diagnosis of All Knee Revisions¹

Table KT11 Primary Total Knee Replacement by Reason for Revision (Primary Diagnosis OA)

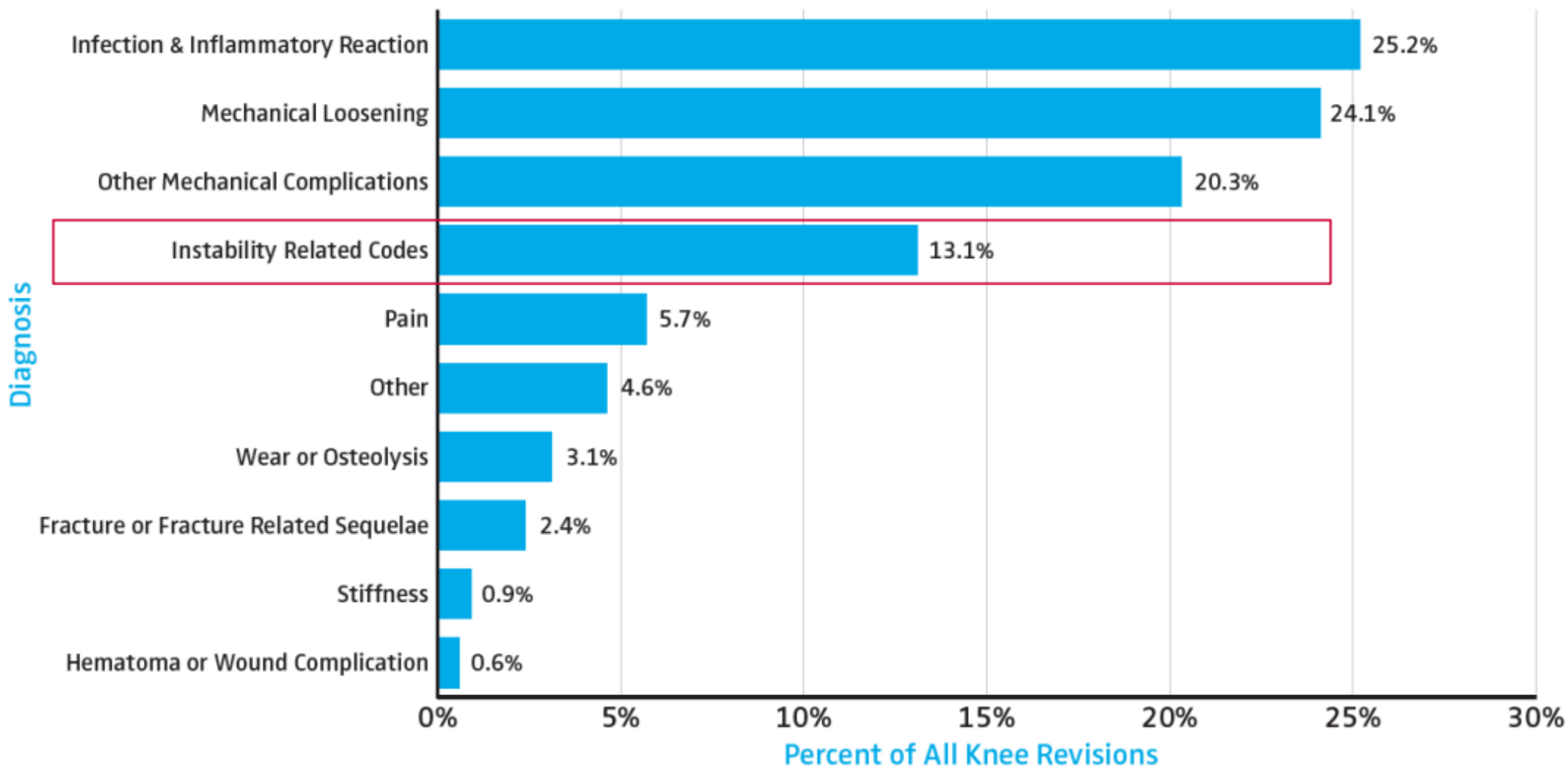
Reason for Revision	Number	Percent
Infection	6055	26.4
Loosening	5194	22.7
Instability	2170	9.5
Patellofemoral Pain	1931	8.4
Pain	1846	8.1
Patella Erosion	1451	6.3
Arthrofibrosis	879	3.8
Fracture	789	3.4
Malalignment	532	2.3
Lysis	304	1.3
Wear Tibial Insert	294	1.3
Incorrect Sizing	244	1.1
Metal Related Pathology	109	0.5
Other	1101	4.8
TOTAL	22899	100.0

Note: Restricted to modern prostheses

#3 Reason for Revision TKA

Instability Ranks a Leading Cause for Revision TKA¹

Figure 3.28 Distribution of Diagnosis Associated with All Knee Revisions, 2012-2020 (N=77,520)



Primary Arthroplasty

The Influence of Postoperative Knee Stability on Patient Satisfaction in Cruciate-Retaining Total Knee Arthroplasty

Tomoyuki Kamenaga, MD ^a, Hirotsugu Muratsu, MD, PhD ^{a,*}, Yutaro Kanda, MD ^b,
Hidetoshi Miya, MD ^a, Ryosuke Kuroda, MD, PhD ^b, Tomoyuki Matsumoto, MD, PhD ^b

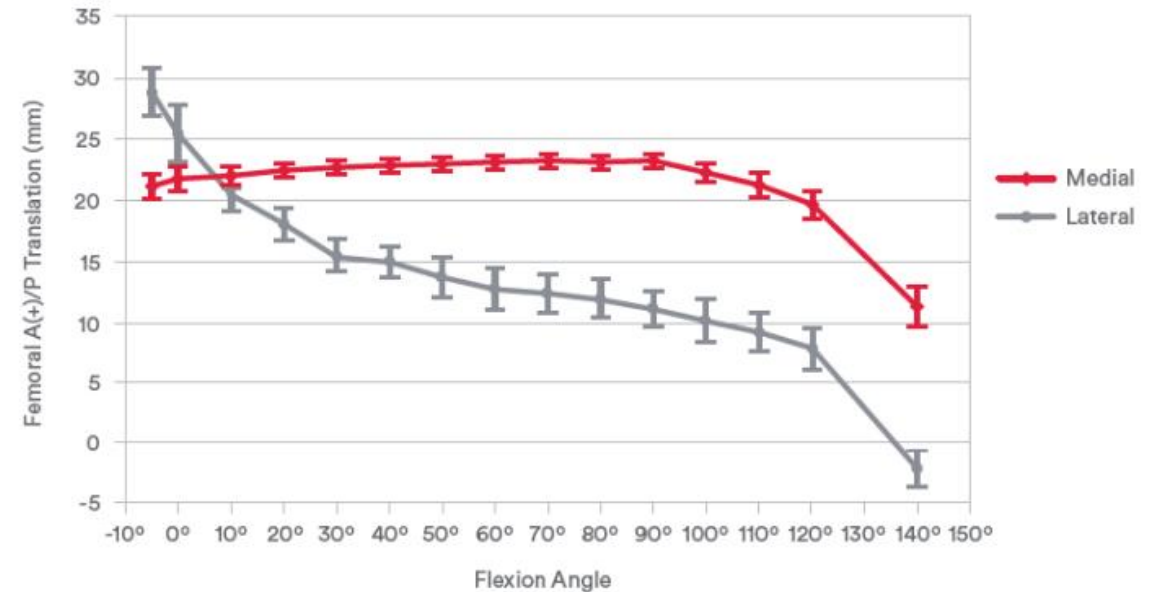
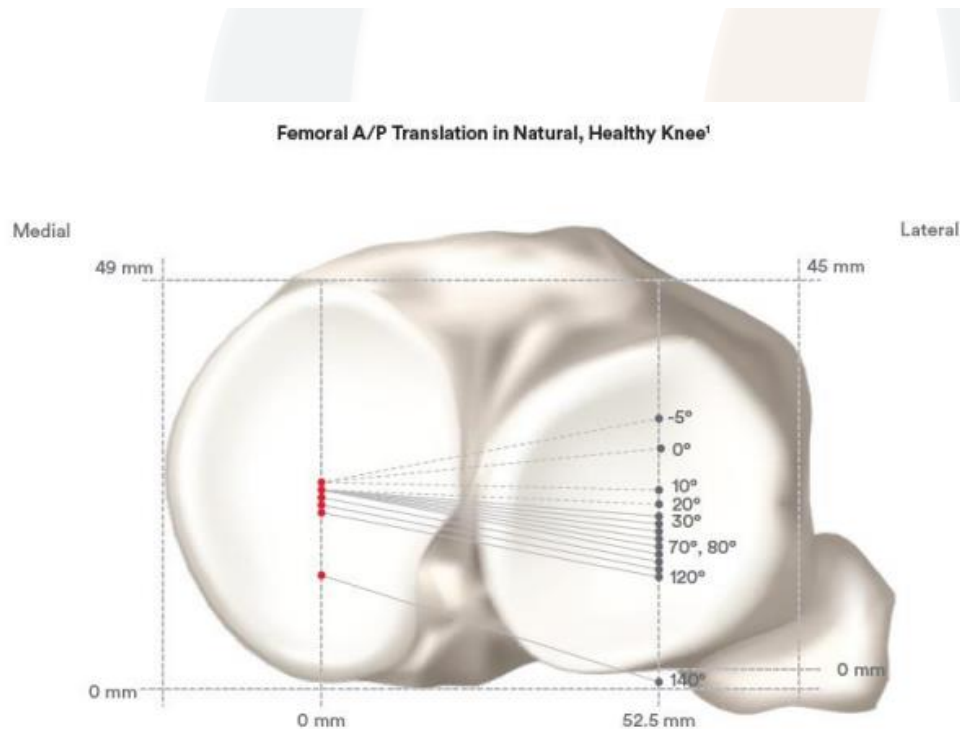


- Strong determinant of dissatisfaction is the perception that the knee feels abnormal
- The knee “not feeling natural” → leads to dissatisfaction
- **Patients with higher stability and function report higher satisfaction**

Tibio-femoral movement in the living knee. A study of weight bearing and non-weight bearing knee kinematics using 'interventional' MRI

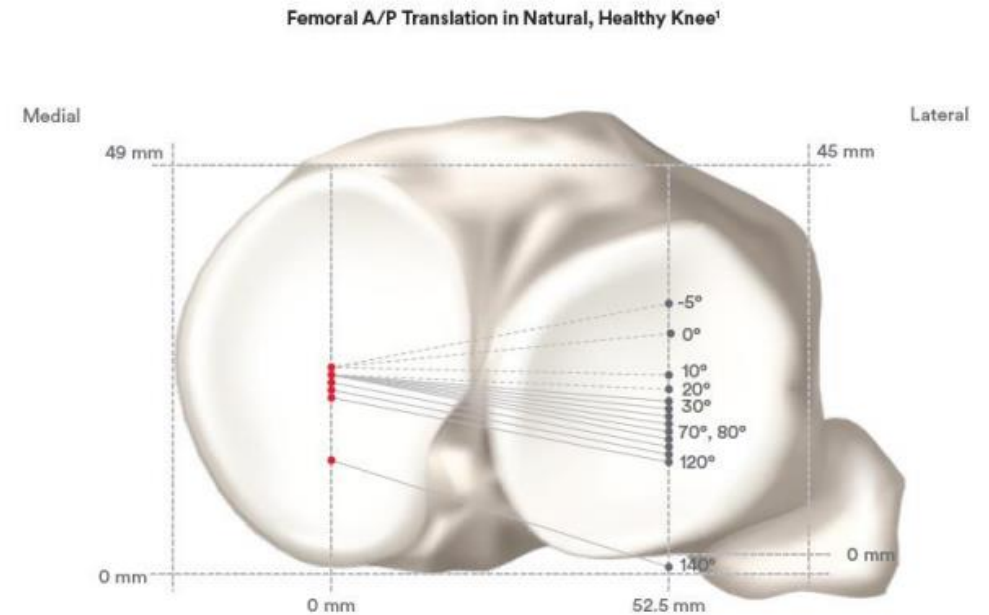
P Johal¹, A Williams, P Wragg, D Hunt, W Gedroyc

J Biomech. 2005 Feb;38(2):269-76.



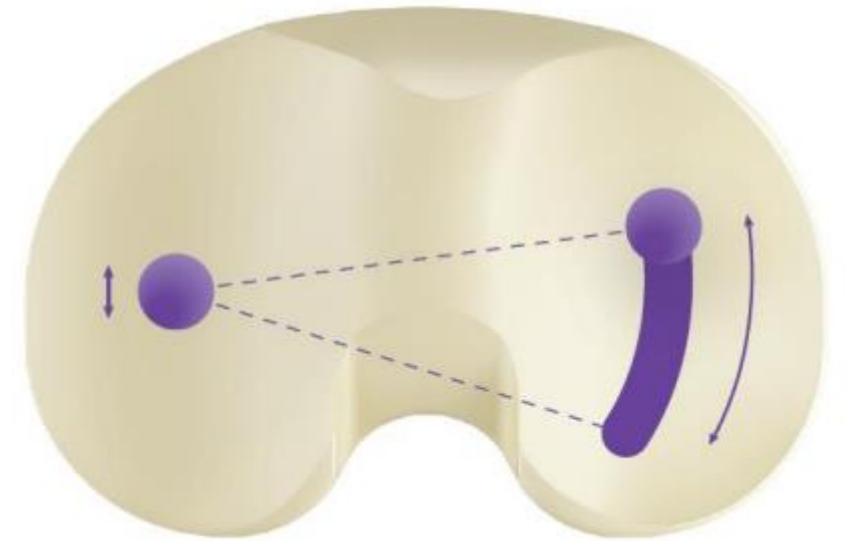
Knee kinematics

- Natural mechanics of the knee
- More stable on the medial side
- Femoral rollback on the lateral side
 - “Screw-home Mechanism”



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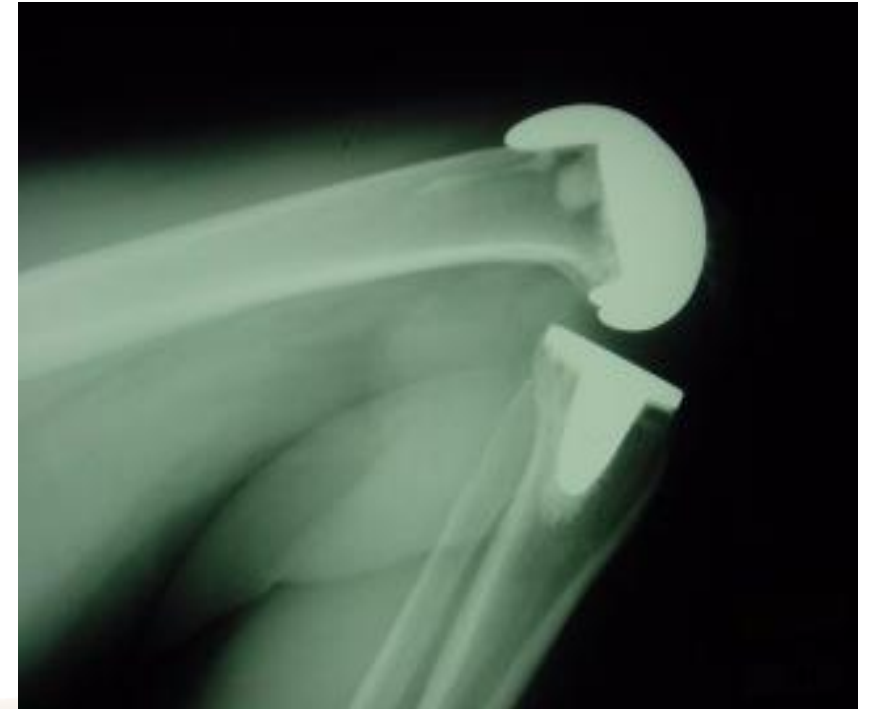
Patient-Reported Outcomes following Total Knee Replacement in Patients Aged 65 Years and Over—A Systematic Review

[Nicholas Woodland](#),¹ [Antony Takla](#),¹ [Mahnuma Mahfuz Estee](#),¹ [Angus Franks](#),¹ [Mansi Bhurani](#),² [Susan Liew](#),² [Flavia M. Cicuttini](#),¹ and [Yuanyuan Wang](#)^{1,*}

- Improvement in Pain
- Improvement in Knee Function
- Improvement in Quality of Life

- PS and CR implants

- Overall satisfaction is high after TKA



- Results of TKA are good, so why do we need something else?



CR/PS TKA designs

- Do Not reproduce physiologic knee kinematics
- Lack of AP stability due to design
- Aim for Femoral Rollback



Are we shooting at the wrong target?

- PS/CR design rationale
 - Based on outdated normal knee mechanics
- Minimize conformity to allow for “physiologic” rollback
- Resulted in paradoxical rollback

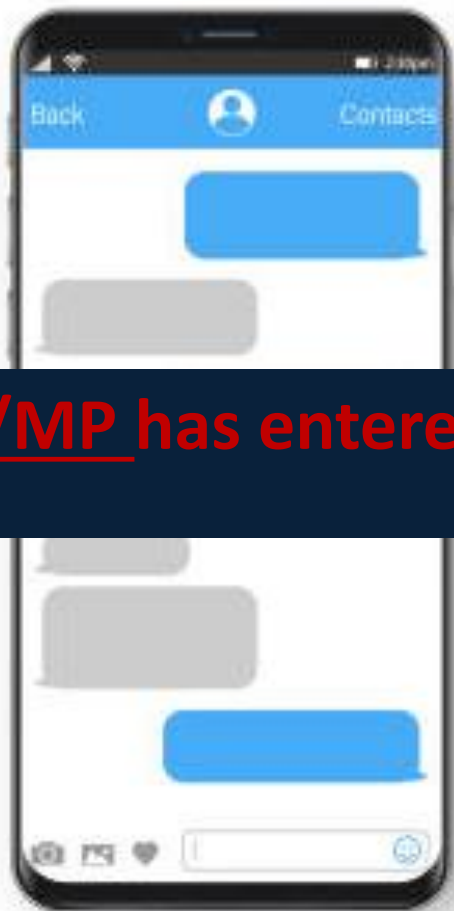


How do we get there?

- Increase Stability
- Soft tissue balance
- Restoration of knee kinematics



Medial stabilized designs



MS/MC/MP has entered the chat



Medial stabilized designs

- Result in less medial condylar movement throughout motion
- Allows for lateral rollback posteriorly
- Increased stability during the gait cycle



J Orthopaedic Experience & Innovation

King, Samuel W, Jeya Palan, and Hemant Pandit. 2024. "Medial Stabilised Total Knee Arthroplasty: Definition and Performance." *Journal of Orthopaedic Experience & Innovation* 5 (1). <https://doi.org/10.60118/001c.91477>.

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Medial rather than lateral knee instability correlates with inferior patient satisfaction and knee function after total knee arthroplasty

Hiroyuki Tsukiyama ¹, Shinichi Kuriyama ², Masahiko Kobayashi ³, Shinichiro Nakamura ⁴,
Moritoshi Furu ⁴, Hiromu Ito ⁴, Shuichi Matsuda ⁴

- Japan
- 50 TKAs with stress radiographs
 - Compared KSS scores
- Increased medial stability resulted in increased satisfaction scores
- Thought to recreate normal knee kinematics

■ KNEE

Mid- to long-term outcomes of a medial-pivot system for primary total knee replacement

A SYSTEMATIC REVIEW AND META-ANALYSIS

D. A. Fitch,
K. Sedacki,
Y. Yang

- Systematic review
- Identified 8 studies for 1156 TKAs
- Implant survival
 - 99.2% at 5 years
 - 97.6% at 8 years
- Similar or better than reported survivorship of other TKA systems in NJR registry

Sagittal Stability and Implant Design Affect Patient Reported Outcomes After Total Knee Arthroplasty

[Christopher W. Jones, PhD, MBBS \(Hons\)](#)^{a,b,c} · [Hans Jacobs, MBChB](#)^d · [Sarah Shumborski, MBBS \(Hons\)](#)^e · ... · [Andrew Redgment, PhD, MBBS](#)^g · [Roger Brighton, MBBS](#)^h · [William L. Walter, PhD, MBBS \(Hons\)](#)ⁱ ... [Show more](#)

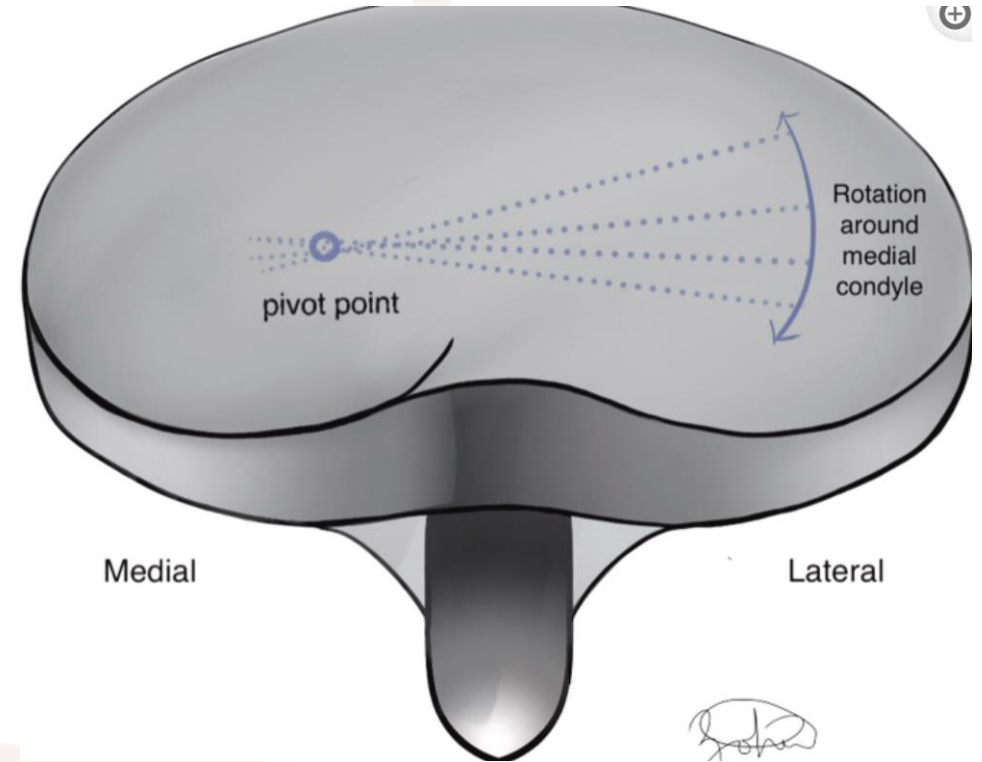


- Matched Cohort study
- 60 Patients (30 MS vs. 30 Non MS)
- Blinded observer assessed AP stability with manual testing and KT-1000 arthrometer
- Measured PROMs

- MS TKA had significantly greater sagittal stability and improved satisfaction scores compared to non-MS TKA.

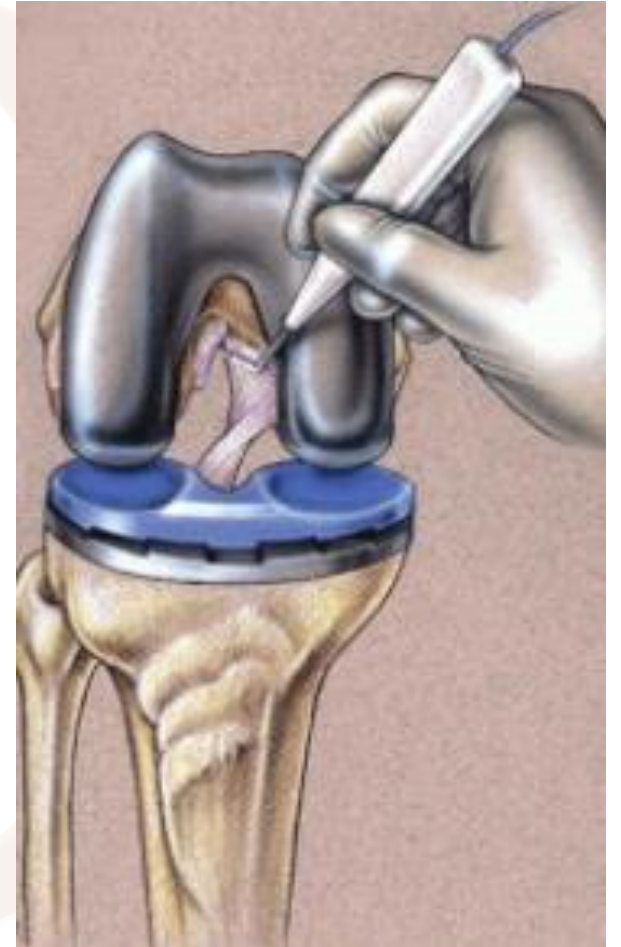
Are all designs created equal?

- Probably not
- Varying amounts of conformity



Should you retain the PCL?

- Ongoing studies and debate
- Personally sacrifice in 100% of TKA
- Easier to balance
- More natural for a converted PS surgeon
- Most studies to date have shown no difference



Widespread adoption

- Increasing Use in TKA at a rapid rate
- Little Long term data
- Subjective Feel in the OR and post operatively



Widespread adoption

- Bringing CR and PS surgeons together!
- Allows for improved kinematics through the bearing surface
- Without a change in Technique



Higher satisfaction scores?

- Early data is promising
- Remains to be seen
- Studies ongoing



OrthoCarolina Experience

- 2020: 8/9 surgeons PS
- 2024: 100% using CR femur with an MS articulation



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Thank You

We are what we repeatedly do,
Excellence then, is not a single act, but a habit
-Aristotle

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