

# **What Matters Now/Kinematic Alignment for total knees**

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**11<sup>th</sup> Annual Delaware Orthopaedic Symposium  
October 27, 2018  
Ammon Medical Education Center**

# Are we happy with TKR results?

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“**Pain** after total knee arthroplasty (TKA) represents a common observation in **about 20%** of the patients after surgery. .... whereas the unexplained **painful TKA still remains a challenge ....**”

The painful knee after TKA: a diagnostic algorithm for failure analysis.  
S. Hofmann , G. Seitlinger , O. Djahani ,M. Pietsch  
Knee Surg Sports Traumatol Arthrosc (2011) 19:1442–1452

# TKR design variables

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## What makes a difference?

- **Morphologic knee implant designs**
- **Comprehensive sizing**
- **Side-specific kinematics**
- **Differential conformity articulation**
- **Constant radius**
- **Cruciate Retaining and Posterior Stabilized**
- **Custom Designed Components**

# Do We Know a good TKR Introp?

“Conclusions: The **surgeon’s** subjective view of technical quality of surgery **did not predict** KSSs unless the technical quality score was **extremely low.**”

1050 patients /1193 primary TKAs single surgeon 2000 and 2004

Can Surgeons Predict What Makes a Good TKA?

Intraoperative Surgeon Impression of TKA Quality Does Not Correlate With Knee Society Scores

Gwo-Chin Lee MD, Paul A. Lotke MD

Clin Orthop Relat Res (2012) 470:159–165

SYMPOSIUM: ANNUAL MEETINGS OF THE KNEE SOCIETY

# Alignment?

## ◆ Traditional fixed angles

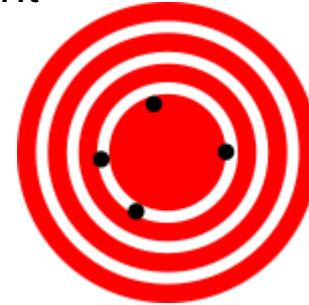
- Average alignment base on Mechanical or Anatomic axis
- Soft tissue sleeve adjusted to this alignment

## ◆ Precisely Wrong alignment?

- Mechanical guides
- Patient specific guides
- Navigation



poor trueness  
good precision



good trueness  
poor precision

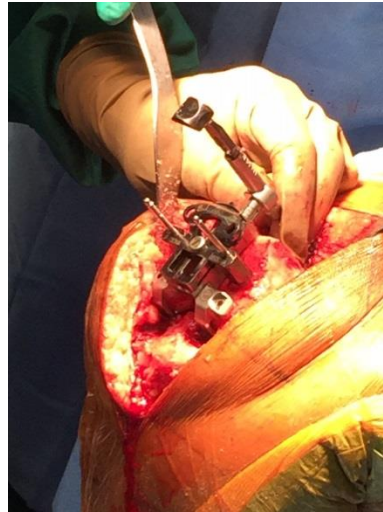
# Questions!!!

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- ◆ **Status quo 20% unhappy patients**
- ◆ **What is wrong with the 20% ?**
- ◆ **Alignment dogma developed 1974**
- ◆ **Engineering ideas / better mouse trap**
- ◆ **More accurate alignment not related to outcomes**
  - Navigation, patient specific
  - Outlier alignment is bad
  
- ◆ **KA alignment > normal knee motion in vitro**
- ◆ **KA not dependent on patient specific guides**

# Concepts

- ◆ **Femur: Measured resection distal and posterior cuts to put joint surface precisely where cartilage surface was**
- ◆ **Soft Tissue: DO NOT MESS WITH IT. Resect osteophytes**
- ◆ **Tibia: cut to balance knee in extension and flexion**



- ◆ **DO NOT** let your experience kick in
- ◆ **DO NOT** use the guides the way you have
- ◆ **DO NOT** think about the femur
- ◆ **DO NOT** think about the soft tissues
- ◆ **DO** cut the tibia to balance the knee







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# Me and Residents

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- ◆ **Me**
  - remind myself constantly
- ◆ **Senior residents**
  - same struggle
  - catch on quickly
  - comment on intraop stability
  - grasp the new concept
- ◆ **Junior residents**
  - Easily make the transition
- ◆ **PA commented covering my clinic**

# Literature

## **Implant Survival and Function Ten Years After Kinematically Aligned Total Knee Arthroplasty.**

**Howell SM, Shelton TJ, Hull ML. J Arthroplasty. 2018**

### ♦ **10-year**

- Implant survivorship 97.5% (0.3%)
- Patients grouped in the varus outlier range, valgus outlier range, and in-range had similar implant survival and function scores.
- Oxford Knee Score averaged 43 (48 best)
- WOMAC averaged 7 points (0 best)

## **Early Outcomes of Kinematic Alignment in Primary Total Knee Arthroplasty: A Meta-Analysis of the Literature.**

**Courtney PM, Lee GC. J Arthroplasty. 2017**

### ♦ **877 kinematic TKAs,**

- Survivorship was 97.4% at 37.9 months.
- Revision were patellofemoral problems in 8 patients (1.2%).
- No difference in the complication rate between the 229 kinematic and 229 conventional TKA patients (3.9% vs 4.4%;  $P = .83$ ).
- Kinematic TKA group had a higher combined postoperative Knee Society Score than the conventional TKA group (mean difference, 9.1 points; 95% confidence interval, 5.2-13.0 points;  $P < .001$ ).

# Conclusion

- ◆ Happy patients
- ◆ No manipulations
- ◆ 1 revision for patella maltracking
- ◆ Guardrails?
  - Tibia 3 degree max varus
  - Tibia 6 degree max slope
  - Femur 9 degree max valgus



