

# UKA Debate

## All Poly Versus Metal Back

## Mobile bearing Versus Fixed

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# Debate – Mobile V Fixed

## -All poly V Metal Backed

Email to Francois

- \* What side am I on ?
- \* Shall we toss a coin



# Debate – Mobile V Fixed

## -All poly V Metal Backed

Francois reply

- \* To both Jean Noel and myself
- \* You choose



# Debate – Mobile V Fixed

## -All poly V Metal Backed

Reply

Fixed and Metal backed  
It's what I use



# Debate – Mobile V Fixed -All poly V Metal Backed

\* 3 minutes later Jean  
Noel replied  
Me too

The quick and the dead



# Debate – Mobile V Fixed

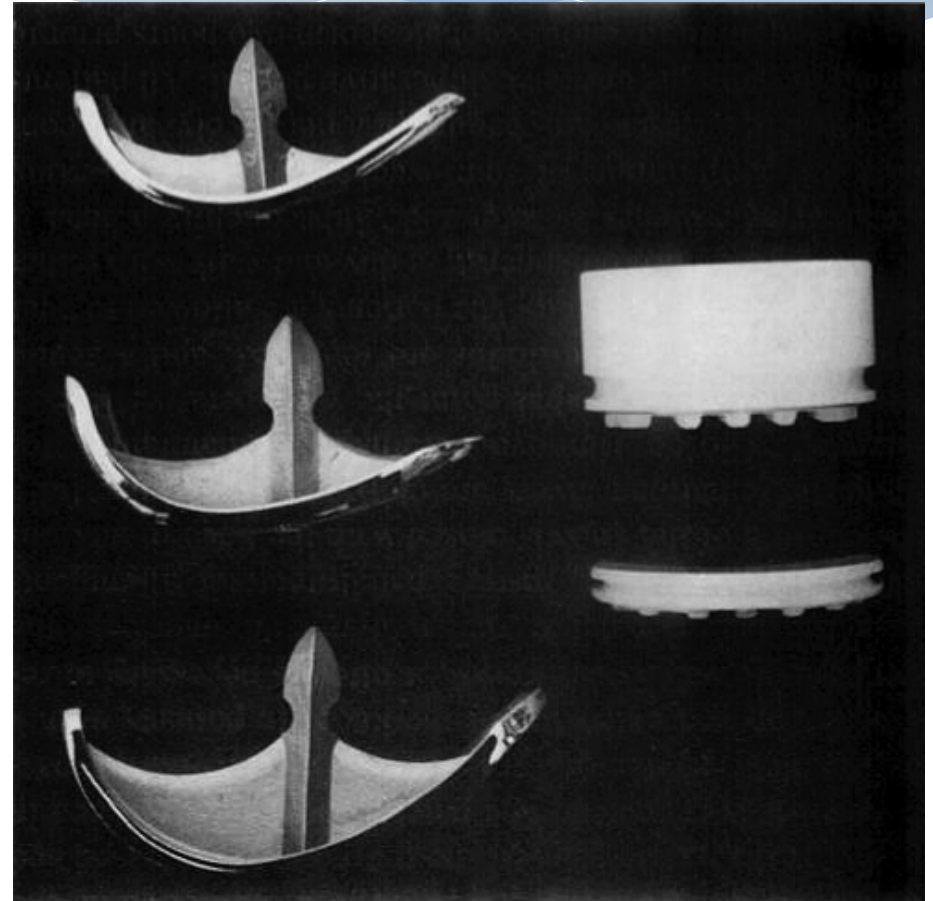
## -All poly V Metal Backed

- \* Let's not fight about who wins
- \* Balanced appraisal
- \* Inform the facts
- \* Answer questions from literature



# History of UKR

- \* UKR performed in 1970's
  - \* Best 10 year survivorship 80% - Marmour
  - \* Most 60-70% at 5 years
  - \* Insall- 1987-IB Knee-90% at 10 years
  - \* Fell into disrepute
  - \* Training 1982-1986
- Not one Uni



# History of UKR

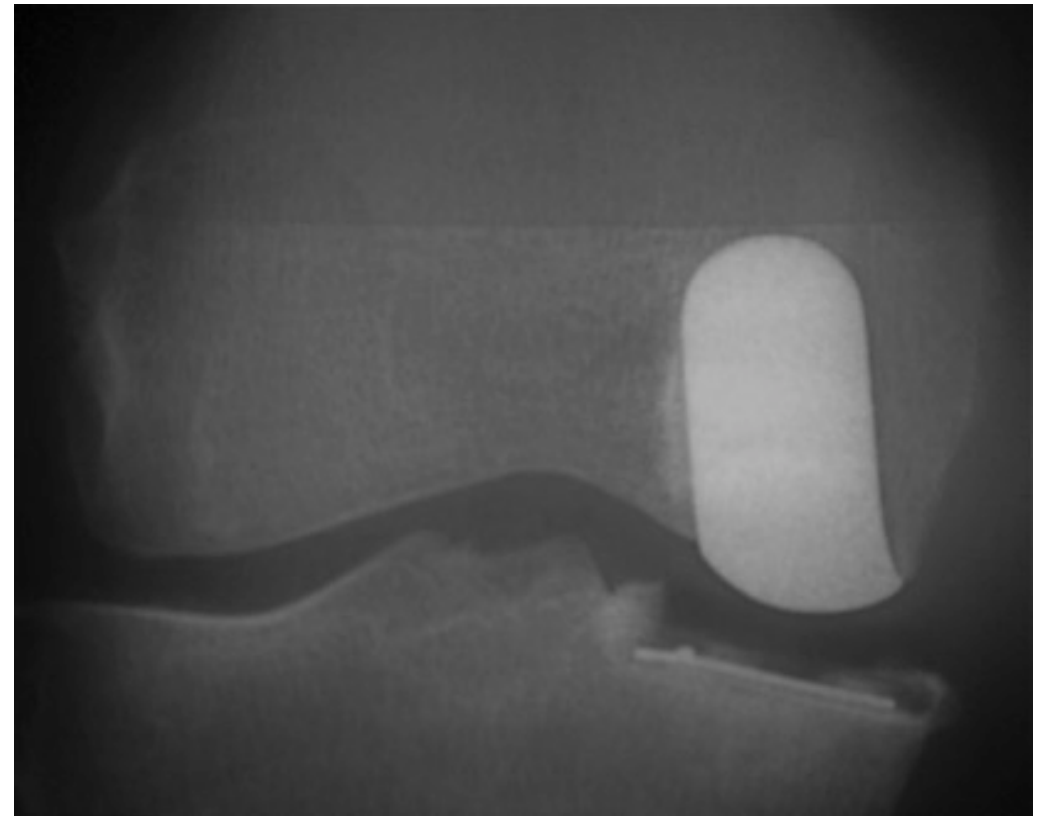
- \* Murray et al Oxford
- \* JBJS 1998 projected 10 year survivorship 97%
- \* Repicci-Buffalo NY- minimally invasive UKR
- \* Renewed interest in UKR
- \* From 2000 marked increase





# History of UKR

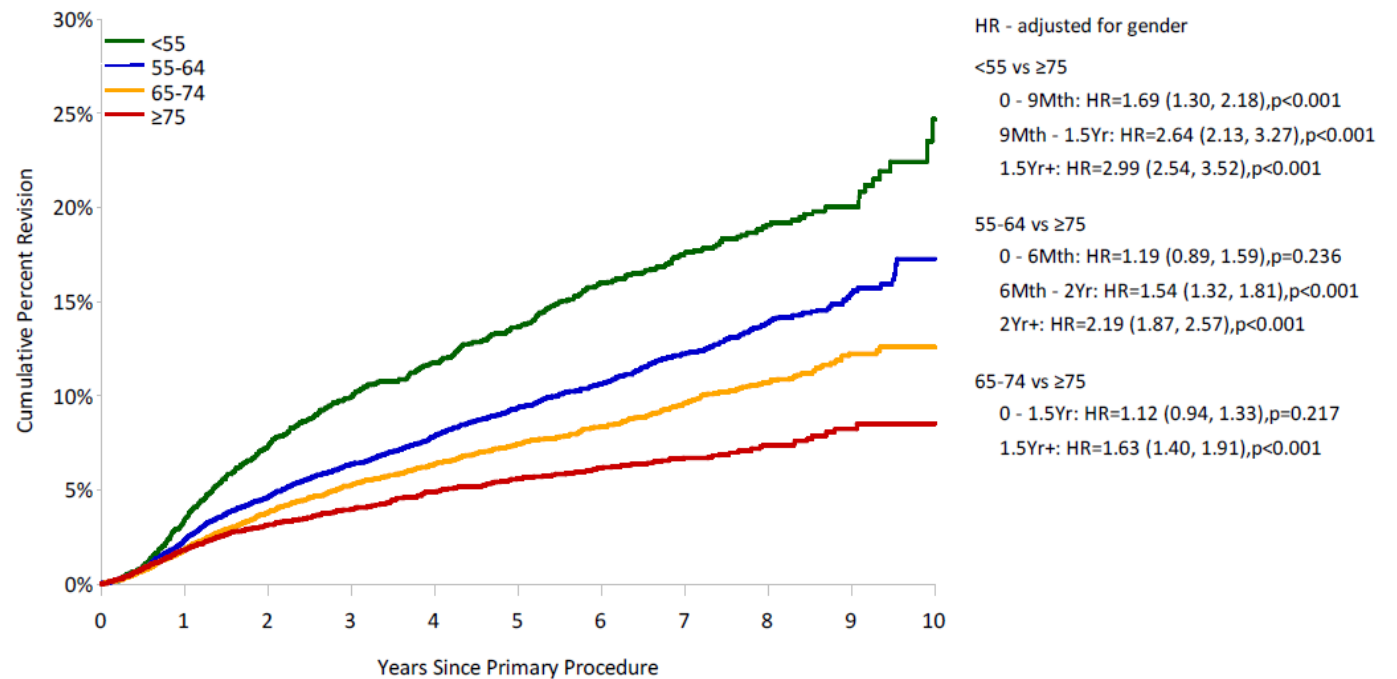
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# History of UKR

Figure KP12: Cumulative Percent Revision of Primary Unicompartmental Knee Replacement by Age (Primary Diagnosis OA)

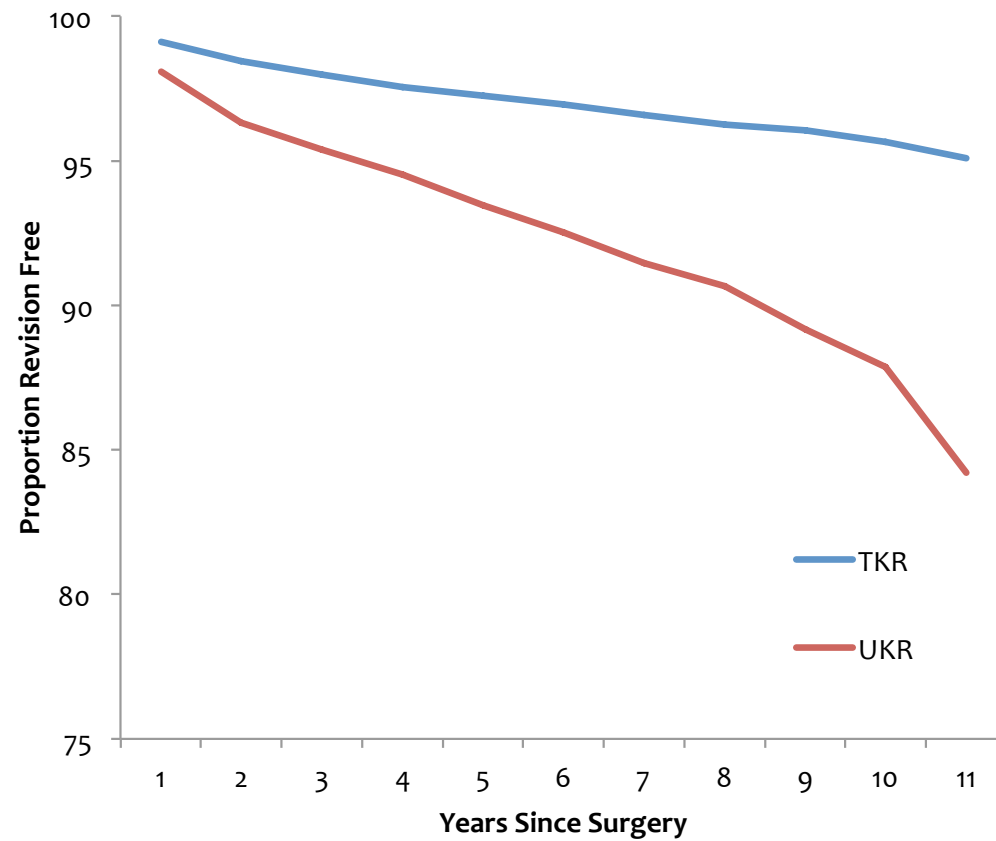
## \* Registries



# History of UKR

\* Registries

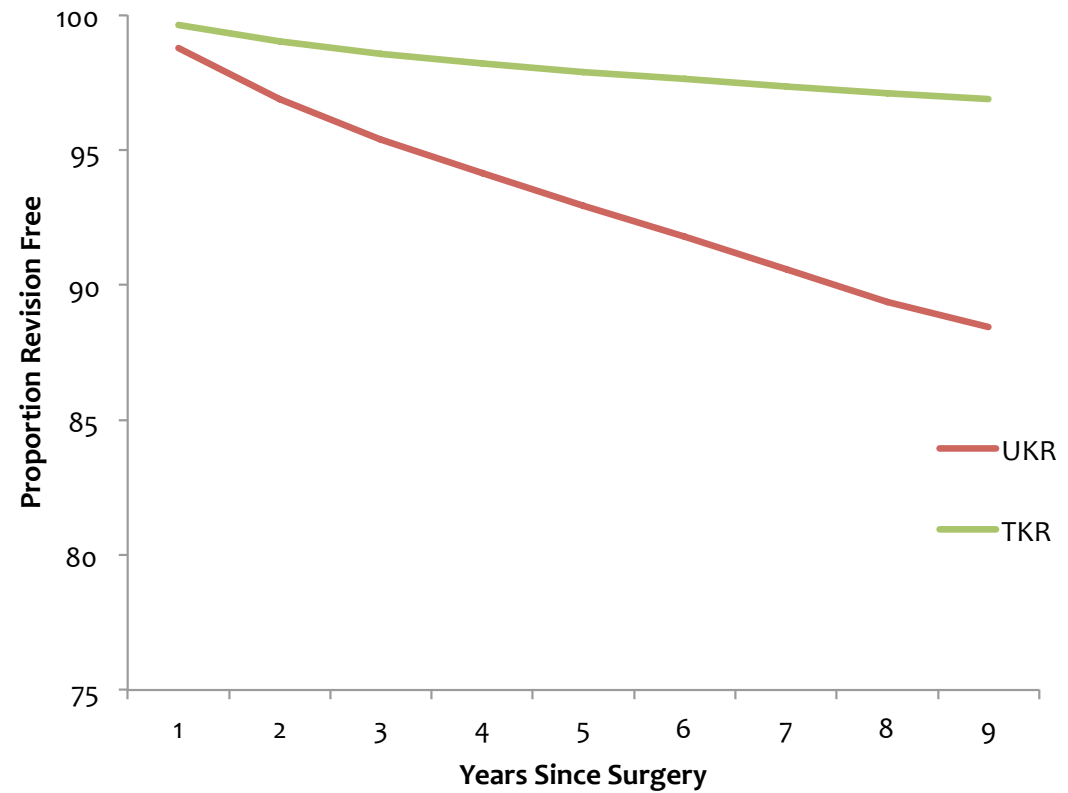
2013 NZ Joint Registry



# History of UKR

\* Registries

2013 UK Joint Registry



# History of UKR

- \* Enthusiasm for UKR reduced
- \* Especially in countries with registries
  
- \* There are advantages
  - Smaller incision
  - Quicker recovery
  - Less post-op pain
  - Increased flexion
  - Replacing what's worn
  - Higher PROMS



Patients come and ask for a Uni

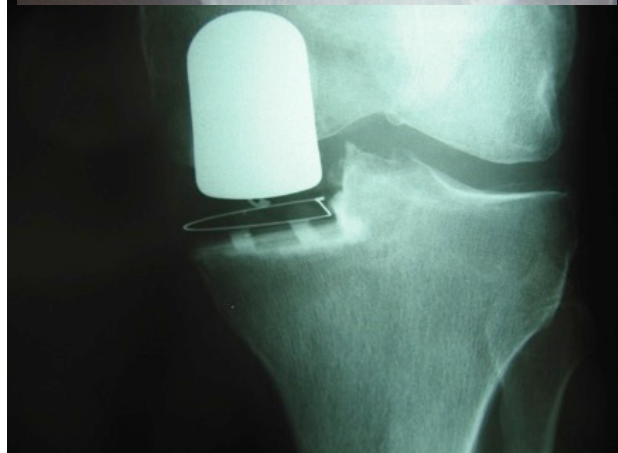
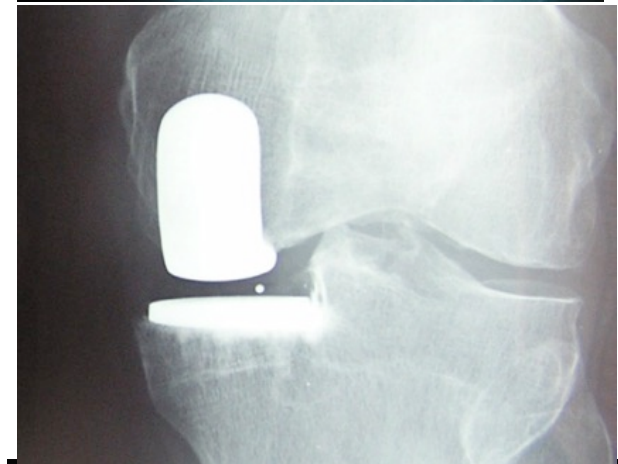
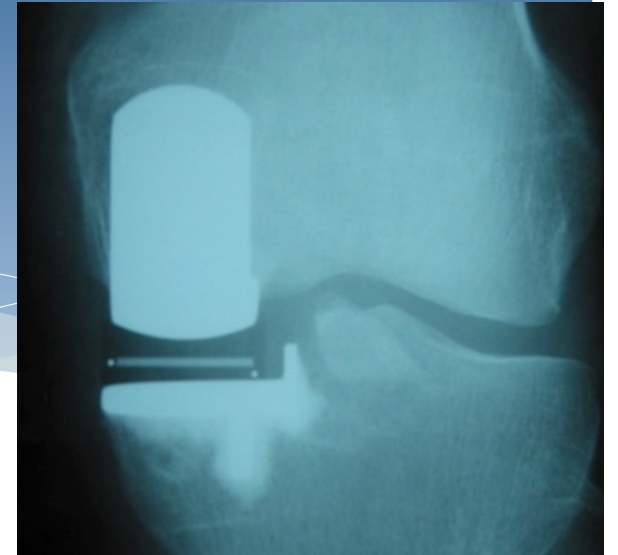
# Tibial Designs

- \* Mobile-bearing Design

- \* Fixed-bearing Design

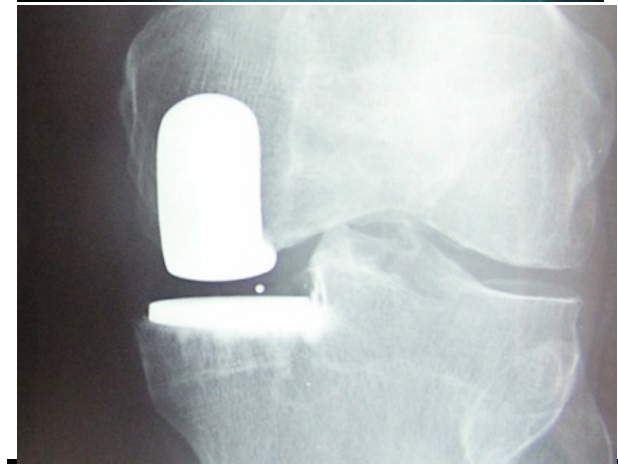
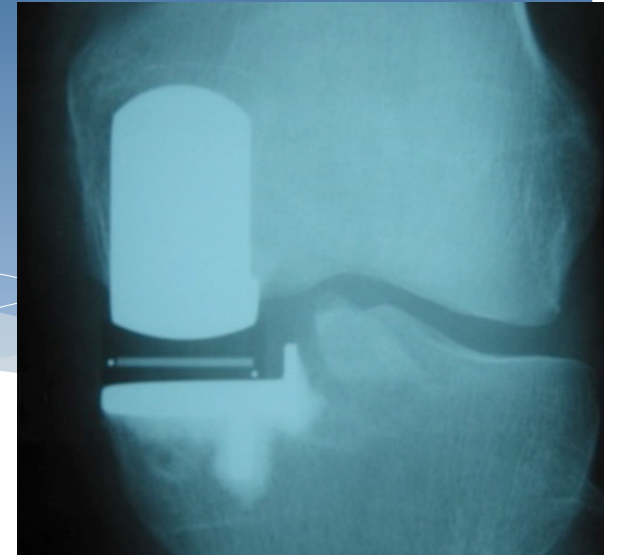
  - Metal-backed

  - All polyethylene



# UKR Questions

- \* Which design gives best function
- \* Which design lasts longest
- \* Which is easiest to convert to TKR



# Mobile-bearing Design

## Oxford- Phase 3

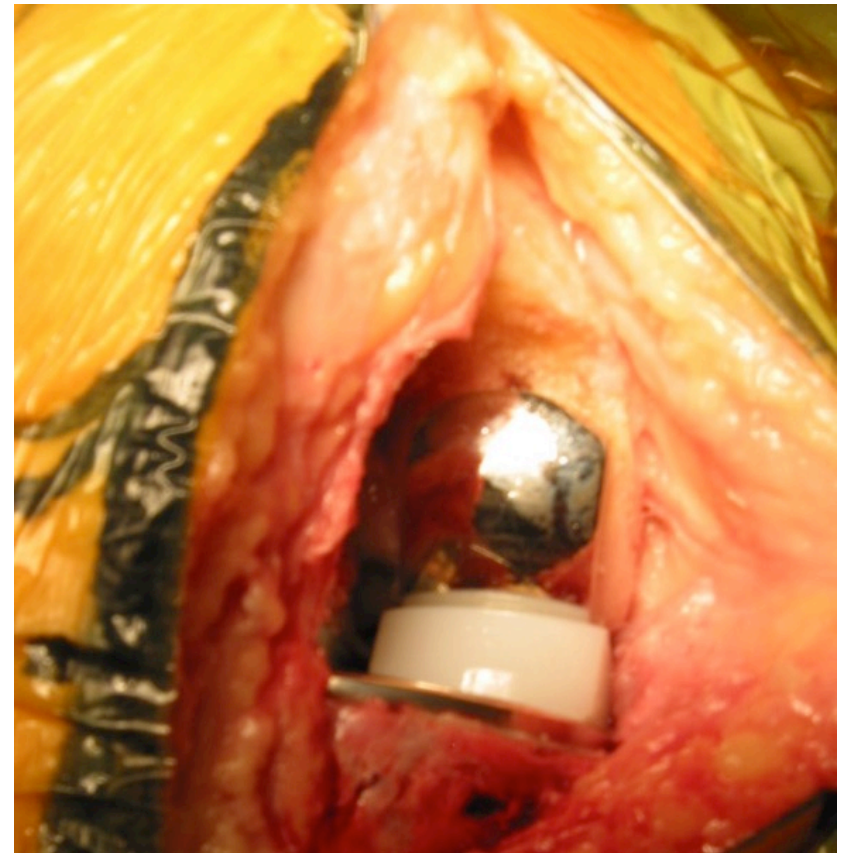
- \* Spherical femoral component
- \* Superior conformity
- \* Improved tibiofemoral biomechanics
- \* Natural joint motion
- \* Lower polyethylene wear





# Mobile-bearing Design

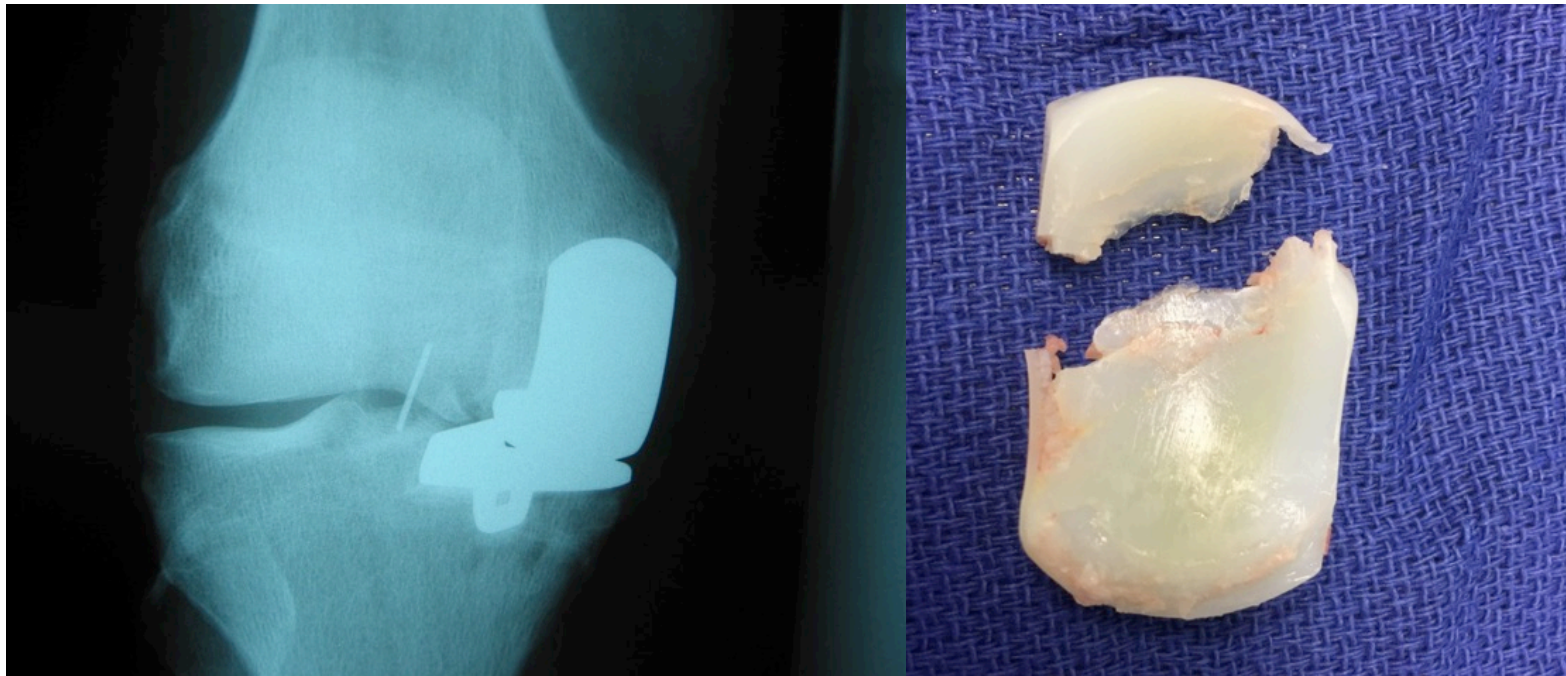
- \* Meniscal bearing
- \* New bearing designed to reduce anterior impingement
- \* Flat polished Cobalt Chrome tibial tray
- \* Movement of bearing dictated by intact ligaments
- \* Goodfellow & O'Connor- Oxford



# Mobile-bearing Design

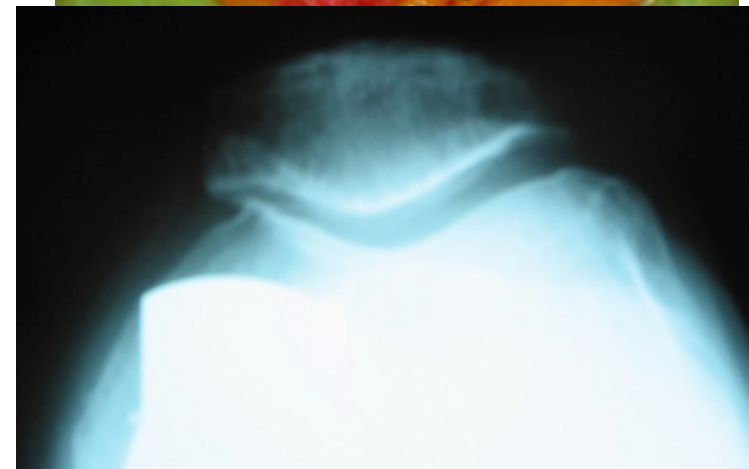
## Concerns

- \* Bearing dislocation
- \* Bearing breakage



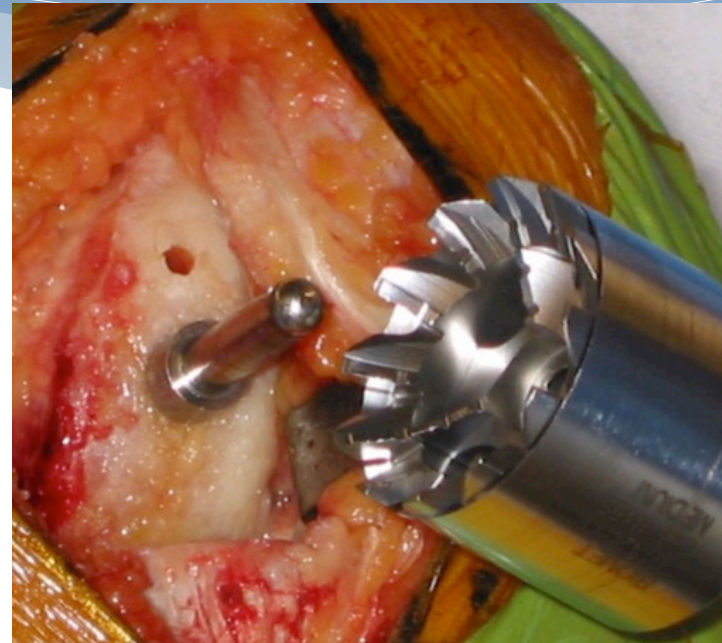
# Mobile Bearing Design

- \* Medial trochlea-condyle junction ridge
- \* Medial patellar wear
- \* Difficulty with balance
- \* Tendency to excessive valgus



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# Fixed-bearing-Metal Base Plate

- \* More even distribution of stress
- \* Modular
- \* Drawback: Thinner polyethylene liner or a larger tibial cut is needed



# Fixed-bearing Design-All poly

- \* All polyethylene tibial component.
- \* Substantial reduction in costs.
- \* Relatively smaller tibial cut is needed.
- \* Comparable clinical outcomes and survivorship rates to metal-backed modular components in TKA.



# Fixed Vs Mobile results

- \* Parratte et al-2011
- \* 79 fixed bearing
- \* 77 mobile bearing
- \* Mean follow up 17.2 years
- \* Lucencies 69% MB  
24% FB
- \* Revisions 15% MB  
12% FB



# Fixed Vs Mobile results

- \* Fixed bearing implants- survivorship at 10-13 years has consistently been reported as 91-96%. (Berger 2005, Gioe 2003, Naudie 2004, Swienckowski 2004)
- \* Survivorship in mobile bearing implants more variable- reported at 85-98% at 10 year follow up. (Emerson 2002, Murray 1998)
- \* Outside Oxford only Svard has reproduced results



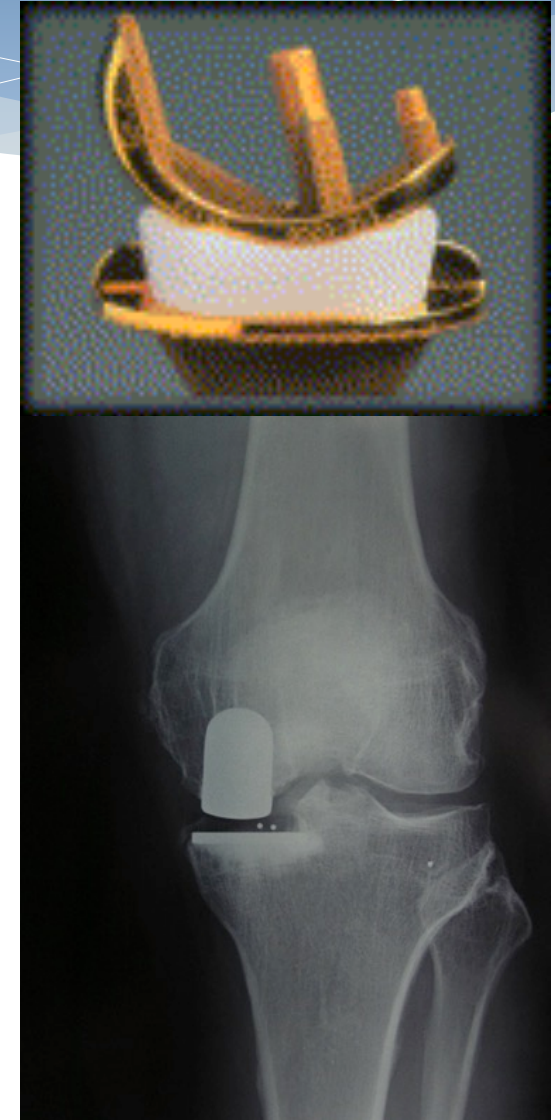
# Fixed Vs Mobile results

- \* Price *et al* (2005) - Oxford meniscal-bearing implant found no degradation in outcome with thinner poly 93% survival at 15 years in 439 knees.
- \* Observed that congruency and resulting decrease in contact stress may obviate need for thicker (> 6mm) inserts
- \* Supports surgical principle of minimizing tibial bone cut thickness.

# Fixed Vs Mobile results

Confalonieri *et al* 2004:

- \* Prospective RCT
- \* AMC mobile bearing (Alphanorm)
- \* Allegretto fixed-bearing (Centerpulse)
- \* No statistical difference at 5.7 years



# Fixed Vs Mobile results

- \* Smith *et al* (2009) in their meta-analysis showed *no* significant difference in clinical, radiological and kinematic outcomes between medial and lateral mobile and fixed bearing UKAs.
- \* Huang-2002-MB produces smaller more biological active wear particles  
Greater osteolysis and a more complex revision  
Higher use of augments

# Fixed Vs Mobile results

- \* Gleeson *et al* (2004) observed, in the short-term, the (Oxford) mobile bearing prosthesis had a higher re-operation rate and that the St. Georg Sled (fixed bearing)
- \* St Georg sled achieved better pain relief.
- \* The functional scores of the two groups were similar.

# Fixed V Mobile-AOANJRR

## Registry Analysis - 15 year revision rates

- \* Oxford Cemented      22.4
- \* Preservation      22.8

Three tibial options available fixed bearing all-poly, and metal-backed and mobile bearing.

- \* Miller Galante      15.5
- \* Allegretto      21.4

# Metal Vs Poly-Good

- \* Lustig *et al* (2008) using Uni-HLS Evolution® showed excellent long-term results. However, strict selection criteria was followed.
- \* Ensini *et at* (2012) in a 2-year follow-up, presented a RSA study demonstrating a successful implant-to-bone fixation in conforming all-polyethylene cemented tibial component in UKA. This was found in addition to excellent clinical outcomes.

# Metal Vs Poly-Good

- \* Plate *et al* (2015) Inlay technique with Robot-assisted UKA improve component positioning and showed favourable outcomes of all-polyethylene UKAs, but only short to mid-term.
- \* Hyldahl *et al* (2001) No difference in clinical results or migration at short term

# Metal Vs Poly-Bad

- \* Aleto *et al* (2008) noticed that older age, all-polyethylene components, and tibial component slope were associated with medial tibial collapse leading to failure in UKAs
- \* . Koh *et al* (2017) observed that, all-poly tibial components confer a significantly higher risk of early failure relative to metal backed modular component UKAs. This they thought is may be related to increased localized tibial strain, which results in tibial loading distribution failure following all-poly tibial component UKA.



# Summary

- \* No randomised trials confirm superiority of MB
- \* Several show higher radiolucencies and higher revision or reoperation rates in MB
- \* Bearing breakage and dislocation seen only in MB
- \* Registries show lower revision rates with FB
- \* MB revisions to TKR require more augments
- \* All poly tibial components have been shown to be associated with increased subsidence

# Thank You

