# MIS ed EBM:
# sigle a confronto.

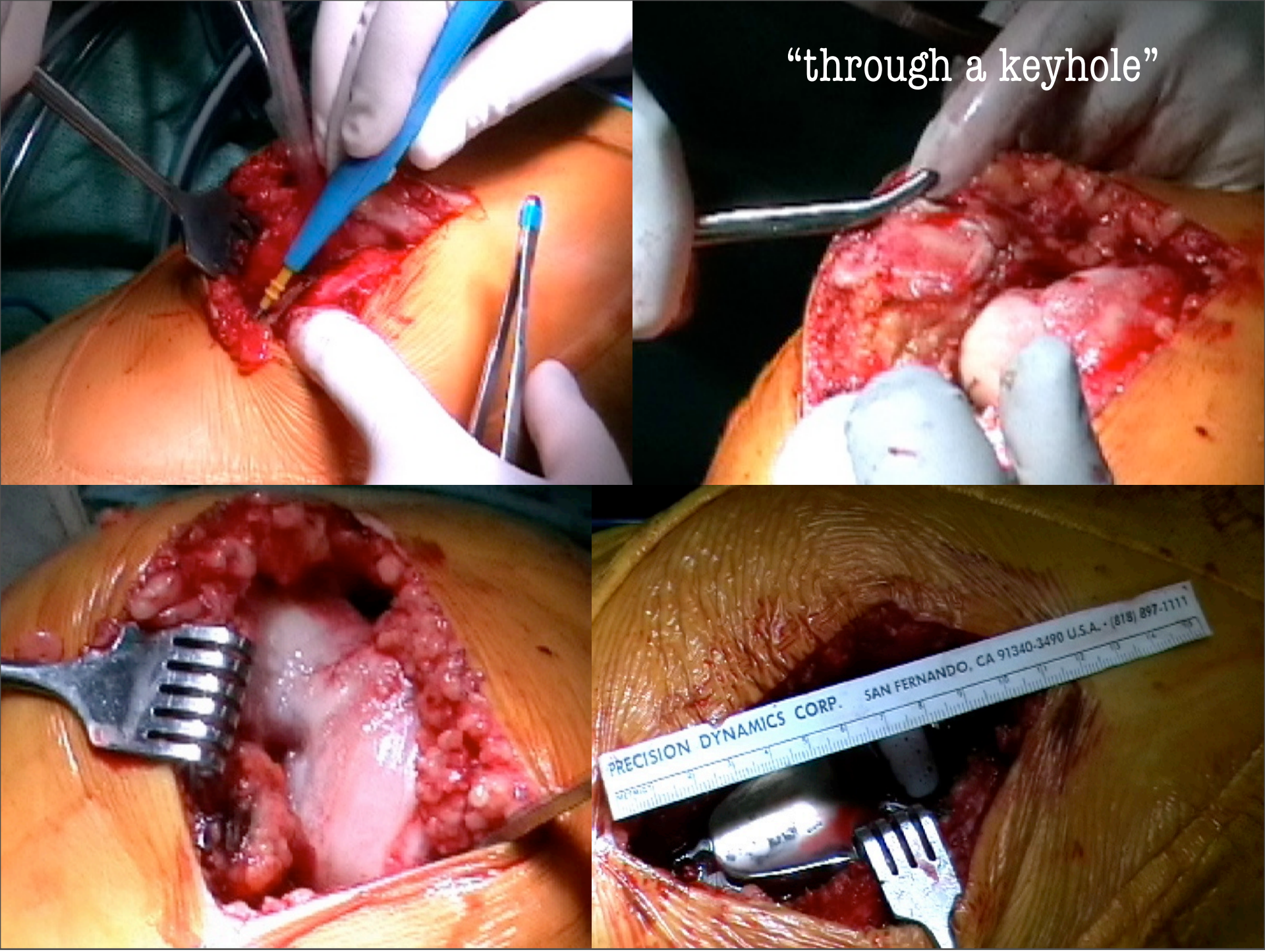
F.Boniforti, F.Giangrasso

*Fondazione San Raffaele Giglio*

*Cefalù*

**Minimally Invasive Surgery**
is a recent surgical innovation
that has generated great interest among
both patients and surgeons.

To reduce skin incision is a Key surgical features


“through a keyhole”
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In addition to alternative anatomical approaches,
**modified implant designs**
are often necessary to facilitate the implantation
of the prosthesis through limited incisions.

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## Symposium

# Minimally Invasive Total Hip Arthroplasty

## Development, Early Results, and a Critical Analysis*

By Daniel J. Berry, MD (Moderator), Richard A. Berger, MD, John J. Callaghan, MD, Lawrence D. Dorr, MD, Paul J. Duwelius, MD, Mark A. Hartzband, MD, Jay R. Lieberman, MD, and Dana C. Mears, MD

# Slower Recovery After Two-Incision Than Mini-Posterior-Incision Total Hip Arthroplasty

## A Randomized Clinical Trial

By Mark W. Pagnano, MD, Robert T. Trousdale, MD, R. Michael Meneghini, MD, and Arlen D. Hanssen, MD

*Investigation performed at Mayo Clinic, Rochester, Minnesota*

**Background:** It has been claimed that the two-incision total hip arthroplasty technique provides quicker recovery than other methods do. To date, however, there have been no studies that have directly compared the two-incision technique with another method in similar groups of patients managed with the same advanced anesthetic and rehabilitation protocol. We posed the hypothesis that patients managed with two-incision total hip arthroplasty would recover faster than those managed with mini-posterior-incision total hip arthroplasty and designed a randomized controlled trial specifically (1) to determine if patients recovered faster after two-incision total hip arthroplasty than after mini-posterior-incision total hip arthroplasty as measured on the basis of the attainment of functional milestones that reflect activities of daily living, (2) to determine if the general health outcome after two-incision total hip arthroplasty was better than that after mini-posterior-incision total hip arthroplasty as measured with Short Form-12 (SF-12) scores, and (3) to evaluate the surgical complexity of the two procedures on the basis of the operative time and the prevalence of early complications.

# CATASTROPHIC COMPLICATIONS OF MINIMALLY INVASIVE HIP SURGERY

## A SERIES OF THREE CASES

BY THOMAS K. FEHRING, MD, AND J. BOHANNON MASON, MD

*Investigation performed at the Charlotte Hip and Knee Center, Charlotte, North Carolina*

# Minimally Invasive Total Knee Arthroplasty Compared with Traditional Total Knee Arthroplasty

## Assessment of the Learning Curve and the Postoperative Recuperative Period

By Jason King, MD, MPH, Daniel L. Stamper, PA-C, Douglas C. Schaad, PhD, and Seth S. Leopold, MD

*Investigation performed at the Departments of Orthopaedics and Sports Medicine and Medical Education and Biomedical Informatics, University of Washington Medical Center, Seattle, Washington*

**Background:** There is disagreement about whether so-called minimally invasive approaches result in faster recovery following total knee arthroplasty. It is also unknown whether patients are exposed to excess risk during the surgeon's learning curve. We hypothesized that a minimally invasive quadriceps-sparing approach to total knee arthroplasty would allow earlier clinical recovery but would require longer operative times and compromise component alignment during the learning period compared with a traditional medial parapatellar approach.

**Methods:** The first 100 minimally invasive total knee arthroplasties done by a single high-volume arthroplasty surgeon were compared with his previous fifty procedures performed through a medial parapatellar approach, with respect to operative times, implant alignment, and clinical outcomes. Radiographic end points and operative times for the minimally invasive group were evaluated against increasing surgical experience, in order to characterize the learning curve.

**Results:** Overall, the minimally invasive approach took significantly longer to perform, on the average, than a medial parapatellar approach (86.3 and 78.9 minutes, respectively; $p = 0.01$); this was the result of especially long operative times in the first twenty-five patients in the minimally invasive group (mean, 102.5 minutes). After the first twenty-five minimally invasive operations, no significant difference in the operative times was detected between the groups. The first twenty-five minimally invasive procedures had significantly less patellar resection accuracy ($p < 0.001$) and significantly more patellar tilt than the last twenty-five ($p = 0.006$). Other end points for implant alignment, including the frequency of radiographic outliers, were not different between the minimally invasive and traditional groups. The patients who had the minimally invasive approach demonstrated significantly better clinical outcomes with respect to the length of hospital stay ($p < 0.0001$), need for inpatient rehabilitation after discharge ($p < 0.001$), narcotic usage at two and six weeks postoperatively ($p = 0.001$ and $p = 0.01$, respectively), and the need for assistive devices to walk at two weeks postoperatively ($p = 0.025$).

**Conclusions:** A quadriceps-sparing minimally invasive approach seems to facilitate recovery, but a substantial learning curve (fifty procedures in the hands of a high-volume arthroplasty surgeon) may be required. If this experience is typical, the learning curve may be unacceptably long for a low-volume arthroplasty surgeon.

**Level of Evidence:** Therapeutic Level III. See Instructions to Authors for a complete description of levels of evidence.

# Evidence Based Medicine

What type of research will best improve clinical practice?

- A Carr JBJS br 2005

Level of evidence

I° livello:  studio prospettico ad alta randomizzazione test/controllo.

II° livello: comparativo prospettico a minor qualità di randomizzazione test/controllo.

III° livello: comparativo retrospettivo test/controllo.

IV° livello:  descrizione di casi clinici.

V° livello: opinione di un esperto.

# Evidence Based Medicine

Survival curve at follow-up

**The Swedish Knee Arthroplasty Register**

Dept. of Orthopedics, Lund University Hospital

## Swedish Knee Arthroplasty Register

The Swedish Arthroplasty Register is celebrating 32 years of auditing knee replacement, and compares over 58,000 TKR procedures in the latest report (2007). It is the only register that is captures data fully nationwide, has a very high compliance, and has such a long history. It also lists the comparative clinical success of most popular knee implants in Sweden. The register is exhaustive, covering every surgeon in every hospital regularly performing knee arthroplasty. The 2007 report continues to demonstrate both the superior clinical performance of NexGen and ongoing success from previous reports.

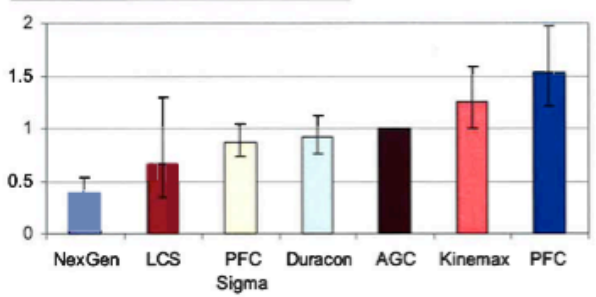
**The main results are**

- **NexGen is the best performing knee on the register** (it has the lowest Relative Risk Ratio – the measure of risk of revision, 0.40, 95% confidence interval of 0.30-0.54)
- **NexGen has a statistically significant lower revision rate than**
  - **AGC, PFC, PFC Sigma, Duracon, Kinemax, Scan, AMK, Axiom.**
- **A user of AGC, PFC, PFC Sigma, Duracon, or Kinemax can expect a revision rate ranging from over double, rising to as much four times the Revsion rate of NexGen.**
- The only other knee that demonstrated superior results than the reference standard is also a Zimmer product.
- The PFC and AMK both had survivourship significantly worse than the reference standard.

Relative survivourship for TKR implants when used for the majority indication (Osteoarthritis). Only the popular implants are listed, the remaining implants appear under the heading "other".

| OA / TKA | n | p-value | RR | 95% CI |
|---|---|---|---|---|
| AGC | 14,307 | | ref. | |
| PFC-Sigma | 13,528 | 0,12 | 0,87 | 0,74-1,04 |
| NexGen | 6,354 | <0,01 | 0,40 | 0,30-0,54 |
| Duracon | 6,280 | 0,41 | 0,92 | 0,76-1,12 |
| F/S Mill | 6,163 | <0,01 | 0,65 | 0,53-0,81 |
| Kinemax | 2,195 | 0,05 | 1,26 | 1,00-1,59 |
| Scan | 1,467 | 0,20 | 1,19 | 0,91-1,57 |
| PFC | 1,415 | <0,01 | 1,54 | 1,21-1,97 |
| AMK | 529 | 0,02 | 1,55 | 1,08-2,23 |
| Profix | 517 | 0,22 | 0,64 | 0,32-1,30 |
| MillerGalante II | 499 | 0,28 | 1,26 | 0,83-1,91 |
| LCS | 391 | 0,24 | 0,67 | 0,35-1,30 |
| Natural II | 251 | 0,61 | 1,29 | 0,48-3,47 |
| Other | 665 | 0,27 | 1,26 | 0,84-1,91 |
| Gender (male is ref.) | . | 0,33 | 0,95 | 0,84-1,06 |
| Age (per year) | . | <0,01 | 0,96 | 0,95-0,97 |
| Year of op. (per year) | . | 0,95 | 1,00 | 0,97-1,03 |

Comparative revision rates



# Early Recovery After Total Knee Arthroplasty Performed with and without Patellar Eversion and Tibial Translation

## A Prospective Randomized Study

By David F. Dalury, MD, Brian D. Mulliken, MD, Mary Jo Adams, RN, BSN, Christina Lewis, MPT, Rebecca R. Sauder, DPT, and Jennifer A. Bushey, MPT, OCS

*Investigation performed at the Department of Orthopaedic Surgery, St. Joseph Medical Center, and Orthopaedic Associates, Towson, Maryland*

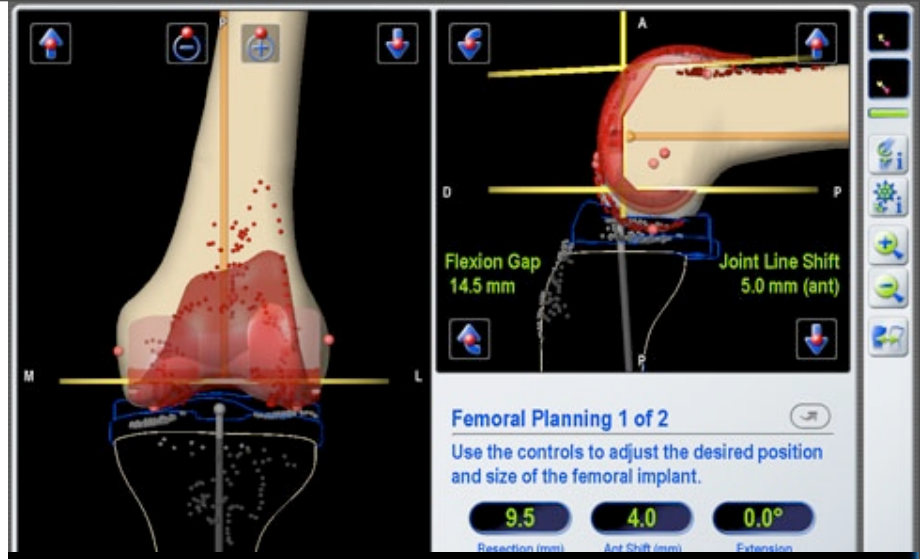
**TABLE II Quadriceps Strength**

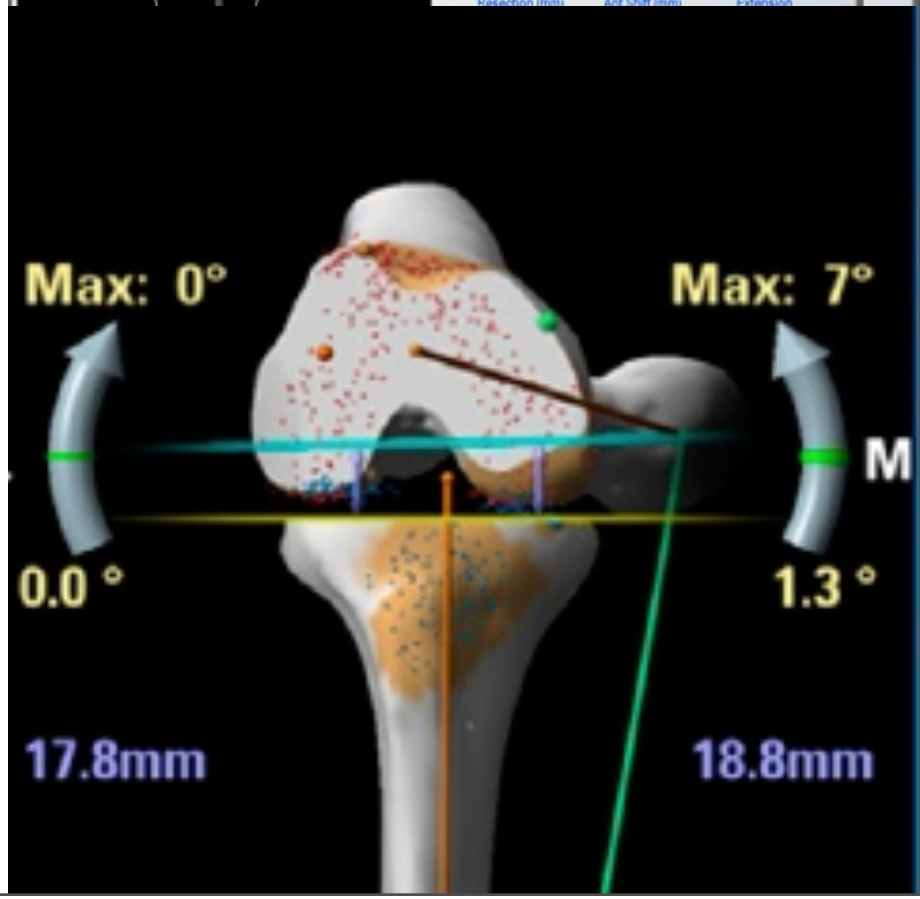
| | Preop. (kg) | | 6 Wk (kg) | | 12 Wk (kg) | | 6 Mo (kg) | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Eversion | Subluxation | Eversion | Subluxation | Eversion | Subluxation | Eversion | Subluxation |
| Mean | 10.48 | 10.34 | 8.53 | 9.40 | 12.02 | 11.25 | 13.65 | 12.56 |
| Stand. dev. | 7.67 | 7.62 | 5.35 | 5.13 | 7.21 | 7.48 | 7.98 | 7.35 |
| Minimum | 0.76 | 0.00 | 0.60 | 1.13 | 1.89 | 0.76 | 4.35 | 2.83 |
| Maximum | 34.02 | 29.48 | 21.17 | 26.08 | 30.05 | 36.29 | 31.37 | 30.99 |
| P value | 0.87 | | 0.24 | | 0.26 | | 0.18 | |

**TABLE IV Rates of Patient Knee Preference Based on Pain, Motion, and Strength**

| | Pain (%) | | | Motion (%) | | | Strength (%) | | |
|---|---|---|---|---|---|---|---|---|---|
| Preferred Knee | 6 Wk | 12 Wk | 6 Mo | 6 Wk | 12 Wk | 6 Mo | 6 Wk | 12 Wk | 6 Mo |
| Eversion | 35 | 36 | 49 | 43 | 39 | 41 | 43 | 33 | 24 |
| No preference | 24 | 27 | 27 | 22 | 32 | 30 | 35 | 43 | 54 |
| Subluxation | 41 | 36 | 24 | 35 | 29 | 30 | 22 | 24 | 22 |

the reliability of navigation to optimize gap kinematics is **unclear**.



The Royal College of Surgeons of England

*Ann R Coll Surg Engl* 2003; **85**: 40–43

Original article

# Surgical time and motion: the intermediate equivalent revisited

PSP Senapati[1], JD Barry[1], P Edwards[1], I Hodzovic[2], K Shute[1], WG Lewis[1]

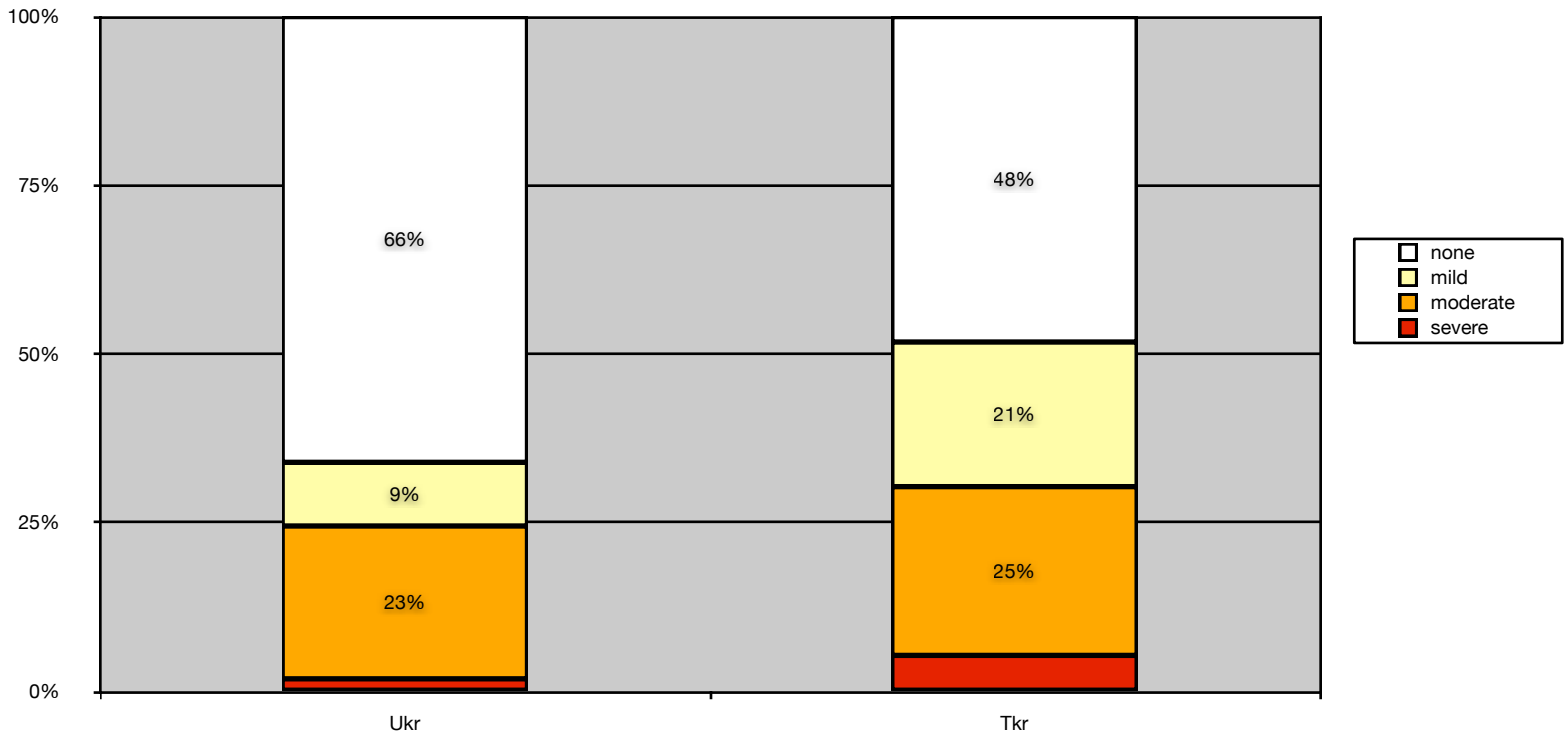
*Departments of [1]Surgery and [2]Anaesthetics, Royal Gwent Hospital, Newport, UK*

**The relationship between operative time, the intermediate equivalent value (IEV) and the complexity of common general surgical operations was examined. Correlation was found between**

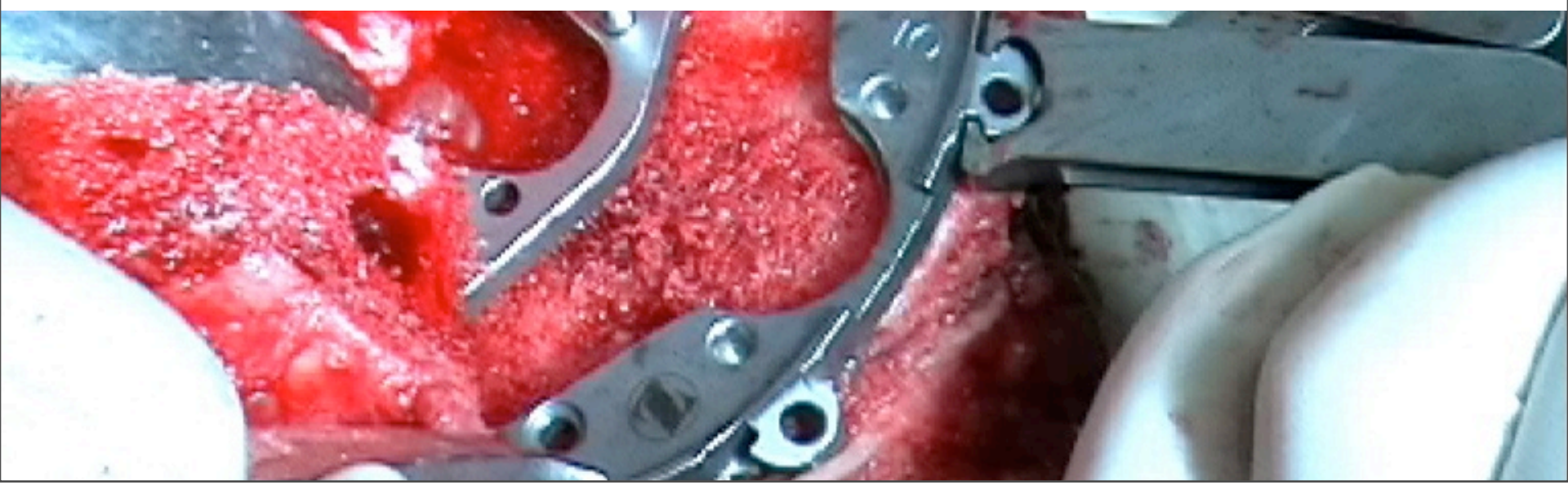
# Patient Satisfaction and Pain in UNI vs TOTAL knee arthroplasty

*F Boniforti et al.*

satisfaction 12 mts FU



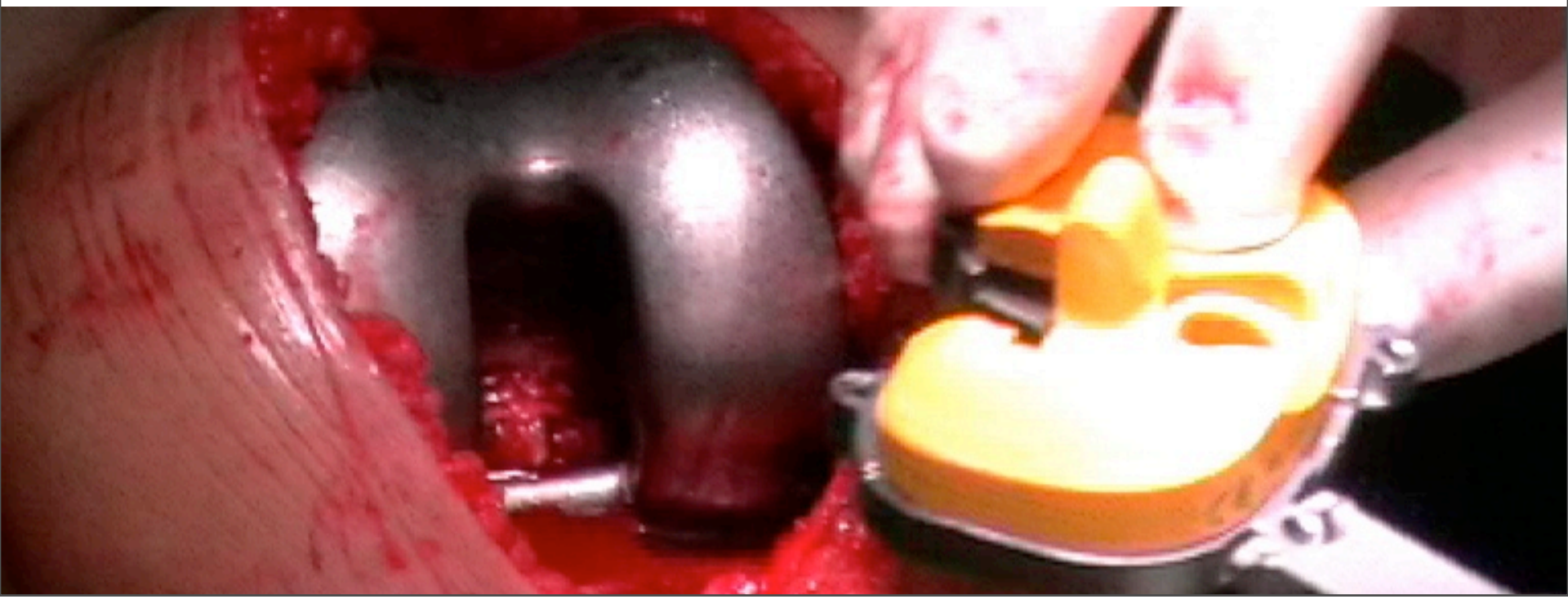
Our desire **to improve** the outcome after surgery is what drives us to develop innovative surgical techniques



MIS and EBM give rise to several important **ethical** questions.

Can we satisfy the principles of beneficence, nonmaleficence, autonomy, and justice by introducing this procedure on a widespread basis?

For a surgical technique to be applied on a regular basis, it must offer outcome measures that are at least **as good as** those offered by conventional techniques



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# Grazie