

TKR: Fixed is better

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Mr V., engineer 1940

- 10 years post-TKR on the right knee
- Former 110 hurdle Tchehia record



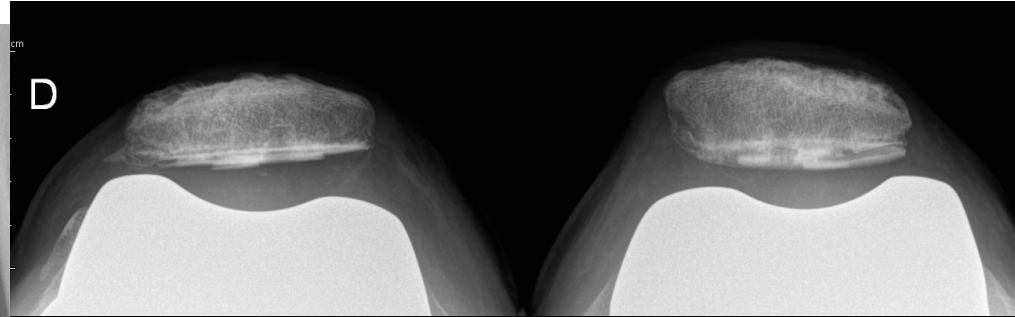


Mr V., 1940

- “Doc, I’m very happy with my prosthesis and I want the same one on the other side...”

“...however, I have to tell you that I couldn’t feel the same freedom in motion and those typical clicks one year after the operation, do you think my plateau is still mobile?”

Mr V., 1940



And the patient
is happy so far!



Pro- / contra- FB

- Durable long term fixation
- Survival rate over 90% at 10 to 17 years FU

Schai et al *JBJS* 1998

Khaw et al *J Arthroplasty* 2001

Rhaskina et al *JBJS* 2006

Rodricks et al *JBJS* 2007

- Polyethylene wears
- Fixation failure in young active patients



Theoretical advantages MB

- Improved stress distribution between tibial and femoral components
 - Reducing loosening forces
 - Minimizing polyethylene wears
- Better reproduction of the tibial internal rotation during flexion (minimizing tibial component mal-rotation)
- Improved patellofemoral tracking



Disadvantages MB

- Spin out / dislocation of the polyethylene insert
- More revision for implant-related failure
- Arthrofibrosis
- Increase wear at the interface insert/
component
- Cost

Woolson et al *J Arthroplasty* 2004

Literature

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No difference

Clin Orthop Relat Res (2012) 470:33–44
DOI 10.1007/s11999-011-2114-5

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SYMPOSIUM: PAPERS PRESENTED AT THE ANNUAL MEETINGS OF THE KNEE SOCIETY

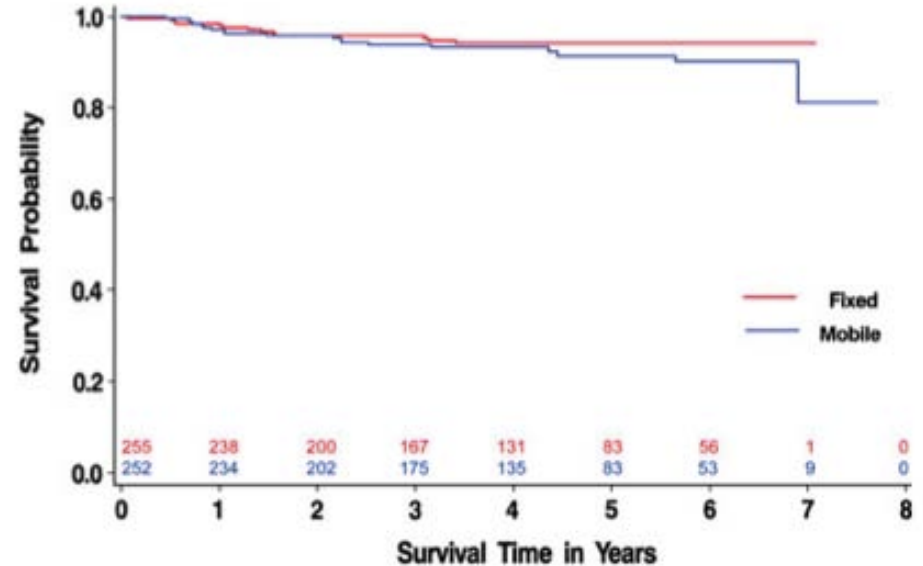
The John Insall Award

No Functional Advantage of a Mobile Bearing Posterior Stabilized TKA

**Ormonde M. Mahoney MD, Tracy L. Kinsey MSPH,
Theresa J. D'Errico MSHS, Jianhua Shen MS**

No difference

- 252 FB
- 254 MB
- Womac index , SF-12, ROM,
- Knee Society scores
- FU: 6 years
- 19 failure in MB vs 12 FB groups



Conclusion We found no evidence of functional advantage of the MB design. Survivorship was similar, although the study is limited by short duration of followup.



FB vs MB

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Mobile Bearings Do Not Improve Fixation in Cemented Total Knee Arthroplasty

Anders Henricson, MD; Tore Dalén, MD, PhD†; and Kjell G. Nilsson, MD, PhD†*



FB vs MB

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Mobile and Fixed-Bearing (All-Polyethylene Tibial Component) Total Knee Arthroplasty Designs

A Prospective Randomized Trial

By Terence J. Goe, MD, Jason Glynn, MD, Jonathan Sembrano, MD, Kathleen Suthers, MS,
Edward R.G. Santos, MD, and Jasvinder Singh, MD, MPH

Investigation performed at Department of Veterans Affairs Medical Center, Minneapolis, Minnesota

Conclusions: We found no advantage of the mobile-bearing arthroplasty over the fixed-bearing arthroplasty with regard to the clinical results at mid-term follow-up. The risk of bearing subluxation and dislocation in knees with the mobile-bearing prosthesis is a cause for concern and may necessitate early revision.



FB vs MB



Simultaneous mobile- and fixed-bearing total knee replacement in the same patients

A PROSPECTIVE COMPARISON OF MID-TERM OUTCOMES USING A SIMILAR DESIGN OF PROSTHESIS

Y.-H. Kim,
D.-Y. Kim,
J.-S. Kim

*From The Joint
Replacement Center
of Korea, Ewha
Womans University
College of Medicine,
Seoul, Korea*

We conducted a randomised prospective study to evaluate the clinical and radiological results of a mobile- and fixed-bearing total knee replacement of similar design in 174 patients who had bilateral simultaneous knee replacement. The mean follow-up was for 5.6 years (5.2 to 6.1).

The total knee score, pain score, functional score and range of movement were not statistically different ($p > 0.05$) between the two groups. Osteolysis was not seen in any knee in either group. Two knees (1%) in the mobile-bearing group required revision because of infection; none in the fixed-bearing group needed revision. Excellent results can be achieved with both mobile- and fixed-bearing prostheses of similar design at mid-term follow-up. **We could demonstrate no significant clinical advantage for a mobile bearing.**

FB vs MB



Patient-reported outcomes after fixed- *versus* mobile-bearing total knee replacement

A MULTI-CENTRE RANDOMISED CONTROLLED TRIAL USING THE KINEMAX TOTAL KNEE REPLACEMENT

V. Wylde,
I. Learmonth,
A. Potter,
K. Bettinson,
E. Lingard

*From Bristol Implant
Research Centre,
University of Bristol,
Bristol, United
Kingdom*

We compared patient-reported outcomes of the Kinemax fixed- and mobile-bearing total knee replacement in a multi-centre randomised controlled trial. Patients were randomised to the fixed- or the mobile-bearing prosthesis via a sealed envelope method after the bone cuts had been made in the operating theatre. Randomisation was stratified by centre and diagnosis. Patients were assessed pre-operatively and at eight to 12 weeks, one year and two years post-operatively. Validated questionnaires were used which included the Western Ontario MacMasters University, Short-Form 12, Mental Health Index-5, Knee Injury and Osteoarthritis Outcome Score for Knee-Related Quality of Life and Function in Sport and Recreation scales and a validated scale of satisfaction post-operatively. In total, 242 patients (250 knees) with a mean age of 68 years (40 to 80) were recruited from four NHS orthopaedic centres. Of these, 132 patients (54.5%) were women.

No statistically significant differences could be identified in any of the patient-reported outcome scores between patients who received the fixed-bearing or the mobile-bearing knee up to two-years post-operatively.



FB vs MB

The Journal of Arthroplasty Vol. 25 No. 6 2010

Review Article

Mobile-Bearing Total Knee Arthroplasty

Better Than a Fixed-Bearing?

Zachary D. Post, MD, Wadih Y. Matar, MSc, MD, FRCSC,
Tim van de Leur, MD, FRCSC, Eric L. Grossman, MD, and Matthew S. Austin, MD

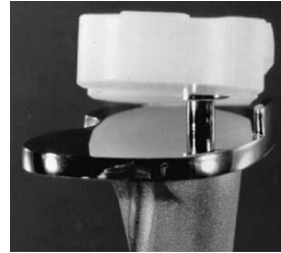
Abstract: The purported advantages of mobile-bearing knee include increased survivorship and restoration of more natural knee kinematics compared to a standard fixed-bearing design. To evaluate these claims, an extensive review of the available literature was undertaken. We compared survivorship and clinical function, including patient preference. We found no difference in survivorship at 12 to 23 years. Kinematic profiles of both designs did not differ significantly: rotation, flexion, and extension were comparable. Studies evaluating both designs in the same patient showed no difference in range of motion, knee preference, knee scores, and survivorship at midterm follow-up. Both designs were capable of producing excellent long-term results and clinical outcomes if properly implanted. **The available evidence does not point to the superiority of one design over another in survivorship and clinical function.** **Keywords:** mobile bearing, fixed bearing, TKA, survivorship, functional score.

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Better ROM

Haas B, Dennis DA, Komistek RD, Brumley JT, Hammill C (2001) Range of motion of posterior-cruciate-substituting total knee replacements: the effect of bearing mobility. J Bone Joint Surg Am 83-A Suppl 2(Pt 1):51-55

The Journal of Arthroplasty Vol. 20 No. 2 2005



Comparison of Mobile-Bearing and Fixed-Bearing Total Knee Arthroplasty

A Prospective Randomized Study

Paolo Aglietti, MD, Andrea Baldini, MD, Roberto Buzzi, MD, Domenico Lup, MD, and Lapo De Luca, MD

- 104 patients Legacy posterior stabilized TKA
- 107 patients Meniscal Bearing Knee
- FU:36 months

At an average follow-up of 36 months, knee, function, and patellar scores were comparable in both groups. The LPS group showed a significantly higher maximum flexion than the MBK group

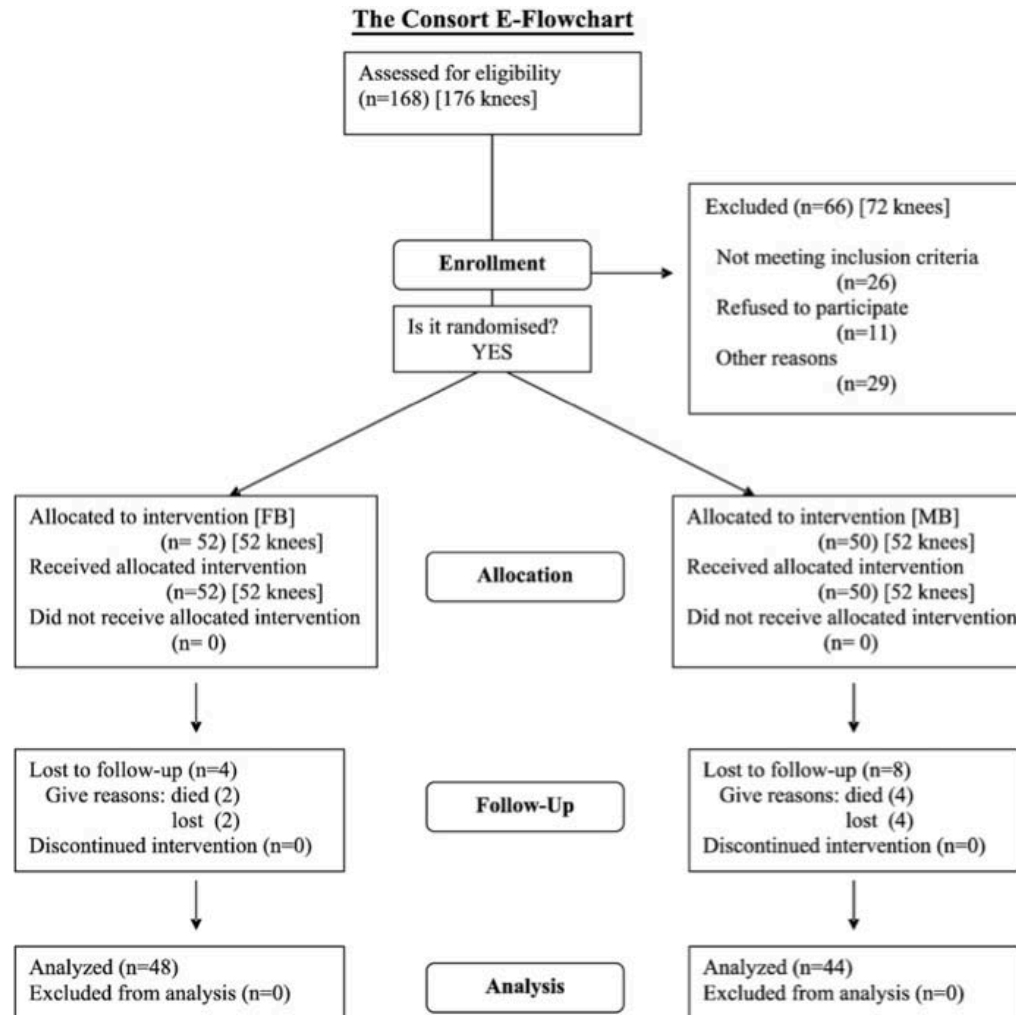
Using a fixed-bearing or a mobile-bearing design did not seem to influence the short-term recovery and early results after knee arthroplasty.



Our experience

- 1999-2003, P.F.C. Sigma FB vs P.F.C. Sigma MB
- RCT
- FU: 5 years
- AKSS score, SF-12, VAS, knee flexion
- Radiographic evaluation

Our experience



Our experience

Clinical results at last follow-up

	FB group	MB group	Mean diff. (95% CI)	<i>p</i> -value
Patients (knees)	48 (48)	42 (44)		
AKSS-TKS, mean (SD)	92.2 (\pm 10.2)	92.3 (\pm 10.1)	-0.1 (-4.3;4.1)	0.959*
AKSS-TFS, mean (SD)	78.0 (\pm 19.3)	80.6 (\pm 20.6)	-2.6 (-10.8;5.7)	0.542*
AKSS pain score, mean (SD)	44.7 (\pm 9.0)	45.5 (\pm 8.5)	-0.8 (-4.4;2.9)	0.677*
VAS score, mean (SD)	1.5 (\pm 1.8)	1.4 (\pm 1.7)	0.1 (-0.7;0.8)	0.848*
Anterior knee pain, knees (%)	6 (12.5%)	8 (18.6%)	0.8 (0.5;1.3)**	0.320***
Flexion angle, mean (SD)	119.4 (\pm 11.6)	116.7 (\pm 13.4)	2.7 (-2.5;7.9)	0.301*
SF-12 pcs, mean (SD)	44.2 (\pm 11.4)	44.1 (\pm 10.3)	0.1 (-4.4;4.6)	0.959*
SF-12 mcs, mean (SD)	54.3 (\pm 9.3)	53.6 (\pm 9.3)	0.7 (-3.2;4.6)	0.719*

*Student's *t*-test, **Risk ratio (95% CI), ***Fisher's Exact test.

VAS = visual analogue scale.

Our experience

Radiographic results

	FB groups (<i>n</i> =48 knees)	MB Groups (<i>n</i> =44 knees)
<i>Mechanical axis</i>		
Varus > 5°	1 (2.1%)	–
Varus 3°–5°	4 (8.3%)	4 (9.3%)
0°±2°	38 (79.2%)	36 (83.7%)
Valgus 3°–5°	5 (10.4%)	3 (7.0%)
Valgus > 5°	–	–
Patellar tilt > 5°	2	1
<i>Radiolucent lines</i>		
Overall, <i>n</i> (%)	5 (10%)	3 (7%)
Tibia (<i>n</i>)		

In conclusion, our study does not show any clear advantage in terms of function, pain, range of motion, general health, and radiological signs of loosening of the fixed-bearing or mobile-bearing total knee arthroplasty at a mean follow-up of 7.1 years.



Discussion

Cochrane Database Syst Rev. 2004;(2):CD003130.

Mobile bearing vs fixed bearing prostheses for total knee arthroplasty for post-operative functional status in patients with osteoarthritis and rheumatoid arthritis.

Jacobs W, Anderson P, Limbeek J, Wymenga A.

Orthopedics, Sint Maartenskliniek, Hengstdal 3, PO Box 9011, Nijmegen, Netherlands, NL-6500 GM.

REVIEWERS' CONCLUSIONS:

We could find **no evidence of superiority** for one of the two prosthesis types with regard to ROM or functional performance of the patients. The majority (96%) of patients in the 2 included studies had OA. Therefore, the results reflect primarily results in OA patients.



Discussion

Clin Orthop Relat Res (2011) 469:123–130
DOI 10.1007/s11999-010-1557-4

SYMPOSIUM: PAPERS PRESENTED AT THE ANNUAL MEETINGS OF THE KNEE SOCIETY

Wear Damage in Mobile-bearing TKA is as Severe as That in Fixed-bearing TKA

Natalie H. Kelly BS, Rose H. Fu BS,
Timothy M. Wright PhD, Douglas E. Padgett MD

- 48 retrieved TKA
- Visual stereomicroscopy, mapping of the damage
- Not correlated to BMI or alignment
- Correlated to length of implantation, if no infection or stiffness

Mobile-bearing TKAs **did not improve wear damage**, providing another argument against the superiority of these implants over fixed-bearing implants.

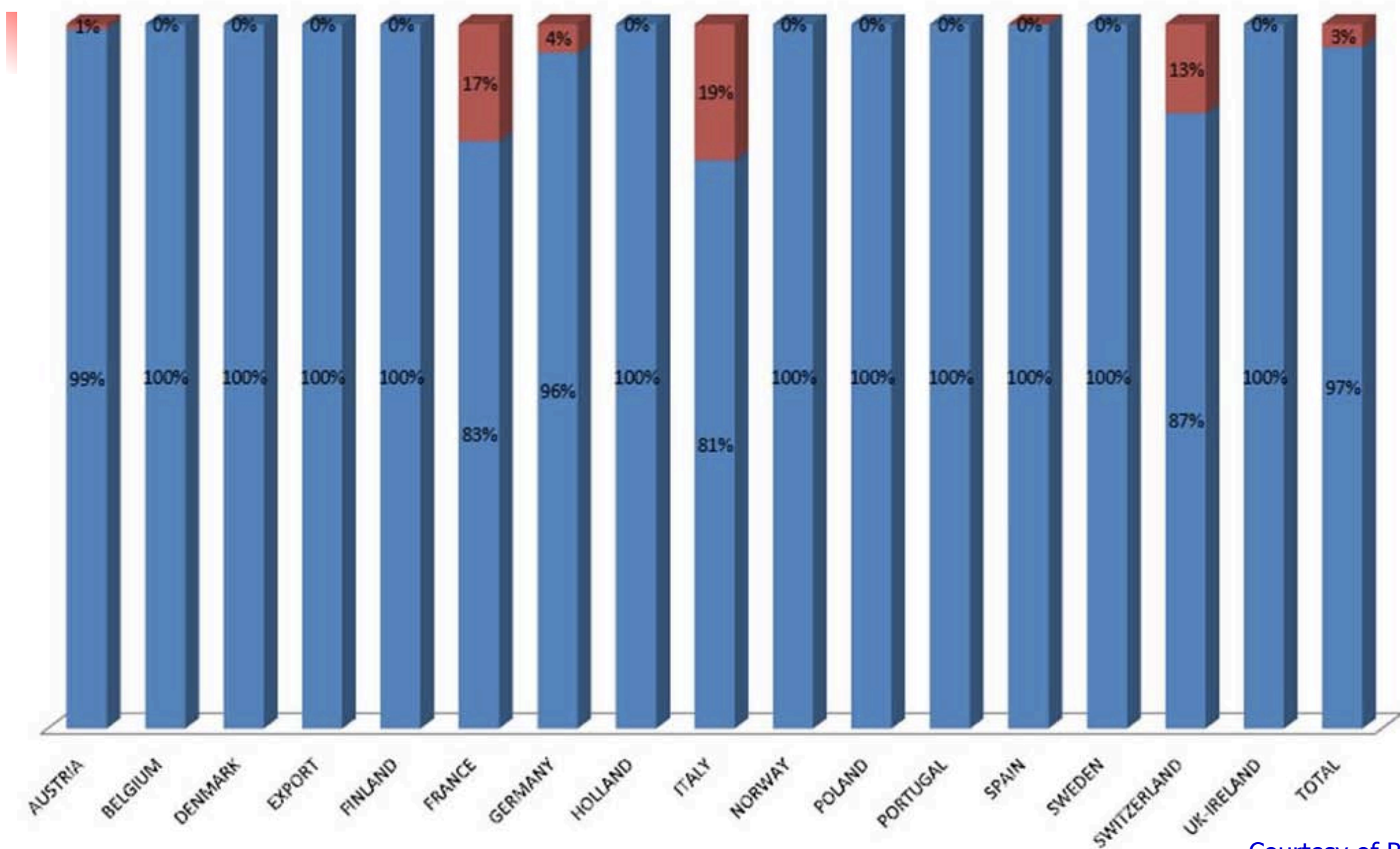


FB / MB our observation - level VI

- Less inflammation
- Less swelling
- Better functional capacity
- No advantage regarding the PF

Fixed vs Mobile

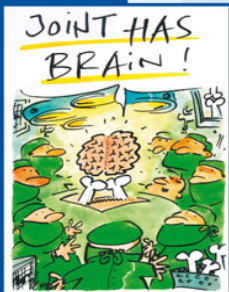
■ Fixed ■ Mobile





In summary

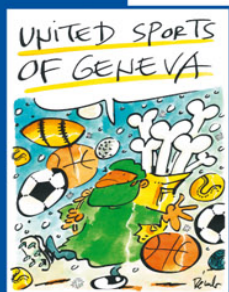
- Theoretical advantages of the MB not confirmed clinically
- We couldn't find any advantages in using MB
- More expensive (600.- sfrs)
- We therefore routinely use FB



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Thank you for listening

