

# Concomitant meniscus repair with ACL reconstruction does not affect short-term postoperative outcomes clinically

**Kennan Yeo<sup>1</sup>, Kamaraj Thirukumaran<sup>1</sup>, Mok Ying Ren<sup>2</sup>, Yee Han Dave Lee<sup>2</sup>, Zi Qiang Glen Liao<sup>2</sup>**

<sup>1</sup>Yong Loo Lin School of Medicine, National University of Singapore, Singapore

<sup>2</sup>Department of Orthopaedic Surgery, National University Hospital, Singapore

# Conflicts of Interest

The authors declare no conflict of interest.

# Introduction

- Anterior cruciate ligament (ACL) injuries commonly present with concomitant menisci tears potentially requiring a meniscus repair (MR).<sup>1</sup>
- For younger patients in particular, MR is often the first choice to maintain the integrity of the meniscus.<sup>2</sup>
- Current literature is divided on whether there is a difference in preoperative state and postoperative outcomes between patients who undergo isolated ACL reconstruction (i-ACLR) and those who undergo ACLR with MR (ACLR+MR).<sup>3,4,5</sup>
- Aim is to evaluate the preoperative and 2-year postoperative outcomes between i-ACLR and ACLR+MR groups

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2. Nelson CG, Bonner KF. Inside-Out Meniscus Repair. *Arthroscopy Techniques*. 2013 Nov;2(4):e453-60.

3. Singh A, Wei DT, Lin CTP, et al. Concomitant meniscal injury in anterior cruciate ligament reconstruction does not lead to poorer short-term post-operative outcomes. *Knee Surg Sports Traumatol Arthrosc*. Apr 2018;26(4):1266-1272. doi:10.1007/s00167-017-4635-2

4. Svantesson E, Cristiani R, Hamrin Senorski E, Forssblad M, Samuelsson K, Ståhlman A. Meniscal repair results in inferior short-term outcomes compared with meniscal resection: a cohort study of 6398 patients with primary anterior cruciate ligament reconstruction. *Knee Surg Sports Traumatol Arthrosc*. 2018 Aug;26(8):2251-2258. doi: 10.1007/s00167-017-4793-2. Epub 2017 Nov 13. PMID: 29134251; PMCID: PMC6061769.

5. LaPrade CM, Dornan GJ, Granan LP, LaPrade RF, Engebretsen L. Outcomes After Anterior Cruciate Ligament Reconstruction Using the Norwegian Knee Ligament Registry of 4691 Patients: How Does Meniscal Repair or Resection Affect Short-term Outcomes? *Am J Sports Med*. 2015;43(7):1591-7.

# Methods

- Retrospective study of consecutive series of patients from a tertiary institution between 2009 to 2022.
- Patients who had undergone meniscus debridement, arthroscopic partial meniscectomy, revision ACL surgery, combined ACL reconstruction with osteotomy surgery or had multi-ligament knee injuries were excluded.
- Patient-reported outcome measures (PROMs) were assessed pre-operatively and at 2-year follow-up using the Lysholm and Knee Injury and Osteoarthritis Outcomes score (KOOS).
- Minimally clinical important difference (MCID) was used as a measure of clinical significance by comparing the percentage of patients from i-ACLR and ACLR+MR populations who achieve MCID.

# Clinical Significance → MCID

- Minimally clinically important difference (MCID), is defined as the **smallest difference before and after a procedure** that the patient perceives as beneficial in a patient reported outcome measure (PROM).<sup>6</sup>
- The MCID accounts for the subjective experiences of individual patients.
- Using both clinical and statistical significance allows us to evaluate procedures more holistically.
- MCID was calculated using distribution method, which is  $\frac{1}{2}$  of the standard deviation, as recommended by Engel et al.<sup>7</sup>

Table 1: MCID values

Score	MCID Values	
	i-ACLR	ACLR + MR
Lysholm score	8.60	9.73
KOOS Symptoms	9.44	10.9
KOOS Pain	8.58	9.98
KOOS ADL	7.62	9.21
KOOS Sports	15.0	17.5
KOOS QoL	14.3	15.6

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# Results: Demographics

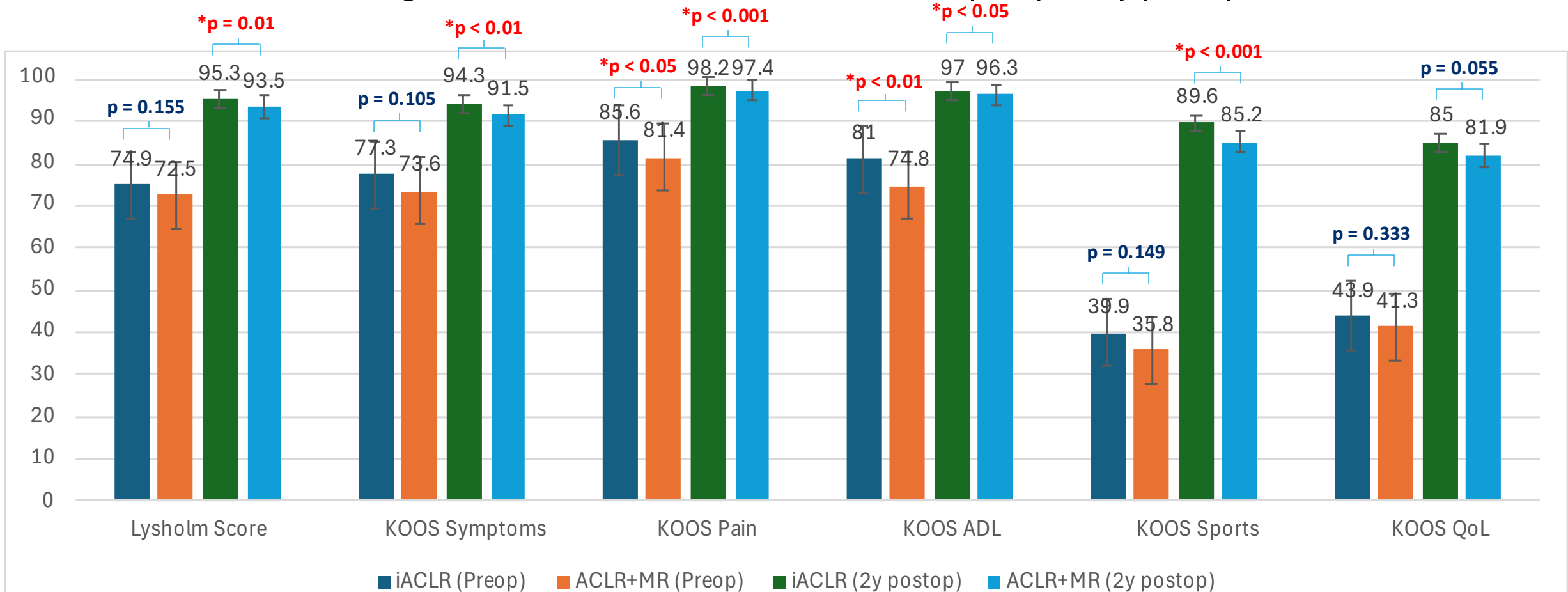
- 290 cases, with 205 cases of i-ACLR and 85 cases of ACLR+MR
- Demographics show no confounders

Table 1: Demographics

Variable	i-ACLR (Mean, 95% CI)	ACL + MR (Mean, 95% CI)	p-value
Age, M	25.4 (24.4, 26.4)	25.9 (24.3, 27.5)	0.754
Gender (M:F)	159: 46	88:33	0.325
BMI (kg/m <sup>2</sup> ), Mean $\pm$ S.D. (R)	23.9 $\pm$ 3.8	24.0 $\pm$ 3.8	0.905

# Results: Statistical Significance

Fig. 1: PROMs of iACLR and ACLR+MR at preop vs 2y postop

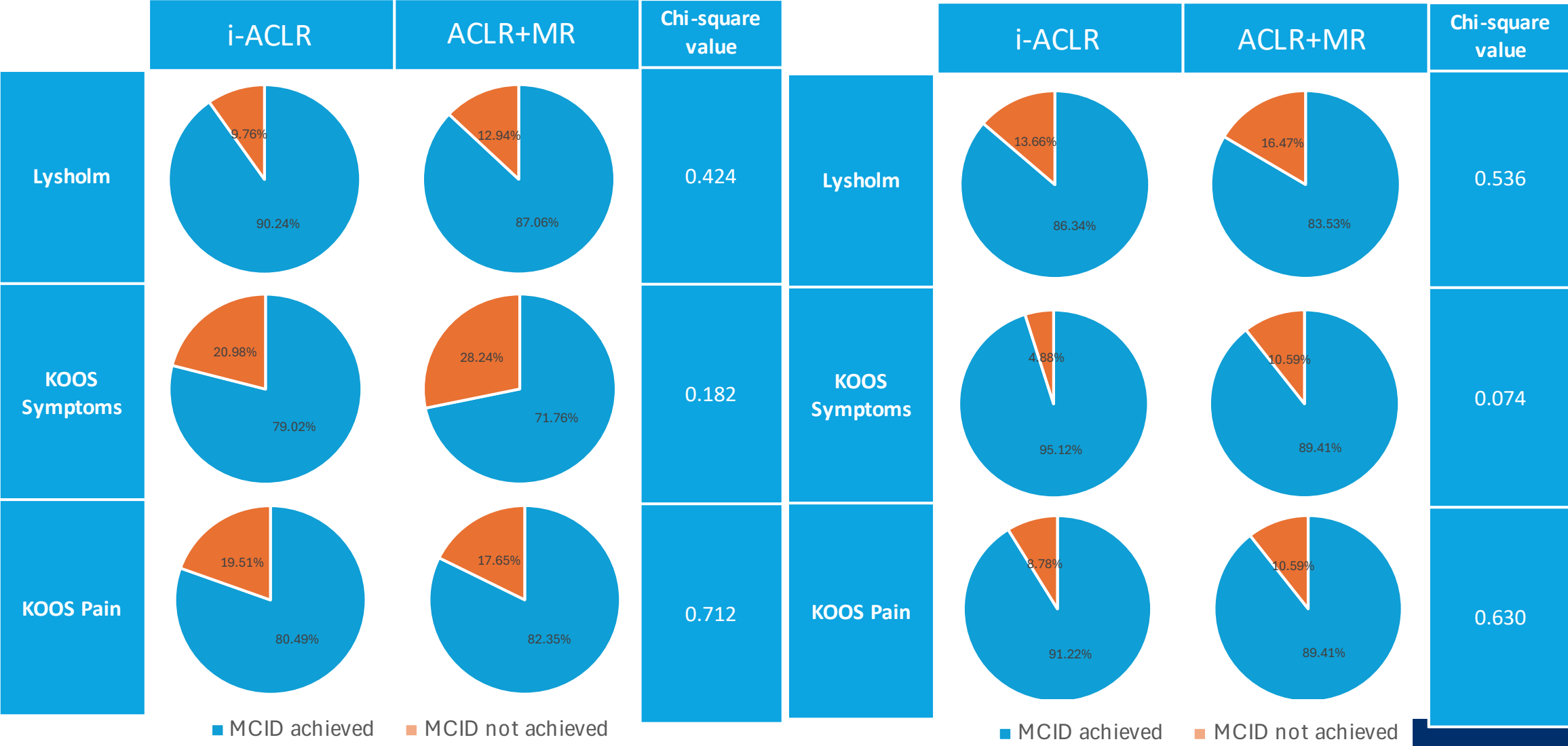


- iACLR generally have higher absolute PROMs preoperatively and postoperatively
- Some preoperative PROMs show statistically significant difference
- Most postoperative PROMs show a statistically significant difference

# Results: Clinical Significance

MCID values have comparable levels of achievement in both i-ACLR and ACLR+MR groups

Fig. 2: MCID Achievement Rates





# Summary of Results

1. 290 cases, with 205 cases of i-ACLR and 85 cases of ACLR+MR
2. **Statistically**, i-ACLR has better outcomes preoperatively and significantly better outcomes at 2-year follow-up compared to ACLR+MR (Fig. 1)
3. **Clinically**, i-ACLR and ACLR+MR have no significant difference as shown by similar rates of MCID achievement (Fig 2.)

## Discussion

- ACLR+MR had **statistically significantly inferior** outcomes in comparison to i-ACLR but **clinically similar outcomes**
- Preoperative findings are similar to Singh et al.<sup>3</sup> who reported inferior outcomes in ACLR+MR patients using different PROMs.
- Postoperative findings have no consensus -- Svantesson et al.<sup>4</sup> proved that patients who undergo ACLR+MR fare worse than i-ACLR, which differs from Barnieus et al.<sup>8</sup> who indicated that meniscus procedures was not a predictive factor of functional recovery.

3. Singh A, Wei DT, Lin CTP, et al. Concomitant meniscal injury in anterior cruciate ligament reconstruction does not lead to poorer short-term post-operative outcomes. *Knee Surg Sports Traumatol Arthrosc.* Apr 2018;26(4):1266-1272. doi:10.1007/s00167-017-4635-2


4. Svantesson E, Cristiani R, Hamrin Senorski E, Forssblad M, Samuelsson K, Stålmán A. Meniscal repair results in inferior short-term outcomes compared with meniscal resection: a cohort study of 6398 patients with primary anterior cruciate ligament reconstruction. *Knee Surg Sports Traumatol Arthrosc.* 2018 Aug;26(8):2251-2258. doi: 10.1007/s00167-017-4793-2. Epub 2017 Nov 13. PMID: 29134251; PMCID: PMC6061769.

8. Barenus B, Forssblad M, Engström B, Eriksson K. Functional recovery after anterior cruciate ligament reconstruction, a study of health-related quality of life based on the Swedish National Knee Ligament Register. *Knee Surg Sports Traumatol Arthrosc.* 2013 Apr;21(4):914-27. doi: 10.1007/s00167-012-2162-8. Epub 2012 Aug 12. PMID: 22885701.

# Conclusion

- Patients undergoing ACLR+MR had comparable pre-operative outcomes to the i-ACLR group.
- At 2 years, despite significant post-operative improvement, patients undergoing MR had poorer PROMs.
- However, these differences lacked clinical significance, suggesting similar clinical outcomes for both groups.

# Limitations

- Did not perform subgroup analysis considering factors like graft type and laterality of meniscus injury.
  - No formal rehabilitation protocol leading to variability dependent on surgeon preference.
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# References

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