

Frobell and colleagues' NEJM paper debunks 'early reconstruction' after ACL rupture: give a piece of rehab a chance!

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A hot Saturday in Vancouver (that's news!). Warm up deadline imminent, but the draft is turgid. Check email (ie, procrastinate). Subject line: 'Did you see *New England Journal of Medicine* (NEJM) anterior cruciate ligament (ACL) paper?' I click through and see that Dr Richard Frobell *et al*¹ from Sweden and Denmark asked whether structured rehabilitation could match early ACL reconstruction! In the spirit of *Inglourious Basterds*² I say to myself 'Now that's a bingo!'..Open a new Microsoft Word document. 'A hot Saturday in Vancouver.'

Experts said this study could not be done. This paper is an absolute 'game changer' given that ACL surgery costs exceed \$5000 per patient in the USA.³ The Holy Grail of research is 'impact,' and this team's research will influence management of well over a million people worldwide who rupture their ACL annually. Adding further weight to their study is the public health significance of almost universal post-ACL injury osteoarthritis.⁴ Therefore, this Warm up underscores the critical nature of the paper, highlights the authors' podcasts (<http://podcasts.bmj.com/bjism>) and encourages readers' contributions via the BJSM blog (<http://blogs.bmj.com/bjism>) and e-letters (<http://bjism.bmj.com/letters>).

Ten years of hard work to be an overnight success

Dr Frobell's PhD dissertation⁵ tells us that in spring 2001, he was a physical therapist rehabilitating ACL injuries and assisting at ACL surgeries to better understand the procedure. As is so often the case, astute clinical observation provided a catalyst for this study—in one particular case, a ruptured ACL had partially healed to the posterior cruciate ligament, and the knee was stable. This led to collegial discussion, protocols being circulated among multidisciplinary

team members and clear recognition that no randomised controlled trial supported 'early reconstruction' over carefully structured rehabilitation. The protocol ('KANON') took 10 months to develop, and the first participant was enrolled in February 2002. Recruitment took 4 years. Dr Frobell defended his PhD in December of 2007 with several important collateral papers, but with his most important paper maturing like vintage Dom Pérignon. Why is this background important? To acknowledge the courage and endurance of the researchers, advisors and funding agencies who saw 2001–2010 as a reasonable gestation period for this NEJM paper. As a result, this paper provides much, much, more than just another brick in the wall.

Clinical implications

The paper details the rehabilitation protocol in a supplementary appendix—an important example of clinical 'best practice' that was carefully crafted and meticulously monitored. Beware that other rehabilitation protocols cannot be assumed to provide similar outcomes.¹ Also, the group's criteria for 'failure of conservative management' are now readily available. A system to evaluate meniscal tears is carefully outlined for clinicians. The study applies to both patellar tendon and hamstring/gracilis ACL reconstructions. Importantly, the authors followed patients through to 2-year outcomes, even when they crossed from rehabilitation to surgical reconstruction; this real-life phenomenon adds further 'external validity' to the study. And this study validates the dozen years Professor Roos and her collaborators's⁶ committed to the Knee Injury and Osteoarthritis Outcome Score outcome measure—a superior instrument for evaluating patient outcomes. The authors highlight that the study 'are best generalised to young adults who have high pre-injury activity levels but not professional athletes.' They also warn that longer-term follow-up is needed, and I am certain they will execute that.

A team approach to excellence

This NEJM paper¹ highlights the value of a group of investigators focusing on a research area for a long period of time, with ongoing collaboration, and by continually adding strength. Teams work best when they have a 'compelling goal' (ie, superior outcome after ACL injury), benefit from a supportive 'macroenvironment' (think minimal red tape, leadership that cares) and genuinely collaborate rather than work in silos.⁷ I have been impressed with the longevity of liaisons in the Norwegian, Swedish, Danish and Finnish powerhouse research centres.

Credit to Professor Stefan Lohmander, an orthopaedically trained PhD and PI of the Lund Osteoarthritis Research Group, as well as to Professor Ewa Roos, another in the increasing line of physiotherapists with stellar PhD contributions themselves and in their trainees. The timing of this transformative rehabilitation research fits well with this month's issue of BJSM, which highlights the Physiotherapy Evidence Database (PEDro)⁸ (*see page 836*) and work (*see page 862*) by physiotherapy professor Bill Vicenzino.⁹

Warm-down

Dr Frobell's paper hints at the emerging importance of health economics across the field of sport and exercise medicine. The authors report the burden of disease (\$US3 billion annually in the USA alone), and it is clear that avoidance of surgery in 61% of cases would introduce substantial savings for individuals and health maintenance organisations. Given that the study reports the SF-36 Quality of Life Measure, I expect to see a future paper from these data showing that the structured rehabilitation programme provided better value per quality-adjusted life year gained during the study period. But I will follow-up that point on the BJSM blog.

Enjoy this 'knee focused' issue of BJSM. And remember that even though rehabilitation may prevent 61% of surgeries after ACL rupture, 50% of primary ACL injuries can be prevented!¹⁰ And please listen to the podcast with the authors of this paper (<http://bjism.bmj.com>). BJSM even tweets links to great papers! (BJSportMed_BMJ). We welcome your thoughts via the blog, or email me directly at karim.khan@ubc.ca.

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