

PRIORITIES for knee injury and post-traumatic osteoarthritis (PTOA) research



- ✦ **Prioritise symptomatic knee PTOA** with or without the presence of structural features, over structural PTOA
- ✦ Reach **consensus** on how to **define, measure and report** symptomatic and structural knee PTOA to facilitate data synthesis
- ✦ Assess the association between **social determinants of health** (including sex, gender, race), and PTOA to understand disparities

STUDY DESIGNS to assess PTOA risk factors & rehabilitation interventions after traumatic knee injury



- ✦ **Include** participants with Anterior Cruciate Ligament (ACL) tear (including ACL deficient) and/or non-ACL tear related injuries
- ✦ **Report** structural knee OA overall and by medial tibiofemoral, lateral tibiofemoral and patellofemoral joint compartments
- ✦ **Follow** participants >5 years to assess the effect on symptomatic and structural knee PTOA

WHAT OUTCOME DOMAINS TO MONITOR after a traumatic knee injury



- ✦ **Core** research outcome domains include: **knee-related** pain, other symptoms, adverse events (e.g., subsequent injury, giving way), cognitive behavioural factors, physical function (e.g., self-reported, performance-based, muscle function), quality of life (QOL), **overall** physical activity and sport participation, and participant global assessment
- ✦ **Other** important research outcome domains include: adiposity, health-related QOL, injury-related costs, comorbidities, participation in social roles (e.g., occupation, care-giving, community participation), imaging (structural) and molecular biomarkers, and injury-related mental health (e.g., anxiety, depression)
- ✦ **Consider monitoring outcomes** across the timespan from injury to OA diagnosis

HOW TO MONITOR PATIENT-REPORTED OUTCOMES (PROs) after a traumatic knee injury

Core research patient-reported outcomes include:

- ✦ Pain: KOOS_{Pain}, Numerical Rating Scale or Visual Analogue Scale
- ✦ Other knee symptoms: KOOS_{Symptoms}
- ✦ Knee-related cognitive behavioural factors: ACL-RSI Scale, K-SES, or TSK-11
- ✦ Knee-related physical function: KOOS_{SportRec}
- ✦ Knee-related QOL: ACL QOL Score, or KOOS_{QOL}
- ✦ Physical activity and sport participation: Sport resumption and frequency
- ✦ Participant global assessment: GROC, PASS or Treatment Failure Score

Research patient-reported outcomes for other **single** domains include:

- ✦ Health-related QOL: EQ-5D Index, SF-12 or SF-36
- ✦ Participation in social roles: occupation, caregiving and community
- ✦ Injury-related mental health: anxiety and depression

Research patient-reported outcomes for **multiple** domains include:

- ✦ IKDC-SKF (composite score of knee-related symptoms, function and sports activities)
- ✦ KOOS (composite AND single domain scores of knee pain, other symptoms, function in daily living and sport/recreation, and QOL)
- ✦ WOMET (composite score of knee-related physical symptoms, sports/recreation/work/lifestyle, and emotions: meniscal only)

HOW TO MONITOR MUSCLE FUNCTION after a traumatic knee injury

Core research knee muscle function measures include: peak thigh muscle (knee extensor/flexor) strength.

Research measures of peak knee extensor/flexor strength (most to least rigour) include:

- ✦ Computerized dynamometry (concentric isokinetic contraction at $\geq 60^\circ/s$)
- ✦ Hand-held dynamometry (isometric maximum effort)
- ✦ Weight machine (concentric isotonic 1repetition maximum knee extension or knee flexor curl)

Other important outcomes include: thigh muscle endurance, power, morphology & neurophysiology, & trunk, hip, & leg muscle function

HOW TO MONITOR FUNCTIONAL PERFORMANCE after a traumatic knee injury

Core research functional performance measures include: hop performance

Research measures of hop performance include a battery of forward (single, repeated), diagonal and/or vertical hop tests. Specifically;

- ✦ Crossover hop (diagonal) test
- ✦ Single hop (single-forward) test
- ✦ Triple-hop and 6m timed hop (repeated-forward) test
- ✦ Vertical hop (vertical) test

Other important research measures of functional performance include: balance, agility or other tasks meaningful to the patient

Certainty of evidence for the recommendations ranges from expert opinion to a GRADE rating of moderate (burden, risk factors, interventions) or high (patient reported, strength, functional performance outcomes). All recommendations were rated appropriate (median agreement 9/9 (7-9)). For more information including guidance for interpreting changes in patient reported, muscle function and functional performance outcomes see Whittaker JL, Culvenor AG, Juhl CB et al OPTIKNEE 2022: consensus recommendations. *British Journal of Sports Medicine* 2022; 56:1393-1405 for more information.



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