

qualitative data from all participants confirming DART was simple to use.

Conclusion With all significant usability problems addressed DART can proceed to a randomized controlled trial assessing safety and effectiveness against a usual care comparator.

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SELECTIVE HEAD-AND-NECK COOLING ACUTELY FOLLOWING SPORTS-RELATED CONCUSSION REDUCES TIME FROM PLAY IN SWEDISH ELITE ICE HOCKEY PLAYERS

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10.1136/bmjsem-2022-sportskongres.12

Introduction Sports-related concussions (SRCs) are an increasingly recognized health problems and treatment options are scarce. We tested the hypothesis that immediate selective head-neck cooling shortens return-to-play (RTP) in concussed ice hockey players.

Material and Methods Over 5 seasons, 19 professional ice hockey teams were divided into 2 groups – intervention teams, where concussed players received selective head-neck cooling, and control teams using standard SRC management. Concussion was diagnosed by established criteria. A head-and-neck cooling cap-system, designed to reduce the brain temperature with a cold circulating coolant, was used. The cooling started acutely after SRC diagnosis and was used for ≥ 45 min. All players were subjected to a standardized graduated RTP protocol. Before RTP, SCAT baseline level and medical teams' clearance should be reached. The main outcome measure was time until completing the graduated rehabilitation program and RTP.

Results In the teams using cooling, 62 concussions were recorded, and 75 in the control teams. Median time to initiate cooling was 11 (range 5–30) minutes. The median time to RTP was 9 days in the cooling group, in controls 12 days ($p < 0.00001$; 95% CI: -7.0; -1.99). In players receiving selective head-neck cooling, 94% (58/62) had an RTP ≤ 3 weeks and 100% had an RTP ≤ 56 days. In controls, 71% (53/75) had an RTP ≤ 3 weeks and 87% ≤ 56 days ($p < 0.001$).

Conclusions Acute selective head- and neck cooling shortens RTP and reduces the risk of long-term absence from play in concussed ice hockey players.

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NUMEROUS TREATMENTS ARE EFFICACIOUS FOR PATELLOFEMORAL PAIN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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10.1136/bmjsem-2022-sportskongres.13

Introduction Patellofemoral pain (PFP) is common and impacts health-related quality of life. Despite numerous published guidelines, understanding of intervention efficacy is limited.

Materials and Methods We registered with PROSPERO (CRD42019152252) and searched multiple databases to April 2021 and included only high-quality randomised controlled trials (RCTs) scoring >7 on the PEDro scale. We pooled methodologically homogenous pain (e.g., numerical rating scale) and function (e.g., kujala scale) data using random effects models at short-, medium- and long-term (<3 , >3 - <12 , >12 months respectively). Interventions demonstrated primary efficacy if there was a significant comparison with sham, placebo, or wait-and-see control in an adequately powered RCT ($n > 23$) or data pooling. Secondary efficacy or superiority was determined by a significant comparison to an intervention with primary efficacy. The GRADE criteria determined evidence certainty (very low to high).

Results We identified 61 high-quality RCTs involving 3,543 participants. Four interventions demonstrated primary efficacy for short-term pain and function: knee-targeted exercise (high/moderate), multi-modal physiotherapy (low/low), foot orthoses (low/absent), and lower-quadrant manual therapy (absent/moderate). Hip- and knee-targeted exercise demonstrated secondary efficacy for pain and function in the short (low/moderate), medium (moderate/moderate), and long-term (moderate/moderate). Knee-targeted exercise combined with perineural dextrose injection demonstrated secondary efficacy in the short-term (moderate/moderate). Multi-modal physiotherapy demonstrated superiority for pain and function in the short-term (very low/very low) compared to knee-targeted exercise alone.

Conclusions Wait-and-see, sham, or placebo should not be used for PFP, as several interventions have proven efficacy. Future effectiveness studies should include long-term follow-up. Our synthesis will inform a future updated best practice guide.

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SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS AND COHORT STUDIES OF RISK FACTORS FOR KNEE OSTEOARTHRITIS AFTER TRAUMA (OPTIKNEE)

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10.1136/bmjsem-2022-sportskongres.14

Introduction It is unclear why some people develop osteoarthritis after knee trauma and others don't. This study identified risk factors for osteoarthritis following knee trauma.

Materials and Methods After protocol registration, 5 databases were searched to 09–2021. RCTs and cohort studies assessing risk factors for symptomatic or structural osteoarthritis in persons with knee trauma, mean injury age ≤ 30 -years, and minimum 2-year follow-up were included. Record screening, data extraction and risk-of-bias assessment was duplicated (blinded). Meta-analyses (random effects models) estimated the odds of osteoarthritis for risk factors assessed in ≥ 4 studies. Remaining