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.

### 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<0.0001; 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.