

While, players that pass the concussion assessment may re-dress and return to play, the equipment removal and re-dressing delays their return into the game. The objective of our study was to develop and evaluate a new in-skates balance error scoring system (SBESS) to reduce the delay in returning to the game. **Methods:** A prospective randomized single blinded study was conducted with 80 healthy university hockey players split into two groups. An at-rest group performed the SBESS assessment at rest on two separate occasions. A post-exercise group performed the test once at rest and once after exercise. The SBESS consisted of performing 4 different stances for 20 seconds each without equipment removal. The assessments were video recorded, and 3 independent reviewers scored the videos. For both the at-rest and post-exercise groups, the primary outcome measured was the number of balance errors. The secondary outcome was the number of falls. Statistics: For the primary outcome, both inter-rater and intra-rater reliability were calculated. The concordance between the SBESS and the currently used baseline pre-season balance score (MBESS) was also assessed. **Results:** The number of cumulative balance errors for all four stances varied between 4 and 7 for both groups without any significant exercise effect. No athletes fell. For inter-rater reliability, the intra-class correlation (ICC) was above 0.86, ranging from 0.86-0.92 for most stances except for the easiest stance, for which it was 0.66. For intra-rater reliability, the ICC ranged from 0.88 to 1 for all stances and raters. There was a lack of concordance between the SBESS and MBESS. **Conclusion:** The SBESS is a reliable balance test that can be safely performed in healthy athletes wearing their full equipment. The next step will be to evaluate the use of this test on concussed hockey athletes.

Keywords: concussion, balance, hockey

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Introduction of extracorporeal cardiopulmonary resuscitation (ECPR) into emergency care: a feasibility study

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Introduction: Traditionally, out of hospital cardiac arrests (CA) have poor outcomes. Incorporation of extracorporeal cardiopulmonary resuscitation (ECPR) is being used increasingly to supplement ACLS to provide better outcomes for patients. Current literature suggests potentially improved outcomes, including neurological function. We assessed the feasibility of introduction of ECPR to a regional hospital using a 4-phase study. We report phase-1, an estimation of the number of potential candidates for ECPR in our setting. **Methods:** Following development and agreement on local criteria for selection of patients for ECPR using a modified Delphi Technique, inclusion and exclusion criteria were applied retrospectively, to a database comprising 4 years of emergency department (ED) cardiac arrests (n=395). This provided estimates of the number of patients who would have qualified for EMS transport for ECPR and initiation of ECPR in the ED. **Results:** Application of criteria would result in 20.0% (95% CI 16.2-24.3%) of CA being transported to the ED for ECPR (mean 18.5 patients per year). In the ED 4.6% (95% CI 2.83-7.26%) would be eligible to receive ECPR (4.3 patients per year). Incorporating downtime criteria, 3.0% (95% CI 1.6-5.3%) qualify. After considering local in-house cardiac catheterization hours 9.4% (95% CI 6.8-12.9%) and 5.4% (95% CI 3.5-8.2%), without and with EMS rhythm assumptions respectively, would be eligible for transport. For placement on pump, 3.0% (95% CI 1.6-5.3%) and 2.4% (95% CI 1.2-4.6%), without and with use of total downtime respectively, were eligible. **Conclusion:** If historical patterns of CA were to continue, we believe that an ECPR program may be feasible in

our regional hospital setting, with a small number of selected cardiac arrest patients meeting eligibility for transportation and initiation of ECPR. These numbers suggest that an ECPR program would not be resource intensive, yet would be sufficiently busy to maintain adequate team competency.

Keywords: extracorporeal cardiopulmonary resuscitation, resuscitation, cardiac arrest

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Development of inclusion and exclusion criteria for ECPR in a regional hospital

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Introduction: Extracorporeal cardiopulmonary resuscitation (ECPR), a method of cardiopulmonary bypass, is increasingly being used to supplement traditional CPR to improve outcomes for cardiac arrest (CA). CA and particularly out of hospital CA (OHCA) have poor outcomes. Prior to development of a 3 phase ECPR program in a Canadian regional hospital, we wished to identify and optimize a practical selection process (inclusion and exclusion criteria) for patients who may benefit from ECPR. **Methods:** Using a locally modified Delphi technique, we followed a literature review to construct a proposed set of evidence based criteria with a questionnaire, where inclusion and exclusion criteria were scored by a selected group of 13 experts. Following 3 rounds, and additional review by an international expert in the field of ECPR, consensus was achieved for patient selection criterion. **Results:** First round responses achieved 87.5% agreement for selection of exclusion criteria. Inclusion criteria had agreement 62.5%. Responses to the second round for selection of inclusion criteria were unanimous at 100% with the exception of age parameters (<65 years vs. <70 years). The third and final set of criteria achieved 100% consensus though subsequent expert review refined a single exclusion criteria (asystole). Agreed inclusion criteria were: witnessed CA, age <70, refractory arrest, no flow time <10min, total downtime <60min, and a cardiac or select non-cardiac etiology (PE, drug OD, poisoning, hypothermia). Exclusion criteria were: unwitnessed arrest, asystole, certain etiologies (uncontrolled bleeding, irreversible brain damage, trauma), and comorbidities (severe disability limiting ADLs, standing DNR, palliation). Simplified criteria for EMS transport included witnessed OHCA, age, and no flow time. **Conclusion:** Selection criteria of candidates for ECPR are important components for any program. Expert consensus review of current evidence is an effective method for development of ECPR selection criteria.

Keywords: extracorporeal cardiopulmonary resuscitation, resuscitation, selection

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A prospective study of the management and outcomes of patients with symptomatic atrial fibrillation and/or flutter presenting to emergency departments

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Introduction: Patients with new onset and chronic atrial fibrillation and/or flutter (AFF) present to emergency departments (ED) with symptoms requiring acute management decisions. Most research has