

2025 CASEM Poster Abstracts

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The Benefits of Sport and Exercise for Donor Kidney Recipients

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Objective: To study physical activity and cardiovascular disease (CVD) risk factors in donor kidney recipients.

Study Design: Evidence-based medicine. Descriptive studies.

Subjects: Seventy adult donor kidney recipients (not on dialysis) with satisfactory graft function.

Intervention: Physical activity was assessed using a pedometer and the International Questionnaire on Physical Activity (IPAQ). Risk factors for CVD were identified using a questionnaire developed by the researchers.

Outcome Measures: On the day of the competition, physical activity, quality of life, and a questionnaire to identify CVD risk factors were assessed. The study included 70 adult kidney donor recipients who participated in sports competitions in running and swimming in June 2024. The study population included 41 men and 29 women (patients underwent transplantation between 2004 and 2023). The mean age of the patients was 43.5 ± 10.3 years (maximum, 64 years; minimum, 20 years). At the time of the competition, the minimum time since kidney transplantation was 6 months, and the maximum was 19 years.

Results: According to the survey results, 23 participants (32.85%) lead an active lifestyle, 32 participants (45.7%) lead a moderately active lifestyle, 7 participants (10%) lead a sedentary lifestyle, and 8 participants (11.4%) lead a sedentary lifestyle. Patients with active and moderately active lifestyles were grouped into Group I, and those with inactive and sedentary lifestyles were grouped into group II. Group I showed a reduced incidence of arterial hypertension (by 17.7%), obesity (by 11.5%), overweight (by 12.2%), and underweight (by 9.7%) compared to group II. Sports history showed that 37 participants were involved in sports (53.85%), with 10 participants practicing sports before and after transplantation (14.3%). Seven participants had formal sports achievements (10%). Ten participants were actively engaged in sports activities such as sports games, swimming, running, tennis, and martial arts (14.3%). According to IPAQ testing, hypodynamia was observed in 7 participants from Group II (46.7%).

Conclusions: Exercise and sports serve as a preventive measure against various comorbidities and complications to

which kidney transplant patients are prone. All donor kidney recipients can be recommended to engage in physical training and sports to prevent the development of CVD risks.

Lower Extremity Weakness and Injury Risk in High-Level Football Players

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Objective: To investigate whether hip abductor strength deficits and asymmetry are associated with a higher incidence of in-season lower extremity injuries in high-level football players.

Study Design: Prospective cohort study.

Subjects: 319 participants from 4 high-level post-secondary football teams: 2 U Sports Canadian university teams ($n = 70$ and $n = 86$) and 2 Canadian Junior Football League (CJFL) teams ($n = 71$ and $n = 92$).

Observation Technique: Participants underwent preseason and mid-season assessments, which included countermovement jump (CMJ) testing on dual force plates, and isometric hip abduction strength measurements using handheld dynamometers. Injuries sustained throughout the season were documented by team therapists.

Outcome Measures: The primary outcomes included hip abductor strength and asymmetry, both assessed during preseason and mid-season testing, and the incidence of lower extremity injuries recorded throughout the season.

Results: Data from the CJFL teams ($n = 141$; 35 documented injuries) revealed no significant association between muscle strength metrics and injury occurrence. A prior history of lower extremity injury demonstrated a potential trend toward increased injury risk but did not reach statistical significance ($P = 0.10$).

Conclusion: Preliminary analysis suggests that isometric muscle strength alone does not significantly predict injury occurrence. However, our initial analysis is limited by a small sample size and narrow assessment of variables due to active data collection. Further analyses plans to incorporate a larger sample size including data from the U Sports teams, and will account for additional factors such as distinguishing contact and non-contact injuries, and body mass index once available. We hypothesize that impaired hip abductor strength will show

a stronger association with non-contact lower extremity injuries during the in-season period. If a significant relationship is established, these findings can be used to identify and counsel athletes at increased risk, as well as develop targeted strengthening programs to reduce injury risk.

The Relationship Between Repeat Sprint Ability and Sport-Specific Skills in Elite Youth Soccer Players

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Objective: To investigate the relationship between repeat sprint ability (RSA) and sport-specific skills in elite youth soccer players.

Study Design: Cross-sectional.

Subjects: Sixty-seven elite youth soccer players (age: 16.3 ± 0.8 years, weight: 69.0 ± 8.7 kg, height: 179.4 ± 8.3 cm, BMI: 21.3 ± 1.4 kg/m²).

Observation Technique: The test battery assessed speed and strength (30-m sprint, countermovement jump), sport-specific skills (change of direction (COD), agility *t* test, dribbling), and anaerobic endurance (RSA) using the 6 x 20/20 protocol: 6 20-meter sprints with 20 seconds of passive rest.

Outcome Measures: Mean time across all RSA test sprints (RSAm_{mean}) and fatigue indices caused by repeated sprints, such as the fatigue index (FI) and percentage decrement score (Sdec), were analyzed. A correlation was considered strong if it was between 0.70 and 1.00, moderate if it was between 0.30 and 0.69, and weak if it was between 0.01 and 0.29. The Shapiro-Wilk test was used to assess the normality of distribution. Pearson's or Spearman's correlation tests were used to determine the relationships between the analyzed parameters. The test results were obtained using a SmartSpeed Pro timing system (VALD Performance, Australia).

Results: RSAm_{mean} showed a moderate positive correlation with COD performance ($r_s = 0.589$, $P < 0.001$) and dribbling skills ($r_s = 0.507$, $P < 0.001$), and a strong positive correlation with agility *t* test time ($r_s = 0.764$, $P < 0.001$). No significant correlations were found between FI or Sdec and sport-specific skills.

Conclusions: A significant positive relationship was found between the mean time of RSA test sprints and the performance in dribbling, change of direction, and agility *t* test in elite youth soccer players. Practitioners should consider these findings when designing training programs aimed at developing sport-specific skills.

Attitudes Towards Chiropractic: An Analysis of Written Comments From a Survey of Canadian Sport and Exercise Medicine Physicians

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Objective: To analyze and discuss the written survey comments of Canadian sport and exercise medicine physicians

and their attitudes towards chiropractic, including its use for the treatment of athletes and/or Canadians who participate in sports or exercise.

Study Design: Online survey.

Subjects: Active physician members of the Canadian Academy of Sport and Exercise Medicine (CASEM). Seventy physicians completed the survey, 30 left written comments.

Intervention: An invitation to complete the survey was included in the monthly newsletter emailed to all CASEM members in March and April 2023. A card with a link to the survey was distributed to all attendees of the 2023 CASEM symposium.

Outcome Measures: We administered a 49-item survey to CASEM physicians that inquired into demographic variables and their attitudes towards chiropractic. The survey included an option for respondents to include written comments. Our present analysis is restricted to these comments, and they are the primary outcome measure.

Results: Seventy physicians completed the survey (response rate 11%) and 30 provided written comments. Our analysis revealed 8 themes and 13 sub-themes represented in physician's comments. A previous framework informed our current themes. Reported themes were: "variability amongst chiropractors" ($n = 15$), "personal experience with chiropractic" ($n = 5$), "concerns with chiropractic treatment" ($n = 4$), "unethical behaviour" ($n = 4$), "chiropractic training" ($n = 3$), "patient interaction" ($n = 2$), "areas where chiropractic treatment is perceived as effective" ($n = 1$). Subthemes that were endorsed by at least 2 physicians include: "chiropractic terminology is misleading," "chiropractors rely on manipulation only," "chiropractors treat excessively," "chiropractors are overly financially motivated," "positive and negative personal experiences with chiropractors."

Conclusions: Our analysis revealed a number of issues that will need to be considered for chiropractic to advance its integration into the field of sports medicine.

Femoral Shaft Stress Fracture in a Varsity Basketball Athlete: A Case Report

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Objective: To present a case of a femoral shaft stress fracture in a female varsity basketball athlete. She was managed conservatively following a BJSM published protocol with successful return to sport.

Study Design: Case report.

Subjects: A female university basketball athlete with a one-year history of left medial thigh pain.

Intervention/Observation Technique: Following a comprehensive assessment, including history, physical examination and MRI, the athlete was diagnosed with a left femoral diaphysis stress fracture. The athlete was treated conservatively with a structured rehabilitation protocol involving rest, weightbearing restrictions, progressive loading, and cross-training activities. Consistent improvement was demonstrated at each follow up visit and key measures of progress were the fulcrum and hop tests.

Outcome Measures: Outcome measures included pain reduction, resolution of symptoms during provocative tests,

x-ray imaging of the left femur, and the time taken to fully return to basketball.

Results: We facilitated their return to competition in 15 weeks, which falls within the 12 to 18 weeks window mentioned in the original paper. There was no recurrence of femoral pain.

Conclusions: Femoral shaft stress fractures, although uncommon in basketball athletes, should be considered in the differential diagnosis for players presenting with persistent activity related thigh pain. A stepwise loading algorithm is a safe and effective way to facilitate healing, rehabilitation and eventual return to sport in a timely manner.

Impact of Physical Activity on Quality of Life and Risks of Cardiovascular Disease in Persons With Transplanted Organs and on Dialysis

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Objective: To study the impact of physical activity (PA) on quality of life (QoL) and cardiovascular disease (CVD) risks in patients with transplanted organs and those on dialysis, who took part in the Second All-Russian Transplant Games in 2023.

Study Design: Case-control study.

Subjects: Group I—163 participants of the sports games (71 men, 92 women). Group II (control)—100 healthy individuals (50 men, 50 women), not in need of organ transplantation, living a normal urban lifestyle, and not involved in sports.

Intervention: A survey was conducted using the International Physical Activity Questionnaire (IPAQ) and the SF-36 QoL questionnaire. PA levels were assessed, including distance traveled daily, and CVD risk factors were evaluated.

Outcome Measures: Group I included 163 participants, with a mean age of 41 ± 8 years (min. 20, max. 65), while group II consisted of 100 individuals with a mean age of 43.7 ± 8.7 years. On the day of the competition, physical activity levels, QoL, and CVD risk factors were assessed.

Results: The majority of group I participants (76.7%; 125 individuals) regularly practiced physical exercises before and after transplantation or dialysis, walking an average of 8300 steps per day. Improvement in QoL indicators was observed in group I, with a significant increase in the physical component of health by 25.4% and in the mental component of health by 24.6% ($P < 0.05$) compared to group II. In group I, BMI was within the normal range for the majority, with a mean BMI of 24.19 ± 0.6 (min. 15.94, max. 40.01). Thirty-eight individuals had arterial hypertension, 3 had diabetes mellitus. IPAQ assessments identified hypodynamia in 35 participants. PA and QoL indicators in group I were significantly higher than in Group II by 50.46% and 32%, respectively ($P < 0.05$), which is attributed to the participants' increased motivation to regularly engage in physical activities to prepare for competitions.

Conclusions: Participation in sports games by transplant recipients and individuals on dialysis increased their PA levels by up to 50%. This significantly improved the components of their QoL. Regular participation in sports activities may serve as a preventive measure against CVDs.

Effect of Whole-Body Electromyostimulation on Muscle Strength and Body Composition in People With a Sedentary Lifestyle and Prediabetes

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Introduction: A state of glucose metabolism is called prediabetes when diabetes mellitus is not yet present but elevated fasting plasma glucose levels or impaired glucose tolerance are known. Up to one-third of people with prediabetes can be classified as physically inactive. Although physical activity (PA) interventions have shown beneficial effects on weight management and HbA1c levels in people with prediabetes, insufficient PA remains an issue in this population. Therefore, PA programs with an attractive profile are needed to reduce sedentary behavior. Whole-body electromyostimulation (WB-EMS) provides exercise-like effects by inducing muscle contractions using electrical currents from an external source. WB-EMS simultaneously stimulates up to 8 to 12 major muscle groups. In the current study, we aim to assess the effect of WB-EMS on muscle strength and body composition in people with a sedentary lifestyle and prediabetes.

Materials & Methods: A total of 60 individuals with prediabetes were randomly assigned to 1 of 3 study arms: WB-EMS + fitness tracker and lifestyle education program (LEP); fitness tracker and LEP; and LEP only. WB-EMS consisted of 1.5×20 minutes per week. The intensity of the EMS was regulated on the basis of the individual's reported rating of perceived exertion (RPE). Body composition was assessed using bioimpedance analysis (BIA). Hand grip strength was measured using a hydraulic hand dynamometer. All measurements will be repeated at the end of the study.

Results: This study has been registered with Clinicaltrials.gov under the identifier NCT06188481. The collection of data has been initiated and is currently ongoing. Thus, to date, 48 participants, with a mean age of 55.6 ± 6.8 years, have been randomly assigned to their respective groups. The mean body mass index (BMI) and skeletal muscle mass of the participants at the baseline assessment were 28.7 kg/m^2 and 28.13 kg, respectively. The posttest assessment is anticipated to be concluded in April 2025.

Conclusion: In recent years, WB-EMS has become a popular choice for therapeutic training due to its growing reputation for efficiency and personalization. WB-EMS can improve muscle strength and body composition in sedentary people with pre-diabetes.

First Participation of Children With Transplanted Organs in the All-Russian Sports Festival "Transplant Games" In 2023

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Objective: To study the physical activity and physical development of children with transplanted organs participating in sports activities at the All-Russian Transplant Games 2023.

Study Design: Evidence-based medicine; descriptive studies.

Subjects: Eighteen organ transplant patients with satisfactory graft function who participated in sports activities.

Intervention: Participants and their parents completed a questionnaire based on the international and US standardized questionnaires: the Global School-Based Student Health Survey (GSHS), the 2019 Middle School Youth Risk Behavior Survey (USA), and the 2019 National Youth Risk Behavior Survey (USA).

Outcome Measures: A study involving 18 children after organ transplantation (10 liver, 5 kidney, 2 liver and kidney, 1 heart) was conducted. The maximum age was 17 years, the minimum age was 6 years, and the mean age was 11.1 years. Physical activity and physical development were examined. Most participants demonstrated high motor activity and regular exercise. Anthropometric indices (height, weight, chest circumference) were measured in all children. Physical development was assessed using centile tables for the morphological indices of children and adolescents of appropriate ages.

Results: Analysis of the questionnaires revealed that the majority of children included motor activity in their daily routines. The average number of steps taken daily was 5000 to 6000. Among regular activities, 10 participants engaged in walking, 4 attended sports sections, and 1 child participated in recreational running. Additionally, out of the 18 children, 6 adolescents competed in swimming, running, and table tennis, while 12 participated in the sports festival. Physical development (PD) analysis showed that 12 participants (67%) exhibited average PD, 4 participants (22%) had below-average PD, and 2 participants (11%) had above-average PD based on the sigma deviation method evaluation. Low physical activity negatively impacts the physical and psychological development of children, as well as the function of not only transplanted but also healthy organs. A lack of regular physical activity increases the risk of cardiovascular diseases. The results suggest that physical activity and participation in sports activities potentially contribute to the harmonious development of children with organ transplants.

Conclusion: Physical activity in children after organ transplantation may favorably affect their physical development. The effect of physical activity on the physical development of children after organ transplantation warrants further study.

A Study of Soccer Tournament Participants Among Individuals With Organ Transplants and Undergoing Dialysis

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Objective: To study physical activity (PA), cardiovascular disease (CVD), and injury risk factors in soccer

players—recipients and those on dialysis—who participated in the Steel Will 2024 soccer tournament.

Study Design: Evidence-based medicine. Descriptive research.

Subjects: Fifty-four adult athletes (all male) with satisfactory graft function (31 kidney, 9 liver, 5 heart) and on dialysis (9).

Intervention: Physical activity was assessed using a pedometer and the International Questionnaire on Physical Activity-IPAQ (IPAQ). Risk factors for CVD and injury were identified using a questionnaire developed by us.

Outcome Measures: During the tournament, physical activity and CVD risk factors were assessed, BP and HR were measured, and injuries were identified. Six teams participated in the soccer tournament. The mean age was 46.3 ± 9.8 (max, 64 years; min, 19 years). At the time of the tournament, a min of 6 months and a max of 19 years had elapsed since transplantation. In players on dialysis, the mean time was 7 ± 5.6 years. Patients who were examined and cleared were admitted to the competition.

Results: According to the results of the questionnaire, 33 people (61.1%) lead an active lifestyle, 18 people (33.3%) are moderately active, 3 people (5.6%) are inactive, and 0 people are sedentary. According to the IPAQ results, hypodynamia was not registered. Mean blood pressure in patients with active or moderately active lifestyle is 134/82 ± 12/7 mm Hg and in patients with inactive or sedentary lifestyle—143/92 ± 11/9 mm Hg. BMI is within the normal range in 42 (77%) soccer players, higher than normal in 10 (18.5%) and lower in 2 participants (3.7%). The analysis of the results of the classification of injuries showed that from all the participants of the tournament 11 (23.4%) soccer players received light injuries, 2 (3.7%) received injuries of medium severity, there were no severe injuries.

Conclusions: Regular exercise in soccer in persons with transplanted organs and on dialysis contributes to a decrease in BMI, normalization of CCC indicators, increase in physical activity level, which is a factor in reducing CVD risks. However, soccer, as a contact sport, is a controversial point of recommendation for this category of patients.

The Relationship Between Rate of Perceived Exertion, Heart Rate, Delayed Onset Muscle Soreness, and Fatigue Induced by Sport-Specific High-Intensity Load in Young Elite Soccer Players

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Objective: To examine the relationship between fatigue induced by sport-specific high-intensity load, rate of perceived exertion (RPE), heart rate (HR), and delayed onset muscle soreness (DOMS) in young elite soccer players.

Study Design: Cross-sectional.

Subjects: A total of 67 elite young soccer players (age: 16.3 ± 0.8 years, weight: 69.0 ± 8.7 kg, height: 179.4 ± 8.3 cm, BMI: 21.3 ± 1.4 kg/m²).

Observation Technique: The test battery included assessments of speed and strength (30-m sprint, countermovement jump), sport-specific skills (change of direction (COD), agility t test, dribbling), and anaerobic endurance (repeat sprint

ability (RSA) test using a 6 × 20/20-m protocol with 20 seconds of passive rest between sprints).

Outcome Measures: RPE was measured using the Borg Scale-10 five minutes after the RSA. Heart rate post-exercise (HR_{pe}) and after 2 min of rest (HR_{rest}) were measured using the Activo Sport Solution system. Heart rate recovery (HR_{rec}) was calculated as the difference between HR_{pe} and HR_{rest}. DOMS severity was assessed 24 hours post-exercise using a ten-point visual analog scale. Fatigue index and percentage decrement score (S_{dec}) were calculated based on RSA results using standardized formulas. Correlations between variables were classified as strong (0.70-1.00), moderate (0.30-0.69), or weak (0.01-0.29). Normality of distribution was evaluated using the Shapiro-Wilk test. Pearson's or Spearman's correlation tests were used to analyze relationships between variables.

Results: A moderate positive correlation was found between RPE and DOMS severity ($r_s = 0.497$, $P < 0.0001$). No significant correlations were observed between other parameters.

Conclusions: RPE measured using the Borg Scale-10 is positively correlated with DOMS severity 24 hours after high-intensity sport-specific exercise in young elite soccer players. These findings suggest that RPE immediately post-exercise may serve as a predictor of DOMS severity, and may help to optimize post-exercise recovery strategies.

Mouth Rinsing with Solutions of Different Taste Properties as an Ergogenic Aid in Team Sports: A Systematic Review of the Literature

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Objective: To study the effects of mouth rinsing with solutions of different taste characteristics on performance indicators and internal load parameters in team sport athletes.

Data Sources: A systematic review was conducted according to PRISMA guidelines with pre-defined PICOS criteria. Publication searches were performed in the Cochrane Library, PubMed, and Mendeley databases. Study quality was assessed using the Cochrane risk-of-bias tool for randomized trials (RoB2).

Main Results: Fifteen studies involving 246 team sport athletes met the inclusion criteria, all with a low risk of bias. Carbohydrate-based solutions (CHO MR) were the most commonly studied ($n = 8$), followed by carbohydrate-caffeine solutions (CHO + CAF MR, $n = 3$), caffeine-based solutions (CAF MR, $n = 2$), menthol-based solutions (MEN MR, $n = 2$), and capsaicin-based solutions (CAP MR, $n = 1$). Key performance outcomes included speed-strength parameters, external and internal load, repeated sprint ability, endurance, perceptual skills, and thermal sensation. CHO MR showed no ergogenic effect when used before physical activity but demonstrated significant positive effects on speed-strength

parameters and internal load when used during training. CHO + CAF MR or CAF MR improved speed-strength, perceptual skills, and external and internal load parameters when used pre-activity but had no ergogenic effect during training. MEN MR positively influenced thermal sensation when used during physical activity. CAP MR, evaluated in only 1 study, showed no significant effects on performance or thermal sensation. None of the studies reported adverse effects or negative impacts on performance, internal, or external load for any solution type.

Conclusions: Mouth rinsing with carbohydrate solutions during physical activity and caffeine or carbohydrate-caffeine solutions before physical activity can be used as ergogenic aids to enhance performance in team sport athletes. Mouth rinsing with menthol solutions during physical activity improves thermal sensation. Further research, particularly involving professional athletes, is needed to develop precise recommendations.

The Use of Dual-energy X-ray Absorptiometry in Evaluating Recovery following Musculoskeletal Injuries in Athletes—A Scoping Review

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Objective: Dual-energy X-ray absorptiometry (DEXA) is widely used in sports medicine and orthopaedics for its accuracy in assessing bone mineral density (BMD) and body composition. Monitoring these parameters offers insights into recovery after musculoskeletal injuries common among athletes. This scoping review evaluates how DEXA guides rehabilitation by tracking BMD and body composition changes.

Data Sources: The review follows PRISMA guidelines. Literature searches were conducted in Ovid MEDLINE, EMBASE, Cochrane Central, and SportDISCUS databases (2000-2024). Reference lists of included articles were screened for eligibility. Studies were included if they used DEXA to measure BMD or body composition changes in athletes post-injury. Two reviewers independently screened articles, resolving discrepancies through discussion. Data were synthesized qualitatively, with thematic analysis identifying trends and patterns.

Main Results: From 1132 records, 12 studies were selected, covering 319 athletes (34% female) with injuries such as ACL tears, lumbar stress fractures, femoroacetabular impingement, and Achilles ruptures across various sports like soccer, basketball, and triathlons. DEXA scans revealed significant BMD declines in injured limbs shortly after injury—up to 7% following ACL reconstruction—lasting up to 2 years in some cases. Lean mass also decreased during immobilization, especially in the affected limb, but improved with structured

rehabilitation involving diet and exercise. Recovery varied by injury and rehabilitation strategy. Innovative approaches like blood flow restriction therapy and combined running/isometric exercises better preserved BMD and lean mass compared to traditional rehab programs focused on kinetic chain exercises.

Conclusions: This scoping review identifies that DEXA imaging is an emerging tool in orthopaedic sports medicine for evaluating the effects of injury and intervention on body composition of athletes. DEXA provides valuable insights into the injury and recovery process by enabling the monitoring of BMD and body composition changes over time. Its ability to detect subtle changes in bone and muscle health make it a potentially useful tool for evaluating rehabilitation and framing return-to-sport discussions. Future studies are needed to understand how the results of DEXA imaging can be effectively integrated into sport- and athlete-specific rehabilitation protocols with validated targets/thresholds for return-to-play.

Comparison of Painful Accessory Navicular Treatment in Young Athletes and Nonathletes: A Systematic Review of the Literature

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Objective: This systematic review explored reported outcomes of surgeries performed on the accessory navicular (AN). Differences in treatment of AN between young athletes and nonathletes were analyzed.

Data Sources: PubMed database was searched for studies involving treatment of AN. Reviewers conducted a full-text review of eligible studies and the references of these studies. Inclusion and exclusion criteria were applied to the searched studies, data was extracted, and a quality assessment was completed for included studies.

Main Results: We identified 8 eligible articles, including 2 systematic reviews. These studies involve 701 feet with AN in total. The most commonly reported operations were modified Kidner procedures (246, 35%). AN usually exists asymptotically, its prevalence is reported up to 25%. Athletes have more pressure on their feet, that's why symptomatic AN is more common among sportsmen. Conservative treatment demonstrates less effectiveness on athletes (6.9%) than on nonathletes (34%), that's why more aggressive surgical treatment for athletes is required. There are 3 different types of surgeries: AN excision, the Kidner procedure and osteosynthesis. For adult nonathletes, whose activity doesn't include high pressure on feet, various modified Kidner procedures are used. These procedures show low complication rates, but recurrent pain can occur after the surgery. Mostly, pain in the area of AN is caused by its movement and contact with surrounded tissues. Children's bones, whose processes of osteogenesis are still going, are more likely to coalesce. Bone union between AN and primary navicular bone rarely (10%-14%) occurs in young athletes with the disappearance of symptoms, that's why there was developed a special method to help this process. Percutaneous drilling of the synchondrosis

between accessory and primary bones causes damage in osteal tissue and activates the processes of fusion. Results demonstrate that the younger athlete is, the more likely the procedure will be successful.

Conclusions: This review demonstrates that the treatment of painful AN in young athletes and nonathletes differs. The modified Kidner operation causes low percentage of complications. However, less traumatic methods are being developed to decrease damaging effect on surrounding tissues. It seems logical to try mini-invasive operations of bone fusion at first.

Assessing the Implementation of a Self-Referral Acute Musculoskeletal Injury Clinic: Experience in a Tertiary, Rural Practice

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Objective: Pathways for patient referral to specialist musculoskeletal care are fragmented and poorly integrated with other services. These systems lead to delays in diagnosis, treatment, and access to specialist care. To address these issues, a rural tertiary sport medicine clinic initiated a team-based self-referral Acute Injury Clinic (AIC). The objectives were to determine utilization and access, the type and incidence of injuries, and the time to tertiary or definitive care.

Study Design: Case Series.

Subjects: Nine hundred and forty-five patients assessed at the AIC between December 2022 and October 2024.

Outcome Measures: Outcomes included time from injury to AIC assessment, confirmation of an acute injury, injury site, activity at the time of injury, demographic data, diagnostic imaging utilisation, diagnosis, and time from AIC assessment to orthopaedic consult and surgery.

Results: Five hundred and one (53.0%) males and 444 (47.0%) females accessed AIC. Patients ranged in age from 7 to 97, with a mean age of 37.7 (SD = 17.9). Preliminary analysis of the March to October 2023 consultations (n = 262) indicated the mean time from injury to AIC assessment was 9.6 days (SD = 9.2) and 222 (84.7%) injuries were acute (<10 days). Diagnostic imaging was required for 137 patients (61.7%). A definitive diagnosis was determined for 231 patients (88.2%), with 31 (11.8%) requiring further investigation. The most common activity at the time of injury was skiing or snowboarding (n = 76, 29.0%), followed by slips or falls (n = 19, 7.3%), and biking (n = 17, 6.5%). The most common sites of injury were the knee (n = 147, 56.1%), shoulder (n = 50, 19.1%), and ankle (n = 22, 8.4%). The most common diagnosis was anterior cruciate ligament injury (37.4%). Thirty-four ACL injuries (61.8%) underwent surgery with a mean time of 98.9 days (range = 0-398) and 218 days (range = 20-575) from AIC assessment to consent for ACL surgery, and to surgery respectively. Further analysis of the additional AIC consultations will be conducted.

Conclusions: Preliminary results indicate a successful implementation of a self-referral acute injury clinic, with 88% of consultations resulting in a diagnosis within 10 days of injury. Less than 12% of patients required further investigations. Time to orthopaedic surgery consultation and surgery was reduced compared with provincial care reporting.

Individualized Technique Feedback Reduces Knee Abduction Loading during Cutting Movements in Female University Soccer & Basketball Athletes: Implications for ACL Injury Prevention

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Objective: To determine the effectiveness of providing individualized movement technique feedback on external knee abduction moments (KAM) during 180- and 90-degree cutting maneuvers.

Study Design: Repeated measures design.

Subjects: Thirty-four members of the University of Calgary women's soccer and basketball teams.

Intervention/Observation Technique: For baseline assessment, 3 successful preplanned 180 degrees and 90 degrees cutting trials were recorded for both legs while ground reaction forces (Kistler, 2400 Hz) and 3D motion capture (Nexus, 240 Hz) were collected simultaneously. After these trials, players received individualized feedback on their foot strike angle ("land softly on your forefoot instead of your heel"), foot progression angle ("land with your toes facing forward rather than turned inwards"), or trunk lean angle ("place most of your weight on your inside leg"—only used for the 180 degrees cut) based on established cut-off values derived from previous data collected from this same cohort. Following feedback, 3 additional trials of each task were performed for both legs to assess the impact of the cues. If a trial after feedback was slower by >5% than the mean baseline velocity, the trial was repeated to ensure KAM was changed due to the feedback rather than the cutting speed. Paired t-tests were used to assess differences between baseline and feedback trials.

Outcome Measures: Peak external KAM within the first 100 ms of ground contact and kinematic technique variables.

Results: The forefoot strike angle cue resulted in a more pronounced forefoot landing with greater plantar flexion at initial contact for the 180 degrees and 90 degrees tasks (+5.27 degrees, $P < 0.001$, and +8.62 degrees, $P < 0.001$ respectively) and reduced peak external KAM loading (-16.2%, $P = 0.002$, and -39.3%, $P < 0.001$ respectively). The foot progression angle cue influenced a closer to neutral foot alignment for the 180 degrees and 90 degrees tasks (-7.24 degrees, $P = 0.02$, and -26.72 degrees, $P = 0.003$ respectively) and reduced peak external KAM loading (-24.7%, $P = 0.002$, and -49.1%, $P = 0.028$ respectively). The trunk lean cue did not result in significant technique

(+0.26 degrees, $P = 0.955$) or external KAM changes (+10.6%, $P = 0.074$).

Conclusions: Individualized technique feedback can successfully influence immediate technique change and reduce external KAM. Individualized injury prevention programs with inclusion of change of direction technique training may be of interest for athletes involved in sports with cutting and deceleration maneuvers.

Identification and Treatment of Relative Energy Deficiency in Sport (REDs) By Canadian Family Physicians: A Cross-Sectional, Survey-based Study

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Objective: Relative Energy Deficiency in Sport (REDs) is a syndrome of impaired physiological function and athletic performance in male and female athletes secondary to low energy availability. Family physicians are first line providers who can identify and treat REDs, but research suggests that they have low knowledge and confidence in treating it. The objective was to assess Canadian family physicians' knowledge of REDs, as well as how they identify and treat the condition. A second objective was to assess how family physicians prescribe and monitor contraception for patients with REDs.

Study Design: Cross-sectional survey.

Subjects: Fifty-six family physicians practicing in Canada. The majority were female (71.4%), with the most common age group being 35 to 44 (38.9%). Sports Medicine was the most common area of enhanced skills training (15.3%).

Intervention Technique: A novel online survey of 24 questions was sent to 10 national/provincial Family Medicine Colleges and 17 Family Medicine academic institutions.

Outcome Measures: Knowledge of REDs, investigation and management practices for patients with signs and/or symptoms of REDs, and advice on future directions to take in family medicine REDs education. Descriptive statistics were analyzed using Excel and SPSS.

Results: While 76.5% of participants correctly identified signs and symptoms of REDs, 60.4% had experience managing the condition. The most common investigations were laboratory investigations/bloodwork (54.3%) and eating disorder screening (52%). The most common management strategies included mental health counseling (54.4%) and vitamin D supplementation (51.2%). Eighty-four percent reported they would prescribe contraception to patients with REDs, with 26% prescribing oral contraceptives (OCPs) specifically to treat amenorrhea. OCPs are not considered best practice, as they can mask the return of spontaneous menses and allow continued bone loss until energy deficits are corrected. Most participants (96%) agreed that more REDs education would be beneficial.

Conclusions: Although Canadian family physicians exhibit knowledge of REDs, there is variation in how they assess and manage the condition. OCPs are being prescribed to patients with REDs without addressing underlying energy deficits. Further resources and training on REDs for family physicians may be beneficial.

CASEM 2025 Abstract

Outcomes from the “Active Lifestyle by Addressing Behavioral-Economics Cognitive-Biases, the A-B-C Program”: A Quasi-Experimental Study to Explore the Efficacy of the A-B-C Program in Retaining Physical Activity Among Sedentary Adults

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Objective: Explore effectiveness of the A-B-C program for increasing levels of physical activity post-intervention and at follow-up among sedentary adults.

Study Design: Quasi-experimental study design.

Subjects: Twenty sedentary individuals between ages 35 to 65, M:F ratio 2:18, maximum duration of physical activity ≤ 60 minutes per week.

Intervention: The A-B-C program includes 8 twice-weekly group sessions over 4 weeks; sessions aim at changing the cognitive processes of daily decision making in the context of physical activity. The A-B-C program integrates concepts from sports medicine, physical activity health guidelines, logotherapy, neurological mechanisms of motivation, behavioral economics, and cognitive behavioral therapy. Sessions do not include practical exercise training.

Outcome Measures: Primary: weekly duration of moderate-physical activity (reported in daily program-journal). Secondary: depressive symptoms (PHQ-9) and self-esteem

(RSE). Wilcoxon signed-ranks tests was used to conduct a paired difference test of repeated measurements on a single sample to assess whether population mean ranks differ.

Results: Twenty participants enrolled in the program. Twelve participants completed the program and all evaluations. Attendance rate ranged between 87.5% to 100%. The A-B-C program demonstrated significant increase in weekly duration of physical activity pre-post-intervention ($Z = -3.089$, $P = 0.002$), which were maintained at follow-up compared to baseline ($Z = -3.081$, $P = 0.002$). Depressive symptoms improved significantly pre-post-intervention ($Z = -1.980$, $P = 0.048$), and were maintained at follow-up ($Z = -2.809$, $P = 0.005$). Self-esteem improved significantly post-intervention ($Z = -2.227$, $P = 0.026$) and maintained at follow-up compared to baseline ($Z = -3.072$, $P = 0.002$).

Conclusions: The A-B-C program shows promising results for promoting an active lifestyle. Most importantly, increased duration of physical activity post-intervention was maintained at follow-up. Interestingly, the A-B-C program did not aim at improving depressive symptoms or self-esteem, though these outcomes were significantly improved post-intervention and also maintained at follow-up. This may be attributed either to the increased levels of physical activity, or to direct effect from the unique skills of cognitive restructuring learned during the program; this should be explored further. The A-B-C program therefore suggests effective promotion of an active lifestyle which may consequently improve public health and reduce the major economic burden from healthcare costs related to sedentary behavior.

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