

# 24” for HEALTH N°1, 2018.



# Carta del Presidente

Unas breves líneas para daros la bienvenida al **24" FOR HEALTH**. Se trata de un nuevo proyecto trimestral de la Asociación Española de Médicos de Baloncesto.

El objetivo del mismo es poner a vuestra disposición, las últimas publicaciones relacionadas con la medicina y aplicables al baloncesto, así como otras novedades científicas que respondan a nuestras necesidades formativas.

Pretendemos recoger, en cada número, publicaciones relevantes en todas las áreas de conocimiento, que sean de interés para nuestra Asociación (Traumatología, Rehabilitación, Cardiología, Dopaje, Mujer, baloncesto de formación, Nutrición...).

Quiero felicitar al grupo de trabajo que ha lanzado este proyecto, por el excelente resultado conseguido.

Os agradeceremos vuestras aportaciones, así como vuestras sugerencias.



**Dr. Francisco José Sarasa Oliván**  
Presidente de la AEMB.

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*Effect of Hip-Focused Injury Prevention Training for Anterior Cruciate Ligament Injury Reduction in Female Basketball Players: A 12-Year Prospective Intervention Study.*

Omi Y1,2, Sugimoto D3,4, Kuriyama S5,6, Kurihara T2, Miyamoto K7, Yun S8, Kawashima T9, Hirose N10.

**BACKGROUND:**

Programs to prevent anterior cruciate ligament (ACL) injuries in female basketball players are scarce. Also, ACL injury prevention training that focuses on hip joint function has not been reported.

**PURPOSE:**

To determine the effectiveness of a hip-focused ACL injury prevention program in female basketball players.

**STUDY DESIGN:**

Cohort study; Level of evidence, 2.

**METHODS:**

A prospective intervention study was conducted for 12 years. Incidence rates of ACL injuries were collected in the first 4 years (observation period) from college female basketball players. After the observation period, a hip-focused ACL injury prevention program was implemented for 8 years (intervention period). A total of 309 players (mean  $\pm$  SD age,  $19.6 \pm 1.2$  years; height,  $163.7 \pm 5.6$  cm; weight,  $59.1 \pm 5.1$  kg; body mass index,  $22.0 \pm 1.4$ ) were tracked in the observation period and compared with 448 players (age,  $19.6 \pm 1.1$  years; height,  $162.6 \pm 5.8$  cm; weight,  $58.0 \pm 5.7$  kg; body mass index,  $21.9 \pm 1.5$ ) who participated in the intervention period. Athlete-exposures (AEs), ACL numbers and mechanisms of injury (MOIs), relative risk (RR), absolute risk reduction (ARR), numbers needed to treat (NNT), and compliance were analyzed.

**RESULTS:**

There were 16 ACL injuries (13 noncontact MOIs) in the 4-year observation period, whereas 9 ACL injuries (8 noncontact MOIs) were recorded in the 8-year intervention period. The overall ACL injury incidence was 0.25/1000 AEs in the 4-year observation period compared with 0.10/1000 AEs in the 8-year intervention period, respectively. Compared with the 4-year observation period, significant RR reduction was observed (0.38; 95% CI, 0.17-0.87;  $P = .017$ ) with ARR and NNT of 0.032 (95% CI, 0.027-0.037) and 31.6 (95% CI, 27.1-37.7), respectively, in the 8-year intervention period. The noncontact ACL injury incidence was 0.21 per 1000 AEs during the 4-year observation period compared with 0.08/1000 AEs in the 8-year intervention period, which also showed significant RR reduction (0.37; 95% CI, 0.15-0.92;  $P = .026$ ), with ARR and NNT of 0.024 (95% CI, 0.020-0.029) and 41.3 (95% CI, 34.6-51.3), respectively. The mean compliance rate during the intervention periods (8 years) was 89%.

**CONCLUSION:**

A hip-focused injury prevention program demonstrated significant reduction in the incidence of ACL injury in female collegiate basketball players.

<https://www.ncbi.nlm.nih.gov/pubmed/29360406>

*The 'Sequence of Prevention' for musculoskeletal injuries among recreational basketballers: a systematic review of the scientific literature.*

Kilic Ö1,2,3, Van Os V4, Kemler E5, Barendrecht M4, Goutteborge V1,2,3,5,6.

**OBJECTIVE:**

Currently, there is no overview of the incidence and (basketball-specific) risk factors of musculoskeletal injuries among recreational basketball players, nor any insight into the effect of preventive measures on the incidence of basketball injuries. This study aimed to gather systematically the scientific evidence on the incidence, prevalence, aetiology and preventive measures for musculoskeletal injuries among recreational basketball players.

**METHODS:**

Highly sensitive search strategies were built based on three groups of keywords (and related search terms). Two electronic databases were searched, namely Medline (biomedical literature) via Pubmed, and SPORTDiscus (sports and sports medicine literature) via EBSCOhost.

**RESULTS:**

The incidence of musculoskeletal injuries among recreational basketball players ranged from 0.0047 injuries per 1,000 athlete-exposures (AE) for dental injuries to 10.1 injuries per 1000 AE for overall injuries during match play. Significant risk factors for injuries were defending, postural sway, high vertical ground reaction force during jumping and weight >75 kg. All prevention studies have shown to have a significant effect on reducing the risk of injury ranging from an odds ratio (95% confidence interval (CI)) of 0.175 (0.049-0.626) for training injuries and a relative risk (95% CI) of 0.83 (0.57-1.19) achieved with FIFA 11+ prevention exercises and sport-specific balance training, relatively. **CONCLUSION:** In order to gain insight in the aetiology of basketball-specific injuries and consequently facilitate the development of preventive strategies, more high quality basketball-specific and injury-specific studies among recreational basketball players are needed.

<http://www.tandfonline.com/doi/full/10.1080/00913847.2018.1424496> ARTICULO COMPLETO



***Association between frontal plane knee control and lower extremity injuries: a prospective study on young team sport athletes.***

*Räisänen AM1, Pasanen K2,3, Krosshaug T4, Vasankari T3, Kannus P3, Heinonen A5, Kujala UM5, Avela J5, Perttunen J6, Parkkari J1.*

Poor frontal plane knee control can manifest as increased dynamic knee valgus during athletic tasks. The purpose of this study was to investigate the association between frontal plane knee control and the risk of acute lower extremity injuries. In addition, we wanted to study if the single-leg squat (SLS) test can be used as a screening tool to identify athletes with an increased injury risk.

**METHODS:**

A total of 306 basketball and floorball players participated in the baseline SLS test and a 12-month injury registration follow-up. Acute lower extremity time-loss injuries were registered. Frontal plane knee projection angles (FPKPA) during the SLS were calculated using a two-dimensional video analysis.

**RESULTS:**

Athletes displaying a high FPKPA were 2.7 times more likely to sustain a lower extremity injury (adjusted OR 2.67, 95% CI 1.23 to 5.83) and 2.4 times more likely to sustain an ankle injury (OR 2.37, 95% CI 1.13 to 4.98). There was no statistically significant association between FPKPA and knee injury (OR 1.49, 95% CI 0.56 to 3.98). The receiver operating characteristic curve analyses indicated poor combined sensitivity and specificity when FPKPA was used as a screening test for lower extremity injuries (area under the curve of 0.59) and ankle injuries (area under the curve of 0.58).

**CONCLUSIONS:**

Athletes displaying a large FPKPA in the SLS test had an elevated risk of acute lower extremity and ankle injuries. However, the SLS test is not sensitive and specific enough to be used as a screening tool for future injury risk.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5783037/>

***Delaying ACL reconstruction and treating with exercise therapy alone may alter prognostic factors for 5-year outcome: an exploratory analysis of the KANON trial***

Stephanie R Filbay,<sup>1</sup> Ewa M Roos,<sup>2</sup> Richard B Frobell,<sup>3</sup> Frank Roemer,<sup>3,4,5</sup> Jonas Ranstam,<sup>6</sup> L Stefan Lohmander<sup>3</sup>

**Aim**

Identify injury-related, patient-reported and treatment-related prognostic factors for 5-year outcomes in acutely ACL-ruptured individuals managed with early reconstruction plus exercise therapy, exercise therapy plus delayed reconstruction or exercise therapy alone.

**Methods**

Exploratory analysis of the Knee Anterior Cruciate Ligament, Nonsurgical versus Surgical Treatment (KANON) trial (ISRCTN84752559). Relationships between prognostic factors (baseline cartilage, meniscus and osteochondral damage, baseline extension deficit, baseline patient-reported outcomes, number of rehabilitation visits, graft/contralateral ACL rupture, non-ACL surgery and ACL treatment strategy) and 5-year Knee Injury and Osteoarthritis Outcome Score (KOOS) pain, symptoms, sport/recreation and quality of life (QOL) scores were explored using multivariable linear regression. Estimates were adjusted for sex, age, body mass index, preinjury activity level, education and smoking.

Results For all participants (n=118), graft/contralateral ACL rupture, non-ACL surgery and worse baseline 36-item Short-Form Mental Component Scores were associated with worse outcomes. Treatment with exercise therapy alone was a prognostic factor for less knee symptoms compared with early reconstruction plus exercise therapy (regression coefficient 10.1, 95% CI 2.3 to 17.9). Baseline meniscus lesion was associated with

worse sport/recreation function (–14.4, 95% CI –27.6 to –1.3) and osteochondral lesions were associated with

worse QOL (–12.3, 95% CI –24.3 to –0.4) following early reconstruction plus exercise therapy. In the same group, undergoing additional non-ACL surgery and worse baseline KOOS scores were prognostic for worse outcome on all KOOS subscales. Following delayed reconstruction, baseline meniscus damage was a prognostic factor for less pain (14.3, 95% CI 0.7 to 27.9). Following exercise therapy alone, undergoing non-ACL surgery was prognostic for worse pain.

**Conclusions**

Treatment-dependent differences in prognostic factors for 5-year outcomes may support individualised treatment after acute ACL rupture in young active individuals.

**Trial registration number**

Current Controlled Trials ISRCTN84752559.

***Spanish Consensus Statement: Clinical Management and Treatment of Tendinopathies in Sport.***

*Spanish Group for Tendon Consensus, Fernandez-Jaén T, Rey GÁ, Angulo F, Cuesta JA, Loureda RA, España FÁ, Ayala J, Matas RB, Pazos FB, de Dios Beas Jiménez J, Rosell JC, Fernandez CC, Del Pilar Doñoro Cuevas M, Ros FE, Colmenero JE, de Prado JF, García Cota JJ, Garrido González JI, de Vega CG, Santander MG, Herrador Munilla MÁ, Ruiz FI, Díaz FJ, Fernandez AM, Marqueta PM, Muñoz Benito JJ, Vilás RO, Pedret C, Teres XP, Amaro JP, Grifell JP, San Roque JP, Parenteu CR, Serna JR, Font GR, Álvarez MS, Marchori CS, Perez LT, Durán RU, Del Valle Soto M, Villalón Alonso JM, García PG.*

**Abstract**

On October 15, 2016, experts met at Clínica CEMTRO in Madrid, Spain, under the patronage of the Spanish Society for Sports Traumatology (SETRADE), the Spanish Society of Sports Medicine (SEMED), the Spanish Association of Medical Services for Football Clubs (AEMEF), the Spanish Association of Medical Services for Basketball Clubs (AEMB), F.C. Barcelona, and Clínica CEMTRO. The purpose was to consider the most appropriate clinical management and treatment of tendinopathies in sports, based on proven scientific data described in the medical literature as well as on each expert's experience. Prior to the meeting, each expert received a questionnaire regarding clinical management and treatment of tendinopathies in sports. The present consensus document summarizes the answers to the questionnaire and the resulting discussion and consensus regarding current concepts on tendinopathies in sports.

**KEYWORDS:**

consensus statement; injuries; tendinopathy; tendon; therapeutic guide; treatment

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5783037/>

## ***The Impact and Functional Outcomes of Achilles Tendon Pathology in National Basketball Association Players.***

*Amin NH1, McCullough KC2, Mills GL3, Jones MH4, Cerynik DL5, Rosneck J4, Parker RD4.*

Achilles tendon rupture within professional athletes has been shown to lead to devastating consequences regarding return to athletic performance. Not only can this devastating injury affect performance for the remainder of player's career, it frequently becomes a career-ending event. Considering these significant risks associated with complete rupture, the purpose of this study was to evaluate NBA players with a spectrum of reported Achilles tendon pathology, from tendinopathy (insertional and non-insertional) to complete rupture. Between the 1988-1989 and 2010-2011 NBA seasons, we identified 43 cases of Achilles tendon pathology treated non-operatively. A control group was matched for the players able to return to play with the following parameters: age, position played, number of seasons played in the league, and similarly rated career performance statistics. Considering the medical staff, trainers and facilities available to a professional athlete, a "weekend warrior" should be counseled that even in optimal conditions, 14% of NBA players were unable to return to function/play after Achilles tendinopathy, and that those who were able to return did so at a decreased level of performance. In conclusion, players with Achilles tendinopathy have a better chance to return if they are younger in age and early in their professional career. Furthermore, the association between Achilles pathology and decline in player performance is an important message to convey to coaching staff and team management to allow properly informed decisions when these conditions arise.

*<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5659361/> ARTICULO COMPLETO*



***Epidemiology of Overuse Injuries in Youth Team Sports: A 3-year Prospective Study.***

*Leppänen M1, Pasanen K1, Kannus P2, Vasankari T3, Kujala UM4, Heinonen A4, Parkkari J1.*

Prospective studies on overuse injuries and their impact on athletic training among youth team sports are scarce. The purpose of this study was to investigate the incidence, severity and player related risk factors of overuse injuries among young (12-20 years) basketball and floorball players. A total of 387 players participated in a 3-year prospective study. Each player completed a baseline questionnaire regarding their background information. Overuse injuries that prevented players to fully or partly participate in their regular training were collected. In all, 204 overuse injuries were registered (injury incidence 1.51 injuries/1 000 h of exposure; 95% CI 1.35-1.78). Most of the injuries involved the knee (35%) and lower back (21%), and were classified as severe (44%). Injury incidence was 1.51 (95% CI 1.2-1.82) and 1.61 (95% CI 1.32-1.91) in basketball and floorball, respectively. Incidence was significantly higher among female compared with male players (incidence rate ratio 1.58; 95% CI 1.20-2.09). Previous injury and playing at adult level were the strongest factors associated with occurrence of an overuse injury. In conclusion, overuse injuries of the knee and low back are relatively common in youth basketball and floorball. Effective prevention strategies as well as training load monitoring is needed in youth team sports

<https://www.ncbi.nlm.nih.gov/pubmed/28895620> No articulo libre

***Back pain in elite sports: A cross-sectional study on 1114 athletes.***

*Fett D1, Trompeter K1, Platen P1.*

**OBJECTIVES:**

To establish the prevalence of back pain in German elite athletes; examine the influence of age, sex, sports discipline and training volume; and compare elite athletes with a physically active control group.

**METHODS:**

EA standardized and validated online back pain questionnaire was sent by the German Olympic Sports Confederation to approximately 4,000 German national and international elite athletes, and a control group of 253 physically active but non-elite sports students.

**CONCLUSIONS:**

Back pain is a common complaint in German elite athletes. Low back pain seems to be a problem in both elite athletes and physically active controls. A high training volume in elite athletes and a low training volume in physically active individuals might increase prevalence rates. Our findings indicate the necessity for specific prevention programs, especially in high-risk sports. Further research should investigate the optimal dose-effect relationship of sporting activity for the general population to prevent back pain.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5491135/>

*Predictors of clinical recovery from concussion: a systematic review.*

Iverson GL<sup>1,2</sup>, Gardner AJ<sup>3</sup>, Terry DP<sup>1,2</sup>, Ponsford JL<sup>4</sup>, Sills AK<sup>5</sup>, Broshek DK<sup>6</sup>, Solomon GS<sup>7</sup>.

**OBJECTIVE:**

A systematic review of factors that might be associated with, or influence, clinical recovery from sport-related concussion.

Clinical recovery was defined functionally as a return to normal activities, including school and sports, following injury.

**DESIGN:**

Systematic review.

**DATA SOURCES:**

PubMed, PsycINFO, MEDLINE, CINAHL, Cochrane Library, EMBASE, SPORTDiscus, Scopus and Web of Science.

**ELIGIBILITY CRITERIA FOR SELECTING STUDIES:**

Studies published by June of 2016 that addressed clinical recovery from concussion.

**RESULTS:**

A total of 7617 articles were identified using the search strategy, and 101 articles were included. There are major methodological differences across the studies. Many different clinical outcomes were measured, such as symptoms, cognition, balance, return to school and return to sports, although symptom outcomes were the most frequently measured. The most consistent predictor of slower recovery from concussion is the severity of a person's acute and subacute symptoms. The development of subacute problems with headaches or depression is likely a risk factor for persistent symptoms lasting greater than a month. Those with a preinjury history of mental health problems appear to be at greater risk for having persistent symptoms. Those with attention deficit hyperactivity disorder (ADHD) or learning disabilities do not appear to be at substantially greater risk. There is some evidence that the teenage years, particularly high school, might be the most vulnerable time period for having persistent symptoms-with greater risk for girls than boys.

**CONCLUSION:**

The literature on clinical recovery from sport-related concussion has grown dramatically, is mostly mixed, but some factors have emerged as being related to outcome.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5466929/>

## Consensus statement

### ***2018 International Olympic Committee consensus statement on prevention, diagnosis and management of paediatric anterior cruciate ligament (ACL) injuries***

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In October 2017, the International Olympic Committee hosted an international expert group of physiotherapists and orthopaedic surgeons who specialise in treating and researching paediatric ACL injuries. Representatives from the American Orthopaedic Society for Sports Medicine, European Paediatric Orthopaedic Society, European Society for Sports Traumatology, Knee Surgery & Arthroscopy, International Society of Arthroscopy Knee Surgery and Orthopaedic Sports Medicine, Pediatric Orthopaedic Society of North America and Sociedad Latinoamericana de Artroscopia, Rodilla y Deporte attended. Physiotherapists and orthopaedic surgeons with clinical and research experience in the field, and an ethics expert with substantial experience in the area of sports injuries also participated. Injury management is challenging in the current landscape of clinical uncertainty and limited scientific knowledge. Injury management decisions also occur against the backdrop of the complexity of shared decision-making with children and the potential long-term ramifications of the injury. This consensus statement addresses six fundamental clinical questions regarding the prevention, diagnosis and management of paediatric ACL injuries. The aim of this consensus statement is to provide a comprehensive, evidence-informed summary to support the clinician, and help children with ACL injury and their parents/guardians make the best possible decisions.

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<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5466929/>

***Electrocardiographic Findings in National Basketball Association Athletes.***

Waase MP<sup>1</sup>, Mutharasan RK<sup>2</sup>, Whang W<sup>1</sup>, DiTullio MR<sup>1</sup>, DiFiori JP<sup>3,4,5</sup>, Callahan L<sup>6</sup>, Mancell J<sup>7</sup>, Phelan D<sup>8,9</sup>, Schwartz A<sup>1</sup>, Homma S<sup>1</sup>, Engel DJ<sup>1</sup>.

**IMPORTANCE:**

While it is known that long-term intensive athletic training is associated with cardiac structural changes that can be reflected on surface electrocardiograms (ECGs), there is a paucity of sport-specific ECG data. This study seeks to clarify the applicability of existing athlete ECG interpretation criteria to elite basketball players, an athlete group shown to develop significant athletic cardiac remodeling.

**OBJECTIVE:**

To generate normative ECG data for National Basketball Association (NBA) athletes and to assess the accuracy of athlete ECG interpretation criteria in this population.

**DESIGN, SETTING, AND PARTICIPANTS:**

The NBA has partnered with Columbia University Medical Center to annually perform a review of policy-mandated annual preseason ECGs and stress echocardiograms for all players and predraft participants. This observational study includes the preseason ECG examinations of NBA athletes who participated in the 2013-2014 and 2014-2015 seasons, plus all participants in the 2014 and 2015 NBA predraft combines. Examinations were performed from July 2013 to May 2015. Data analysis was performed between December 2015 and March 2017.

**EXPOSURES:**

Active roster or draft status in the NBA and routine preseason ECGs and echocardiograms.

**MAIN OUTCOMES AND MEASURES:**

Baseline quantitative ECG variables were measured and ECG data qualitatively analyzed using 3 existing, athlete-specific interpretation criteria: Seattle (2012), refined (2014), and international (2017). Abnormal ECG findings were compared with matched echocardiographic data.

**RESULTS:**

Of 519 male athletes, 409 (78.8%) were African American, 96 (18.5%) were white, and the remaining 14 (2.7%) were of other races/ethnicities; 115 were predraft combine participants, and the remaining 404 were on active rosters of NBA teams. The mean (SD) age was 24.8 (4.3) years. Physiologic, training-related changes were present in 462 (89.0%) athletes in the study. Under Seattle criteria, 131 (25.2%) had abnormal findings, compared with 108 (20.8%) and 81 (15.6%) under refined and international criteria, respectively. Increased age and increased left ventricular relative wall thickness (RWT) on echocardiogram were highly associated with abnormal ECG classifications; 17 of 186 athletes (9.1%) in the youngest age group (age 18-22 years) had abnormal ECGs compared with 36 of the 159 athletes (22.6%) in the oldest age group (age 27-39 years) (odds ratio, 2.9; 95% CI, 1.6-5.4;  $P < .001$ ). Abnormal T-wave inversions (TWI) were present in 32 athletes (6.2%), and this was associated with smaller left ventricular cavity size and increased RWT. One of the 172 athletes (0.6%) in the lowest RWT group (range, 0.24-0.35) had TWIs compared with 24 of the 163 athletes (14.7%) in the highest RWT group (range, 0.41-0.57) (odds ratio, 29.5; 95% CI, 3.9-221.0;  $P < .001$ ).



## **CONCLUSIONS AND RELEVANCE:**

Despite the improved specificity of the international recommendations over previous athlete-specific ECG criteria, abnormal ECG classification rates remain high in NBA athletes. The development of left ventricular concentric remodeling appears to have a significant influence on the prevalence of abnormal ECG classification and repolarization abnormalities in this athlete group.

***Comparison of Central Hemodynamic Parameters for Young Basketball Athletes and Control Group.***

Zhang Y, Fan X, Qi L, Xu L, Du C.

Long-term exercise training may have negative effects on cardiovascular functions. Measurement and calculation of central hemodynamic parameters can comprehensively evaluate the cardiovascular functions. This study aims to compare the central hemodynamics between young basketball athletes and matched controls.

**METHODS:**

Total 19 young long-term trained male basketball athletes and 17 matched male recreationally active controls participated. The central hemodynamic parameters such as central blood pressure, pulse pressure, heart rate (HR), augmentation index normalised to 75 bpm (AIx@HR75), augmentation index (AIx), ejection duration (ED), sub-endocardial viability ratio (SEVR) were measured, and total peripheral resistance (TPR), stroke volume (SV) and cardiac output (CO) were calculated. Non-parameter tests and t-test were used to analyse the central hemodynamic parameters between athletes and controls.

RESULTS: HR ( $56 \pm 5$  bpm versus  $79 \pm 9$  bpm,  $p < .001$ ), AIx@HR75 ( $-8 \pm 10\%$  versus  $-1 \pm 10\%$ ,  $p < .05$ ), ED ( $28 \pm 2\%$  versus  $36 \pm 3\%$ ,  $p < .001$ ) and TPR ( $0.004 \pm 0.006$  mmHg s/mL versus  $0.012 \pm 0.006$  mmHg s/mL,  $p < .001$ ) were significantly lower in basketball athletes compared to the controls. SEVR ( $231 \pm 32\%$  versus  $159 \pm 21\%$ ,  $p < .001$ ) and SV ( $154 \pm 50$  mL versus  $101 \pm 43$  mL,  $p < .01$ ) were significantly higher in basketball athletes than those in the controls. However, there were no significant differences in central blood pressure, pulse pressure, AIx and CO between them.

**CONCLUSIONS:**

There is no negative effect on central hemodynamics in young basketball athletes after long-term exercise training. The young basketball athletes have a higher myocardial perfusion, higher efficiency of blood supply, stronger vascular functions and better balance of myocardial oxygen of supply and demand than the controls in this central hemodynamic parameters analysis.

***Incidence and Etiology of Sudden Cardiac Death: New Updates for Athletic Departments.***

*Asif IM1, Harmon KG2.*

Sudden cardiac death (SCD) in a young athlete is a tragic event and is the leading medical cause of death in this population. The precise incidence of SCD in young athletes has been subject of debate, with studies reporting drastically different rates (1:917,000 athlete-years (AYs) to 1:3000 AYs) depending on the methodological design of the investigation or the targeted population.

**EVIDENCE ACQUISITION:**

A literature search was performed in PubMed using the terms: incidence, sudden cardiac death, sudden death, sudden cardiac arrest, etiology, pathology, registry, athlete, young, children, and adolescents. Articles were reviewed for relevance and included if they contained information on the incidence of SCD in athletes or young persons up to the age of 35 years.

**STUDY DESIGN:**

Clinical review.

**LEVEL OF EVIDENCE:**

Level 5.

**RESULTS:**

Studies of high quality and rigor consistently yield an incidence of 1:50,000 AYs in college athletes and between 1:50,000 and 1:80,000 AYs for high school athletes, with certain subgroups that appear to be at particularly high risk, including the following: men, basketball players, and African Americans. Initial reports suggest that the most common cause of SCD is hypertrophic cardiomyopathy (HCM). However, more comprehensive investigations in the United States and international populations-athletes, nonathletes, and military-support that the most common finding on autopsy in young individuals with SCD is actually a structurally normal heart (autopsy-negative sudden unexplained death).

**CONCLUSION:**

SCD is the leading cause of death in athletes during exercise and usually results from intrinsic cardiac conditions that are triggered by the physiologic demands of vigorous exercise. Current rates of SCD appear to be at least 4 to 5 times higher than previously estimated, with men, African Americans, and male basketball players being at greatest risk. Emerging data suggest that the leading finding associated with SCD in athletes is actually a structurally normal heart (autopsy-negative sudden unexplained death).

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5435153/>

***Athletic Cardiac Remodeling in US Professional Basketball Players.***

*Engel DJ, Schwartz A, Homma S.*

The incidence of sudden cardiac death is higher in US basketball players compared with other athlete groups. However, the recognition of the risk for sudden cardiac death among basketball players is challenging because little is known regarding athletic cardiac remodeling in these athletes or athletes of similarly increased size.

**OBJECTIVE:**

To perform a comprehensive cardiac structural analysis of National Basketball Association (NBA) professional athletes.

**DESIGN, SETTING, AND PARTICIPANTS:**

Echocardiographic observational study of NBA players on the active rosters for the 2013-2014 and 2014-2015 seasons was performed from December 16, 2013, to December 12, 2014. The policy of the NBA mandates annual preseason stress echocardiograms for each player. The NBA has sanctioned Columbia University Medical Center to conduct annual health and safety reviews of these echocardiograms. Data were analyzed from January to May 2015.

**MAIN OUTCOMES AND MEASURES:**

Cardiac variables assessed included left ventricular (LV) size, mass, wall thickness, and hypertrophy patterns and function; left atrial volume; and aortic root diameter. All dimensions were biometrically scaled.

**RESULTS:**

Of the 526 athletes included in the study, 406 (77.2%) were African American and 107 (20.3%) were white, with a mean (SD) age of 25.7 (4.3) years. Mean (SD) athlete height was 200.2 (8.8) cm; mean body surface area, 2.38 (0.19) m<sup>2</sup>. Left ventricular size and mass in NBA athletes were proportional to body size, extending to the uppermost biometrics of the cohort. Left ventricular hypertrophy was present in 144 athletes (27.4%). African American athletes had increased LV wall thickness (unadjusted mean, 11.2 mm; 95% CI, 11.1-11.3 mm) and LV mass (unadjusted mean, 106.3 g/m<sup>2</sup>; 95% CI, 104.6-108.0 g/m<sup>2</sup>) compared with LV wall thickness (unadjusted mean, 10.5 mm; 95% CI, 10.3-10.7 mm;  $P < .001$ ) and LV mass (unadjusted mean, 102.2 g/m<sup>2</sup>; 95% CI, 99.0-105.4 g/m<sup>2</sup>;  $P = .029$ ) in white athletes. The maximal aortic root diameter in the cohort was 42 mm. Aortic root diameters reached a plateau at the uppermost biometric variables. Five athletes (1.0%) had an LV ejection fraction of less than 50%, and all ventricles augmented normally with exercise.

**CONCLUSIONS AND RELEVANCE:**

This study provides normative cardiac data for a group of athletes with greater anthropometry than any previously studied athlete group and for a group known to have elevated rates of sudden cardiac death. These data can be incorporated into clinical assessments for the primary prevention of cardiac emergencies in basketball players and the athletic community at large.

***Comparison of body composition variables across a large sample of NCAA women athletes from six competitive sports.***

*Fields JB1, Metoyer CJ2,3, Casey JC4, Esco MR2, Jagim AR5, Jones MT1,6.*

Body composition (BC) plays a critical role in sport performance and athlete health. Body size and BC have been widely studied in men's sports, with reported changes observed over time. However, a paucity of current data exists in women athletes. The purpose of the current descriptive study was to measure and compare BC data for collegiate women athletes from six competitive sports. A total of 524 athletes from two NCAA institutions participated: basketball (BB; n = 95), gymnastics (GYM; n = 42), lacrosse (LAX; n = 81), rowing (ROW; n = 57), soccer (SOC; n = 188), and volleyball (VB; n = 61). Height (BH) and body mass (BM) were measured using a stadiometer and calibrated digital scale, respectively. Body fat percentage (BF%), fat mass (FM), and fat free mass (FFM) were assessed using air displacement plethysmography. One-way ANOVA was used to assess differences across sports. Least Squares Difference (LSD) post hoc analyses were performed when a significant finding ( $p \leq 0.05$ ) was identified. ROW had the highest BF% ( $29.9 \pm 6.1\%$ ), and BB the greatest FFM ( $57.2 \pm 6.1$  kg). GYM had the lowest BM ( $58.9 \pm 5.3$  kg), FM ( $11.6 \pm 2.6$  kg), and BH ( $158.73 \pm 2.13$  cm). LAX, SOC, and VB had similar BF%. BH was greatest for BB and VB ( $177.92 \pm 7.55$  cm,  $176.79 \pm 7.36$  cm, respectively). These data may assist in the establishment of descriptive values for use in goal setting and exercise programming. The current data demonstrate a trend toward increased body size and BC from previous research.

<https://www.ncbi.nlm.nih.gov/pubmed/29189580>



***Prevalence and risk of sport types to stress urinary incontinence in sportswomen: A cross-sectional study.***

Hagovska M1, Švihra J2, Buková A3, Dračková D3, Švihrová V4.

**OBJECTIVES:**

The objective of our study was to investigate the prevalence and risk of developing stress urinary incontinence (SUI) in each type of high-intensity sport, and the associated impact on quality of life in sportswomen.

**METHODS:**

This cross-sectional study was conducted between March and November 2016. The study included 278 sportswomen. The basic inclusion criteria were being nulliparous and engaging in high-intensity physical activity. The exclusion criteria were childbirth, surgical treatment of gynecological and urological illnesses and urinary tract infection. For evaluation were used: The International Physical Activity Questionnaire (IPAQ), The International Consultation on Incontinence Questionnaire Urinary Incontinence (ICIQ-UISF), the Overactive Bladder Questionnaire (OAB-q), the Urinary Incontinence Quality of Life Scale (I-QOL).

**RESULTS:**

The highest percentage of SUI was found in athletes (23.8%), followed by volleyball players (19.6%). We found that cumulative metabolic equivalent (MET) did not affect SUI, but the type of sport did. The risk of SUI was highest in volleyball sportswomen (odds ratio[OR] = 2.16, 95% confidence interval[CI] = 0.96-4.89,  $P < 0.05$ ) and athletes (OR = 2.56, 95%CI = 0.87-7.51,  $P = 0.08$ ). As assessed by the I- QOL, SUI in people who participated in fitness and athletics (e.g., basketball, volleyball and handball) had a negative impact on quality of life including behavior, psychosocial impacts and social embarrassment score.

**CONCLUSION:**

Volleyball players have a 116% chance of getting SUI compared to women who play other types of sports that were analyzed as part of this study. Healthcare professionals should inform the population of sportswomen with risk factors for SUI in order to implement preventive physiotherapy for strengthening pelvic floor muscles.

*Normative data on regional sweat-sodium concentrations of professional male team-sport athletes.*

Ranchordas MK1, Tiller NB1, Ramchandani G2, Jutley R3, Blow A3, Tye J3, Drury B4.

**BACKGROUND:**

The purpose of this paper was to report normative data on regional sweat-sodium concentrations of various professional male team-sport athletes, and to compare sweat-sodium concentrations among sports. Data to this effect would inform our understanding of athlete sodium requirements, thus allowing for the individualisation of sodium replacement strategies. Accordingly, data from 696 athletes (Soccer,  $n = 270$ ; Rugby,  $n = 181$ ; Baseball,  $n = 133$ ; American Football,  $n = 60$ ; Basketball,  $n = 52$ ) were compiled for a retrospective analysis. Regional sweat-sodium concentrations were collected using the pilocarpine iontophoresis method, and compared to self-reported measures collected via questionnaire.

**RESULTS:** Sweat-sodium concentrations were significantly higher ( $p < 0.05$ ) in American football ( $50.4 \pm 15.3 \text{ mmol} \cdot \text{L}^{-1}$ ), baseball ( $54.0 \pm 14.0 \text{ mmol} \cdot \text{L}^{-1}$ ), and basketball ( $48.3 \pm 14.0 \text{ mmol} \cdot \text{L}^{-1}$ ) than either soccer ( $43.2 \pm 12.0 \text{ mmol} \cdot \text{L}^{-1}$ ) or rugby ( $44.0 \pm 12.1 \text{ mmol} \cdot \text{L}^{-1}$ ), but with no differences among the N.American or British sports. There were strong positive correlations between sweat-sodium concentrations and self-reported sodium losses in American football ( $r_s = 0.962$ ,  $p < 0.001$ ), basketball ( $r_s = 0.953$ ,  $p < 0.001$ ), rugby ( $r_s = 0.813$ ,  $p < 0.001$ ), and soccer ( $r_s = 0.748$ ,  $p < 0.001$ ).

**CONCLUSIONS:**

The normative data provided on sweat-sodium concentrations might assist sports science/medicine practitioners in generating bespoke hydration and electrolyte-replacement strategies to meet the sodium demands of professional team-sport athletes. Moreover, these novel data suggest that self-reported measures of sodium loss might serve as an effective surrogate in the absence of direct measures; i.e., those which are more expensive or non-readily available.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5661918/>

*Energetic Profile of the Basketball Exercise Simulation Test in Junior Elite Players.*

Latzel R1, Hoos O1, Stier S1, Kaufmann S1, Fresz V1, Reim D1, Beneke R2.

**PURPOSE:**

To analyze the energetic profile of the basketball exercise simulation test (BEST).

**METHODS:**

10 male elite junior basketball players (age:  $15.5 \pm 0.6$  yrs, height:  $180 \pm 9$  cm, body mass:  $66.1 \pm 11.2$  kg) performed a modified BEST (20 circuits consisting of jumping, sprinting, jogging, shuffling, and short breaks) simulating professional basketball game play. Circuit time, sprint time, sprint decrement, oxygen uptake ( $\dot{V}O_2$ ), heart rate (HR), and blood lactate concentration (BLC) were obtained. Metabolic energy and metabolic power above rest ( $W_{tot}$ ,  $P_{tot}$ ) as well as energy share in terms of aerobic ( $W_{aer}$ ), glycolytic ( $W_{blc}$ ), and high energy phosphates ( $W_{pcr}$ ) were calculated from  $\dot{V}O_2$  during exercise, net lactate production, and the fast component of post-exercise  $\dot{V}O_2$  kinetics, respectively.

**RESULTS:**

$W_{aer}$ ,  $W_{blc}$ , and  $W_{pcr}$  reflect  $89 \pm 2\%$ ,  $5 \pm 1\%$ , and  $6 \pm 1\%$  of total energy needed, respectively. Assuming an aerobic replenishment of PCr energy stores during short breaks, the adjusted energy share yielded  $W_{aer}$ :  $66 \pm 4\%$ ,  $W_{blc}$ :  $5 \pm 1\%$ , and  $W_{pcr}$ :  $29 \pm 1\%$ .  $W_{aer}$  and  $W_{pcr}$  were negatively correlated ( $-0.72$ ,  $-0.59$ ) with sprint time, which was not the case for  $W_{blc}$ .

**CONCLUSIONS:**

Consistent with general findings on energy system interaction during repeated high intensity exercise bouts, the intermittent profile of the BEST relies primarily on aerobic energy combined with repetitive supplementation by anaerobic utilization of high energy phosphates.

<https://www.ncbi.nlm.nih.gov/pubmed/29182413>

24 ” for  
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# ¿CONOCES...?

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