SportsMed Update

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Contents:

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In healthy young asymptomatic baseball pitchers, a single session of pitching resulted in decreased shoulder range of motion (internal rotation and total range) as well as decreased elbow extension - these changes persisted 24 hours later

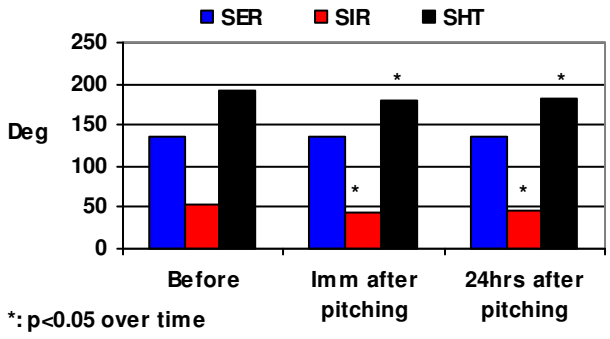
Title: Changes in shoulder and elbow passive range of motion after pitching in professional baseball players
Authors: Reinold MM, Wilk KE, Macrina LC, Sheheane C, Dun S, Fleisig GS, Crenshaw K, Andrews JR
Reference: Am J Sports Med 2008; 36(3): 523-527
Type of study: Controlled intervention study (laboratory)
Keywords: shoulder, pitching, baseball, flexibility, range of motion, throwing athlete, glenohumeral joint

EB Rating: 7.5/10 **CI Rating: 7/10**

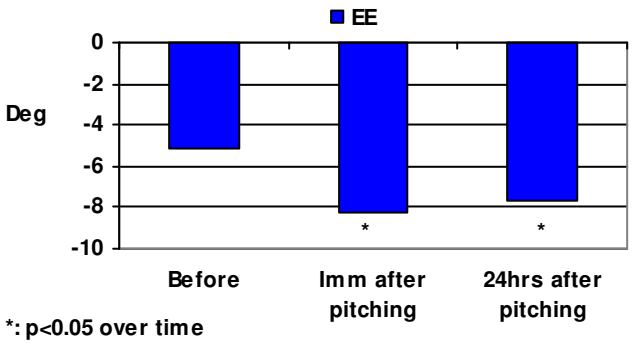
Background: It has been shown that the overhead throwing athlete develops altered range of motion patterns in the shoulder (decreased internal rotation) and elbow (decreased elbow extension) – however the acute effects of throwing (baseball pitching) on shoulder and elbow range of motion has not been studied
Research question/s: Is there a reduction in passive shoulder and elbow range of motion immediately after baseball pitching?

Methodology:
- Subjects: 67 asymptomatic male professional baseball pitchers (26±4 yrs, 92±10 kg, 171±5 cm)
- Experimental procedure: Athletes were assessed at the beginning of the season. Passive range of motion measurements (pilot tested for repeatability) were done before, immediately after, and 24 hours after pitching using a customized bubble goniometer (full capsular and bony end feel) for the following: shoulder external rotation (SER), shoulder internal rotation (SIR), total shoulder rotational motion (ST), elbow flexion (EF), and elbow extension (EE) on the dominant and non-dominant arms.
- Measures of outcome: Range of motion over time

Main finding/s:



*: p<0.05 over time



*: p<0.05 over time

- There were no differences in shoulder or elbow range of motion over time in the non-dominant side

Conclusion/s:
- In healthy young asymptomatic baseball pitchers, a single session of pitching resulted in decreased shoulder range of motion (internal rotation and total range) as well as decreased elbow extension - these changes persisted 24 hours later
- Eccentric muscle contractions during throwing may contribute to acute musculotendinous adaptations and altered range of motion

Methodological considerations:
Well conducted study

A soft commercial shoe insert with a flexible medial arch support can alter knee joint kinetics (promoting a medial force bias) during walking and running thereby increasing knee varus torque – these inserts should be prescribed with care

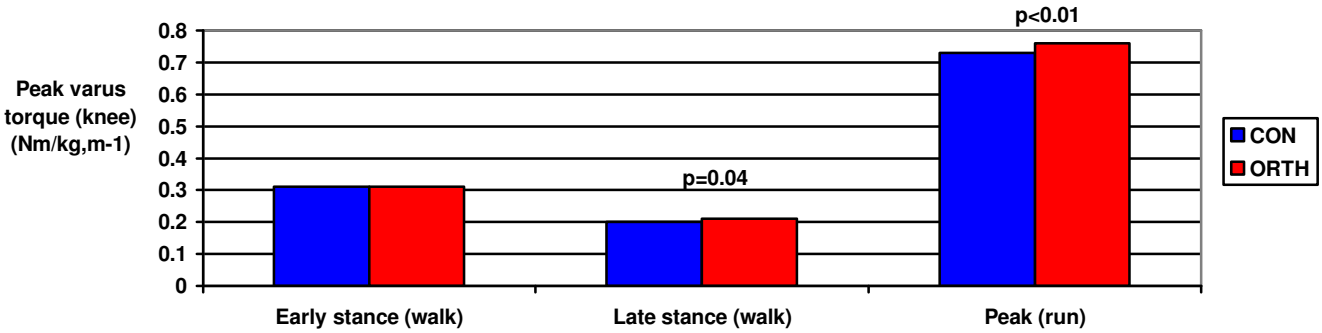
Title: The influence of arch supports on knee torques relevant to knee osteoarthritis
Authors: Franz JR, Dicharry J, Riley PO, Jackson K, Wilder RP, Kerrigan DC
Reference: Med Sci Sports Exerc 2008; 40(5): 913-917
Type of study: Controlled clinical trial (laboratory)
Keywords: knee, injury, osteoarthritis, footwear, orthotics, biomechanics, joint torques

EB Rating: 8/10 **CI Rating: 7/10**

Background: Footwear, including orthotics, may alter knee joint biomechanics and this may play a role in the development or treatment of osteoarthritis (OA) of the knee in particular the medial tibiofemoral compartment
Research question/s: Do commonly prescribed arch support cushions change the medial force bias during gait similar to medial-wedged orthotics, thereby increasing knee varus torque during both walking and running?

Methodology:
- Subjects: 22 active healthy adults (29.2±5.1 yrs) (male=12)
- Experimental procedure: All the subjects were assessed and then tested during self-selected walking (w) and running (r) speeds using either control shoes with (ORT) and without (CON) arch support cushions (Spenco full length arch support cushions). During walking and running, 3D motion capture data were collected together with ground reaction force (GRF) data using an instrumented treadmill
- Main measures of outcome: Peak external knee varus torque (Nm/kg/m) during walking (early stance and late stance) and running (calculated through a full inverse dynamic model)

Main finding/s:



Conclusion/s:
- A soft commercial shoe insert with a flexible medial arch support can alter knee joint kinetics (promoting a medial force bias) during walking and running thereby increasing knee varus torque – these inserts should be prescribed with care

Methodological considerations:
Well conducted study, non-blinded

An injury prevention exercise program (muscular strengthening, coordination, and flexibility) did not reduce the risk of developing overuse knee injuries or medial tibial stress syndrome in military recruits undergoing 3 months basic military training

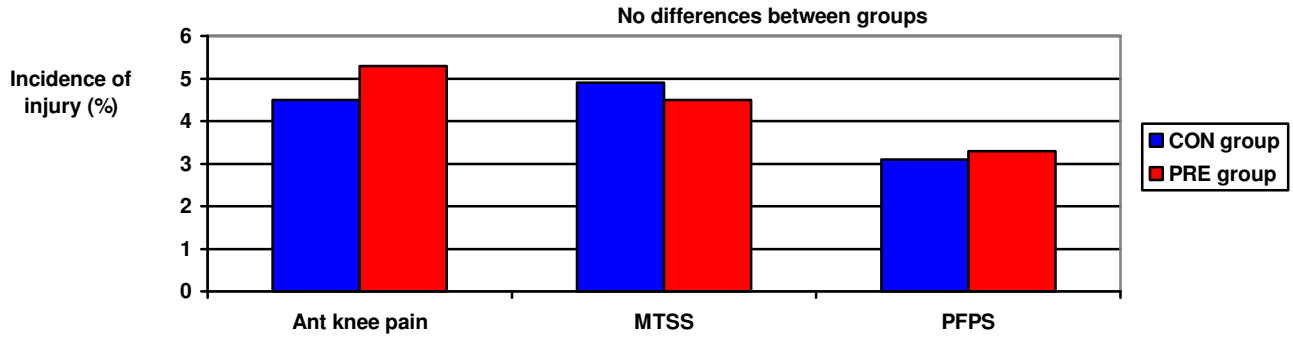
Title: Prevention of overuse injuries by a concurrent exercise program in subjects exposed to an increase in training load
Authors: Brushoj C, Larsen K, Albrecht-Beste E, Nielsen M B, Loye F, Holmich P
Reference: Am J Sports Med 2008; 36(4): 663-670
Type of study: Randomized, controlled, clinical trial
Keywords: injury, overuse, lower limb military training, prevention

EB Rating: 8/10 **CI Rating: 8/10**

Background: Lower extremity overuse injuries are common during rapid increases in training such as military training - it has been suggested that an exercise program to reduce intrinsic risk factors may decrease this risk
Research question/s: Does a preventive exercise training program that is performed concurrently with an increase in physical activity reduce the incidence of overuse knee injuries and medial tibial stress syndrome?

Methodology:
- Subjects: 1020 military recruits from 24 platoons (mean 20.9 yrs, 19-26 years)
- Experimental procedure: All the subjects underwent 3 months basic military training and platoons were randomly assigned to one of two exercise programs (15 min, 3/week) as follows: an injury prevention exercise program (PRE=487, 5 exercises for strength, flexibility, and coordination) or a control program (CON=490, 5 exercises for the upper body). 223 recruits reported lower extremity injuries during the 3 month study period (50 knee and 48 medial tibial stress syndrome - meeting the study criteria)
- Measures of outcome: Incidence (% recruits in 3 months) of injury (lower extremity, knee, medial tibial stress), running performance (12min run time)

Main finding/s:



- Injury incidence: There were no differences in the incidence of injury between the PRE and the CON groups
- Running performance: Subjects in the PRE group had the greater improvement in running distance in 12-minute run tests compared with those in the CON group (82 vs. 43 m; p=0.037)

Conclusion/s:
- An injury prevention exercise program (muscular strengthening, coordination, and flexibility) did not reduce the risk of developing overuse knee injuries or medial tibial stress syndrome in military recruits undergoing 3 months basic military training

Methodological considerations:
Well conducted study, training load (45 min per week) may be low

SMU Volume 8 (6) 1 p4: 2008 **Category: Medical / CVS / Cardiac rehabilitation**

A 3 month patient-centered modular prevention program can significantly improve coronary risk profile for patients with acute coronary syndrome when compared with conventional care – this may be an effective alternative for cardiac patients that do not have access to conventional cardiac rehabilitation

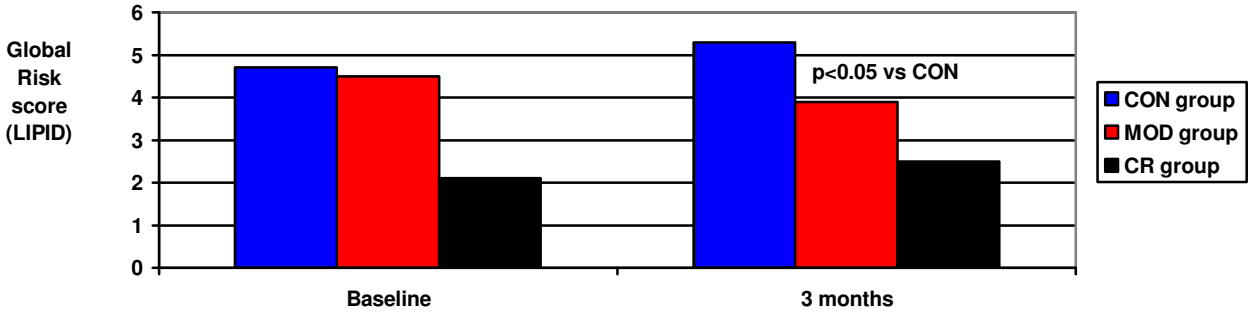
Title: Patient-centered modular secondary prevention following acute coronary syndrome
Authors: Redfern J, Briffa T, Ellis E, Freedman SB
Reference: J Cardiopul Rehab and Prevention 2008; 28: 107-115
Type of study: Randomized controlled trial
Keywords: coronary disease, rehabilitation, patient-centered care, risk factors, secondary prevention

EB Rating: 7.5/10 **CI Rating: 7.5/10**

Background: It is well established that cardiac rehabilitation (CR) is beneficial for coronary artery disease (CAD) but it is also known that the majority of patients do not attend CR
Research question/s: Does a modular prevention program reduce the risk factors in survivors of acute coronary syndrome (ACS) who did not access a conventional cardiac rehabilitation program?

Methodology:
- Subjects: 144 patients who survived an acute coronary syndrome (ACS) and reference group of ACS survivors participating in regular cardiac rehabilitation (CR= 64)
- Experimental procedure: All the subjects were assessed before the onset of the study and risk factors [lipids, blood pressure, BMI, physical activity (IPAC), psychological status (CDS score), smoking) and global risk (Long-Term Intervention with Pravastatin in Ischemic Disease (LIPID) score] was documented. Subjects were then randomly allocated to either a control group (CON=72, receiving conventional care) or modular group (MOD=72, participated in risk factor modules on the basis of patient-centered care and collaborative goal setting to systematically lower risk factors). Subjects were well matched for risk factor level at baseline. Repeat assessments were conducted at 3 months
- Measures of outcome: Risk factors and global risk

Main finding/s:
- Risk factors: Subjects in the MOD group had significant ($p<0.05$) reductions in risk factors compared with the CON group: total cholesterol (158±3.9 vs 186±3.9 mg/dL), systolic BP (134± 2.0 vs 144±2.4 mm Hg, BMI (29.9±0.7 vs 31.0±0.7 kg/m^2), physical activity (1187±164 vs 636±115 METS/kg/min), smoking (6% vs 23%)



Conclusion/s:
- A 3 month patient-centered modular prevention program can significantly improve coronary risk profile for patients with acute coronary syndrome when compared with conventional care – this may be an effective alternative for cardiac patients that do not have access to conventional cardiac rehabilitation

Methodological considerations:
Small sample sizes, short term follow-up

In a randomized controlled laboratory-based clinical trial, acute ingestion of oral glucocorticoid (20mg prednisolone), 3 hours before exercise, did not improve exercise performance but did alter some metabolic and hormonal parameters

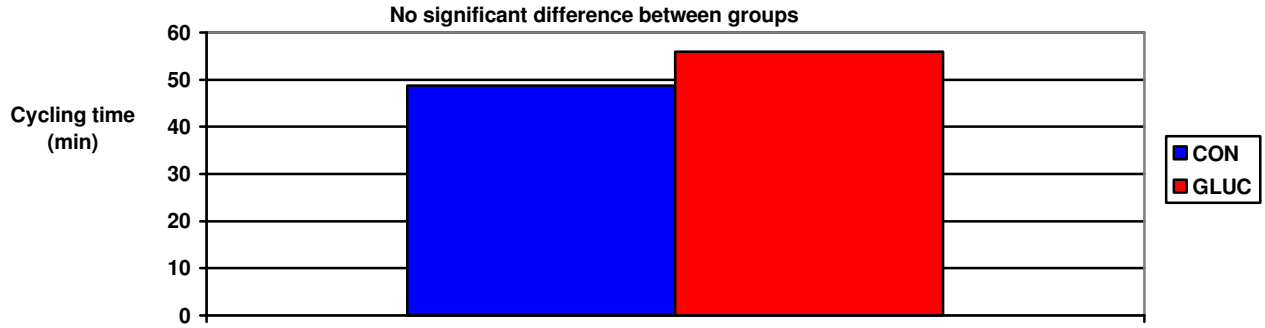
Title: Effects of acute prednisolone administration on exercise endurance and metabolism
Authors: Arlettaz A, Collomp K, Portier H, Lecoq A-M, Rieth N, Le Panse B, De Ceaurriz J
Reference: Br J Sports Med 2008; 42: 250-254
Type of study: Randomized, double-blind, placebo controlled clinical trial (laboratory)
Keywords: drugs, sports, ergogenic effects, glucocorticoids, oral, ingestion

EB Rating: 7.5/10 **CI Rating: 7.5/10**

Background: Systemic glucocorticoid drugs are banned by the World Anti-Doping Agency as possible performance enhancing substances – this effect of oral glucocorticoids has not been well studied
Research question/s: Does that administration of oral glucocorticoids (GC) alter performance and selected hormonal and metabolic variables during sub-maximal exercise?

Methodology:
- Subjects: 14 healthy recreational male athletes (25.2±2.8 yrs, 67.2±2.1 kg)
- Experimental procedure: All the subjects were assessed and then randomized to receive either a lactose placebo (CON) or oral glucocorticoid (GLUC=20 mg of prednisolone) 3 hrs before completing cycling trials at 70-75% VO_{2max} and continuing until exhaustion. Blood samples were collected at rest, after 10, 20, 30 minutes, and at exhaustion and recovery for growth hormone (GH), adrenocorticotropic hormone (ACTH), dehydroepiandrosterone (DHEA), prolactin, insulin, blood glucose, lactate and interleukin (IL)-6 determination
- Measures of outcome: cycling duration (min), blood hormonal changes, blood metabolic changes

Main finding/s:



- Hormonal changes: There was a significant decrease in ACTH and DHEA ($p<0.01$) in the GLUC group during the test and a significant decrease in IL-6 after exhaustion ($p<0.05$)
- Metabolic changes: Only blood glucose was significantly higher in the GLUC ($p<0.05$) at all time points

Conclusion/s:
- In a randomized controlled laboratory-based clinical trial, acute ingestion of oral glucocorticoid (20mg prednisolone), 3 hours before exercise, did not improve exercise performance but did alter some metabolic and hormonal parameters

Methodological considerations:
Well conducted study