

# SportsMedUpdate

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## EFFECT OF ORAL GLUCOSAMINE ON CARTILAGE DEGRADATION IN A RABBIT MODEL OF OSTEOARTHRITIS

Tiraloche G, Girard C, Chouinard L, et al. *Arthritis & Rheumatism* 2005;52:1118-28

### Background:

It is not clear whether oral glucosamine administration has a structure-modifying effect in osteoarthritis, and an animal model may offer an important opportunity to resolve this issue.

### Research question/s:

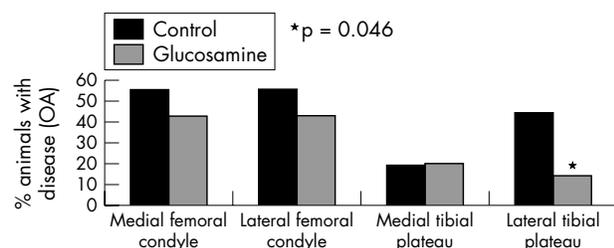
Does oral glucosamine administration reduce cartilage degradation in an animal model of osteoarthritis?

### Methodology:

**Experimental procedure:** Thirty-two rabbits underwent anterior cruciate ligament transection (ACLT) to induce osteoarthritis of the knee joint. The rabbits were randomised to either 8 weeks of daily oral glucosamine hydrochloride glucosamine (GLUC = 16) or a placebo (CON = 16) and were then necropsied at 11 weeks. Seven unoperated rabbits served as controls.

**Measures of outcome:** Macroscopic analysis of cartilage (grades 1-4); histological analysis (proteoglycan loss (Safranin O-fast green staining)), chondrocyte loss (grades 0-4), structure (grades 0-8), clone formation (grades 0-3, tidemark integrity, total type II collagen and glycosaminoglycan (GAG)).

### Main finding/s:



- Histological analysis: proteoglycan loss was significantly less in the lateral tibial plateau cartilage of ACL-transsected limbs in the GLUC group compared with ACL-transsected limbs in the CON group, with a similar trend for the lateral femoral condylar cartilage. Histological scores were similar in both groups
- Glycosaminoglycan content: this was reduced in the femoral condyles of CON ACL-transsected joints, but not in the same region of the GLUC group, compared to the respective contralateral unoperated joints

### Conclusion/s:

In an animal study, oral administration of glucosamine had a detectable, site-specific, partial disease-modifying effect in the development of osteoarthritis of the knee but it did not prevent fibrillation and/or erosions of the articular cartilage in all of the treated animals, and had no effects in the medial joint compartments.

**Evidence based rating:** 7.5/10 **Clinical interest rating:** 8/10

**Type of study:** Randomised controlled clinical trial (animal model)

**Methodological considerations:** Well conducted study, application to the human disease to be taken into account

**Keywords:** knee, osteoarthritis, glucosamine, animal model

## THE DIAGNOSTIC VALUE OF INTRACOMPARTMENTAL PRESSURE MEASUREMENT, MAGNETIC RESONANCE IMAGING, AND NEAR-INFRARED SPECTROSCOPY IN CHRONIC EXERTIONAL COMPARTMENT SYNDROME. A PROSPECTIVE STUDY IN 50 PATIENTS

van den Brand JGH, Nelson T, Verleisdonk EJMM, et al. *Am J Sports Med* 2005;33:699-704

### Background:

Although the diagnosis of chronic exertional compartment syndrome (CECS) is usually confirmed with intracompartmental pressure (ICP) measurement after exercise, magnetic resonance imaging (MRI) and near-infrared spectroscopy (NIRS) may be alternative investigations to confirm the diagnosis.

### Research question/s:

Can MRI and NIRS be used to diagnose CECS?

### Methodology:

**Subjects:** Forty-five subjects with suspected CECS of the lower leg who underwent a fasciotomy based on this suspicion.

**Experimental procedure:** Prior to fasciotomy, ICP, NIRS, and MRI data were collected during and after exercise on a treadmill. NIRS and ICP were then recorded in the same manner after fasciotomy.

**Measures of outcome:** Sensitivity and specificity of diagnostic tests (gold standard - absence of exertional complaints from the preoperative examination during exercise at post-fasciotomy visit).

### Main finding/s:

Diagnostic test	Sensitivity	Specificity
ICP (> 35 mm Hg at end exercise)	77	83
NIRS (% changes from baseline > 40%)	84	67
MRI (% change in ratio > 10%)	40	100

- The diagnosis of CECS was confirmed in 42/45 patients
- Sensitivity of MRI was comparable to that of ICP and NIRS; associated specificity at a given sensitivity appeared to be lower with MRI

### Conclusion/s:

- The sensitivity and specificity of NIRS (84%, 67%) was similar to that of ICP testing (77%, 83%) in confirming the diagnosis of CECS. MRI was not sensitive but more specific (40%, 100%)
- NIRS can be an alternative test to confirm the diagnosis of CECS

**Evidence based rating:** 7/10 **Clinical interest rating:** 8/10

**Type of study:** Cohort study (diagnosis)

**Methodological considerations:** Well conducted study, small number of tests in subjects with no CECS

**Keywords:** chronic exertional compartment syndrome, intracompartmental pressure, MRI, near-infrared spectroscopy

## THE EFFECT OF LONG VERSUS SHORT PECTORALIS MINOR RESTING LENGTH ON SCAPULAR KINEMATICS IN HEALTHY INDIVIDUALS

Borstad JD, Ludewig PM, *J Orthop Sports Phys Ther* 2005;35:227-38

### Background:

It has been suggested that a shortened pectoralis minor can alter scapular kinematics and thereby increase the risk of developing rotator cuff impingement.

### Research question/s:

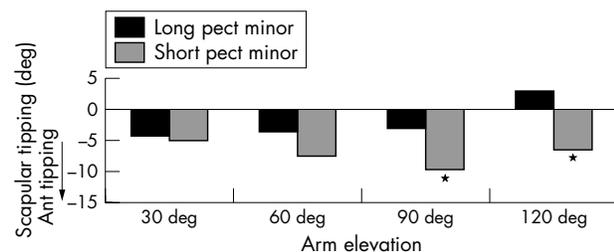
Does a reduced pectoralis minor resting length alter scapular kinematics during arm elevation?

**Methodology:**

**Subjects:** Fifty subjects without shoulder pain.

**Experimental procedure:** All of the subjects were divided into long or short groups according to normalised pectoralis minor resting length. The angular orientation of the scapula, humerus, and trunk was determined during arm elevation in three separate planes (sagittal, scapular plane, coronal) using an electromagnetic motion capture system (Flock of Birds). The three-dimensional scapular orientation (internal rotation, upward rotation, tipping) relative to the trunk at arm elevation angles of 30°, 60°, 90°, and 120° was determined.

**Measures of outcome:** Scapular orientation.

**Main finding/s:****Conclusion/s:**

- A short pectoralis minor is associated with scapular kinematics during arm elevation (anterior tipping and internal rotation) that is similar to the kinematics exhibited in subjects with shoulder impingement
- An adaptively short pectoralis minor may influence scapular kinematics and is therefore a potential mechanism for subacromial impingement

**Evidence based rating:** 7/10 **Clinical interest rating:** 7.5/10

**Type of study:** Case control study

**Methodological considerations:** Well conducted study, measurement errors pectoralis minor length and use of skin based system for electromagnetic device

**Keywords:** shoulder, scapula, impingement, biomechanics, pectoralis muscle, kinematics

### PHYSICAL ACTIVITY ENERGY EXPENDITURE PREDICTS PROGRESSION TOWARD THE METABOLIC SYNDROME INDEPENDENTLY OF AEROBIC FITNESS IN MIDDLE-AGED HEALTHY CAUCASIANS

Ekelund U, Brage S, Franks PW, *et al.* Diabetes Care 2005;28:1195–1200

**Background:**

It is not well established whether physical fitness or physical activity energy expenditure (PAEE) is a better predictor of the development of the metabolic syndrome.

**Research question/s:**

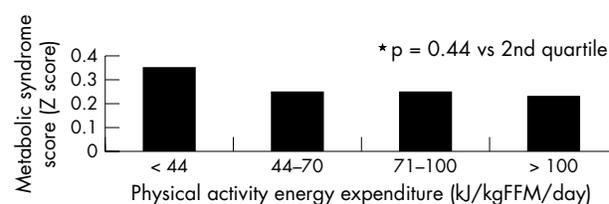
Does PAEE, aerobic fitness ( $VO_{2max}$ ), or obesity best predict the progression toward the metabolic syndrome in middle-aged men and women?

**Methodology:**

**Subjects:** 605 subjects (male = 246, female = 359) free from the metabolic syndrome.

**Experimental procedure:** All of the subjects underwent measurements of PAEE (individually calibrated heart rate against energy expenditure), a sub maximal exercise stress test ( $VO_{2max}$  was predicted), fat mass, and fat-free mass bio-impedance. A metabolic syndrome score was computed (summing the standardised values for obesity, hypertension, hyperglycemia, insulin resistance, hypertriglyceridemia, and the inverse level of HDL cholesterol).

**Measures of outcome:** Associations between PAEE and  $VO_{2max}$  and the metabolic syndrome score (adjusted for sex, baseline age, smoking, SES, follow-up time, baseline phenotypes) follow up of 5.6 years.

**Main finding/s:**

- PAEE predicted progression toward the metabolic syndrome, independent of baseline metabolic syndrome, body fat,  $VO_{2max}$ , and other confounding factors ( $p = 0.046$ ) – this association was stronger when excluding the adiposity component from the metabolic syndrome
- Physical fitness:  $VO_{2max}$  was not an independent predictor of the metabolic syndrome after adjusting for physical activity ( $p = 0.93$ )

**Conclusion/s:**

Daily physical activity energy expenditure rather than physical fitness ( $VO_{2max}$ ) predicts progression toward the metabolic syndrome indicating the importance of physical activity as a metabolic disease prevention strategy.

**Evidence based rating:** 8/10 **Clinical interest rating:** 8/10

**Type of study:** Prospective cohort study

**Methodological considerations:** Well conducted study, physical fitness measure not precise

**Keywords:** physical activity, physical fitness, metabolic syndrome