THE MORE I STUDY, THE LESS I KNOW
Overuse injuries in youth sports.

Stein CJ\textsuperscript{1}, Micheli LJ.

Abstract
Although youth sports participation is beneficial on many levels, it is also associated with an increased risk of injury. Risk factors for injury in children and adolescents include the presence of growth cartilage, existence of muscle imbalance, and pressure to compete despite pain and fatigue. Overuse injuries, such as patellofemoral pain, Osgood-Schlatter disease, calcaneal apophysitis, Little League elbow, Little League shoulder, spondylolysis, and osteochondritis dissecans, are common injuries in organized sports. However, proper education, supervision, and training can help reduce the risk of these injuries and facilitate early intervention.
STRETCH BEFORE EXERCISE
Dynamic vs. static-stretching warm up: the effect on power and agility performance.

McMillian DJ¹, Moore JH, Hatler BS, Taylor DC.

Abstract
The purpose of this study was to compare the effect of a dynamic warm up (DWU) with a static-stretching warm up (SWU) on selected measures of power and agility. Thirty cadets at the United States Military Academy completed the study (14 women and 16 men, ages 18-24 years). On 3 consecutive days, subjects performed 1 of the 2 warm up routines (DWU or SWU) or performed no warm up (NWU). The 3 warm up protocols lasted 10 minutes each and were counterbalanced to avoid carryover effects. After 1-2 minutes of recovery, subjects performed 3 tests of power or agility. The order of the performance tests (T-shuttle run, underhand medicine ball throw for distance, and 5-step jump) also was counterbalanced. Repeated measures analysis of variance revealed better performance scores after the DWU for all 3 performance tests (p < 0.01), relative to the SWU and NWU. There were no significant differences between the SWU and NWU for the medicine ball throw and the T-shuttle run, but the SWU was associated with better scores on the 5-step jump (p < 0.01). Because the results of this study indicate a relative performance enhancement with the DWU, the utility of warm up routines that use static stretching as a stand-alone activity should be reassessed.
HOT OR COLD?

ICE vs HEAT
Is ice right? Does cryotherapy improve outcome for acute soft tissue injury?
Collins NC

Abstract
AIMS: The use of ice or cryotherapy in the management of acute soft tissue injuries is widely accepted and widely practised. This review was conducted to examine the medical literature to investigate if there is evidence to support an improvement in clinical outcome following the use of ice or cryotherapy.

METHODS: A comprehensive literature search was performed and all human and animal trials or systematic reviews pertaining to soft tissue trauma, ice or cryotherapy were assessed. The clinically relevant outcome measures were (1) a reduction in pain; (2) a reduction in swelling or oedema; (3) improved function; or (4) return to participation in normal activity.

RESULTS: Six relevant trials in humans were identified, four of which lacked randomisation and blinding. There were two well conducted randomised controlled trials, one showing supportive evidence for the use of a cooling gel and the other not reaching statistical significance. Four animal studies showed that modest cooling reduced oedema but excessive or prolonged cooling is damaging. There were two systematic reviews, one of which was inconclusive and the other suggested that ice may hasten return to participation.

CONCLUSION: There is insufficient evidence to suggest that cryotherapy improves clinical outcome in the acute setting.
OVER-PRONATION CAUSES INJURIES AND "STABILITY" SHOES WILL FIX IT
CUSHIONING AND MOTION CONTROL IN RUNNING SHOES WILL PREVENT INJURY
Sneaker Brands are Selling a Myth: Aussie Podiatrist

Anyone who has run enough years knows the perils of “runner’s knee” or shin splints. And so running-shoe makers have devoted huge quantities of time and money over the past few decades to developing—and advertising—technologies that are supposed to make for a safer, injury-free run. There’s just one problem: There’s no definitive, research-based evidence that cushioning or motion control actually reduces running injuries, according to Simon Bartold, a well-known sports podiatry and biomechanics expert.

“Where we are in 2018 is we now have a situation where we know pretty conclusively that cushioning has no effect on injury rates whatsoever,” he says. The same goes for motion control, a concept Bartold has previously said should be flushed down the toilet (pdf). “So we’ve got the two main paradigms of the last 40 years and what all the data is telling us is that neither of these things has any relation to injury.”

Source: Marc Bains, Quartzy [7/10/18]
CUSHIONING TECHNOLOGIES WILL PROTECT THE JOINTS
THE TRUTH ABOUT CUSHIONING AND MOTION CONTROL IN RUNNING SHOES

SUMMARY:
- It seems likely that comfort = performance
- vGRF impact peaks are less important than thought
- Midsole geometry is more important than hardness

Softer midsole shoes in fact increase the vertical impact peak, contrary to the belief that midsole cushioning can attenuate impact forces (n=93)

Midsole hardness of modern cushioned running shoes does not seem to influence running related injury risk.

In relation to “motion control” changes can occur in both directions (increase or decrease), for this reason, each runner should be analyzed independently

There is no conclusive evidence that vertical impact forces are associated with running injury

Queen et al, 2009 Am J Sports Med;37

There is no evidence that foot pronation (eversion) is a variable responsible for running injuries

Nigg et al 2016, British Journal of Sports Medicine 49(20)

The concept of dual density as medial support has barely been considered in footwear biomechanics research and lacks scientific proof of functionality

Oriwol et al, 2013, Footwear Science 3, 2

www.bartoldbiomechanics.com
RUNNING INJURIES COME FROM RUNNING ON HARD SURFACES
MINIMALISM IS THE MAGIC BULLET
Injuries observed in a prospective transition from traditional to minimalist footwear: correlation of high impact transient forces and lower injury severity.

Salzler MJ¹, Kirwan HJ², Scarborough DM², Walker JT², Guarino AJ³, Berkson EM².

CONCLUSION: High injury rates occurred during the transition from traditional to minimalist footwear. Non-compliance to transition guidelines and high injury rates suggest the need for improved education. High impact transient forces unexpectedly predicted lower modified RISS scores in this population.
THERE IS A PERFECT RUNNING FORM
Myth 1 - there is a perfect form we should all emulate

Myth 2 - the way we move is the way we are and there is nothing that can change it
HEEL CONTACT IS EXTREMELY IMPORTANT

follow-through swing phase
left leg

stance phase
left leg

heel strike

forward swing

midstance

toe-off

foot descent
I CAN ASSESS YOUR GAIT...
I HAVE A COOL TREADMILL
RUNNING IS BAD FOR YOUR KNEES

You know who NEVER says "running is really hard on your joints"?

People who actually run.

sometee cards
LOW LEVEL LASERS AND OTHER SIMILAR MODALITIES CAN CURE EVERYTHING
Low-Level Laser Therapy at 635 nm for Treatment of Chronic Plantar Fasciitis: A Placebo-Controlled, Randomized Study.


Abstract
Plantar fasciitis affects nearly 1 million persons in the United States at any one time. Conservative therapies have been reported to successfully treat 90% of plantar fasciitis cases; however, for the remaining cases, only invasive therapeutic solutions remain. This investigation studied newly emerging technology, low-level laser therapy. From September 2011 to June 2013, 69 subjects were enrolled in a placebo-controlled, randomized, double-blind, multicenter study that evaluated the clinical utility of low-level laser therapy for the treatment of unilateral chronic fasciitis. The volunteer participants were treated twice a week for 3 weeks for a total of 6 treatments and were evaluated at 5 separate time points: before the procedure and at weeks 1, 2, 3, 6, and 8. The pain rating was recorded using a visual analog scale, with 0 representing "no pain" and 100 representing "worst pain." Additionally, Doppler ultrasonography was performed on the plantar fascia to measure the fascial thickness before and after treatment. Study participants also completed the Foot Function Index. At the final follow-up visit, the group participants demonstrated a mean improvement in heel pain with a visual analog scale score of 29.6 ± 24.9 compared with the placebo subjects, who reported a mean improvement of 5.4 ± 16.0, a statistically significant difference (p < .001). Although additional studies are warranted, these data have demonstrated that low-level laser therapy is a promising treatment of plantar fasciitis.
ESWT IS EXPERIMENTAL
CLINICAL EVIDENCE

JOURNAL OF FOOT AND ANKLE SURGERY-2002

Extracorporeal Shock Wave Therapy for the Treatment of Chronic Plantar Fasciitis: Indications, Protocol, Intermediate Results, and a Comparison of Results to Fasciotomy

Weil LS Jr, Roukis TS, Weil LS, Borrelli AH
Extracorporeal Pulsed Activated Therapy ("EPAT" sound wave) for Achilles Tendinopathy: A Prospective Study

Saxena A, Ramdath S Jr, O'Halloran P, Gerdesmeyer L, Gollwitzer H
Radial Extracorporeal Shock Wave Therapy is Safe and Effective in the Treatment of Chronic Recalcitrant Plantar Fasciitis: Results of a Confirmatory Randomized Placebo-Controlled Multicenter Study

CORTISONE TREATMENT FOR HEEL PAIN
Injected corticosteroids for treating plantar heel pain in adults.

David JA¹, Sankarapandian V, Christopher PR, Chatterjee A, Macaden AS.

AUTHORS' CONCLUSIONS: We found low quality evidence that local steroid injections compared with placebo or no treatment may slightly reduce heel pain up to one month but not subsequently. The available evidence for other outcomes of this comparison was very low quality. Where available, the evidence from comparisons of steroid injections with other interventions used to treat heel pain and of different methods of guiding the injection was also very low quality. Although serious adverse events relating to steroid injection were rare, these were under-reported and a higher risk cannot be ruled out. Further research should focus on establishing the effects (benefits and harms) of injected steroids compared with placebo in typical clinical settings, subsequent to a course of unsuccessful conservative therapy. Ideally, this should be preceded by research, including patient involvement, aimed to obtain consensus on the priority questions for treating plantar heel pain.
REST CAN REPLACE LOAD
Jay Dichary, MPT, SCS

• Use of a boot will remove tensile strain from tissues
• Weakening most structures of the foot and ankle
• Use of a boot requires progressive overload to restore the patient/athlete back to baseline
DISCOLORED TOENAILS ARE HEMATOMAS

Doctors later said the cancer that killed Bob started in the same toe.

NAIL CANCER
Subungual Acral Lentiginous Melanoma

Symptoms of tan, darkened, or black nails can be present for months to years, yet skilled health care professionals may overlook and miss an opportunity for a cure.

- Higher incidence in people of color
- Found under nails of fingers and toes
- Requires surgery with or without chemotherapy

RECOGNIZE, BIOPSY, CURE!
PRP INJECTIONS FOR EVERYTHING

What is PRP?
Platelet Rich Plasma (PRP) refers to the blood plasma which contains various growth factors that stimulate healing and regeneration in human body.

Principle of PRP
PRP therapy uses the growth factors in platelets and plasma separated from autologous blood, eliminating the risk of side effect or rejection reaction.
FLIP FLOPS ARE BAD!
Effect of thong style flip-flops on children's barefoot walking and jogging kinematics.

Chard A¹, Greene A, Hunt A, Vanwanseele B, Smith R.

CONCLUSIONS: Ankle dorsiflexion during the contact phase of walking and jogging, combined with reduced hallux dorsiflexion during walking, suggests a mechanism to retain the thong during weight acceptance. Greater midfoot plantarflexion throughout midstance while walking and throughout midstance and propulsion while jogging may indicate a gripping action to sustain the thong during stance. While these compensations exist, the overall findings suggest that foot motion whilst wearing thongs may be more replicable of barefoot motion than originally thought.
Effect of flip-flops on lower limb kinematics during walking: a cross-sectional study using three-dimensional gait analysis.

Sharpe T¹, Malone A², French H³, Kiernan D⁴, O’Brien T⁴.

Abstract

BACKGROUND: Flip-flops are a popular footwear choice in warm weather however their minimalist design offers little support to the foot.

AIM: To investigate the effect of flip-flops on lower limb gait kinematics in healthy adults, to measure adherence between the flip-flop and foot, and to assess the effect on toe clearance in swing.

METHODS: Fifteen healthy adults (8 male, mean age 27 years) completed a three-dimensional gait analysis assessment using Codamotion. Kinematic and lower limb temporal-spatial data were captured using the Modified Helen Hayes marker set with additional markers on the hallux and flip-flop sole.

RESULTS: Compared to barefoot walking, there were no differences in temporal-spatial parameters walking with flip-flops. There was an increase in peak knee flexion in swing (mean difference 4.6°, 95% confidence interval (CI) [-5.8°, -3.4°], p < 0.001) and peak ankle dorsiflexion at terminal swing (mean difference 2°, 95% CI [-3°, -1°], p = 0.001). Other kinematic parameters were unchanged. Peak separation between foot and flip-flop was 8.8 cm (SD 1.48), occurring at pre-swing. Minimum toe clearance of the hallux in barefoot walking measured 4.2 cm (SD 0.8). Minimum clearance of the flip-flop was 1.6 cm (SD 0.56).

CONCLUSIONS: Healthy adults adapted well to flip-flops. However, separation of the flip-flop from the foot led to increased knee flexion and ankle dorsiflexion in swing, probably to ensure that the flip-flop did not contact the ground and to maximise adherence to the foot. Minimum clearance of the flip-flop was low compared to barefoot clearance. This may increase the risk of tripping over uneven ground.
Kids should focus on one sport to improve and prevent injury...
Sport Specialization, Part I: Does Early Sports Specialization Increase Negative Outcomes and Reduce the Opportunity for Success in Young Athletes?

Myer GD¹, Jayanthi N², Diflori JP³, Faigenbaum AD⁴, Kiefer AW⁵, Logerstedt D⁶, Micheli LJ⁷.

Abstract

CONTEXT: There is increased growth in sports participation across the globe. Sports specialization patterns, which include year-round training, participation on multiple teams of the same sport, and focused participation in a single sport at a young age, are at high levels. The need for this type of early specialized training in young athletes is currently under debate.

EVIDENCE ACQUISITION: Nonsystematic review.

STUDY DESIGN: Clinical review.

LEVEL OF EVIDENCE: Level 4.

CONCLUSION: Sports specialization is defined as year-round training (greater than 8 months per year), choosing a single main sport, and/or quitting all other sports to focus on 1 sport. Specialized training in young athletes has risks of injury and burnout, while the degree of specialization is positively correlated with increased serious overuse injury risk. Risk factors for injury in young athletes who specialize in a single sport include year-round single-sport training, participation in more competition, decreased age-appropriate play, and involvement in individual sports that require the early development of technical skills. Adults involved in instruction of youth sports may also put young athletes at risk for injury by encouraging increased intensity in organized practices and competition rather than self-directed unstructured free play.
THANK YOU!

It isn't what we don't know that gives us trouble, it's what we know that ain't so.

— Will Rogers —