GOOD EVIDENCE MATTERS

GEMs of the Week

SPOTLIGHT

HIIT the Gym to Reduce Asthma Severity!

When Rest Turns Risky

Supine Hypertension and the Hidden Cardiovascular Threat

Comparing Treatment Options for de Quervain Tenosynovitis

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HIIT The Gym to Reduce Asthma Severity!

Effect of High-Intensity Interval Training on Inhaled Corticosteroid Dose in Asthma Patients

Pitzner-Fabricius A, Dall CH, Henriksen M, et al. Effect of High-Intensity Interval Training on Inhaled Corticosteroid Dose in Asthma Patients: A Randomized Controlled Trial. *J Allergy Clin Immunol Pract*. 2023;11(7):2133-2143.e8. doi:10.1016/j.jaip.2023.04.013

KEY TAKEAWAY: High intensity interval training (HIIT) does not reduce inhaled corticosteroid use (ICS) by 25% after six months compared to usual lifestyle and exercise habits in adults with persistent asthma.

STUDY DESIGN: Assessor-blinded single-center randomized controlled trial

LEVEL OF EVIDENCE: STEP 3 (downgraded due to small sample size)

BRIEF BACKGROUND INFORMATION: ICS therapy is a mainstay in asthma management. They are, however, not without significant side effects and the lowest possible dose should be used without affecting asthma control. Aerobic exercise is known to improve asthma symptoms. This study assessed whether high-intensity training reduces the need for ICS use in asthmatics.

PATIENTS: Adults with persistent asthma

INTERVENTION: HIIT

CONTROL: Usual lifestyle and exercise habits

PRIMARY OUTCOME: ICS dose reduction by 25%

Secondary Outcome: ICS dosage per day

METHODS (BRIEF DESCRIPTION):

- Included participants were adults 18–75 years old with a diagnosis of persistent asthma, a minimum daily ICS dose of 400 µg budesonide, a self-reported history of vigorous physical activity, and an Asthma Control Questionnaire (ACQ-5) score of 1.0–2.5.
- Participants were excluded if they were treated with immunotherapy or oral corticosteroid, had a recent asthma exacerbation, or were suspected of having or were previously diagnosed with chronic obstructive pulmonary disease.
- Participants were randomized 2:1 to either exercise or control via computer-based program.
- The HIIT group received instructor supervised training three times per week which included a warm-up, 30 minutes of bike (spinning) training, followed by a 10-minute cool down.
- The control group was instructed to continue their usual lifestyle habits.
- At screening, all participants' treatment with ICS and long-acting beta agonists (LABA) was adjusted into one of six treatment steps.
- Asthma control was assessed using the ACQ-5 questionnaire. Asthma was defined as well-controlled (score of ≤1.0), partially controlled (score of >1.0–1.5), or uncontrolled score of (>1.5).
  - If well controlled, treatment was reduced by one step.
  - If partially controlled, no adjustments were made.
  - If uncontrolled, treatment was increased one step.
- Participants were evaluated at two, four, six, nine and 12 months for these adjustments.
- Primary outcomes were based on intention-to-treat population. Repeated measures linear mixed model regression analyses were used for secondary outcomes.

INTERVENTION (# IN THE GROUP): 102

COMPARISON (# IN THE GROUP): 48

FOLLOW-UP PERIOD: Six months

RESULTS:

Primary Outcome –

- HIIT training did not significantly reduce ICS dose by 25% after six months compared to usual lifestyle and exercise habits (odds ratio [OR] 1.8; 95% CI, 0.82–3.9).

Secondary Outcome –

- HIIT training reduced daily ICS use compared to usual lifestyle and exercise habits (mean difference [MD] –234 µg; 95% CI, –391 to –77).

LIMITATIONS:

- The sample size was quite limited.
- The studies simple treatment approach does not consider the complex nature of a disease like asthma. Participants were homogenous while the disease itself is quite heterogenous.

- The population studied patients with non-severe asthma, and these results may not be generalizable to those with more severe disease.
- The only form of exercise studies was HIIT, which does not consider other forms of exercise.

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When Rest Turns Risky: Supine Hypertension and the Hidden Cardiovascular Threat

Supine Blood Pressure and Risk of Cardiovascular Disease and Mortality

Giao DM, Col H, Larbi Kwapong F, et al. Supine Blood Pressure and Risk of Cardiovascular Disease and Mortality. *JAMA Cardiol*. 2025;10(3):265-275. doi:10.1001/jamacardio.2024.5213

KEY TAKEAWAY: Supine hypertension (HTN) increases the risk of cardiovascular disease (CVD) and mortality, independent of seated HTN.

STUDY DESIGN: Prospective cohort study

LEVEL OF EVIDENCE: STEP 3

BRIEF BACKGROUND INFORMATION: Supine blood pressure (BP) measurements have not been widely used for cardiovascular risk stratification, despite growing evidence that elevated supine BP may be predictive of adverse health outcomes. Current HTN guidelines from the American Heart Association (AHA) and American College of Cardiology (ACC) recommend BP assessment using seated measurements in the clinic or ambulatory/home settings, but they do not include supine measurements in routine evaluation. As a result, clinicians may overlook a significant portion of patients with masked or positional HTN who remain at increased cardiovascular risk.

PATIENTS: Middle-aged adults without known CVD

INTERVENTION: Supine HTN

CONTROL: No supine HTN

PRIMARY OUTCOME: Incidence of coronary heart disease (CHD), heart failure (HF), stroke, fatal congenital heart disease (CHD), all-cause mortality

METHODS (BRIEF DESCRIPTION):

- The researchers analyzed data from the Atherosclerosis Risk in Communities (ARIC) study, which included over 13,000 middle-aged adults from four U.S. communities.
- Participants include adults 45–64 years old with no prior history of CHD, HF, or stroke, and who had valid supine and seated BP measurements during the first study visit.
- Seated BP was measured three times after a five-minute rest using a random-zero sphygmomanometer; the average of the last two readings was used.
- Supine BP was measured after a 20-minute rest while lying flat, using an automated oscillometric device that recorded up to five readings over a two-minute period.
- Supine HTN was defined as a supine systolic BP ≥130 mmHg or diastolic BP ≥80 mmHg.
- The control group consisted of participants without supine HTN based on the same clinic-based measurement protocols.
- The primary outcomes were incident CHD, HF, stroke, fatal CHD, and all-cause mortality.
    - Incident CHD was defined as the first occurrence of CHD after baseline, including fatal CHD, nonfatal myocardial infarction (MI), coronary revascularization procedures, or silent MI detected by new electrocardiogram abnormalities.
    - HF was identified as the first hospitalization or death coded for HF based on ICD-9 or ICD-10 diagnosis codes.
    - Stroke outcomes included both ischemic and hemorrhagic strokes.
    - Fatal CHD was defined as death due to CHD determined by review of hospital records, death certificates, coroner reports, the National Death Index, and next-of-kin interviews.
    - All-cause mortality was identified via linkage to state and national death registries.
- Cox proportional hazards models were used to estimate hazard ratios for each outcome, adjusting for age, sex, race-center, body mass index (BMI), eGFR, diabetes, lipid levels, antihypertensive and cholesterol-lowering medication use, education level, alcohol use, smoking, and physical activity.

INTERVENTION (# IN THE GROUP): 4,263

COMPARISON (# IN THE GROUP): 7,106

FOLLOW-UP PERIOD: Median follow-up of 28 years

RESULTS:

Primary Outcome –

- Supine HTN significantly increased risks of several adverse cardiovascular outcomes and mortality compared to seated HTN.

    - Participants with supine HTN had an increased risk of CHD compared to those without (hazard ratio [HR] 1.6; 95% CI, 1.5–1.8).
    - Participants with supine HTN had an increased risk of HF compared to those without (HR 1.8; 95% CI, 1.7–2.0).
    - Participants with supine HTN had an increased risk of stroke compared to those without (HR 1.9; 95% CI, 1.6–2.1).
    - Participants with supine HTN had an increased risk of fatal CHD compared to those without (HR 2.2; 95% CI, 1.8–2.6).
    - Participants with supine HTN had an increased risk of all-cause mortality compared to those without (HR 1.4; 95% CI, 1.4–1.5).
- Participants with supine HTN alone showed no meaningful difference in risk of CHD, stroke, HF, or all-cause mortality compared to those with HTN in both positions.
- In contrast, participants with seated HTN alone had lower risk estimates than those with supine HTN.
- These associations remained significant after adjusting for baseline seated BP, medication use, and demographic and clinical risk factors. The results also held steady in sensitivity analyses, including models truncated at 10 years of follow-up.

LIMITATIONS:

- This was an observational cohort study.
- Blood pressure measurements were taken at a single point in time, at study inception.
- The study population was derived from the ARIC study, which may limit the generalizability of the findings to other populations.
- While the long follow-up period is a strength, it also introduces the possibility of changes in participants' health status, treatments, and behaviors over time, which could affect the outcomes and introduce time-dependent biases.

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Comparing Treatment Options for de Quervain Tenosynovitis

Effectiveness of Treatment Options for De Quervain Tenosynovitis

Challoumas D, Ramasubbu R, Rooney E, Seymour-Jackson E, Putti A, Millar NL. Management of de Quervain Tenosynovitis: A Systematic Review and Network Meta-Analysis. *JAMA Netw Open*. 2023;6(10):e2337001. Published 2023 Oct 2. doi:10.1001/jamanetworkopen.2023.37001

KEY TAKEAWAY: Corticosteroid injection with supplemental thumb spica immobilization for 3–4 weeks post injection improves pain associated with de Quervain tenosynovitis (dQt).

STUDY DESIGN: Systematic review and network meta-analysis of 19 randomized clinical trials (N=1,663)

LEVEL OF EVIDENCE: STEP 2 (downgraded due to numbers of each outcome and heterogeneity)

BRIEF BACKGROUND INFORMATION: DQt is an overuse condition that affects adults, causing significant pain and function limitation. Currently there are no definitive guidelines for treatment of this condition, and interventions range from immobilization to surgical intervention. This study aimed to compare effectiveness associated with available interventions to facilitate clinical practice decisions and future guidelines.

PATIENTS: Patients with dQt

INTERVENTION: Active treatments for dQt

CONTROL: Other active and inactive treatments

PRIMARY OUTCOME: Patient-reported pain

Secondary Outcome: Patient-reported function and complications

METHODS (BRIEF DESCRIPTION):

- Randomized control trials published in English featuring patients with dQt of any chronicity diagnosed by a medical professional were included in the study.
- Mixed populations with other wrist related diagnoses, and specific populations with predisposing conditions (diabetes, etc.) were excluded from the study.
- The studies assessed effectiveness of any intervention for dQt, including placebo, sham or no treatment.
- Comparators included any intervention, placebo, sham or no treatment.
- Corticosteroid injection (CSI), CSI and thumb spica splint, thumb spica splint, ultrasound (US) guided CSI and normal saline (NS) injection, US guided CSI and hyaluronic acid (HA) injection, neural therapy and thumb spica splint, extracorporeal shock wave therapy (ESWT) and thumb spica splint, thumb spica cast, as decided thumb spica use, US guided CSI in 1st extensor compartment, acupuncture, elastic bandage, and US guided CSI were compared to placebo injection.
- The primary outcome was patient-reported pain reported in visual analogue scale (VAS). Scores range from 0–10, with higher scores indicating worse pain.
- Secondary outcomes included patient-reported function and complications. Function was assessed using the Quick Disabilities of the Arm, Shoulder, and Hand scale (Q-DASH). Scores range from 0–80, with higher scores indicating worse function.
- Measures were divided into short term (≤12 weeks), mid-term (>12 weeks and ≤12 months) and long-term (>12 months).

INTERVENTION (# IN THE GROUP): Not available

COMPARISON (# IN THE GROUP): Not available

FOLLOW-UP PERIOD: Varied (no follow up to 12 months)

RESULTS:

Primary Outcome –

- Conventional CSI improved pain in the short-term compared to placebo injection (mean difference [MD] –3.0; 95% CI, –6.0 to –0.1).
- Conventional CSI + thumb spica splint improved pain in the short-term compared to placebo injection (MD –3.9; 95% CI, –6.7 to –1.2).
- Neural therapy + thumb spica splinting slightly increased pain in the short-term compared to thumb spica splinting alone (MD 2.8; 95% CI, 0.8–4.8).
- ESWT + thumb spica splinting slightly increased pain in the short-term compared to thumb spica splinting alone (MD 2.7; 95% CI, 0.6–4.8).

- US-guided CIS slightly increases pain in the short-term compared to thumb spica splinting alone (MD 3.5; 95% CI, 0.4–6.5).
- Thumb spica splinting alone improved pain in the short-term compared to placebo injection (MD –1.6; 95% CI, –4.8 to –1.6).
- US-guided CSI + normal saline injection improved pain in the short-term compared to placebo injection (MD –5.1; 95% CI, –9.3 to –0.8).
- US-guided CSI + HA injection improved pain in the short-term compared to placebo injection (MD –5.1; 95% CI, –9.3 to –0.8).
- Neural therapy + thumb spica splint improved pain in the short-term compared to placebo injection (MD –4.4; 95% CI, –8.2 to –0.6).
- ESWT + thumb spica splint improved pain in the short term compared to placebo injection (MD –4.3; 95% CI, –8.9 to –0.3).
- US-guided CSI in the 1st extensor compartment improved pain in the short-term compared to placebo injection (MD –5.1; 95% CI, –9.3 to –0.8).
- US-guided CSI improved pain compared to placebo injection (MD –5.1; 95% CI, –8.6 to –1.6).
- Neural therapy + thumb spica splint improved pain in the mid-term compared to thumb spica splinting alone (MD 2.4; 95% CI, 0.2–4.6).

Secondary Outcome –

- Conventional CSI + thumb spica splinting slightly decreased function in the short-term compared to conventional CSI alone (MD 10; 95% CI, 6.4–14).
- Conventional CSI improved function in the short-term compared to thumb spica splinting along (MD –15; 95% CI, –22 to –8.6).
- Conventional CSI improved function in the short-term compared to thumb spica casting (MD –11; 95% CI, –17 to –4.6).
- Conventional CSI improved function in the short-term compared to as-decided thumb spica splinting (MD –13; 95% CI, –24 to –3.1).
- Conventional CSI improved function in the short-term compared to acupuncture (MD –0.5; 95% CI, –9.3 to –8.3).
- Conventional CSI + thumb spica splinting improved function in the short-term compared to thumb spica splinting alone (MD –26; 95% CI, –34 to –18).
- Conventional CSI + thumb spica splinting improved function in the short-term compared to ESWT + thumb spica splinting (MD –14; 95% CI, –26 to –1.4).
- Conventional CSI + thumb spica splinting improved function in the short-term compared to thumb spica casting (MD –21; 95% CI, –26 to –16).
- Conventional CSI + thumb spica splinting improved function in the short-term compared to as-decided thumb spica splinting (MD –24; 95% CI, –35 to –7.8).
- Conventional CSI + thumb spica splinting improved function in the short-term compared to acupuncture (MD –11; 95% CI, –21 to –1.3).
- ESWT + thumb spica splinting slightly decreased function in the short-term compared to thumb spica splinting alone (MD 12; 95% CI, 2.9–22).
- Acupuncture slightly decreased function in the short-term compared to thumb spica splinting alone (MD 15; 95% CI, 3.8–26).
- Conventional CSI + thumb spica improved function in the mid-term compared to thumb spica splint alone (MD –12; 95% CI, –19 to –4.6).

LIMITATIONS:

- Chronicity of the condition, which could influence effectiveness of intervention, was not able to be considered.
- Corticosteroid medication type or number of doses was not considered.
- Studies did not control for concurrent use of anti-inflammatory pharmacologic intervention.
- Diagnostic criteria for de Quervain for each study was not uniform (only included Finkelstein test).
- Not all interventions, specifically surgical, were included in the quantitative analysis for pain.

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