GEMs
GOOD EVIDENCE MATTERS

GEMs of the Week

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What's in this week's issue?

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SPOTLIGHT: Feeling Salty About Cardiovascular Risk? The Effects of Salt Substitutes on Blood Pressure and Mortality

Feeling Salty About Cardiovascular Risk? The Effects of Salt Substitutes on Blood Pressure and Mortality

GEMs GOOD EVIDENCE MATTERS SPOTLIGHT

Effects of Salt Substitutes on Clinical Outcomes: A Systematic Review and Meta-Analysis

Yin X, Rodgers A, Perkovic A, et al. Effects of salt substitutes on clinical outcomes: a systematic review and meta-analysis. *Heart*. 2022;108(20):1608-1615. Published 2022 Sep 26. doi:10.1136/heartjnl-2022-321332

KEY TAKEAWAY: Salt substitutes can modestly reduce systolic blood pressure (SBP), and diastolic blood pressure (DBP), and potentially reduce total mortality and cardiovascular events, although the practicality as an intervention is unclear.

STUDY DESIGN: Systematic review and meta-analysis of 21 randomized control trials (N=31,949)

LEVEL OF EVIDENCE: STEP 2 (downgraded due to high risk of bias in the randomization process in >50% of studies analyzed)

BRIEF BACKGROUND INFORMATION: With cardiovascular disease (CVD) as a leading cause of death and high blood pressure as a significant risk factor, reducing blood pressure using sodium-reduced and potassium-enriched salt substitutes has the potential to improve clinical outcomes related to cardiovascular health. Until the five-year cluster, randomized Salt Substitute and Stroke Studies (SSaSS) of nearly 21,000 people in China, had limited data to compare smaller studies on how salt substitution can improve clinical outcomes.

PATIENTS: Adults with hypertension

INTERVENTION: Substitute 100% NaCl with 5%–75% KCl

CONTROL: No substitution

PRIMARY OUTCOME: SBP and DBP reduction

Secondary Outcome: Proportion of salt substitute decreases SBP and DBP, all-cause mortality, cardiovascular-related mortality, major adverse cardiovascular events

METHODS (BRIEF DESCRIPTION):

- 17 studies were individually randomized trials, three cluster-randomized trials, and one step-wedged randomized trial.
  - Trial sample sizes ranged from N=20 to N=20,995 participants from different global regions, many of whom were already treated for hypertension pharmacologically. The mean age for the largest study was 65 years old, and the mean age of each study ranged from 21–75 years old.
  - Most data (88%–99%) was derived from the SSaSS single Chinese study. Salt substitute was defined as regular salt (100% NaCl) with at least 5% replaced with KCl.
- Salt substitute (33%–75% NaCl) with KCl (25%–65%) at varying durations of time (1–60 months).
- The effects of salt substitutes were compared on blood pressure, regional consistency, hyperkalemia, urinary electrolytes, all-cause, and vascular death.

INTERVENTION (# IN THE GROUP): Not available

COMPARISON (# IN THE GROUP): Not available

FOLLOW-UP PERIOD: Varies across studies without a clear mean/median

RESULTS:

Primary Outcome –

- Salt substitutes decreased (19 studies):
  - SBP by –4.6 mmHg (95% CI, –6.1 to –3.1)
  - DBP by –1.6 mmHg (95% CI, –2.4 to –0.79)
- Higher proportion of potassium enrichment (each 10% substituted) was associated with decreased:
  - SBP decrease of –1.5 mmHg (95% CI, –3.02 to –0.03)
  - DBP decrease of –0.95 mmHg (95% CI, –1.8 to –0.12)

Secondary Outcome –

- Salt substitutes decreased:
  - All-cause mortality (5 trials; pooled RR 0.89; 95% CI, 0.85–0.94)
  - Cardiovascular mortality (3 trials; pooled RR 0.87; 95% CI, 0.81–0.94)
  - Major adverse cardiovascular events (2 trials; pooled RR 0.89; 95% CI, 0.85–0.94)
  - Urine sodium excretion (13 trials; –0.48 g/day; 95% CI, –0.82 to –0.15)
- Salt substitutes increased potassium excretion (13 trials; 0.45 g/day; 95% CI, 0.25– 0.65).
- Subgroup analysis showed urine sodium excretion decreased by an additional –0.45 g/day (95% CI, –0.78 to –0.12) for every 10 years of age with salt substitute.

- Six studies showed no serious adverse events attributed to hyperkalemia.

LIMITATIONS:

- 66% of meta-analysis participants came from one study (SSaSS).
- All studies excluded participants with known CKD or risks for hyperkalemia.
- Unclear practicality about this intervention

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Ultrasonography or MRI for Shoulder Pathology?

Diagnostic Accuracy of Ultrasonography for Rotator Cuff Tears: A Systematic Review and Meta-analysis

Farooqi AS, Lee A, Novikov D, et al. Diagnostic Accuracy of Ultrasonography for Rotator Cuff Tears: A Systematic Review and Meta-analysis. *Orthop J Sports Med.* 2021;9(10):23259671211035106. Published 2021 Oct 11. doi:10.1177/23259671211035106

KEY TAKEAWAY: Ultrasonography (US) has similar diagnostic validity compared to magnetic resonance imaging (MRI) for both full-thickness tears and partial-thickness tears.

STUDY DESIGN: Systematic review and meta-analysis of 23 cohort studies

LEVEL OF EVIDENCE: STEP 2 (downgraded due to a small sample for the comparison)

BRIEF BACKGROUND INFORMATION: Rotator cuff disorders (RCDs) decrease mobility leading to approximately 70% of shoulder-related physician visits. RCDs also account for the most common cause of shoulder disability. MRI is the current imaging modality of choice in the United States, but with advancements in the use of US, it is important to compare the accuracy of US versus MRI when evaluating RCDs.

PATIENTS: Adults with RCDs

INTERVENTION: US

CONTROL: MRI

PRIMARY OUTCOME: Diagnostic sensitivity, specificity, and overall accuracy for full-thickness tears and partial-thickness tears

METHODS (BRIEF DESCRIPTION):

- Patients had a mean age of 42–66 years old. No other demographic information of patients was provided.
- Inclusion criteria for studies:
  - Published between January 2010–March 2020
  - Minimum 10 patients
  - English language
  - Arthroscopy as the standard for diagnosis
- US and MRI diagnostic capabilities were compared amongst the various rotator cuff muscles for partial and full thickness tears by various US operators, including radiologists and surgeons.
- Each study's quality and risk of bias were measured using the Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2). The overall risk of bias was low however, due to a small number of studies for comparison, there could be publication bias.

INTERVENTION (# IN THE GROUP): 580

COMPARISON (# IN THE GROUP): 579

FOLLOW-UP PERIOD: Not available

RESULTS:

Primary Outcome –

- There were no significant differences in sensitivity, specificity, and overall accuracy for any thickness supraspinatus tears and full-thickness tears or partial-thickness tears between US and MRI.
  - Median sensitivity for full thickness tears (5 studies, n=315; US, 94% vs MRI, 94%; *P*=.89–.99; I^2=0%)
  - Median specificity for full thickness tears (5 studies, n=315; US, 94% vs MRI, 89%; *P*=.89–.99; I^2=0%)
  - Median sensitivity for partial thickness tears (5 studies, n=315; US, 89% vs MRI, 85%; *P*=.15–.50; I^2=0-41%)
  - Median specificity for full thickness tears (5 studies, n=315; US, 94% vs MRI, 89%; *P*=.89–.99; I^2=0%)
  - Median specificity for partial thickness tears (5 studies, n=315; US, 89% vs MRI, 87%; *P*=.15–.50; I^2=0-41%)
  - Data for overall accuracy for full and partial-thickness tears were not clearly provided.

LIMITATIONS:

- A small sample size for the US and MRI comparison.
- Potential for selection bias of more severe shoulder pathology by use of arthroscopy as the reference standard.

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Administering Progesterone Vaginally or Intramuscularly to Prevent Recurrent Preterm Birth

Vaginal Progesterone Compared with Intramuscular 17-Alpha-Hydroxyprogesterone Caproate for Prevention of Recurrent Preterm Birth in Singleton Gestations: a Systematic Review and Meta-Analysis

Boelig RC, Locci M, Saccone G, Gragnano E, Berghella V. Vaginal progesterone compared with intramuscular 17-alpha-hydroxyprogesterone caproate for prevention of recurrent preterm birth in singleton gestations: a systematic review and meta-analysis. *Am J Obstet Gynecol MFM*. 2022;4(5):100658. doi:10.1016/j.ajogmf.2022.100658

KEY TAKEAWAY: This meta-analysis supports that vaginal progesterone therapy decreases the rate of subsequent preterm birth at <34 weeks gestation compared to intramuscular (IM) 17-alpha-hydroxyprogesterone caproate (17-OHPC), but studies with lower risks of bias are needed to confirm this difference.

STUDY DESIGN: Systematic review and meta-analysis of 7 randomized controlled trials (N=1910)

LEVEL OF EVIDENCE: STEP 2 (downgraded due to low quality of evidence in included trials)

BRIEF BACKGROUND INFORMATION: Patients with previous spontaneous preterm birth are at increased risk of preterm birth in subsequent pregnancies. Daily vaginal progesterone therapy and weekly intramuscular (IM) 17-OHPC may decrease rates of spontaneous preterm birth, but guidelines for the use of these therapies vary between international organizations. Selecting the best route of administration for the prevention of spontaneous preterm birth could help decrease perinatal morbidity and mortality related to preterm birth.

PATIENTS: Pregnant women with history of spontaneous birth

INTERVENTION: Vaginal progesterone

CONTROL: IM 17-OHPC

PRIMARY OUTCOME: Preterm birth and <34 weeks gestation

Secondary Outcome: Preterm birth at other gestational ages and maternal adverse drug reactions

METHODS (BRIEF DESCRIPTION):

- Patients with asymptomatic singleton gestations and prior spontaneous preterm birth who were not in preterm labor at the time of intervention were included.
  - Seven randomized controlled trials, including international trials, met the inclusion criteria.
  - Quasi-randomized trials, cluster randomized controlled trials; trials in which patients were in preterm labor at the time of randomization, trials with patients with multiple gestations, and trials in which patients underwent cerclages were excluded.
- Patients received either daily vaginal progesterone or weekly IM 17-OHPC.
  - One study used 90 mg of vaginal progesterone daily, one used 100 mg of vaginal progesterone daily, and the remainder used 200 mg of vaginal progesterone daily.
  - All studies used 250 mg of 17-OHPC weekly.
  - Progesterone therapy was started between 16–24 weeks gestation and continued until 36–37 weeks gestation or delivery.
- Data among the included trials was synthesized and evaluated for rates of preterm birth at <34 weeks of gestation for the primary outcome.
- The secondary outcomes included preterm birth at <37 weeks of gestation, preterm birth at <32 weeks of gestation, preterm birth at <28 weeks of gestation, maternal adverse reactions, and neonatal morbidity and mortality (which included admission to neonatal intensive care unit, respiratory distress syndrome [RDS] including transient tachypnea of the newborn or severe RDS, bronchopulmonary dysplasia, intraventricular hemorrhage [grade 3 or 4], neonatal culture-proven sepsis, and perinatal death).

INTERVENTION (# IN THE GROUP): 963

COMPARISON (# IN THE GROUP): 947

FOLLOW-UP PERIOD: Unavailable

RESULTS:

Primary Outcome –

- Vaginal progesterone decreased preterm birth at <34 weeks gestation compared to IM 17-OHPC (6 trials; N=1,110; relative risk [RR] 0.74; 95% CI, 0.57-0.96).

- When limited to trials with the lowest risk of bias, the difference was no longer statistically significant (4 trials; N=575; RR 0.87; 95% CI, 0.57-1.32).

Secondary Outcome –

- Vaginal progesterone decreased preterm birth at <37 weeks gestation compared to IM 17-OHPC (7 trials; N=1910; RR 0.76; 95% CI, 0.69-0.85).
- Vaginal progesterone decreased preterm birth at <32 weeks gestation compared to IM 17-OHPC (4 trials; N=868; RR 0.58; 95% CI, 0.39-0.86).
- Vaginal progesterone was associated with fewer maternal adverse effects than IM 17-OHPC (4 trials; N=805; RR 0.71; 95% CI, 0.54-0.92).
- There was no statistically significant difference between the vaginal progesterone and IM 17-OHPC groups for the outcomes of preterm birth at <28 weeks gestation and neonatal morbidity and mortality.

LIMITATIONS:

- The quality of evidence in the trials included in the meta-analysis was low or very low when assessed with the Grading of Recommendations Assessment, Development, and Evaluations (GRADE) scale.
- The difference in the rate of preterm births between the vaginal progesterone group and the IM 17-OHPC group was no longer statistically significant when only trials with lower risks of bias were included.
- Different doses of vaginal progesterone were used among the different randomized controlled trials, and further studies will be required to determine the optimal dose of vaginal progesterone.
- None of the randomized controlled trials included in this study were double-blinded.

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A Comparison of Emtricitabine with Tenofovir Alafenamide or Tenofovir Disoproxil Fumarate for HIV PrEP

Emtricitabine and Tenofovir Alafenamide vs Emtricitabine and Tenofovir Disoproxil Fumarate for HIV Pre-Exposure Prophylaxis (DISCOVER): Primary Results from a Randomised, Double-Blind, Multicentre, Active-Controlled, Phase 3, Non-Inferiority Trial

Mayer KH, Molina JM, Thompson MA, et al. Emtricitabine and tenofovir alafenamide vs emtricitabine and tenofovir disoproxil fumarate for HIV pre-exposure prophylaxis (DISCOVER): primary results from a randomized, double-blind, multicentre, active-controlled, phase 3, non-inferiority trial. *Lancet*. 2020;396(10246):239-254. doi:10.1016/S0140-6736(20)31065-5

KEY TAKEAWAY: Emtricitabine and tenofovir alafenamide (FTC/TAF) is as effective and may be safer than emtricitabine and tenofovir disoproxil fumarate (FTC/TDF) for HIV prevention.

STUDY DESIGN: Multi-site, randomized, double-blind, active-controlled trial

LEVEL OF EVIDENCE: STEP 2

BRIEF BACKGROUND INFORMATION: FTC/TDF has been shown as a safe and effective option for pre-exposure prophylaxis (PrEP) against HIV, but the safety and efficacy of FTC/TAF for PrEP is unknown. Limited information exists comparing FTC/TDF to FTC/TAF.

PATIENTS: Adult, cisgender men who have sex with men (MSM) and transgender women (TGW) who have sex with men at high risk of acquiring HIV

INTERVENTION: FTC/TAF plus placebo

CONTROL: FTC/TDF plus placebo

PRIMARY OUTCOME: New HIV infection

Secondary Outcome: Bone mineral density and renal biomarkers

METHODS (BRIEF DESCRIPTION):

- Conducted at 94 community, public health, and hospital-associated clinics throughout Europe and North America
- Demographics:
  - 85% White
  - Gender or sexual orientation
    - FTC/TAF: 98% cisgender MSM
    - FTC/TDF: 99% cisgender MSM
- Inclusion criteria: HIV negative; rectal gonorrhea; rectal chlamydia; syphilis; two or more receptive condomless anal sex partners
- Exclusion criteria: serious infection; acute hepatitis A, B, or C or chronic hepatitis B; history of osteoporosis or fragility fracture; and/or renal dysfunction
- Participants were randomly assigned in a 1:1 ratio to receive FTC/TAF 200 mg/25 mg orally daily plus placebo (intervention group) or FTC/TDF 200 mg/300 mg orally daily plus placebo (control group).
  - HIV, gonorrhea, chlamydia, and syphilis testing and physical exams occurred at initial screening, four weeks and 12 weeks, and every 12 weeks thereafter.
  - Dual-energy x-ray absorptiometry (DXA) scans of the hip and lumbar spine were conducted at baseline and week 48 in a subset (n=383).
- Alpha was set a priori at .05.

INTERVENTION (# IN THE GROUP): 2,694

COMPARISON (# IN THE GROUP): 2,693

FOLLOW-UP PERIOD: The primary endpoint was analyzed when all participants completed at least 48 weeks of therapy and when at least 50% of participants completed 96 weeks of therapy.

RESULTS:

Primary Outcome –

- FTC/TAF was non-inferior to FTC/TDF for the prevention of HIV (IRR 0.47; 95% CI, 0.19–1.15).
  - Seven participants in the FTC/TAF group (0.16 infections per 100 person-years; 95% CI, 0.06–0.33) and 15 participants in the FTC/TDF group (0.34 infections per 100 person-years; 95% CI, 0.19–0.56) tested positive for HIV.
  - A sensitivity analysis excluded one participant from the FTC/TAF group and four participants from the FTC/TDF group suspected to have acquired HIV before baseline (IRR 0.55; 95% CI, 0.20–1.48).

Secondary Outcome –

- FTC/TAF demonstrated significant superiority to FTC/TDF for the secondary safety outcomes:
  - Hip bone mineral density (0.18% vs. -0.99%, *P* <.0001)
  - Spine bone mineral density (0.50% vs. -1.12%, *P* <.0001)
  - β_2-microglobulin to creatinine ratio (-10.7% vs. 15.2%, *P* <.0001)

- Retinol-binding protein to creatinine ratio (0.2% vs. 19.9%, *P*<.0001)
- Changes in the distribution of urine protein to creatine ratio above 22.6 mg/mmol at 48 weeks (1% vs. 2%, *P* =.005)
- Changes in serum creatinine (-0.88 µmol/L vs. +0.88 µmol/L, *P* <.0001)

LIMITATIONS:

- Power was limited by low HIV incidence potentially secondary to high PrEP adherence misrepresentative of the true population.
- Participants were not screened at baseline with a sensitive fourth-generation antigen-antibody test to ensure negative HIV-1 RNA results prior to PrEP initiation.
- The impact of tenofovir-containing PrEP regimens on long-term bone health is unclear, especially for younger patients who initiate PrEP prior to acquiring peak bone mass.
- The study did not include a non-PrEP control group for comparison.
- Study demographics limit generalizability:
  - Populations at higher risk of acquiring HIV such as Black patients and TGW were not proportionally included.
  - Participants at risk for acquiring HIV through receptive vaginal or frontal sex or by injection drug use were not included.

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Sports-Related Concussion Risk in Adolescent Soccer Players

Association of Sex with Adolescent Soccer Concussion Incidence and Characteristics

Bretzin AC, Covassin T, Wiebe DJ, Stewart W. Association of Sex With Adolescent Soccer Concussion Incidence and Characteristics. *JAMA Netw Open*. 2021;4(4):e218191. Published 2021 Apr 1. doi:10.1001/jamanetworkopen.2021.8191

KEY TAKEAWAY: This prospective cohort study of male and female soccer athletes provides evidence of sex-associated differences in concussion risk, mechanism of injury, short-term management, and time to return to play.

STUDY DESIGN: Prospective, longitudinal cohort study

LEVEL OF EVIDENCE: STEP 2

BRIEF BACKGROUND INFORMATION: Significant efforts have been placed on identifying the risks of sports-related concussions (SRC). Females were previously associated with a higher risk for SRC, which merited investigation into potentially manageable gender-specific variables.

PATIENTS: High school soccer athletes

INTERVENTION: Athletes who reported having a sports-related concussion (SRC)

CONTROL: Athletes without a sports-related concussion

PRIMARY OUTCOME: Compare sex-associated differences in epidemiology and concussion management in athletes

METHODS (BRIEF DESCRIPTION):

- All high school (9^{th}–12^{th} grade) soccer athletes in Michigan from the beginning of the 2016-2017 academic year to the end of the 2018-2019 academic year were included in this study.
  - All athletes were required to enter data in the head injury reporting system.
- Recognized sports-related concussions were recorded via an online repository.
  - This included demographic data (age, sex, grade, level of competition, and sport) and injury event data (game/practice, mechanism of injury, and individual who authorized return-to-play).
- Sports-related concussions were defined as:
  - An injury occurring because of participation during the preseason, in-season, practice, scrimmage, or game AND
  - Required the student-athlete to be withheld from activity after exhibiting signs/symptoms of SRC.
  - All SRCs require confirmation by a physician, nurse practitioner, or physician assistant.
- The head injury reporting system required that the personnel assessing the student-athlete with suspected SRC and responsible for decision-making be recorded.
  - For the study, the initial examiner was coded as either an athletic trainer or an athletic trainer.
  - Only 52.3% of high schools in Michigan have athletic training personnel.
- Mechanisms of injury were defined as person-to-person, person-to-object, person-to-playing surface, or uncertain about the cause of injury.
  - SRC data included whether the athlete was removed from the activity at the time of the recorded injury.
  - The MHSAA required medical clearance in writing before return-to-play.
- The MHSAA staff monitored data entry daily for accuracy.
  - The completion rate was 99% of injury reports.
  - Statistical analysis was performed using StataCorp software.
  - Between-group differences were compared using X^2.
  - Differences were expressed in relative risks (RRs) with 95% Cis.

INTERVENTION (# IN THE GROUP): 557 males and 950 females

COMPARISON (# IN THE GROUP): 43,184 males and 38,687 females

FOLLOW-UP PERIOD: Three academic years from 2016–2019

RESULTS:

Primary Outcome –

- Concussion Risk and Mechanisms:
  - A greater portion of female athletes than male athletes were in lower grades of school (308 [32.4%] vs 111 [21.0%] in ninth grade; $P<.001$).

- A greater proportion of female athletes than male athletes participated in junior varsity soccer (337 [35.5%] vs 141 [27.1%]; *P*<.004).
- A greater proportion of female athletes than male athletes had a prior history of concussion (199 [21.0%] vs 78 [14.0%]; *P*<.001).
- Most concussions occurred during competition in both male and female athletes (813 [85.5%] and 476 [85.6%], respectively; *P*=.55).
- Athletes with SRC were more likely to be removed from activity when a certified athletic trainer was supervising the sporting event than when an athletic trainer was not (OR 3.1; 95% CI, 2.4–4.1; *P*=.001).

- Sex Differences in Concussion:
  - Female soccer athletes had a higher risk of sport-related concussions than their male counterparts (RR 1.9; 95% CI, 1.7–2.1; *P*<.001).
  - The most common concussion-related mechanism of injury in female athletes was contact with an object, while male athletes was contact with another person (398 [41.9%] and 264 [48.4%], respectively; *P*<.001).
  - Male athletes with documented SRC were more likely to be removed from play on the day of injury than female athletes (OR 1.5; 95% CI, 1.2–2.1).
  - Male athletes with documented SRC typically returned to play two days earlier than female athletes (median 10 [IQR, 7–14] days vs 12 [IQR, 7–16] days; Peto test *P*<.001).

LIMITATIONS:

- The presence of certified athletic trainers at athletic events was not universal.
  - Thus, the athlete's initial evaluation, diagnosis, and management were not standardized at the time of injury.
- The head injury reporting system only tallied the total number of athletes participating each year and did not include athlete exposures without injury events.
- Athletes had limited clinical history, potentially missing associations between premorbid and comorbid factors in relation to sport-related concussion.
- The head injury reporting system records each concussion as a new case.
  - Thus, there are no means to correlate or match this data with previous concussions for the same athlete within the system.

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Out of Time for OMT? Investigating Reasons OMT is Tabled

Osteopathic Manipulative Treatment Use Among Family Medicine Residents in a Teaching Clinic

Caldwell G, Zeng L, Kaufman J, Bates J. Osteopathic manipulative treatment use among family medicine residents in a teaching clinic. *J Osteopath Med*. 2022;122(10):517-520. Published 2022 Jun 23. doi:10.1515/jom-2022-0040

KEY TAKEAWAY: Despite its perceived efficacy, Osteopathic Manipulative Treatment (OMT) is utilized a fraction of the time it could be used for treatment. Of those patient encounters where OMT is not used, the most common reason given for omitting OMT is the lack of available time.

STUDY DESIGN: Retrospective cross-sectional survey

LEVEL OF EVIDENCE: STEP 5

BRIEF BACKGROUND INFORMATION: Osteopathic Manipulative Treatment (OMT) is a central focus in osteopathic medical schools and is appreciated as an effective treatment for a wide range of medical conditions. Despite its perceived efficacy, prior studies have shown infrequent application during patient encounters. The purpose of this study was to quantify the use and omission of OMT and to investigate reasons OMT is not used in the family medicine clinic.

PATIENTS: Resident physicians

INTERVENTION: Survey of potential OMT encounters

CONTROL: Encounters appropriate for OMT versus utilization of OMT

PRIMARY OUTCOME: Barriers to OMT use

METHODS (BRIEF DESCRIPTION):

- 15 residents from an osteopathically recognized family medicine residency program in Michigan were surveyed.
- The residents completed the surveys after each half day spent in the family medicine clinic.
- The information collected included the number of patients seen, the number of patients for which OMT was considered an appropriate treatment, the number of patients for which OMT was performed, and reasons why OMT was not utilized for patients when it could have been appropriate.
- Survey information collected was combined and simple calculations were made to evaluate the data.

INTERVENTION (# IN THE GROUP): 304

COMPARISON (# IN THE GROUP): 60

FOLLOW-UP PERIOD: Three, two-week periods

RESULTS:

Primary Outcome –

- Survey results found that 19.7% (60/304) of all encounters were described as appropriate for OMT, and 1.6% (5/304) of all encounters utilized OMT.

Secondary Outcome –

- Reasons OMT was not performed included:
  - Time constraints: 42/50 encounters
  - Insufficient OMT faculty: 3/50 encounters
  - Resident physician being uncomfortable with OMT: 2/50 encounters
  - Patient being uncomfortable with OMT: 2/50 encounters
  - OMT treatment table not available: 1/50 encounters.

LIMITATIONS:

- The survey consists of a small sample size.
- The survey was collected during the COVID-19 pandemic, likely decreasing in-person visits at the clinic, and perhaps limiting physical contact.
- The residency program surveyed includes an increased number of residents who are candidates for OMT, and neuromuscular fellowship as compared to other family medicine programs.
- Because the data was collected by survey, there is likely some recall bias.
- Because the data was collected in several intervals, this may have primed the participants to modify their use of OMT.

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