ABSTRACTS IN URGENT CARE

- Progress in Assessing for mTBI
- Reducing Asthma Flare-Ups in Adults
- Keeping Kids with Asthma out of the ED
- Identifying the Source of Vaginitis
- Prednisone + Levocetirizine vs Levocetirizine Alone for Urticaria
- Cotton-Tip Applicator Injuries in Children
- Still Too Many Opioids for Migraine Patients
- Consequences to Waiting 24 Hours for Appendectomy?

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Each month the College of Urgent Care Medicine (CUCM) provides a handful of abstracts from or related to urgent care practices or practitioners. Glenn Harnett, MD leads this effort.

Validating a Quantitative EEG-Based Brain Function Index

Key point: A novel EEG-based point of care, handheld, and non-invasive head injury assessment device, utilizing an index based on EEG measures reflective of concussion, was demonstrated to provide a quantitative index of brain function impairment in mild traumatic brain injury (mTBI).

Citation: Hanley D, Prichep LS, Badjatia N, et al. A brain electrical activity (EEG) based biomarker of functional impairment in traumatic head injury: a multisite validation trial. *J Neurotrauma*. [Epub ahead of print June 9, 2017]

There is currently no gold standard for the diagnosis of concussion. Clinical symptom checklists and neurocognitive tests are commonly used, but disadvantages include lack of clinical validation, poor test-test reliability, and frequent underreporting or exaggeration of symptoms. Previous studies have demonstrated a change in the frequency spectra, power relationships, and coherence between brain regions of the EEG in the presence of concussion. This observational, prospective, multisite validation trial was published in *Academic Emergency Medicine* and included 720 adult patients (age 18-85) admitted to the ED within 3 days of sustaining a closed head injury. Ninety-seven percent of trial participants had a Glasgow Coma Scale score of 15. Using a handheld BrainScope One device (FDA cleared as the Ahead 300) and disposable headset at the point of care, 5-10 minutes of electroencephalogram (EEG) from frontal and frontotemporal regions was acquired. The paper describes the development and validation of a quantitative EEG-based brain function index (BFI), which is derived from EEG features associated with functional brain impairment reflective of current consensus on the physiology of concussive injury. Significant differences in BFI were demonstrated among normal, mTBI/concussed, and CT+ patients ($p<0.0001$). A multinomial logistic regression analysis and regression slopes of the odds ratios support the BFI as a quantitative marker of brain function impairment, which scaled with the severity of functional impairment in mTBI patients. The results suggest that the BFI directly addresses the need for an objective, readily available assessment of brain function following head injury. It can aid urgent care providers in the rapid initial diagnosis of functional injuries and has the potential to provide a quantitative marker for the progression or resolution of MTBI/concussion. ■

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Decreasing Frequency of Asthma Exacerbations in Adults

Key point: Adults with persistent symptomatic asthma experience fewer asthma exacerbations and improved quality of life when treated with oral azithromycin for 48 weeks, suggesting it could be a useful add-on therapy in persistent asthma.

Citation: Gibson PG, Yang IA, Upham JW, et al. Effect of azithromycin on asthma exacerbations and quality of life in adults with persistent uncontrolled asthma (AMAZES): a ran-

domized, double blind, placebo controlled trial. *Lancet*. 2017;390(10095):659-668.

Previous studies have demonstrated that azithromycin (and other macrolides) have anti-inflammatory effects and are reported to be beneficial in both eosinophilic and non-eosinophilic subtypes of asthma. This randomized, double-blind, placebo-controlled parallel group trial studied whether or not oral azithromycin decreased the frequency of asthma exacerbations in adults with symptomatic asthma despite current use of inhaled corticosteroids and a long-acting bronchodilator. Four hundred twenty patients were randomly assigned to either azithromycin 500 mg three times per week or placebo. Azithromycin decreased moderate-to-severe asthma exacerbations compared with placebo (1.86 per patient year), and the proportion of patients experiencing at least one asthma exacerbation was reduced by its use (44% azithromycin vs 61% placebo). Azithromycin treatment was also shown to significantly increase asthma-related quality of life (adjusted mean difference 0.36; p=0.001). ■

Helping Prevent Return ED Trips for Children with Asthma

***Key point:** Mite-impermeable bedcovers are effective at reducing the number of mite-sensitized children requiring hospital treatment for asthma exacerbations, but not the number requiring oral prednisolone.*

Citation: Murray CS, Foden P, Sumner H, et al. Preventing severe asthma exacerbations in children: a randomized controlled trial of mite-impermeable bedcovers. *Am J Resp Crit Care Med*. 2017;196(2):150-158.

Studies have revealed that allergen exposure in sensitized individuals with asthma interacts with viruses to increase the risk of asthma exacerbations. This randomized, double-blind, placebo-controlled study included 284 pediatric patients with mite-sensitized asthma. The subjects were identified after presenting to 14 EDs in England with acute asthma exacerbation. Subjects received either mite-impermeable or placebo bedcovers at discharge from this initial study visit and were followed over a 12-month intervention period. At 12 months, significantly

fewer children who received the mite-impermeable bedcovers vs the placebo group required a repeat ED visit for an asthma exacerbation (that required IV corticosteroid treatment) as compared with the placebo group (29% vs 42%). This constitutes a 45% decrease. The study also measured the use of the mite-impermeable bedcover's effect on the rate of use of oral corticosteroids for ≥3 days or longer in the intervention period. They found no difference between placebo and the intervention on the rate of oral steroid use. These results suggest that mite-impermeable bedcovers are effective in reducing ED visits for acute asthma exacerbations requiring IV corticosteroids. Urgent care providers should consider the recommendation of mite-impermeable bedcovers to pediatric patients with mite-sensitive asthma. ■

Comparing Collection Methods when Testing for Vaginitis

Key point: A molecular-based test using vaginal swabs collected by clinicians or patients can accurately diagnose most common bacterial, fungal, and protozoan causes of vaginitis.

Citation: Gaydos CA, Beqaj S, Schwebke JR, et al. Clinical validation of a test for the diagnosis of vaginitis. *Obstet Gynecol*. 2017;130(1):181-189.

This cross-sectional study was performed in 2015 with 1,740 women who complained of symptoms of vaginitis. Swabs were self-obtained (then sheathed and handed to the clinician) or clinician-obtained in order to compare differences between collection methods. All samples were evaluated with the molecular test and six different reference tests. The sensitivity and prevalence rates were very similar between the two collection methods. Bacterial vaginosis was diagnosed via the reference methods in 56.5%, vaginal candidiasis in 32.8%, and trichomonas in 8% of patients. The investigational test sensitivity was 9.5% and specificity was 85.8% for bacterial vaginosis; for candida, sensitivity was 90.9% and specificity 94.1%; and in the trichomonas group sensitivity was 93.1% and specificity 99.3%. These results suggest that this molecular-based test using vaginal swabs collected by the patient or clinician can diagnose most bacterial, fungal, and protozoan causes of vaginitis. ■

Does Adding Prednisone to Levocetirizine Help in Patients with Urticaria?

Key point: The addition of a prednisone burst did not improve the symptomatic or clinical response of acute urticaria to levocetirizine.

Citation: Barniol C, Dehours E, Mallet J, et al. Levocetirizine and prednisone are not superior to levocetirizine alone for the treatment of acute urticaria: a randomized double-blind clinical trial. *Ann Emerg Med*. [Epub ahead of print May 2, 2017]

This double-blind randomized trial compared the use of levocetirizine (5 mg orally for 5 days) alone vs levocetirizine plus prednisone (40 mg orally for 4 days) in 100 adults who presented to an ED with acute urticarial without angioedema. Results at 2-day follow-up revealed that 62% of patients in the prednisone + levocetirizine treated group had an itch score of 0 while 76% of those who took levocetirizine alone had an itch score of 0. Also, 30% of the prednisone + levocetirizine-treated group reported relapses of urticaria while 24% of the levocetirizine group alone reported relapses. These differences were not clinically significant, and this study does not support the use of a prednisone burst in addition to levocetirizine in the treatment of adult patients with urticaria without angioedema. ■

Cotton-Tip Applicators Injuries in Children

Key point: Cotton tip applicator injuries continue to be prevalent in children, especially when the children themselves are the ones handling the CTA; this suggests that further injury prevention strategies are warranted.

Citation: Ameen ZS, Chounthirath T, Smith GA, Jatana KR. Pediatric cotton-tip applicator-related ear injury treated in United States emergency departments, 1990-2010. *J Pediatr*. [Epub ahead of print May 1, 2017]

Cotton-tip applicators (CTAs) were invented in 1923, and their use for ear hygiene has since been associated with cerumen impaction, tympanic membrane perforation (TMP), foreign body, and otitis externa. The researchers in this study utilized the National Electronic Injury Surveillance System (NEISS) to retrospectively determine the rates of CTA-associated injuries in children from 1990 to 2010. The study revealed that children <8 years old sustained the highest rates of injury (more than two thirds of patients). Ear cleaning was the most frequently documented reason for injury, with 76.9% of those patients reporting that they themselves were handling the CTA when the injury occurred. The most common presenting complaints in the ED were foreign body sensation (39.2%) and bleeding (34.8%). The most common diagnoses were the presence of a foreign body (29.7%) and tympanic membrane rupture (25.3%). Urgent care providers should continue to dispel the notion that ears need to be manually cleared in the home setting and should suggest gentle ear irrigation, cerumenolytics, or consultation with an otolaryngologist when indicated. ■

Patients Still Receiving Opioids for Migraine

Key point: Despite increasing evidence against the use of opioids for migraines, over one third of patients in this multicenter ED retrospective study received them.

Citation: Young N, Silverman D, Bradford H, Finkelstein J. Multicenter prevalence of opioid medication use as an abortive therapy in the emergency department treatment of

migraine headaches. *Am J Emerg Med*. [Epub ahead of print June 16, 2017]

Previous head-to-head studies have shown that ketorolac, antiemetics, and dihydroergotamine are all superior to opioids for the treatment of acute migraine headaches. In fact, the American Academy of Neurology has determined that abortive use of opioids in migraine treatment is one of the top five correctable actions to be addressed in their specialty. This retrospective study involved 1,222 ED visits for migraine in three types of EDs—an academic medical center, a nonacademic urban ED, and a community ED. Opioids were ordered in 35.8% of the visits, including in 12.3% of academic medical center visits, 40.9% of urban ED visits, and 68.6% of community EDs. The patients who received opioids had a higher rate of repeat visits than those who did not. Also of note, the academic center and the urban ED both found a >30% decrease in length of stay in visits where opioids were not given. Opioid visits were also associated with a higher rate of use of rescue medicines. Urgent care providers should consider alternative therapies for the treatment of acute migraine headaches. ■

Does Delaying Appendectomy for 24 Hours Increase Complications?

***Key point:** Delay of appendectomy within 24 hours of presentation was not associated with increased risk of complicated appendicitis or adverse outcomes, suggesting that appendectomy can be safely performed as an urgent (rather than an emergent) procedure.*

Citation: Serres SK, Cameron DB, Glass CC, Graham DA, et al. Time to appendectomy and risk of complicated appendicitis and adverse outcomes in children. *JAMA Pediatr*. [Epub ahead of print June 19, 2017]

This retrospective cohort study utilized the Pediatric National Surgery Quality Improvement Program appendectomy database of 2,429 children <18 years of age who underwent appendectomy within 24 hours of presentation at 23 children's hospitals over a 2-year period, from 2013-2014. The main exposure was time to appendectomy (TTA), which was further categorized as early and late TTA as compared with their hospital's median TTA. The primary outcome was complicated appendicitis documented at operation. Results revealed a median TTA of 7.4 hours. Roughly one quarter (23.6%) of patients were diagnosed with complicated appendicitis. Increasing TTA was not associated with complicated appendicitis, and only one of 23 hospitals had an increased rate of complication for late TTA vs early TTA. Increase in TTA was associated with a slight increase in length of stay, but was not associated with an increase in postoperative complications. ■