ABSTRACTS IN URGENT CARE

- Accuracy of Dipsticks in Diagnosing Infant UTIs
- Vestibular Suppressants and Vertigo
- Management of Sudden-Onset Headaches: New Questions
- Hemorrhage in Elderly Patients on Anticoagulation
- Detecting Skull Fractures in Children
- An Approach to Episodic Wheezing in Children

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Are Urine Dipsticks Accurate in Diagnosing UTIs in Infants?

Take-home point: Point-of-care (POC) urinalysis (ie, urine dipstick) is moderately sensitive and highly specific for diagnosing urinary tract infection in febrile infants. The optimum cut-point for excluding UTI is leucocytes (1+), and the optimum cut-point for confirming UTI is nitrites (trace).

Citation: Waterfield T, Foster S, Platt R, et al. Diagnostic test accuracy of dipstick urinalysis for diagnosing urinary tract infection in febrile infants attending the emergency department. *Arch Dis Child*. 2022;107:1095–1099.

Relevance: Diagnosing and treating UTI in infants can be challenging. This study addresses this conundrum with the tool most widely available in UC.

Study summary: This was a multicenter cohort study conducted in sites from Pediatric Emergency Research in the UK and Ireland as part of the Febrile Infants Diagnostic assessment and Outcome (FIDO) study. The study included patients under 90 days of age with a recorded fever (≥38°C) at triage. The index test was the commercially available Siemens Multistix POC urine dipstick test performed on urine samples obtained by clean-catch or transurethral bladder catheter (TUBC). The authors identified 275 patients; 252 (92%) were clean-catch samples and 23 (8%) were TUBC for analysis. They found 38 (13.8%) participants had a confirmed (noncontaminant) UTI. Of those, 35 (92%) were *Escherichia coli*; two (5%) were *Klebsiella*; and one (3%) was *Enterococcus*. The most sensitive individual dipstick result for UTI was the presence of leukocytes; using trace indicating a positive result gave the highest sensitivity of 84% (95% CI 69 – 94%) and a specificity of 73% (95% CI 67 – 79%). The most specific individual dipstick result for UTI was the presence of any nitrites. The specificity of 1+, 2+, or 3+ was 95% (95% CI 91-97%), 99% (95% CI 97 - 100%) and 98% (95% CI 95 – 99%), respectively. The presence of both leucocytes and nitrites was highly specific for UTI but poorly sensitive.

Editor's comments: The study population was too small to allow for further subgroup analysis, such as by age or symptoms, and included only very young infants (‹3 months of age). It is helpful that the vast majority of urine specimens collected were clean-catch, as catheterized samples are rarely collected in urgent care centers. It is worth noting that even the lowest threshold of leukocyte esterase (ie, trace) still was only 84% sensitive for excluding UTI. ■

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Vestibular Suppressants in Treatment of Vertigo

Take-home point: Canalith repositioning maneuvers (CRMs), rather than vestibular suppressants, seem to be the most effective treatment for benign paroxysmal positional vertigo (BPPV).

Citation: Sharif S, Koujah D, Greer A, et al. Vestibular suppressants for benign paroxysmal positional vertigo: A systematic review and meta-analysis of randomized controlled trials. *Acad Emerg Med*. 2022 Oct 21.

Relevance: Recommendations for the treatment of BPPV from the American Academy of Otolaryngology (AAO) and the American Academy of Neurology have been against the use of suppressants in favor of CRM, yet prescribing of

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the suppressants remains common.

Study summary: This was a systematic review of literature regarding the utility of medications relative to placebo, no treatment, or CRM in BPPV. The authors conducted a comprehensive search of MEDLINE, Cochrane, EMBASE, and ClinicalTrials.Gov for randomized controlled trials investigating the role of antihistamines, benzodiazepines, anticholinergics, and phenothiazines for the management of BPPV.

The authors identified five RCTs in the quantitative analysis and one RCT for qualitative analysis, involving a total of nearly 300 patients. The use of vestibular suppressants had no effect on symptom severity at the point of longest follow-up (2-4 weeks). CRM had a relative risk (RR) of 0.63 (95% CI 0.52 to 0.78) for symptom improvement at follow-up within 1 month. It was unclear whether vestibular suppressants reduced the rate of repeat ED or clinic visits, patient satisfaction, and symptom resolution within 24 hours as confidence intervals for RR for each of these metrics crossed the neutral point.

Editor's comments: None of the included studies assessed the ability of an emergency physician to perform CRMs adequately and not all studies used the Epley maneuver as the CRM of choice. The studies focused exclusively on BPPV and other causes of vertigo were not assessed. ■

Management of Sudden-Onset Headaches—Are the Days of Lumbar Puncture Behind Us?

Take-home point: With newer multislice CT scanners, head CT undertaken within 6 hours of headache onset is highly sensitive and can rule out subarachnoid hemorrhage (SAH) in low-moderate suspicion cases.

Citation: Walton M, Hodgson R, Eastwood A, et al. Management of patients presenting to the emergency department with sudden onset severe headache: systematic review of diagnostic accuracy studies. *Emerg Med J*. 2022; 39(11):818-825.

Relevance: Recent studies question the need for routine lumbar puncture after a normal head CT. This systematic review suggests scans undertaken beyond 6 hours are less sensitive; therefore, additional testing is likely to be beneficial.

Study summary: This was a systematic review of evidence on diagnostic strategies for neurologically intact adult patients presenting to hospital with nontraumatic sudden-onset severe headache. Eighteen databases (including MEDLINE and Embase) were searched. Studies included assessed any care pathway for ruling out SAH (including clinical decision rules and specific diagnostic tests, such as CT or LP) in neurologically intact adult patients presenting to the ED with a sudden-onset severe headache and clinical suspicion of SAH.

The authors identified 37 studies which were included in their analysis. The use of Ottawa SAH Clinical Decision Rule was highly sensitive (99.5%) for excluding SAH clinically, but poorly specific. Noncontrast head CT <6 hours from headache onset on a modern, multislice scanner with CT assessed by a neuroradiologist or radiologist who routinely interprets head CT images had a sensitivity of 98.7% (95% CI 96.5 to 100) and specificity of 100% (95% CI 99.7 to 100). Head CT beyond 6 hours was significantly less sensitive (<90%). Two small studies that were included evaluated the utility of CT-angiography; however, neither study identified any patients with cerebral aneurysms. LP was 100% sensitive for identifying SAH in patients with negative head CT after 6 hours.

Editor's comments: There was the substantial heterogeneity in the study methods and population characteristics of the included studies. It appears that with clinical decision aids, such as the Ottawa Rule, and adoption of modern CT scanners, the necessity of LP is limited for patients who present early after sudden-onset headache. As many UC centers do not have CT scanners, it is important for UC providers to understand that 6 hours is a cutoff for the use of CT alone in reliably excluding SAH. Understanding this can inform rapid ED referrals to allow for patients with thunderclap headache presentations to undergo expedited ED evaluation and ideally forego LP. ■

Delayed Intracranial Hemorrhage in Elderly Patients on Anticoagulation

Take-home point: Overall risk of delayed intracranial hemorrhage (ICH) is low, but highest among patients prescribed warfarin.

Citation: Liu S, McLeod S, Atzema C, et al. Delayed intracranial hemorrhage after head injury among elderly patients on anticoagulation seen in the emergency department. *CJEM*. 2022.24:853–861.

Relevance: UC clinicians and practitioners should be aware of the risk of delayed intracranial hemorrhage after head injury, particularly in those on warfarin compared with other forms of anticoagulation (or none).

Study summary: This was a planned subgroup analysis of a larger study that compared the risk of intracranial hemorrhage in elderly patients (age >65 years) on anticoagulation who presented to the ED after head injury. Data were obtained from the Canadian Institutes of Health Information National Ambulatory Care Reporting System (CIHI-NACRS) and the electronic Canadian Triage and Acuity Scale (eCTAS) database.

The authors identified 69,321 patients for analysis, of whom 58,233 (84.0%) were not on anticoagulation, 8,007 (11.6%) were on a direct-acting oral anticoagulant (DOAC), and 3,081 (4.4%) were on warfarin. Delayed ICH occurred in 718 (1.0%) patients. Of those, 586 (1.0%) not on anticoagulation had a delayed ICH, compared with 54 (1.8%) patients on warfarin and 78 (1.0%) patients on a DOAC. There was an increased odds of delayed ICH among patients on warfarin compared with those not on oral anticoagulation (OR 1.5, 95% CI 1.1–2.1). There was no significant difference in delayed ICH between patients on a DOAC compared with no oral anticoagulation (OR 0.9, 95% CI 0.6–1.1).

Editor's comments: This study used administrative data, therefore there is the possibility of coding errors. The authors were unable to identify if anticoagulation was stopped following initial head injury, which might affect the rate of bleeding. Importantly, the risk of delayed intracranial hemorrhage seems to be between 1% and 2% regardless of anticoagulation in elderly patients. The data suggest caution against dismissing delayed or repeat head injury presentations in older adults, especially with concerning symptoms (eg, severe headache, confusion, vomiting). ■

Sensitivity of Physical Examination in Detecting Skull Fractures in Children

Take-home point: Skull fractures are common in patients with intracranial injury from blunt trauma. Physical exam by emergency clinicians had poor sensitivity for detecting skull fractures, with the lowest sensitivity for detecting basilar or depressed skull fractures.

Citation: Akie T, Gupta M, Rodriguez R, et al. Physical examination sensitivity for skull fracture in pediatric patients with blunt head trauma: a secondary analysis of the National Emergency X-Radiography Utilization Study II Head Computed Tomography Validation Study. *Ann Emerg Med*. 2022;S0196-0644(22)01031-9.

Relevance: Physical examination (PE) is required as part of the pediatric head CT clinical decision rules but has limits and can impact in imaging decision-making.

Study summary: This was a post-hoc secondary analysis of pediatric patients from the validation studies of the NEXUS Head CT decision instrument. The present study additionally analyzed the prevalence of skull fractures and the provider's ability to detect these injuries clinically. Clinicians were asked to determine whether patients had evidence of skull fracture, which included signs of any of the following: basilar skull fracture, including ecchymosis in the periorbital or preauricular area, hemotympanum, and clear drainage from the ear or nose; depressed or diastatic skull fracture (palpable step-off, stellate laceration from a point source).

The authors identified 1,018 patients for final analysis, 128 (12.5%) of whom had any injury identified on a CT scan. Among those, 85 (66% of all patients with intracranial injury) also had radiographically identified skull fractures. Eighteen (14% of all patients with intracranial injuries) had depressed or basilar skull fractures. They found overall prevalence of skull fracture in patients with any injury on CT to be 66.4%; basilar and/or depressed skull fractures were present in 14%. Provider sensitivity and specificity for detection of any skull fracture were 18.5% (95% confidence interval [CI], 10.5% to 28.7%) and 96.6% (95.3% to 97.7%), respectively. Sensitivity and specificity of basilar or depressed skull fractures were 11.1% (1.4% to 34.7%) and 95.9% (94.5% to 97.1%).

Editor's comments: Participants had to have a CT head obtained at the index visit to be included. Emergency providers missed most of the skull fractures on clinical exam, suggesting that a reassuring cranial exam should not obviate concern for intracranial injury or skull fracture in patients with serious head injury and/or red flag symptoms (eg, seizure, vomiting). ■

Use of Intermittent Tiotropium Bromide for Episodic Wheezing in Children

Take-home point: Intermittent tiotropium bromide treatment may be an effective alternative to current therapies for pediatric episodic wheezing.

Citation: Kotaniemi-Syrjanen A, Klemola T, Koponen P, et al. Intermittent tiotropium bromide for episodic wheezing: a randomized trial. *Pediatrics*. 2022;150(3): e2021055860.

Relevance: Options for treating episodic viral wheeze, which mimics asthma in the pediatric population but has a different pathophysiology, are scarce. Finding solutions that do not have significant side effects, such as inhaled steroids, would be useful.

Study summary: This study was a multicenter, randomized, open-label, controlled, parallel-group trial across four hospitals in Finland. Eligible children recruited were born at the gestational week of 36 or later, aged 6 to 35 months, and had two to four physician-confirmed episodes of wheeze and/or shortness of breath. The children were randomized in a 1:1:1 treatment ratio to receive intermittent tiotropium bromide treatment co-administered with as-needed albuterol sulfate (tiotropium group), intermittent fluticasone propionate treatment co-administered with as-needed albuterol sulfate (fluticasone group), or as-needed albuterol sulfate treatment alone (albuterol group). Symptom-free days were highest in the tiotropium once daily vs 87% in the fluticasone group and 88% in the as-needed albuterol only group.

The authors found that patients in the albuterol group discontinued the intervention more often because of troublesome respiratory symptoms than the patients in the tiotropium group. Recruitment of the patients was discontinued after including the 80th subject to the study. The authors noted that the tiotropium group needed less albuterol for symptom relief than the other treatment groups.

Editor's comments: Early termination of the study resulted in underpowering statistically; the authors attempted to ameliorate this by recalculations of power. There was no blinding for the study, which could introduce bias. Regardless, tiotropium seems to be a well-tolerated and effective adjunct for children with wheezing in the setting of viral URI. ■

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