



ABSTRACTS IN URGENT CARE

Can Artificial Intelligence Be Used as a Behavioral Health Tool for Adolescents?

Take Home Point: Conversational Artificial Intelligence (CAI) may have potential as a tool to help address the unmet needs of adolescent behavioral health treatment.

Citation: Opel D, Kious B, Cohen I. AI as a Mental Health Therapist for Adolescents. *JAMA Pediatr.* doi:10.1001/jamapediatrics.2023.4215

Relevance: Mental health issues among adolescents have been rapidly increasing in prevalence. The increasing need for adolescent mental healthcare has led to the exploration of CAI as a possible adjunctive treatment via the use of various chatbots.

Study Summary: This was an editorial exploring the possible role AI may play in filling the demand gap for adolescent behavioral health care. The authors note that there has been a rapid increase in the development of CAI within this area specifically. Preliminary evidence suggests that CAI may be effective in decreasing symptoms among users with mild depression. The allure of CAI is accessibility with low expense for anyone with a smartphone and internet connection. This makes this option especially appealing for adolescents who nearly universally have constant access to technology and who are generally willing to embrace these new technologies when compared to traditional psychotherapy.

The authors do warn about the lack of accountability and transparency that currently exists with most CAI platforms. Two duties inherent to mental health services highlight the importance of accountability for CAI: the duty to protect confidentiality and the duty to warn. The quickly evolving AI landscape poses additional risks for children. Generative AI (GAI) is now being integrated into social media platforms. GAI differs from CAI as it can create new content in response to a user-generated prompt, not just provide responses using a rules-based system. How con-

versations with CAI might be monitored for concerning patterns or warning signs for self-harm is also unknown.

Editor's Comments: The viewpoints expressed were those of the authors. In the ever-evolving landscape of AI, it is important for urgent care practitioners to be aware of these resources and their benefits and risks. Given the large unmet need for adolescent behavioral health care, CAI offers a promise for closing this gap. However, its implementation must be monitored with caution as there are likely to be unintended consequences. ■

Comparative Efficacy of Acne Treatments

Take Home Point: The most effective treatment for acne is oral isotretinoin, followed by triple therapies containing a topical retinoid, benzoyl peroxide (BPO), and an antibiotic.

Citation: Huang C, Chang I, Bolick N, et. al. Comparative Efficacy of Pharmacological Treatments for Acne Vulgaris: A Network Meta-Analysis of 221 Randomized Controlled Trials. *Ann Fam Med.* 2023 Jul-Aug;21(4):358-369. doi: 10.1370/afm.2995

Relevance: Acne is a common skin condition and the second highest cutaneous condition for disability-adjusted life years, with annual costs of \$3 billion in the US.

Study Summary: This was a meta-analysis of present literature comparing the common pharmacological treatments for acne, including oral and topical medications as single or combined treatments. The authors only included randomized controlled trials comparing efficacy of pharmacological therapies for acne vulgaris. Some 37 treatment modalities were reviewed in the meta-analysis, including 6 oral antibiotics, 5 topical antibiotics, oral isotretinoin, 5 topical retinoids, 6 combined oral contraceptives, topical clascoterone, 10 combination therapies, BPO, azelaic acid, and placebo. The primary end points were mean percentage reduction in total, inflammatory, and noninflammatory lesions.

The authors included 210 articles describing 221 trials comprising 65,601 patients for analysis. They found oral isotretinoin the most effective treatment, followed by combination therapies consisting of an oral or topical antibiotic, topical retinoid, and BPO. Local side effects or discontinuation due to adverse events were more commonly



Prepared by Ivan Koay MBChB, MRCS, FRNZCUC, MD; Urgent Care Physician and Medical Lead, Kings College Hospital Urgent Treatment Centre, London; Convenor Ireland and UK Faculty of the Royal New Zealand College of Urgent Care; Independent Assessor European Reference Network, Andalusian Agency for Healthcare Quality

observed for the topical adapalene with BPO combination group than other combinations. Common side effects of oral isotretinoin were mucocutaneous (eg, dry lip, dry skin, cheilitis), while oral tetracyclines caused nausea, vomiting, and abdominal pain.

Editor’s Comments: It’s important to note that oral isotretinoin, while more effective than other acne treatments, has a significant side effect profile and teratogenic potential. Prescription of this medication is typically limited to dermatologists or other practitioners with longitudinal follow-up with patients. Given delays in specialist care, particularly with dermatologists, and an increasing number of patients without primary care, it is likely UC practitioners will be seeing patients presenting with complaints of acne vulgaris with increasing frequency in the coming years. ■

A New Cutoff for Positive Urine Cultures in Children?

Take Home Point: In this study, a cutoff of 10,000 colony forming units (CFU) per mL provided the optimal balance between sensitivity and specificity for children undergoing bladder catheterization.

Citation: Shaikh N, Lee S, Krumbek J, et. al. Support for the Use of a New Cutoff to Define a Positive Urine Culture in Young Children. *Pediatrics*. 2023 Oct 1;152(4): e2023061931. doi: 10.1542/peds.2023-061931

Relevance: The identification of urinary tract infection in young children requires different considerations given likelihood of disease progression and chronic complications which must be weighed against the risks of unnecessary antibiotic treatment.

Study Summary: This was a prospective cross-sectional study of children presenting to the emergency department at Children’s Hospital of Pittsburgh, PA. The authors enrolled children aged 1 month to 3 years who had a fever (documented in the emergency department or by parental report) within 24 hours of presentation and also had a urine sample collected via catheter. Each child had a microscopic urinalysis in which white blood cells (WBCs) were counted as well as a colorimetric dipstick test in which the leukocyte esterase test was reported semi-quantitatively (none, trace, 1+,2+,3+).

The authors included 341 children in the final analysis. They found 46 children with urinary tract infection (UTI). Using a cutoff of $\geq 10,000$ CFU to define a positive urine

culture, among these 46 children with UTI, 45 were correctly identified by conventional urine culture (sensitivity of 98%, confidence interval [CI]: 93% to 100%). Changing the cutoff to $\geq 50,000$ CFU/mL decreased the sensitivity of urine culture to 80% (95% CI: 68%–93%) and had a negligible effect on specificity. Using a cutoff of 100,000 CFU/mL (the present adult range), resulted in a significantly inferior sensitivity as well 70% (95% CI: 55%–84%).

Editor’s Comments: This study had several limitations. The total number of patients with UTI was only 46 and only included febrile patients < 3 years of age. The use of bladder catheterization limits this study’s generalizability to urgent care centers which frequently cannot obtain catheter urine specimens in infants. However, these findings do suggest that in reviewing urine culture results, a significantly lower cutoff has been used. This threshold of 10,000 CFU/mL would lead to significantly better sensitivity than 50,000 or 100,000 without sacrificing specificity. Perhaps most significantly, outcomes were not reported and therefore it is unclear if children with lower colony counts may be less susceptible to complications of UTI than patients with greater CFUs. Rather, sensitivity and specificity were simply reported based on the reference gold standard molecular test. ■

Does That Temperature Recorded Indicate Fever/Infection?

Take Home Point: Normal oral temperature varies in an expected manner based on sex, age, height, weight, and time of day.

Citation: Ley C, Heath F, Hastie T, et. al. Defining Usual Oral Temperature Ranges in Outpatients Using an Unsupervised Learning Algorithm. *JAMA Intern Med*. 2023;183(10):1128-1135. doi:10.1001/jamainternmed.2023.4291

Relevance: The present definition of “normal” temperature of 37°C is based on historical data from over a century ago. Temperature measurement has tremendous implications in the evaluation of undifferentiated patients and oral temperature measurement is among the more common methods used in the outpatient setting.

Study Summary: This was a cross-sectional study based on adult outpatient encounters in the divisions of Internal

Medicine and Family Medicine at Stanford University, California. Temperature measurements were obtained orally using annually calibrated digital thermometers (SureSigns Vs4; Philips). Temperature, date and time of the temperature measurement, age, sex, weight, height, body mass index, primary reason for the visit, prescribed medications, and all ICD-10 codes were identified from each encounter.

The authors collated 618,306 sets of complete data from 724,199 patient encounters. They found the chief determinants of temperature were the time of day, age, and gender of the patients. “Normal” (ie, mean) oral temperature among this data set was 36.64°C, with 95% of these normal temperatures ranging from 35.96°C to 37.32°C. Men had lower temperatures than women on average. Temperature varied with time of day, peaking at 16:00 (eg, late afternoon) and then decreasing rapidly in both men and women. Older patients had lower temperature and this age effect was more pronounced in men than women. Women younger than 50 years had higher oral temperatures than men of any age, with the oldest men aged 70 to 80 years having the lowest temperature. Increasing weight was associated with a linear increase in oral temperature for both sexes (0.001°C/kg among men and 0.0008°C/kg among women; $P < .001$ for both).

Editor’s Comments: The authors were not able to assess non-healthcare related confounders like type of clothing worn, hot or cold beverage or food consumption, smoking, light exposure, activity prior to measurement, menstrual cycle phase, and waking time. There was also a lack of information regarding ethnicity in the data analyzed, and there were no pediatric data. ■

Another Option to Simplify Wound Closure, but How Well Does it Work?

Take Home Point: In this study, microMend appears to be an acceptable option for would repair.

Citation: Nizami T, Beaudoin F, Suner S, et. al. Evaluation of microMend wound closure device in repairing skin lacerations. *Emergency Medicine Journal*. 2023;40:564-568.

Relevance: The microMend™ device has been approved as wound closure device by the U.S. Food and Drug Administration (FDA). It offers the advantage over sutures in rapidity of closure and offers more tensile strength than tissue adhesive or conventional adherent skin strips.

“They found chief determinants of temperature were the time of day, age, and gender of the patients.”

Study Summary: This was an open-label, single-arm study, conducted at a large tertiary academic medical centre and an affiliated community site in the US. Eligible participants were adults recruited via convenience sampling who presented to the emergency department with a laceration requiring skin closure. Each individual device is designed to close 1.5 cm of wound length, and healthcare providers were allowed to choose the number of devices to obtain satisfactory closure. Participants were followed prospectively for 3 months and participants with standardized digital photographs taken of each wound at each follow-up visit. Quality of wound healing and cosmetic results were rated independently by 2 plastic surgeons who reviewed the photographs digitally and were not involved in the patients care and were blinded to the closure technique used.

The authors included 31 participants for final analysis. They found the microMend device offered an acceptable alternative for skin closure. Participants had satisfactory cosmetic outcomes at 90 days. Just 5 patients reported device detachment, which the authors postulate could be due to failure to apply the device to dry skin. The inter-rater reliability of the 2 plastic surgeons represented fair agreement at the 90-day review.

Editor’s Comments: This was single-centered study with a small sample size. The author also included participants that had deep dermal sutures placed followed by the application of the device to the skin, which limits the potential added utility of the device. This was also funded by the device manufacturer. With the potential limitations in mind, this device, like other similar non-suture closure devices, offers an appealing alternative for UC practitioners as many lacerations seen in UC centers are minor, and rapidity of closure is critical for clinical efficiency. As non-suture closure techniques proliferate, it will be of interest how this affects provider skills and confidence in conventional suturing. ■

Use of 3D Printing to Teach Interphalangeal Joint Dislocation Reduction

Take Home Point: The 3D-printed dorsal and volar dislocation reduction models used in this study were easy to use and affordable. It improved perceived competency among the learners.

Citation: Lord S, Greary S, Lord G. Application of a Low-cost, High-fidelity Proximal Phalangeal Dislocation Reduction Model for Clinician Training. *West J Emerg Med.* 2023;24(5):839–846.

Relevance: Proximal interphalangeal joint (PIPJ) dislocations are a common UC presentation. Increasing UC clinician confidence in managing these injuries would be helpful to improve patient care and limit ED referrals.

Study Summary: This was a prospective observational study performed at a single, Level One trauma center in

the U.S. All study participants were EM resident trainees and physician assistants (PAs) who were given a live demonstration of how to perform a volar and dorsal reduction. Following the demonstration, participants were assessed for observed competency on the 3D-printed model.

The authors recruited 21 participants comprising 19 residents and 2 PAs. They found all participants agreed the dorsal proximal interphalangeal joint (dPIPJ) model improved their competency in dPIPJ reduction technique. Likewise, 81% participants either agreed or strongly agreed that the model mimicked a dPIPJ dislocation, and 17/21 (81%) agreed or strongly agreed it mimicked a volar proximal interphalangeal joint (vPIPJ) dislocation.

Editor's Comments: The 3D-model used in the study is not readily available commercially and therefore limits this study's generalizability. While this was a very small study which did not investigate competency among learners in the care of actual patients after the intervention, the study does demonstrate a novel and practical application for 3D printing as it pertains to medical education. ■



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