



ABSTRACTS IN URGENT CARE

- Assessing the Ottawa Ankle Rule in Pediatric Patients
- Subconjunctival Hemorrhage in Children
- How Much Cardiac Risk Is Acceptable to Patients?
- Discharging Children with Abnormal Vital Signs
- Analgesia for Children in Casts
- Effects of Burnout in Healthcare Providers
- Cod Liver Oil + Vitamin D and COVID-19: Preventive Medicine or Snake Oil?

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Applying the Ottawa Ankle Rule to Pediatric Patients

Take-home point: Application of the Ottawa Ankle Rule (OAR) limits unnecessary imaging in children without missing clinically relevant fractures.

Citation: de Almeida S, Rios J, Lima S, et al. Applying the Ottawa Ankle Rule in a pediatric emergency department. *Pediatr Emerg Care.* 2022;38(3):e1123-e1126.

Relevance: Ankle fractures in children are common. Use of the OAR, a simple clinical decision rule, by UC providers could save time and spare radiation and expense if effective in children.

Study summary: This was a prospective case control study based in a pediatric emergency department in Portugal. In the initial phase of the study (control), all clinicians were asked to complete a questionnaire and provide usual care for patients presenting to the ED with foot and ankle injuries. In the second phase (case), all clinicians were required to use the OAR to guide the decision regarding imaging. In both phases, a follow-up call was made 1 to 3 weeks after the ED evaluation. The OAR recommends ankle radiograph if there is pain in the malleolar region *and* bony tenderness along the distal 6 cm of the posterior edge of either malleolus or inability to bear weight for four steps both immediately after injury and in the ED. For midfoot injuries, a foot x-ray is recommended if there is bony tenderness at navicular bone or at the base of the fifth metatarsal or inability to bear weight for four steps both immediately after injury and in the ED.

The authors recruited 102 control and 104 case patients for the

study. They found prevalence of fractures between control and case group was similar (4%). There was a significant reduction in imaging in the case group ($p=0.001$). The sensitivity of the OAR in this study was 100% (95% CI, 39.76–100.00) and the specificity was 23.33% (95% CI, 15.06–33.43) with a negative predictive value of 100%. There was a 16% reduction in imaging ordered in the case group.

Editor's comments: This was a small single center study leading to large confidence intervals, especially for sensitivity. It is not clear these results could be extrapolated to the UC setting. Patients and parents often present expressly for the purposes of requesting an x-ray; therefore, acceptance of the OAR as sufficient evaluation may be variable. ■

Subconjunctival Hemorrhage in Children

Take-home point: Subconjunctival hemorrhage (SCH) is uncommon in children. Most cases are due to trauma, and the possibility of abuse should be considered.

Citation: Parikh A, Christian C, Forbes B, et al. Prevalence and causes of subconjunctival hemorrhage in children. *Pediatr Emerg Care.* 2022;38(8):e1428-e1432.

Relevance: Presentations with unusual signs and symptoms should prompt UC providers to take a thorough history. Early detection of nonaccidental trauma (NAT) can be lifesaving.

Study summary: This was a retrospective cross-sectional study of patients <18 years of age presenting to an outpatient eye clinic in Philadelphia. Data were abstracted from the medical record for each child. The primary study outcomes were the prevalence of SCH across all examinations based on ophthalmological examination findings documented in the ophthalmologist's clinical note.

The authors found 949 cases of SCH among a total of 86,277 examinations. The prevalence of SCH from any cause among all examinations was 1.1%. Most of the cases (636/949), were caused



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by ocular, eyelid, or orbital surgery. There were 313 cases of SCH that were not surgically related with a prevalence of 0.4% (95% CI, 0.3%–0.4%). Two hundred sixty-one cases (83%) were due to trauma, 40 (13%) were due to ocular surface inflammation, 7 (3%) were due to an orbital or conjunctival lesion, 3 (1%) were due to vessel rupture from choking or cough, and 2 (1%) were related to coagulopathy. Twelve cases were deemed to be due to child abuse/nonaccidental trauma.

Editor’s comments: There is limited generalizability due to the study setting in an ocular specialty clinic. For example, most SCH was postsurgical in this population. However, cases of NAT were identified in this population. It is likely that the proportion of SCH that is traumatic would be higher in a UC population. This warrants further study. ■

Patients’ Perspective of Acceptable Cardiac Risks

Take-home point: Engaging patients in discussions about their risk of adverse cardiac outcomes reduced admissions and unnecessary testing.

Citation: Greenslade J, Wilkinson S, Parsonage W, et al. What is an acceptable risk of major adverse cardiac event soon after discharge from emergency? The patient’s perspective. *Emerg Med J.* 2022;39(7):519-520.

Relevance: Many studies and clinical decision rules for chest pain evaluation have demonstrated there is little utility in admission or further invasive testing for low-risk patients. Shared decision-making is an increasingly accepted approach to medical decision-making. A better understanding of the patient’s perspective on acceptable risk may help individualize care and ensure it is acceptable to each patient.

Study summary: This was a cross-sectional study using a convenience sampling of adult patients presenting with chest pain to an inner-city ED in Queensland, Australia. A research assistant administered a questionnaire to the participants, who were asked whether they would like to have input or whether they would prefer the doctor to make decisions regarding their assessment. Patients were asked whether they would be willing to be discharged at various levels of risk of adverse cardiac events over the next 30 days. The options were presented in graphic and text form.

The authors found 80.8% of the 125 participants recruited wanted to be involved in decisions around their care. More than half (51.2%) of patients reported they would be willing to be discharged only if their risk were <0.1%; 10.4% patients were willing to be discharged at 2% risk; and 36.8% of patients did not want to be discharged unless there was 0% risk of a negative outcome.

Editor’s comments: There is limited generalizability to UC pop-

ulations in the U.S. based on the study setting and location. It is noteworthy that over a third of patients felt comfortable only if there were no risk of a 30-day event. This suggests that unrealistic expectations are common. ■

Can I Safely Discharge This Child with Abnormal Vital Signs?

Take-home point: Children with two or more abnormal vital signs (VS) at ED discharge had increased odds of ED revisit within the subsequent 48 hours.

Citation: Kazmierczak M, Thompson A, DePiero A, et al. Outcomes of patients discharged from the pediatric emergency department with abnormal vital signs. *Am J Emerg Med.* 2022;57:76-80.

Relevance: Abnormal vitals are common in children with viral illnesses. However, the significance of these findings is often uncertain in terms of short-term risk for adverse outcomes and repeat healthcare visits.

Study summary: This was a retrospective cohort study of children discharged from two pediatric tertiary-level, academic EDs in Delaware and Florida. The electronic health record was queried for children discharged from the ED during the study period with abnormal VS. Vitals were defined as abnormal if flagged in the EHR indicating a heart rate, respiratory rate, or blood pressure outside of the fifth and 95th percentiles for age, an oxygen saturation <95%, or temperature <97°F or >100.4°F. The primary outcomes were repeat ED visits within 48 hours and disposition at return visit. The secondary outcomes were admission location (inpatient, operating room, ICU) and adverse outcomes during admission.

The authors reviewed the cases of 83,092 patients discharged during the study period. Of those, 21.3% were discharged with at least one abnormal VS. Children discharged from the ED with abnormal VS were more likely to return to the ED within 48 hours if they had two or more abnormal VS (OR 1.62, 95% CI 1.25–2.11) compared with one abnormal VS, but they were not significantly more likely to require admission at revisit (OR 1.70, 95% CI 0.972–2.987, p=0.061). Heart rate, blood pressure, respiratory rate, and oxygen saturation did not individually have a significant association with revisit.

Editor’s comments: This study has significant limitations, including retrospective design and being conducted in tertiary care pediatric EDs. The authors’ analysis did not compensate for potential confounders like medications or medical conditions that cause VS abnormalities but are not reflective of severity of illness. Return visits may not have been captured if patients sought care at a different medical facility. The range of “normal” values for temperature and oxygen saturation were somewhat arbitrary. Despite these limitations, there was a significant finding that children with

multiple VS abnormalities are more likely to cause enough concern for parents to trigger repeat evaluations. It is also worth noting that although these patients returned more often, there was no increased risk of admission. ■

Analgesia Requirements for Children in Casts

Take-home point: Displaced fractures were associated with significantly higher rates of analgesia dosing compared with non-displaced fractures.

Citation: Cozzi G, Wiel LC, Bassi A, et al. Need for pharmacological analgesia after cast immobilisation in children with bone fractures: an observational cross-sectional study. *Emerg Med J.* 2022;39(8):595-600.

Relevance: Historically, casting has been used as a method of providing analgesia for limb fractures. Predicting which patients are likely to have higher additional analgesia requirements is useful in pain management and guiding expectations.

Study summary: This was a prospective, observational, cross-sectional study at a tertiary-level pediatric ED in Italy. Children with extremity fractures requiring cast immobilization were included. On discharge from the ED, caregivers of participants were provided with standardized instructions for pain management (ibuprofen 10 mg/kg as needed up to every 8 hours). Rescue therapy, in case of ibuprofen failure, was also prescribed (acetaminophen 20 mg/kg up to every 6 hours as needed). The primary outcome was the administration of analgesia in children with casts for fractures in the 10 days following discharge from the ED.

The authors enrolled 213 patients and found 201 (94.4%) non-displaced and 12 (5.6%) displaced fractures. One hundred thirty-seven (64.3%, 95% CI 57 to 70.7) children were not administered any analgesic and 76 (34.7%) received at least one dose of analgesia. Median number of daily doses was two (IQR 1-4). Fifty children (65.8%) were administered ibuprofen, while 24 patients (31.6%) used acetaminophen and two (2.6%) used ketoprofen. A strong association between receiving analgesia and type of fracture was found for displaced vs nondisplaced fracture (OR 5.5; 95%CI 1.4 to 21.0).

Editor's comments: There was no assessment of the child-reported pain in the study, and the administration of analgesics at home was based on parental discretion. There were very few displaced fractures in the population. Most notably, however, is the finding that two-thirds of children required no analgesia beyond immobilization. This suggests that simple over-the-counter analgesic options are sufficient for pain control in most pediatric fractures in UC. This also provides reasonable justification for opioid nonprescribing in this population and parental reassurance that significant pain, especially in nondisplaced fractures, is un-

common and warrants additional evaluation if it occurs. ■

Burnout in Healthcare Providers and Effects on Quality of Care

Take-home point: Physician burnout was found to affect patient outcomes and lead to career disengagement.

Citation: Hodkinson A, Zhou A, Johnson J, et al. Associations of physician burnout with career engagement and quality of patient care: systematic review and meta-analysis. *BMJ.* 2022;378:e070442.

Relevance: Understanding the association of burnout with career engagement is necessary in mitigating the global healthcare workforce crisis.

Study summary: This was a systematic review across four databases which included studies assessing the association of physician burnout with career engagement and the quality of patient care. Random-effect models were used to calculate the pooled odds ratios. Career engagement outcomes included career choice regret, career development, job satisfaction, productivity loss, and turnover intention. Quality of patient care outcomes included low professionalism, patient safety incidents, and patient satisfaction.

The authors identified 170 observational studies including 239,246 physicians for meta-analysis. They found burnout in physicians to be associated with a fourfold decrease in job satisfaction (OR 3.79, 95% CI 3.24 to 4.43, k=73 studies, n=146,980 physicians), threefold increase in career choice regret (OR 3.49, CI 2.43 to 5.00, k=16 studies, n=33,871), and threefold increase in turnover intention (OR 3.10, CI 2.30 to 4.17, k=25 studies, n=32,271). Physician burnout was also associated with a twofold increase in patient safety incidents (OR 2.03, CI 1.68 to 2.44, k=35 studies, n=41,059), a twofold decrease in professionalism (OR 2.33, CI 1.96 to 2.70, k=40 studies, n=32,321), and a twofold decrease in patient satisfaction (OR 2.22, CI 1.38 to 3.57, k=8 studies, n=1,002). The link between burnout and patient care outcomes was greatest in younger physicians working in emergency medicine.

Editor's comments: Diversity in the outcome definition may have led to overestimating the association with physician burnout in the study; nevertheless, there is compelling evidence that burnout adversely affects patient care. There is no easy solution immediately evident to prevent burnout. However, to avert a worsening crisis, healthcare organizations and authorities should institute effective, evidence-based interventions to mitigate burnout. ■



COVID-19 Abstract

Do Cod Liver Oil and Vitamin D Help Prevent COVID-19 or Other Respiratory Infections?

Take-home point: Supplementation with cod liver oil did not re-

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duce the incidence of SARS-CoV-2 infection, serious COVID-19, or other acute respiratory infections vs placebo.

Citation: Brunvoll S, Nygaard A, Ellingjord-Dale M, et al. Prevention of COVID-19 and other acute respiratory infections with cod liver oil supplementation, a low dose vitamin D supplement: quadruple blinded, randomised placebo controlled trial. *BMJ*. 2022;378:e071245.

Relevance: Vitamin D supplementation is an increasingly common strategy implemented by patients in an effort to “boost immune function.” The current evidence for the efficacy of this practice is, however, lacking.

Study summary: This was a randomized, parallel group treatment, quadruple-blinded (participant, investigator, outcomes assessor, and data analysts), two-armed trial based in Norway. Participants were randomized to receive either cod liver oil or placebo (corn oil) to examine if cod liver oil affects the risk of COVID-19 infection, serious COVID-19, or other acute respiratory infections. The cod liver oil used contained 10 µg of vitamin D₃ (400 IU); long-chained

omega 3 polyunsaturated fatty acids, including eicosatetraenoic acid and docosahexaenoic acid (DHA); vitamin A; and of vitamin E while the placebo contained vitamin A and vitamin E.

The authors recruited 34,741 participants. They found similar rates of positive SARS-CoV-2 tests in both groups (RR 1.00, 97.0% CI 0.82 to 1.22). There was no association between concentrations of vitamin D and risk of SARS-CoV-2 infection or serious COVID-19. The relative risk of having one or more acute respiratory infection was 1.04 (99.9% CI 0.97 to 1.11) for the cod liver oil group compared with placebo.

Editor’s comments: This was a well-designed RCT; however, it has some significant limitations. All were self-reported via questionnaire which introduces an element of recall bias. The dose of vitamin D₃ used was quite low relative to commonly recommended supplementation strategies and practices. The study population was homogenous and residing in an area of the world with relatively low levels of sunlight, which would limit generalizability. While there was no difference between groups, this is unlikely to put to rest the question of the utility of vitamin D supplementation to promote resilience to respiratory viruses. ■



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