



### Validation of Clinical Predictive Rules in Pediatric Testicular Torsion

**Take Home Point:** In this study, the Testicular Emergency Score for Torsion (TEST) identifies a larger group of patients at low risk for testicular torsion suitable for safe management without Doppler ultrasound compared to the other clinical validation scores.

**Citation:** Valdivieso-Castro M, Vázquez-Gómez L, Olabarrí M, et. al. Clinical Prediction Rules for Identifying Children With Testicular Torsion: A Multicenter Prospective Study. *Pediatr Emerg Care.* 2025 Aug 1;41(8):620-627

**Relevance:** Acute nontraumatic unilateral testicular pain is a common presentation to urgent care centers and/or emergency departments with most having benign causes. However, it is crucial to rule out acute testicular torsion (TT). This study reviews the TEST and other scoring systems in the identification of patients who do not need Doppler ultrasound.

**Study Summary:** This was a multicenter prospective study in 21 Spanish pediatric emergency departments (EDs) to evaluate the performance of various clinical scoring systems in assessing children presenting to the ED with non-traumatic unilateral testicular pain. The clinical scoring systems assessed were the Testicular Workup for Ischemia and Suspected Torsion (TWIST), testicular torsion (TT) score, Artificial Intelligence-based Score (AIS), and Boettcher Alert Score (BALS). Additionally, their performance was compared with the TEST scoring system. Electronic questionnaires were completed for all children included in the study. Patients received a follow-up by phone 2 weeks after their initial ED visit to identify any misdiagnosis.

The authors identified 903 patients for the study with 884 contacted for follow-up. Of these, 93 patients had confirmed TT with 88 undergoing surgical exploration. Ultrasound showed a sensitivity of 99% (95% confidence interval [CI]: 97-100), a specificity of 99% (95% CI: 98-99),

a positive predictive value of 90% (95% CI: 84-96), and a negative predictive value of 100% (95% CI: 99-100). In comparison of the scoring systems, which focused on sensitivity and negative predictive value, the TWIST, TT, AIS, and BALS scores demonstrated strong performance in identifying children at low risk for testicular torsion (37.9%, 52.7%, 28%, and 30.3%, respectively). Additionally, the TEST score outperformed the others in identifying a greater number of children at low risk for TT (63.3%) who could be safely managed without Doppler ultrasound.

**Editor's Comments:** There continues to be a lack of gold standard scoring and validation of all the TT tools reviewed, and ultrasound remains the best modality for investigating atraumatic testicular pain. While novel and useful for UC clinicians where access to ultrasound may be difficult, these clinical decision tools are still only aids for diagnosis and should not be fully relied on for final decision making. It is also important to note the setting of the study was in Spanish pediatric EDs, thus limiting its generalizability to other settings. ■

### PERC-35 Rule for Pulmonary Embolism Risk Stratification

**Take Home Point:** In this study, the pulmonary embolism rule-out criteria 35 (PERC-35), had a low failure rate and shows promise in reducing imaging exposure in young adult patients with low pretest probability for pulmonary embolism (PE).

**Citation:** Josseï T, Mazzolai L, Lorenzo Hernández A, et. al. Failure rate of the pulmonary embolism rule-out criteria rule for adults 35 years or younger: Findings from the RIETE Registry. *Acad Emerg Med.* 2025 Apr;32(4):414-425. doi: 10.1111/acem.15046

**Relevance:** PE is a possible diagnosis for urgent care (UC) patients presenting with a variety of chest and respiratory symptoms. The ability to identify those patients in the younger adult cohort who do not warrant further investigation will help UC clinicians reduce ED transfers and as an extension, patient care and satisfaction.

**Study Summary:** This is a retrospective cohort study based on data obtained from the Registro Informatizado de la Enfermedad TromboEmbolica Venosa (RIETE) Registry (in-



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ternational) from 2001 to 2023. It aimed to evaluate the performance of the PERC-35 rule, developed specifically to identify patients aged 18-35 years at potential risk of having PE. The modification from the original PERC includes the substitution of temperature for heart rate, as fever is a significant predictor of PE in the younger adult age group. The authors attempted to review all patients with negative PERC-35 scores (PERC-35N) and compared these patients' characteristics with those with positive PERC-35 scores (PERC-35P), while assessing the failure rate of those with PERC-35N in the RIETE registry.

The authors identified 2,935 18-35-year-old patients with PE, of which 2,731 were PERC-35P and 204 were PERC-35N. There was a miss rate of 7.0% (95% CI: 6.0–7.9). They found the missed PE rate of PERC-35 was higher (7.0%) compared to the original PERC rule (5.5%), although this difference was not statistically significant. The authors noted that in the PERC-35N group, one-third had a pulse of  $\geq 100$  beats/min, and 16% of had a temperature of  $>38^{\circ}\text{C}$ . Therefore, adding the item “pulse  $\geq 100$ ” to the PERC-35 rule would lower its failure rate to 5.9% in the 18-35-year-old group.

**Editor's Comments:** This study is one of the few studies examining this adjusted clinical decision tool. As such, UC clinicians need to be cautious in using this tool. Future research is required with focus on larger, multicenter prospective studies to validate the adjusted tool and assess its impact on clinical outcomes, including transfer rates from UC to hospital. ■

## Streamlining Single-Use Plastic Items in Healthcare

**Take Home Point:** The Pragmatic Approach to Streamlining Single-Use Plastics (PASS-UP) addresses the misperception of conflicts between the central healthcare values of safety, effectiveness, and affordability with environmental sustainability efforts.

**Citation:** Greene J, Merritt M, Paina L, et. al. A Pragmatic Approach to Streamlining Single-Use Plastics in Health Care. *Ann Intern Med.* 2025 Aug;178(8):1192-1194. doi: 10.7326/ANNALS-25-01264.

**Relevance:** Plastic pollution particularly from single-use plastic (SUP) devices and equipment—upon which healthcare is heavily reliant—has a significant environmental cost. The ability of healthcare organizations to identify ways to reduce waste is crucial to helping address this important concern.

**Study Summary:** This was an opinion piece authored by the PASS-UP working group looking at ways to reduce the reliance on SUP equipment/devices within the healthcare sector. At present, the authors comment that disposability is not just tolerated within healthcare but in some cases perceived as inherently good. However, there is a significant negative environmental impact due to this practice. Therefore, the authors suggest the use of the PASS-UP approach to assess SUP healthcare items based on the degree of conflict posed to clinical safety, effectiveness, and affordability.

The authors identified ideas including reusing blood pressure cuffs, revisiting medication expiration dates, use of single-wrapping sterile surgical instruments, reusable “blue wrap,” reduction of plastic packaging, and reusable scrub caps as no conflict for the above 3 measures. They state that avoiding unnecessary use of latex gloves, switching IV antibiotics to oral form, and reusing isolation gowns are possible in certain contexts. They also state that the above measures in certain circumstances align with the fundamentals of infection control with minimal tradeoffs. These measures are meant to be suggestive rather than exhaustive, with other additional measures that could be considered.

**Editor's Comments:** This piece raises important points to be considered by UCs in general, particularly for those who have deep concerns about the environmental impact of healthcare sector work. Certain suggestions including reusing of blood pressure cuffs, consideration of oral antibiotic use, and unnecessary use of latex gloves could easily be implemented in UCs. Please join the College of Urgent Care Medicine's Waste Reduction Program at <https://urgentcareassociation.org/college-of-urgent-care-medicine/waste-reduction-program/>. ■

## Improved Benign Paroxysmal Positional Vertigo Diagnosis and Management

**Take Home Point:** Using an educational intervention demonstrated enhanced benign paroxysmal positional vertigo (BPPV) screening, improved evidence-based diagnosis, and more efficient treatment.

**Citation:** Gerlier C, Mehenni L, Chatellier G, et. al. Improving benign paroxysmal positional vertigo management in the emergency department: A longitudinal study post-GRACE-3. *Acad Emerg Med.* 2025 Jul;32(7):739-747. doi: 10.1111/acem.15115

**Relevance:** It has been estimated that 30% of patients presenting to EDs with dizziness suffer from BPPV. The Guidelines for Reasonable and Appropriate Care of Acute Vertigo in the ED (GRACE-3) suggest that these should be managed based solely on clinical findings, unless atypical clinical features are present.

*“The key point for UC clinicians to consider is the importance of adequate initial irrigation and washout of the wound—something that is critical to improving wound outcomes.”*

**Study Summary:** This was a longitudinal study to evaluate the impact of a 2-tiered educational intervention on the timely diagnosis and management of BPPV in a single French ED utilizing GRACE-3. Patients with triggered episodic vestibular syndrome were enrolled by ED physicians and BPPV management was compared between 2 consecutive 6-month periods: an observational phase during which patients received standard care (control cohort), and an interventional phase during which a 2-tiered educational intervention was implemented (intervention cohort). The interventional phase included a standardized 2-hour training session where a practical approach for managing patients with suspected BPPV was conducted, including hands-on demonstrations.

The authors identified 166 patients in the control cohort and 216 in the intervention cohort. They found that compared to the control group, the intervention cohort had significantly higher rates of clinical diagnostic testing for BPPV (82.9% vs. 33.7%) and prescriptions for vestibular rehabilitation (25.0% vs. 8.4%), as well as lower rates of patients requiring hospitalization (61.1% vs. 76.5%) and reduced prescriptions for antivertigo medication (28.7% vs. 66.3%). There was also a reduced median length of stay in the ED for the intervention cohort compared to the control cohort (137 minutes vs. 246 minutes).

**Editor’s Comments:** This study was performed at a single French ED, which limits the generalizability to other settings. Additionally, the included clinicians were not blinded and had significant prior experiences in treating BPPV, which may have influenced both the control and interventional cohort’s results. There was also a lack of longer-term follow-up to review the lasting impact of the provided education. Nevertheless, the findings of this study point to a potential UC application in which short bursts of edu-

cation to the clinicians may have large benefits in the care delivered for BPPV. ■

## Penetrating Nail Gun Injuries – What To Do Next

**Take Home Point:** This study concludes that routine surgical debridement or prolonged antibiotics after an uncomplicated nail gun injury may not be necessary, while appropriate first aid including wound irrigation is vital.

**Citation:** Slater S, Vasudeva M, Mitra B, et. al. Penetrating nail gun injuries: Role of antibiotics and surgical management. *Trauma*. 2025;27(3):232-237. doi:10.1177/14604086251320524

**Relevance:** Nail gun injuries are a common cause of injury from use of power tools with complications, including infection, causing morbidity and resulting in time off work.

**Study Summary:** This was a retrospective cohort study of patients presenting to a major Australian ED, an adult tertiary trauma referral center, with penetrating nail gun injuries. Patients were identified by an electronic medical record search with data extracted to identify the patients’ injury, demographics, surgical management, prophylactic antibiotic use, and outcomes. The primary measure was infection, defined as any soft tissue infection, bony infection, or tendon flexor sheath infection, within 30 days of the injury.

The authors identified 157 patients for review, 43 (27.4%) patients underwent surgical debridement either on the day of injury or during the subsequent hospital admission. They found that 117 (74.5%) patients received at least one dose of antibiotics. Fifty-five (35.1%) were treated with a combination of intravenous (IV) and oral antibiotics, 51 (32.5%) were treated with only oral antibiotics, and 11 (7.0%) were treated with only a single dose of IV antibiotics. Of those treated without surgery, 17 (14.9%) patients were managed with both IV and oral antibiotics, 6 (5.3%) were managed with a single dose of IV antibiotics alone, and 51 (44.7%) were managed with only oral antibiotics. There were 3 (1.9%) documented cases of infection within 30 days of injury. They were all in the non-surgical group and 2 had not been managed with any antibiotics (OR 0.25 95% CI: 0.21-2.81).

**Editor’s Comments:** There are several limitations to this study, the first being it was performed at a single center which limits its generalizability. There was no distinction

between patients who were seen directly in the ED as a self-presentation compared to those who were referred by another healthcare facility. Additionally, there was no comment on prior antibiotic administration at the previous healthcare facility. The study did not distinguish between the degree of penetrative injury—ie, superficial vs. deep and consideration of the site (volar vs. dorsum). As such, these omissions may affect the overall conclusions drawn by the authors. The key point for UC clinicians to consider is the importance of adequate initial irrigation and washout of the wound—something that is critical to improving wound outcomes. ■

## Artificial Intelligence Augmented Human Instruction and Surgical Simulation Performance

**Take Home Point:** Personalized human instruction resulted in enhanced surgical performance and skill transfer compared with intelligent tutor instruction alone, highlighting the value of human input in artificial intelligence (AI)-based training.

**Citation:** Giglio B, Albeloushi A, Alhaj AK, et. al. Artificial Intelligence-Augmented Human Instruction and Surgical Simulation Performance: A Randomized Clinical Trial. *JAMA Surg.* 2025;160(9):993-1003. doi: 10.1001/jamasurg.2025.2564

**Relevance:** Giving human educators artificial intelligence performance data to tailor feedback can improve learning outcomes in surgical simulation training.

**Study Summary:** This was a parallel-designed, single-blinded, 3-arm randomized clinical trial to investigate the effect of AI-augmented human instruction on learners' technical skill acquisition during simulation surgical training. Participants were recruited for a single 90-minute surgical simulation session in Canada. They were block randomized to 1 of 3 intervention arms with an allocation ratio of 1:1:1. All tasks were performed on the NeuroVR, a surgical simulator that simulates a subpial brain tumor resection procedure in a 3-dimensional virtual reality environment. Following a baseline practice task, participants then completed 4 repetitions (trials 2-5) of the task with feedback. The control group (group 1) received real-time verbal feedback delivered by the Intelligent Continuous

Expertise Monitoring System (ICEMS). The first intervention group (group 2) received in-person, real-time verbal feedback in identical words as the ICEMS and the second intervention group (group 3) received verbal AI-informed, personalized expert feedback.

*“This suggests that while AI-human augmentation can enhance performance, it may also introduce emotional challenges for learners.”*

The authors recruited 87 participants, 30 to group 1, 29 to group 2 and 28 to group 3. They found that Group 3 significantly outperformed group 1 during trial 5 (mean difference, 0.26; 95% CI, 0.09-0.43; P=0.01) and the realistic task (mean difference, 0.20; 95%CI, 0.06-0.34; P=0.02). Although group 3 generally achieved higher mean scores than group 2 across practice trials, these differences were not statistically significant.

**Editor's Comments:** The findings from this study should be interpreted with caution due to several important limitations. The study is focused on one specific neurosurgical procedure limiting its generalizability. Additionally, the study did not address the potential influence of human factors, such as non-verbal cues, which may play a significant role in surgical training and performance. It was noted that participants in group 3 experienced ongoing negative activating emotions (i.e. frustration) compared with those in group 1. This suggests that while AI-human augmentation can enhance performance, it may also introduce emotional challenges for learners. From the perspective of UC, this study indicates there is potential for clinicians to acquire procedural skills from various instructional methods, including those incorporating artificial intelligence. However, full applicability in UC is unknown due to access to these learning resources. ■