TAKE-HOME MESSAGE

Modest-quality evidence suggests that clinical decision instruments may be useful in identifying children and adolescents at increased risk for alcohol abuse, suicide, and need for mental health admission.

Are There Tools to Screen Children and Adolescents in the Emergency Department With Mental Health and Substance Abuse Issues?

EBEM Commentators
Michael P. Wilson, MD, PhD
Rawle A. Seupaul, MD
Department of Emergency Medicine
University of Arkansas for Medical Sciences
Little Rock, AR

METHODS

DATA SOURCES

A research librarian searched the following databases from 2000 to 2015: MEDLINE, EMBASE, CENTRAL, EBM Reviews, PsycINFO, CINAHL, Social Services Abstracts, and ProQuest Theses and Dissertations. The gray literature, clinicaltrials.gov, and conference proceedings in 2014 and 2015 from the American College of Emergency Physicians, Canadian Association of Emergency Physicians, and the Emergency Medicine Academy were also searched. All databases were restricted to English language.

STUDY SELECTION

Diagnostic, psychometric, and cohort trials were included if they evaluated an instrument that assessed mental health or substance abuse issues in children and adolescents (6 to 18 years) who presented to an emergency department (ED). Primary outcomes were validity and reliability for psychometric instruments and likelihood ratios for diagnostic and cohort trials.

DATA EXTRACTION AND SYNTHESIS

Two authors extracted data with standardized forms and independently assessed trial quality. Risk of bias for diagnostic and cohort trials was assessed with the Quality Assessment of Diagnostic

Results

Table 1. Helpful ED screening tools.

	Positive LR	Negative LR	Sensitivity, % (95% CI)	Specificity, % (95% CI)
HEADS-ED	6.3	0.21	82 (NR)	87 (NR)
ASQ	2.8	0.04	98 (91.7–99.7)	66 (55.2–75.0)
DSM-IV	8.8	0.13	88 (NR)	90 (NR)

LR, Likelihood ratio; *CI*, confidence interval; *NR*, not reported; *ASQ*, Ask Suicide-Screening Questions.
The HEADS-ED tool is used to predict the need for hospitalization. The *DSM-IV* criteria are used to screen for alcohol use disorders.

H	Home
E	Education
A	Activities
D	Drugs and alcohol
S	Suicidality
E	Emotions and behaviors
D	Discharge resources

Figure 1. Components of the HEADS-ED score.[6]

In the past few weeks, have you thought that you or your family would be better off if you were dead?

In the past few weeks, have you wished that you were dead?

In the past week, have you been having thoughts about killing yourself?

Have you ever tried to kill yourself?

One or more positive responses are considered a positive screening result.

Figure 2. The Ask Suicide-Screening Questions.

Accuracy Studies–2 (QUADAS-2); for psychometric trials, a modified version of a previously developed tool for early childhood social and emotional screening was used.[1] For psychometric tests, results were reported descriptively. For diagnostic and cohort trials, results were reported as likelihood ratios. A meta-analysis could not be performed because of significant heterogeneity in the populations studied, clinical instruments studied, and outcomes measured.

The search identified 4,832 references; 14 trials evaluating 18 instruments met inclusion criteria. None of the trials with a focus on psychometric analyses met criteria for reliability, validity, or usability, and none of the diagnostic and cohort studies were at low risk of bias in all domains of QUADAS-2 (ie, there were no high-quality studies).

Commentary

Pediatric mental health presentations to US EDs are increasing, accounting for 5% or more of pediatric ED visits.[2] As many as 2 million adolescents express suicidal behavior each year, and many of them present to the ED for evaluation.[3] Providers are often uncomfortable assessing these patients, and many do not undergo screening or diagnostic interviews despite that they often have prolonged ED stays.[4,5] Based on the existing evidence, this review provides an expansive analysis of clinical decision instruments applicable to the pediatric and adolescent ED population. The systematic review suggests that the HEADS-ED rule may be used as an aid to predict the need for hospital admission among pediatric mental health patients, the Ask Suicide-Screening Questions may be used to assess suicide risk, and the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* 2-item instrument may be used to screen for alcohol use disorders.

In the past year, have you sometimes been under the influence of alcohol in situations in which you could have cased an accident or gotten hurt?	Have there often been times when you had a lot more to drink than you intended to have?

Figure 3. *DSM-IV* 2-item screener for alcohol use disorder in adolescents.

Although most of these tools do not provide sufficient sensitivity and specificity to be used in isolation, they may offer advantages over physician gestalt, particularly for those working at centers with a lower volume of pediatric patients. First, the HEADS-ED tool had modest power to identify patients requiring hospital admission for mental health care (Table 1).[6] In this scoring system, each of 7 components (Figure 1) is rated as 0 (no action needed), 1 (action needed but not now), and 2 (needs immediate action). A score greater than 7 with a suicidal risk score of 2 suggests the need for admission.

The Ask Suicide-Screening Questions was found to be highly sensitive for suicidality (Figure 2)[7]; the instrument performed equally well in all patients regardless of age, sex, or race.

Finally, the *DSM-IV* 2-item instrument to evaluate pediatric alcohol use disorders was found to be highly accurate in ruling in or out alcohol abuse disorders (Figure 3). Adolescents who answered yes to any one of the 2 items were 8 times more likely to have an alcohol use disorder.

The psychometric properties of these tools are encouraging. However, from an evidence-based medicine perspective, none of these clinical decision instruments have been shown to improve outcomes in large, high-quality clinical trials conducted in ED settings. Therefore, in ED settings with robust mental health resources, comprehensive diagnostic interviews will likely follow both positive and negative screening results when there is a high degree of clinical suspicion.

Editor's Note: This is a clinical synopsis, a regular feature of the *Annals*' Systematic Review Snapshots (SRS) series. The source for this systematic review snapshot is:
Newton AS, Soleimani A, Kirkland SW, et al. A systematic review of instruments to identify mental health and substance use problems among children in the emergency department. *Acad Emerg Med.* http://dx.doi.org/10.1111/acem.13162.

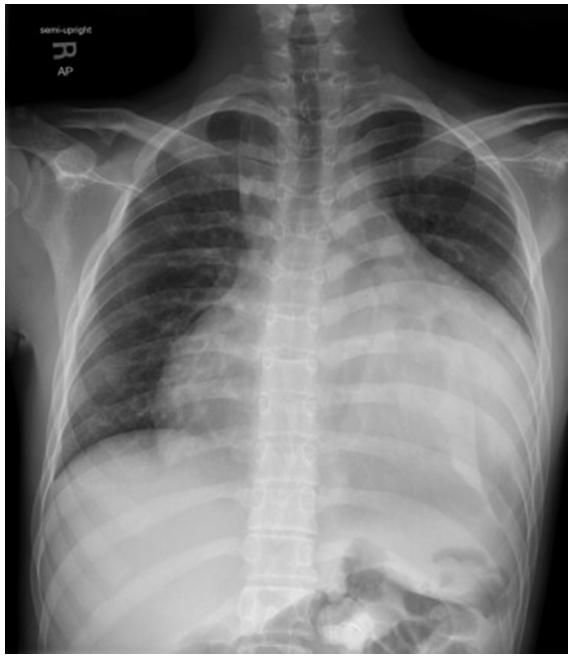
1. Blyth L, Atkinson P, Gadd K, et al. Bedside focused echocardiography as predictor of survival in cardiac arrest patients: a systematic review. *Acad Emerg Med.* 2012;19:1119-1126.
2. Chun TH, Katz ER, Duffy SJ. Pediatric mental health emergencies and special health care needs. *Pediatr Clin North Am.* 2013;60:1185-1201.
3. Newton AS, Hamm MP, Bethell J, et al. Pediatric suicide-related presentations: a

systematic review of mental health care in the emergency department. *Ann Emerg Med*. 2010;56:649-659.
4. Santiago LITM, Foltin GL, Mojica MA. Children requiring psychiatric consultation in the pediatric emergency department: epidemiology, resource utilization, and complications. *Pediatr Emerg Care*. 2006;22:85-89.
5. Habis A, Tall L, Smith J, et al. Pediatric emergency medicine physicians' current practices and beliefs regarding mental health screening. *Pediatr Emerg Care*. 2007;23:387-393.
6. Cappelli M, Gray C, Zemek R, et al. The HEADS-ED: a rapid mental health screening tool for pediatric patients in the emergency department. *JAMA Pediatr*. 2012;130:e321-e327.
7. Horowitz LM, Bridge JA, Teach SJ, et al. Ask Suicide-Screening Questions (ASQ): a brief instrument for the pediatric emergency department. *Arch Pediatr Adolesc Med*. 2012;166:1170-1176.

Michael Brown, MD, MSc, Jestin N. Carlson, MD, MS, and Alan Jones, MD, serve as editors of the SRS series.

Images in Emergency Medicine

The *Annals* Web site (*www.annemergmed.com*) contains a collection of hundreds of emergency medicine-related images, complete with brief discussion and diagnosis, in 18 categories. Go to the Images pull-down menu and test your diagnostic skill today. Below is a selection from the Cardiovascular Images.



"Adolescent With Chest Pain" by Neal and Rempell, June 2017, Volume 69, #6, pp. 687, 713.