

**Critical Review Form
Prognosis**

PGY- 2

[Clinical utility of screening laboratory tests in pediatric psychiatric patients presenting to the emergency department for medical clearance. Ann Emerg Med. 2014 Jun;63\(6\):666-75.e3.](#)

Objectives: To evaluate the hypothesis that “in the pediatric population, as in adults, clinically relevant laboratory test result abnormalities would be rare if the history and physical examination result did not indicate the presence of underlying medical conditions.” (p. 667)

Methods: This retrospective chart review was conducted at a large academic, inner city, Level 1 trauma center in California between July 2009 and December 2010. Consecutive patients less than 18 years of age brought to the emergency department (ED) for danger to self or others or “grave disability” were included. These patients were identified by selection of charts with either a psychiatric diagnosis or a chief complaint consistent with a psychiatric concern. Patients older than 18, those with repeat visits, and those with missing data were excluded.

One of four unblinded reviewers reviewed each medical chart and laboratory test results to determine whether any component altered medical management or disposition. In equivocal cases, two pediatric emergency medicine faculty members reviewed the chart and came to a consensus (this occurred in less than 10 cases). An urgent change in management included any evaluation or treatment required to rule out a "condition potentially leading to morbidity or mortality in the ensuing 30 days." A non-urgent change in management included any abnormality that could be followed up as an outpatient and did not require immediate care.

The primary outcome was the presence of an abnormal laboratory test result - in the setting of a normal history and physical examination - that did not alter management of disposition. The secondary outcome was ED length of stay.

There were 1640 potentially eligible patient visits during the study period, of which 558 were excluded, leaving 1082 visits in the final analysis with a total of 13725 individual laboratory tests performed in 871 visits (80.5%). The final disposition was boarding on the pediatric medical ward in 46.1% of cases and transfer to an inpatient psychiatric hospital in 36.9% of cases. The [kappa values](#) for interrater reliability for type of change in management or disposition ranged from 0.78 to 0.89 for blood tests, 0.47 for urinalysis (UA), 0.89 for urine toxicology, and 0.89 for urine pregnancy test.

Guide		Comments
I.	Are the results valid?	
A.	<p>Was the sample of patients representative? <i>In other words, how were subjects selected and did they pass through some sort of “filtering” system which could bias your results based on a non-representative sample. Also, were objective criteria used to diagnose the patients with the disorder?</i></p>	Yes. The authors attempted to identify all pediatric patients with a psychiatric complaint or diagnosis but searching the records by both final diagnosis and by chief complaint. The authors used a fairly comprehensive set of objective identifiers in order to identify their cohort.
B.	<p>Were the patients sufficiently homogeneous with respect to prognostic risk? <i>In other words, did all patients share a similar risk from during the study period or was one group expected to begin with a higher morbidity or mortality risk?</i></p>	Uncertain. The authors do not provide any demographic information other than patient age. They do not provide information with regards to medical comorbidity, substance abuse issues, or details regarding the psychiatric history or complaint. Given that this was a pediatric population with a likely low incidence of significant comorbidity, it likely that this was a fairly homogeneous group.
C.	<p>Was follow-up sufficiently complete? <i>In other words, were the investigators able to follow-up on subjects as planned or were a significant number lost to follow-up?</i></p>	No. There were 114 charts excluded because of missing data. The authors do note that “There was no significant difference in the ED length of stay or disposition in the excluded patients compared with that of the included patient population.” (p. 669). It is uncertain how many patients were initially registered but left without being seen by a provider.
D.	<p>Were objective and unbiased outcome criteria used? Investigators should clearly specify and define their target outcomes before the study and whenever possible they should base their criteria on objective measures.</p>	<p>No. The primary outcome of interest was a laboratory abnormality that results in a change in management or disposition, and this would be very difficulty to objectively define. Additionally, the authors evaluated whether abnormalities in the history or physical exam predicted abnormalities in lab testing, but again this would be difficult to define objectively.</p> <p>The authors do reports kappa values for interrater reliability for change in management or disposition, though these were calculated on only 10% of the data set and was performed by random selection of charts by a single reviewer. Interrater reliability was excellent for all testing except urinalysis.</p>
II.	What are the results?	
A.	How likely are the outcomes over	<ul style="list-style-type: none"> Out of 871 visits in which a laboratory test was

	<p>time? <i>For the defined follow-up period, how likely were subjects to have the outcome of interest.</i></p>	<p>ordered, 7 (0.8%, 95% CI 0.4 to 1.6%[†]) had at least 1 laboratory test abnormality associated with a change in disposition</p> <ul style="list-style-type: none"> ○ In 6 of these cases (85.7%) there was an associated abnormality in the history or physical exam. ○ In the one case where disposition was changed, the abnormality was a positive pregnancy test. <ul style="list-style-type: none"> ● In 50 cases (5.7%, 95% CI 4.4 to 7.5%[†]), there was at least one abnormality associated with a change in medical management other than change in disposition. <ul style="list-style-type: none"> ○ In 25 of these cases (50%) there was an associated abnormality in the history or physical exam. ○ In the 25 cases in which management was changed, all involved non-urgent changes in medical management. ● ED LOS was significantly shorter in patients undergoing no blood testing compared to those requiring blood testing (median difference 119 minutes, 95% CI 144.4 to 123.6). ● ED LOS was shorter for those requiring no screening labs compared to those requiring any screening labs (median difference 117 minutes, 95% CI 109.7 to 124.4). <p>[†] 95% CI calculated using http://www.vassarstats.net/prop1.html</p>
B.	<p>How precise are the estimates of likelihood? <i>In other words, what are the confidence intervals for the given outcome likelihoods?</i></p>	See above.
III.	<p>How can I apply the results to patient care?</p>	
A.	<p>Were the study patients and their management similar to those in my practice?</p>	Yes (when comparing to Children’s Hospital). This was a large, urban, academic medical center with a large pediatric volume.
B.	<p>Was the follow-up sufficiently long?</p>	Yes. This study sought to evaluate the effect of lab testing on disposition and management of patients in the ED. Follow-up to disposition from the ED should therefore be sufficient.
C.	<p>Can I use the results in the management of patients in my practice?</p>	Uncertain. While lab testing did not significantly alter medical management or disposition in the vast majority of patients, it is uncertain if some testing altered psychiatric management. Likely the

		majority of testing employed routinely is of little value (CBC, BMP, hepatic function, and thyroid testing) in patients with an established psychiatric diagnosis, urine drug screens likely impact further psychiatric care.
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Limitations:

1. Because this study sample was based on discharge diagnoses, some patients may have been unintentionally excluded if their discharge diagnosis was not included in the query.
2. This was a retrospective study, and is unclear what effect the laboratory test results would have on the documented history and physical exam.
3. The primary outcome of interest was a change in management or disposition based on the results of laboratory testing. This is a rather subjective outcome, as is the association between history and physical exam findings and laboratory abnormalities. The authors did evaluate [inter-rater reliability](#), which was excellent in most cases, but was poor in the case of urinalysis results.
4. The authors do not evaluate the impact of routine lab testing psychiatric management.

Bottom Line:

In this retrospective chart review of pediatric patients presenting to a large, urban, academic ED with a psychiatric issue, management or disposition was altered in only 57 of 871 (6.5%) cases in which laboratory testing was ordered. There was only one case in which disposition was changed without an associated abnormality in the history or physical exam, involving a positive pregnancy test. There were 25 cases in which management was altered without an abnormality in the history or physical exam, though none of these constituted an urgent change in management. This data suggests that laboratory testing be determined on a case-by-case basis in pediatric psychiatric patients, determined by history and physical exam. Routine pregnancy testing in girls of child-bearing age remains reasonable.