

## Selected Topics: Psychiatric Emergencies



### MEDICAL SCREENING OF MENTAL HEALTH PATIENTS IN THE EMERGENCY DEPARTMENT: A SYSTEMATIC REVIEW

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**Abstract—Background:** Patients presenting to the emergency department (ED) with psychiatric complaints often require medical screening to evaluate for a medical cause of their symptoms. **Objective:** We sought to evaluate the existing literature on the medical screening of psychiatric patients and establish recommendations for ideal screening practices in Western-style EDs. **Methods:** PubMed, PsycINFO, and ClinicalTrials.gov were searched for clinical studies examining the medical screening of adult psychiatric patients in the ED or inappropriate referrals to psychiatry. Articles were graded using the Effective Public Health Practice Project (EPHPP) grading tool and sorted into topics. A 3-level grading algorithm used by other emergency medicine organizations was used to evaluate the strength of the evidence for each recommendation. **Results:** Sixty articles met the inclusion and exclusion criteria. Most published literature on medical screening consisted of nonrandomized studies with a high risk of bias. Some screening procedures, such as history and physical examination, were extensively recommended. Other screening procedures received mixed recommendations. **Conclusions:** Based on available literature, physician experts developed 7 recommendations. For a patient with known psychiatric disease presenting with symptom exacerbation, medical screening should include a full medical

and psychiatric history, a targeted physical examination, and a mental status examination. Urine toxicology screening and nonurine drug screen laboratory testing should not be routinely performed. Additional screening tests may be valuable for patients with new-onset psychiatric symptoms who are  $\geq 65$  years of age, are immunosuppressed, or have concomitant medical disease. However, additional studies on this topic with more rigorous methodology must be conducted to establish definitive guidelines. © 2018 Elsevier Inc. All rights reserved.

**Keywords—**emergency department; emergency room; guidelines; medical clearance; medical screening; mental health; psychiatry

#### INTRODUCTION

Patients who present to an emergency department (ED) with acute psychiatric symptoms typically require medical screening, often termed “medical clearance” (MC). Although experts often disagree over the precise definition of MC and have advocated that it be replaced with the term “medical screening,” such examinations are typically conducted to exclude medical comorbidities that require urgent treatment or that may be contributing significantly to the psychiatric complaint (1).

Reprints are not available from the authors.

Medical screening of psychiatric patients is an issue that impacts a significant population of emergency physicians on a regular basis. Studies conducted before the establishment of modern EDs found a high prevalence of co-occurring physical illness among psychiatric patients (2–4). In addition, physical illness has been shown to cause or exacerbate psychiatric symptoms in up to one quarter of agitated ED patients (5,6). Complicating this, MC protocols vary significantly in both content and quality across EDs, ostensibly due to a lack of empirical evidence supporting one set of screening procedures over another. Previous reviews of MC have only examined the utility of routine laboratory testing (7,8). The objective of this systematic review was to evaluate all existing studies on medical screening of adult mental health patients and to develop a standardized set of clinical recommendations for the ED. In doing so, the review aims to improve the management and outcomes of emergency psychiatric patients and to alleviate health care costs by eliminating unnecessary screening procedures. It is crucial that emergency physicians and psychiatrists work in conjunction to implement this screening plan to streamline the medical screening process.

## METHODS

This review was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement for conducting a systematic review (9). The review addressed the following question: “In the population of adult psychiatric patients presenting to U.S. EDs, what are the practices for medical screening (commonly termed MC) of these patients that meaningfully guide and alter patient management versus current medical screening procedures?” The protocol for this systematic review was registered on PROSPERO, an international database of prospectively registered systematic reviews in health and social care (CRD42017060782). After piloting search terms to ensure maximum sensitivity, the PubMed, PsycINFO, and ClinicalTrials.gov databases were searched for all papers published before or on November 18, 2016 using the following search terms: “emergency department AND medical clearance,” “emergency room AND medical stability,” “emergency department AND medical stability,” and “emergency room AND medical clearance” without limits or restrictions. All abstracts found through this search were manually inspected for adherence to our inclusion and exclusion criteria as delineated in the following section. The reference sections of relevant studies and review papers were also examined to identify additional articles that were appropriate for inclusion.

## *Inclusion/Exclusion Criteria*

Articles were included if they were clinical studies of any type (including nonrandomized or observational studies) that examined any of the following topics: medical screening of adult mental health patients in the ED; medical screening of adult mental health patients in the psychiatric ED; inappropriate referrals to the psychiatry service; or admissions to the psychiatry service. Manuscripts were excluded if they were not originally published in English or if an English translation of the manuscript was not available in the databases searched (because the intent of the study was to look at practices in the United States or other Western-style EDs); the translated versions of all non-English manuscripts examining Western-style EDs were available on PubMed. Articles were also excluded if they were case studies, review papers, or abstracts, if the results were formulated solely by expert consensus, or if the patient populations were primarily <18 years of age. Although the inclusion of nonrandomized studies in a systematic review is controversial, much of the expert consensus on medical screening relies on this type of data (1,10). Consequently, we included these data for the purposes of a systematic review but, given the heterogeneity of topics and study design, did not plan to perform a meta-analysis.

## *Data Collection and Processing*

Two reviewers (K.C., M.L.) independently abstracted study designs based upon 2 factors: exposure and outcome, and kappa scores for interrater reliability were calculated. For most of the studies included in this review, exposure was defined as implementation of a certain medical screening procedure, and outcome was defined as the effect of the screening procedure. One reviewer (K.C.) evaluated financial disclosures by screening all articles for statements of funding sources.

The authors of this article represent emergency medicine and psychiatry; combined, they represent >90 years of research experience and >65 years of clinical experience. Major topics of study of included articles were determined by expert consensus of practicing emergency physicians and emergency psychiatrists (E.A., K.N., M.P.W.), all of whom have extensive experience in the field of behavioral emergencies and have published studies on medical screening. An article was included in a topic if the topic was directly examined in the article and the topic’s utility was evaluated in the study. An article could be included in >1 topic depending on the conclusions reached by its authors. Two evaluators (E.A., K.C.) abstracted the topics; disagreements were resolved by consensus.

Two evaluators (K.C., S.M.) independently assessed the studies for quality using the Effective Public Health

Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies while blinded to one another's grades, and kappa scores were calculated (11). Retrospective chart reviews were additionally compared against criteria for this type of study (12,13).

The EPHPP grading tool was chosen to assess the quality of the included studies because it is designed for retrospective and nonrandomized study designs in addition to randomized controlled trials (11). The EPHPP tool assigns a global rating of strong, moderate, or weak based upon strong, moderate, or weak scores in the following 6 subcomponents: selection bias, study design, confounders, blinding, data collection methods, and withdrawals and dropouts. Questions pertaining to the integrity of the intervention and the appropriateness of the quantitative analysis to the research question are also posed, but neither of the aforementioned metrics contributes to the global rating. The American College of Emergency Physicians Clinical Policy Development Guidelines were used to evaluate each recommendation according to the strength of study designs contributing to the recommendation and the degree of benefit versus risk (14). In this schema, each recommendation receives a Level A, B or C recommendation depending on the methodological quality of the studies that comprise it.

*Level A recommendations.* Generally accepted principles for patient care that reflect a high degree of clinical certainty (e.g., based on evidence from  $\geq 1$  studies without major methodological limitations or multiple studies with moderate limitations).

*Level B recommendations.* Recommendations for patient care that may identify a particular strategy or range of strategies that reflect moderate clinical certainty (e.g., based on evidence from  $\geq 1$  studies with moderate methodologic limitations or strong consensus of studies with major limitations).

*Level C recommendations.* Recommendations for patient care that are based on evidence from studies with major methodological limitations or, in the absence of any adequate published literature, are based on expert consensus.

A set of guidelines was developed under the Institute of Medicine standards for developing guidelines and met almost all criteria. Consensus was gathered from all experts on this review before publication (E.A., K.N., R.A.S., M.P.W.). The level of evidence for each recommendation was then assessed by all authors (K.C., S.M., E.A., M.J.L., K.N., R.A.S., M.P.W.) using the American College of Emergency Physicians grading algorithm (14). The National Guideline Clearinghouse Extent Adherence to Trustworthy Standards instrument was

used to score how well the review adhered to each of the Institute of Medicine standards for developing clinical guidelines. The tool rates how well the review performs in adhering to each guideline by assigning it a numerical rating ranging from 1 through 5, with 1 signifying the lowest adherence and 5 signifying the highest adherence.

## RESULTS

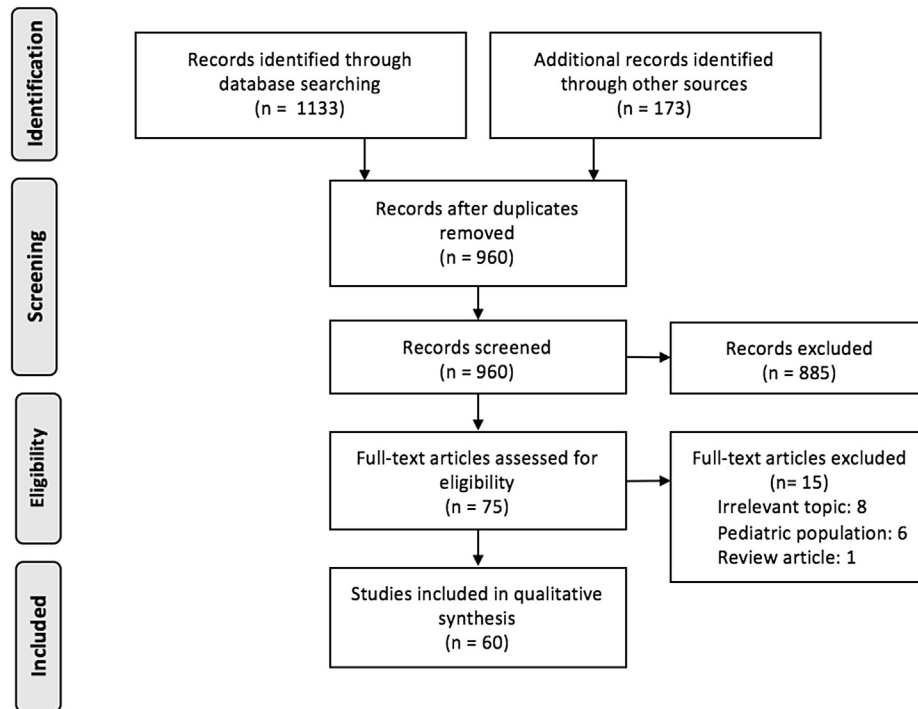
After screening all relevant titles ( $N = 960$ ), 60 trials were included for analysis (Figure 1). Interrater reliability was high for study design ( $\kappa = 0.918$ ), medical setting ( $\kappa = 0.971$ ), and number of subjects in each study ( $\kappa = 1$ ). After expert review of these articles, the following topics were identified: 1) age cutoffs for additional screening procedures; 2) important elements of the patient history; 3) vital signs; 4) important elements of the physical examination; 5) mental status examination; 6) routine urine drug screens (UDSs); and 7) routine laboratory testing excluding UDSs.

All of the medical screening topics addressed in each study were marked in Table 1. For each topic, a plus sign (+) indicates support, a minus sign (−) indicates a lack of support or advice against, and a plus/minus symbol ( $\pm$ ) indicates recommended routine screening in specialized circumstances. Interrater reliability was good for topics ( $\kappa = 0.856$ ) and EPHPP evaluations ( $\kappa = 0.945$ ).

The review had high or highest adherence (score of 4/5 or 5/5, respectively) to 10 of the 12 Institute of Medicine standards for developing clinical guidelines outlined in the National Guideline Clearinghouse Extent Adherence to Trustworthy Standards instrument.

### Summary of Included Studies

The included studies were largely nonrandomized and received weak global ratings on the EPHPP grading scale. Two studies were weak in all domains of the EPHPP scale and were therefore not included in the formulation of the final recommendations of this review; this was not an initial exclusion criterion published on PROSPERO (38,54). Most studies were retrospective cohort studies and did not follow established methodologic conventions (12,14). Almost all studies relied on the initial physician evaluation of patients for the medical screening process. However, 1 study involved an emergency medical services protocol that allowed trained paramedics to medically screen patients with exclusively psychiatric complaints using a form, with the requirement that paramedics remotely consult with an ED attending as a component of the screening (23). Another study required triage nurses to fill out a standardized form that determined whether a patient was to be



**Figure 1. Diagram of study selection.**

sent to the ED or behavioral health unit; patients in both groups were then further screened by an emergency physician (49).

#### *Funding Bias or Affiliation*

Only 1 study was funded by industry (34). An author from another study was an associate medical director at Blue Cross, but that study was unfunded (26). Multiple studies were funded by government grants from the National Institute of Mental Health, the National Institute on Alcohol Abuse and Alcoholism, the National Institute on Drug Abuse, and the California State Department of Mental Health (17,24,44,59). Two studies were funded by nonprofit organizations (29,55). Eight studies explicitly denied any affiliations or funding sources that would have contributed to a conflict of interest (16,18,33,49,52,56,67,69). Forty-three studies (72%) did not report a source of funding.

## DISCUSSION

### *Age Cutoffs for Additional Screening Procedures*

Eight studies addressed age cutoffs for additional screening procedures. Four were prospective cohort studies of moderate or strong quality, 1 was a prospective case series of weak quality, and 3 were retrospective cohort studies of weak quality (22,30,34,35,49,

60,62,65). None of the studies evaluated age cutoffs in a systematic, randomized fashion or compared routine laboratory values against clinician judgment for directed testing.

Suggested age cutoffs ranged from >30 to >40 to >65 years of age (32,35,49,60,62). Chandler and Gerndt found that after medical examination, 27% of patients  $\geq 60$  years of age had a change in psychiatric diagnosis or treatment (22). Medical illness often presents differently in elderly patients, and a regular history and physical examination alone may not detect important medical presentations in such patients, especially among those with several medical comorbidities (62). Ultimately, all 6 studies concur that patients  $\geq 65$  years of age should undergo additional screening.

Some studies indicate that patients younger than a certain age cutoff may also benefit from additional screening measures, although there is disagreement over the minimum age at which additional screening should occur. One study found that patients  $\leq 30$  years of age were significantly less likely to have documentation of an appropriately detailed physical examination, while another found that patients <55 years of age were 4 times as likely to have a missed medical diagnosis (63,65). In addition, expert consensus guidelines suggest that younger patients with chronic medical conditions, such as diabetes, new-onset psychosis, and immunosuppression receive additional evaluation and laboratory testing (3,4,51).

**Table 1. Summary of included studies**

Author, Year	Study Design	Study Setting	No. of Pts	Funding Bias	Topic						EPHPP							
					Age Cutoff	History	Vitals	PE	MSE	UDS	Routine Laboratory Testing, Non-UDS	Global Rating	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals/ Dropouts
Abiodun et al., 2000 (15)	Retrospective cohort	Inpatient, psychiatric hospital	191	NR				+				W	M	W	S	W	W	N/A
Amin and Wang, 2009 (16)	Prospective cohort	ED	375	D		+		+	-	-		W	W	M	S	W	W	M
Ananth, 1989 (17)	Prospective cohort	Inpatient	75	California Department of Mental Health		+		+		±		W	W	M	S	W	M	M
Bagoien et al., 2009 (18)	Prospective, cross-sectional	Psychiatric emergency unit	262 samples for 217 pts	D						±		M	W	M	S	M	M	M
Broderick et al., 2002 (19)	Cross-sectional	ED	290/500 surveys returned	NR								W	W	W	S	W	W	N/A
Bunce et al., 1982 (2)	Retrospective cohort	Psychiatric hospital, acute care unit	102	NR								W	M	W	S	W	W	N/A
Burke, 1972 (20)	Prospective cohort	Psychiatric hospital	200	NR								W	W	W	S	W	W	M
Carlson et al., 1981 (21)	Prospective cohort	PES	2000	NR								W	M	M	S	W	W	S
Chandler and Gerndt, 1988 (22)	Case series, prospective	Psychiatric hospital	224	NR		+	+		+	-		W	W	M	S	W	M	S
Cheney et al., 2007 (23)	Prospective cohort	PES (paramedic screeners)	174	NR		+	+		+			M	M	M	S	W	M	S
Cherpitel et al., 1992 (24)	Multicenter, Cross-sectional	ED	1814	NIAAA		+						W	M	M	M	W	W	S
Claassen et al., 1997 (25)	Retrospective cohort	Psychiatric ED	112	NIMH						±		W	M	W	S	W	W	N/A
Corl et al., 2008 (26)	Retrospective cohort	ED	2291	NR								W	M	W	W	W	M	N/A
Crede et al., 2011 (27)	Retrospective cohort	Emergency Center in Capetown	748	NR		+	+	+		-		W	M	W	S	W	W	N/A
Davies, 1965 (28)	Prospective cohort	Outpatient clinic	72	NR					+			W	W	M	W	W	W	S

(Continued)

Table 1. Continued

Author, Year	Study Design	Study Setting	No. of Pts	Funding Bias	Topic						EPHPP									
					Age Cutoff	History	Vitals	PE	MSE	UDS	Routine Laboratory Testing, Non-UDS	Global Rating	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals/Dropouts		
Dolan et al., 1985 (29)	Retrospective cohort	Inpatient, Private psychiatric hospital	250	Nonprofit		+		+			±		W	M	W	S		W	W	N/A
Dubin et al., 1983 (30)	Prospective cohort	PES in ED	1140	NR		+		+		+			M	M	M	S		W	M	S
Eastwood et al., 1970 (31)	Prospective cohort	Psychiatric emergency clinic	100	NR		+				+			W	M	M	S		W	W	S
Eilenberg and Whatmore, 1961 (32)	Retrospective cohort	Inpatient psychiatric unit	1259	NR						+			W	W	W	S		W	W	N/A
Eisen et al., 2004 (33)	Prospective cohort	ED	110	D							–		M	M	M	S		W	M	S
Elangovan et al., 1993 (34)	Prospective cohort	PES	218	Pfizer		+	+				+		M	S	M	S		W	M	S
Ferguson and Dudleston, 1986 (35)	Retrospective cohort	Inpatient	650	NR		+	+			+		±	W	W	W	S		W	W	N/A
Hall et al., 1978 (6)	Prospective cohort	Outpatient, CMH	658	NR						+		+	M	M	M	M		W	M	M
Hall et al., 1980 (36)	Prospective cohort	Psychiatric hospital	100	NR		+	+	+			+		W	W	M	S		W	M	S
Hall et al., 1981 (37)	Prospective cohort	State psychiatric hospital	100	NR		+		+			+		W	W	M	S		W	W	S
Hatta et al., 1998 (38)	Retrospective cohort	Psychiatric ICU	659	NR		+	+	+			+		W	W	W	W		W	W	N/A
Henneman et al., 1994 (4)	Case series, prospective	ED	100	NR		+		+			±	±	W	W	M	S		W	M	S
Herridge, 1960 (39)	Retrospective cohort	Inpatient psychiatric unit	209	NR				+			±		W	W	W	S		W	W	N/A
Hoffman, 1982 (40)	Prospective cohort	Med-psychiatric inpatient unit	215	NR									W	M	M	S		W	W	S
Janiak and Atteberry, 2012 (41)	Retrospective cohort	Inpatient psychiatric ward	502	NR		+		+			–	–	W	M	W	S		W	W	N/A
Johnson et al., 1968 (42)	Case series	Inpatient psychiatric unit	250	NR						+			W	W	W	S		W	W	N/A

(Continued)

Table 1. Continued

Author, Year	Study Design	Study Setting	No. of Pts	Funding Bias	Topic						EPHPP								
					Age Cutoff	History	Vitals	PE	MSE	UDS	Routine Laboratory Testing, Non-UDS	Global Rating	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals/ Dropouts	
Koranyi, 1979 (3)	Retrospective cohort	Psychiatric outpatient clinic	2090	NR				+		+		W	W	W	S	W	W	N/A	
Korn et al., 2000 (43)	Retrospective cohort	ED	212	NR		+	+		+	-	±	W	M	W	S	W	W	N/A	
Kroll et al., 2013 (44)	Retrospective cohort	ED	439	NIAAA		+					-	W	S	M	S	W	W	N/A	
Lemogne, 2008 (45)	Prospective cohort	Psychiatric ED	527	NR		+						M	S	M	S	W	M	S	
Lieberman et al., 1985 (46)	Retrospective cohort	PES	50	NR								W	W	W	S	W	M	N/A	
Maguire and Granville-Grossman, 1968 (47)	Retrospective cohort	Inpatient psychiatric unit	200	NR					+		+	W	W	W	S	W	W	N/A	
Marshall 1949 (48)	Retrospective cohort	Inpatient psychiatric unit	175	NR					+			W	W	W	S	W	W	N/A	
Miller et al., 2012 (49)	Prospective cohort (triage nurse screeners)	ED	93	D	+	+	+	+	+			S	M	M	S	M	M	S	
Montague et al., 2001 (50)	Prospective cohort	ED	107	NR		+					-	±	W	M	M	S	W	W	S
Olshaker et al., 1997 (51)	Retrospective cohort	ED	345	NR		+	+	+			-	±	W	M	W	S	W	W	N/A
Parmar et al., 2012 (52)	Multicenter, Prospective cohort	ED	589	D		+		+			-	±	M	M	M	S	W	M	S
Perrone et al., 2001 (53)	Prospective, cross-sectional	ED	218	NR		+					+		W	W	M	S	W	M	S
Pinto et al., 2010 (54)	Case series	Psychiatric ED	20	NR				+	+	+			W	W	W	W	W	W	N/A
Reeves et al., 2000 (55)	Retrospective cohort	ED psychiatric unit	64	Nonprofit		+			+	+			W	W	W	S	W	W	N/A
Reeves et al., 2010 (56)	Retrospective cohort	VA psychiatric unit	1953	D		+	+	+	+				W	M	M	S	W	W	N/A
Riba and Hale, 1990 (57)	Retrospective cohort	ED	137	NR					+				W	M	W	S	W	W	N/A
Saloojee, 2009 (5)	Retrospective cohort	ED	339	NR					+		±		W	M	W	S	W	W	N/A

(Continued)



Table 1. Continued

Author, Year	Study Design	Study Setting	No. of Pts	Funding Bias	Topic						EPHPP							
					Age Cutoff	History	Vitals	PE	MSE	UDS	Routine Laboratory Testing, Non-UDS	Global Rating	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals/Dropouts
Schauer, 2015 (58)	Retrospective cohort	Army ED	204	NR						–	–	W	M	W	S	W	W	N/A
Schiller et al., 2000 (59)	RCT	PES	392	NIDA						–		S	S	S	M	S	M	S
Shah et al., 2012 (60)	Prospective cohort	ED	485	NR	+	+	+	+				M	M	M	S	W	M	S
Sheline and Kehr, 1990 (61)	Retrospective cohort	Inpatient	252	NR								W	M	W	S	W	W	N/A
Stiffler, 2015 (62)	Retrospective cohort	Geriatric psychiatric unit	100	NR	+	+						W	M	W	S	W	W	N/A
Szpakowicz and Herd, 2008 (63)	Retrospective cohort	ED	202	NR								W	M	W	S	W	W	N/A
Thomas, 1979 (64)	Retrospective cohort	Inpatient psychiatric unit	613	NR								W	M	W	S	W	M	N/A
Tintinalli et al., 1994 (65)	Retrospective cohort	Voluntary psychiatric inpatient unit	298	NR	+	+	+	+	+			W	M	W	S	W	W	N/A
White and Barraclough, 1989 (66)	Retrospective cohort	Inpatient psychiatric unit	1007	NR							±	W	M	W	S	W	W	N/A
Zun and Downey, 2008 (67)	Prospective cohort	ED	401	D		+	+	+	+			W	M	M	M	W	W	M
Zun et al., 2004 (68)	Cross-sectional	ED and psychiatric facilities	507/1055 surveys returned	NR								W	W	W	M	W	W	N/A
Zun et al., 2007 (69)	Prospective cohort	ED	97	D		+	+	+	+			W	W	M	S	W	W	S

CMH = community mental health center; D = denied; ED = emergency department; EPHPP = Effective Public Health Practice Project; ICU = intensive care unit; M = moderate; NIAAA = National Institute on Alcohol Abuse and Alcoholism; NIDA = National Institute on Drug Abuse; NIMH = National Institute of Mental Health; NR = not reported; PES = psychiatric emergency services facility; pts = patients; S = strong; VA = Veterans Affairs; W = weak; RCT = randomized clinical trial; PE = psychiatric emergency; MSE = mental status examination; UDS = urine drug screen.

A plus sign (+) indicates that the study found support for routine screening. A minus sign (–) indicates that the study found a lack of support or advice against routine screening. A plus/minus symbol (±) indicates that the study found support for routine screening only in select circumstances.



### *Routine Screening Laboratory Testing, Non-UDS: Basic Metabolic Panel, Complete Blood Cell Count, Etc*

Twenty-two studies of various designs and quality examined the utility of routine screening laboratory testing (3–6,16,22,27,29,31,35–39,41,43,47,50–52,58,66). One study was weak in all domains and not included in formulating this recommendation (38). The remaining studies reach mixed conclusions as to the value of routine laboratory testing, with most studies of slightly higher methodologic quality recommending against it while studies of lower methodologic quality recommending in favor of such screening. Studies that have strongly advocated for routine laboratory screening are typically also from an era before the establishment of the modern ED, when emergency medicine was an emerging specialty and medical personnel working in the ED were not specifically trained to manage the complex range of patients who presented. Some studies discuss the value of certain laboratory tests, including measurement of acetaminophen levels in patients with suspected overdose, but are opposed to routinely administering a battery of tests (50,52,66). More recent studies, including 1 with more rigorous methodology, indicate that routine laboratory screening, even if it should reveal abnormal results, rarely alters patient management (27,41,52). However, laboratory testing may be more useful in patient populations in whom a thorough history and physical examination cannot be performed or in patients with new-onset psychiatric symptoms (29,52). Of note, a recent American College of Emergency Physicians clinical policy on psychiatric patients agreed with this assessment but gave it only a level C rating of evidence (8).

### *Important Elements of the Patient History*

The medical history was examined by numerous studies of various designs and generally weak quality (4,16,17,22–24,27,29,31,34,36–38,41,43–45,49–53,55,56,60,62,65,67,69). One study was ranked as weak in all domains and was not included in the development of this recommendation (38). All included studies agreed on the necessity of completing a thorough medical and psychiatric history, but most did not specify the level of detail or specific contents of the history. Suggested elements for the past psychiatric history include: previous psychiatric symptoms and diagnoses, psychiatric hospitalizations, episodes of self-injurious or suicidal behavior, and drug use history (43,44,51).

It may be important not to depend on medical records for diagnosis; Chandler and Gerndt found that 69% of the medical conditions that led to changes in management were not listed in medical records, and that neurologic history in particular altered diagnosis and management

(22). Some authors stated that it may also be important to complete a timely and thorough evaluation of all patients regardless of psychiatric history. Abiodun, for instance, found a patient with schizophrenia who died because of a failure to perform a timely workup and treatment of a medical condition, and Reeves found that 85.5% of patients with missed medical diagnoses had a documented psychiatric condition and received less extensive evaluation (15,56).

Multiple studies have examined the utility of a properly conducted history, although this is poorly defined. Olshaker found that history alone could identify 94% of medical conditions (51). Meanwhile, 2 prospective studies of moderate quality with sample sizes of  $N = 485$  and  $N = 589$ , respectively, found that history and physical examination including vitals were sufficient to rule out medical conditions in all but 1 patient in their study populations (52,60).

### *Vital Signs*

Fourteen studies examined the value of measuring vital signs (23,27,30,36,38,43,49,51,54,56,60,65,67,69). Eight were prospective in nature, with 3 ranked as moderate and 1 as strong (23,30,49,60). Two studies were ranked as weak in all domains, and so were not included in the development of this recommendation (38,54).

All 12 included studies supported the measurement of vital signs. In addition, several studies that tested a screening protocol for psychiatric patients included abnormal vitals as a component of the evaluation (23,49,60,67). However, none of the 14 studies systematically compared the importance of various vital sign parameters or quantified the sensitivity of a given parameter in the detection of disease.

Substance use and overdose can be dramatically complex to manage and may even require admission to the intensive care unit. However, vital sign monitoring may help identify worsening of substance overdose and withdrawal syndromes that require medical intervention (30,55).

### *Important Elements of the Physical Examination*

Thirty-two studies examined the value of the physical examination (3–6,15–17,22,27–29,31,32,35–39,41,42,47–49,51,52,54–57,65,67,69). Though most were prospective and retrospective cohort studies of weak or moderate quality, 2 studies ranked unsatisfactory in all 5 domains of the EPHPP grading scale and were not considered in the context of this recommendation (38,54).

All articles included in this recommendation agreed on the importance of conducting a complete physical

examination, though “complete” is poorly defined; little standardization of physical examinations was found across studies. In general, such examinations involved evaluation of the major systems suitable for an ED setting and included a neurologic examination.

Chandler and Gerndt found the physical examination including a neurologic examination was the most significant screening component in altering medical management, while Olshaker et al. found that physical examinations had a 51% sensitivity for identifying medical problems overall (22,51). In a study examining aggressive patients, a physical examination including a neurologic examination was highly sensitive for identifying a medical origin of the aggression (5). None of the included studies compared the relative sensitivities of the individual elements that comprise a physical examination.

Two studies indicated that psychiatrists performed fewer physical examinations and arrived at fewer physical diagnoses, and 1 study found that attending emergency physicians are less likely to perform a complete physical examination than trainees, with no evaluation of the impact (28,57,63). However, no study compared the sensitivities of physical examinations as performed by providers with different levels of training, such as residents and attending physicians.

Patients who are psychotic may be agitated, which could make physical examination difficult or even dangerous. If possible, repeating a physical examination when a patient is more able to engage has been recommended (17).

Finally, no study has quantified the number of psychiatric patients forced to return to an ED for further treatment of a medical disease that was missed by history and physical examination alone.

#### *Mental Status Examination (with Orientation)*

The mental status examination (MSE) was primarily studied by weak or moderately rigorous studies, though one of the prospective cohort studies was ranked strong (23,30,43,49,55,56,60,65,67,69). One article was ranked weak in all domains of the EPHPP grading scale and was not included in formulating this recommendation (54).

Reeves et al. found that 69.1% of patients admitted to psychiatric units did not undergo a proper mental status assessment before admission, and Henneman et al. found that an appropriate MSE was performed on 0 patients in a study population who had a high rate of misdiagnosis (4,56). However, all studies included in this recommendation agreed upon the necessity of administering an MSE. Dubin found that a test of orientation and concentration were components of an

effective evaluation of patients who may have dementia (30). Miller suggests that assessment of delusions and hallucinations including type are important in mental status assessment (49). The clinical utility of an MSE was increased when a test of orientation was included.

#### *Routine UDS*

Sixteen studies of various designs and quality evaluated UDS (4,16–18,25,33,34,41,43,44,50–53,58,59). Schiller et al., in a randomized controlled trial ranked as strong, recommended against routine UDS (59). The remaining studies reached mixed conclusions. While physicians tend to overestimate substance abuse in their patients and self-report about drug use is often unreliable, routine UDS rarely leads to changes in patient disposition, even when positive (16,25,33,34,41,43,44,50–52,58). Still, routine UDS may be useful in adults with new-onset psychiatric symptoms, acutely psychotic patients, or those who are completely unable to provide a history (4,18,25,50). A 2006 American College of Emergency Physicians clinical policy also agreed with this assessment but gave this only a level C rating of evidence (8).

#### *Medical Screening Tools*

Reeves et al. found that physicians often perform insufficiently thorough histories (34%), physical examinations (44%), and MSEs (80%) (56). Reeves et al. further discovered that only 60% of patients admitted to a psychiatric unit had an adequate history documented, 60% had an adequate physical examination performed, and 31% had an adequate MSE conducted (56). In the sample of 137 patients, Riba and Hale found that a history of present illness was documented in only 33% of patients, vital signs in only 68%, and MSE in 0 (57). Finally, Tintinalli et al. concluded that physician failure to conduct essential components of the history or physical examination was responsible for 10 of 12 inappropriate medical screenings that took place during the course of their study (65). Consequently, although evidence recommending the use of screening tools is weak, these may be of some benefit in standardizing medical examinations of psychiatric patients (70).

#### *Limitations*

This review was limited by its exclusion of studies that examined non-Western style EDs, although this may be less of a limitation given that the intent of the review is to examine medical screening in U.S. EDs. In addition, it is possible that non-English articles from databases other than PubMed were not identified and therefore

not included in this review. A medical librarian was not used to search for articles appropriate for inclusion. Furthermore, of the 12 National Guideline Clearinghouse Extent Adherence to Trustworthy Standards criteria, the review scored poorly on the criteria requiring a formal methodologist and patient evaluation of the guidelines. However, these limitations were not important to the conduct of the review.

## CONCLUSIONS

Even though medical screening of mental health patients in U.S. EDs is often required, the literature on ideal practices is sparse and generally of low methodologic quality. After reviewing the published literature in a systematic fashion, we have developed a set of seven expert recommendations for routine medical screening. These recommendations are limited by existing literature, which may contain significant bias. Given the strength of existing evidence, all recommendations should be considered preliminary until further evidence establishes their validity. Additional prospective, randomized, double-blind studies are needed to verify these recommendations, and these guidelines should be updated as appropriate with the publication of additional high-quality studies on this topic.

### *Recommendation 1 (Level of Evidence C)*

Nonelderly healthy adult patients with complaints consistent with previous presentations of known psychiatric disease and who can provide a coherent history likely do not require screening for medical stability beyond a routine physical examination and history. Laboratory testing may be useful in patients who do not meet these criteria. Patients who are  $\geq 65$  years of age, who have new-onset of psychiatric symptoms, who are immunosuppressed, and who have concomitant medical disease may benefit from further evaluation and testing. The exact age cutoff for expanded testing of patients  $\leq 65$  years of age has not been well-defined, and physicians may need to take frailty or dementia into account rather than a strict age limit.

### *Recommendation 2 (Level of Evidence C)*

A thorough history consisting of a history of present illness, a psychiatric history, and medical history should be completed on every patient in a timely manner. Existing studies have not systematically examined different elements of the medical or psychiatric history. However, valuable elements of the history may include psychiatric symptoms and diagnoses, psychiatric hospitalizations, episodes of self-injurious or suicidal behavior, medication adherence history, and substance use history.

### *Recommendation 3 (Level of Evidence B)*

Vital signs should be taken from all patients; those with abnormal vital signs should be considered at higher risk of a medical illness.

### *Recommendation 4 (Level of Evidence B)*

A brief physical examination that includes major organ systems and emphasis on the neurologic system should be conducted on every patient.

### *Recommendation 5 (Level of Evidence C)*

An MSE testing cognition and orientation may be useful in the medical screening process. Delirium screening tools have been shown to help emergency physicians identify delirium in elderly patients, but there is little to no consensus about the optimum MSE in younger patients, because most research involving cognitive screening instruments relies on data that are heavily centered on geriatric patients (71).

### *Recommendation 6 (Level of Evidence C)*

UDS should not be routinely performed because it rarely changes patient disposition. Clinicians may consider testing patients who are unable to provide a history or have a recent onset of acute psychosis.

### *Recommendation 7 (Level of Evidence C)*

The use of medical screening tools may be useful in standardizing the medical screening process.

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*Acknowledgments*—The protocol for this systematic review was registered on PROSPERO (CRD42017060782). Dr. Wilson's time was generously supported by the University of Arkansas for Medical Sciences Clinician Scientist Program.

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## ARTICLE SUMMARY

### **1. Why is this topic important?**

Medical screening of psychiatric patients is a complex challenge that emergency medicine providers face daily, and a process that currently lacks standardization. The utility of different screening practices (history, urine drug screen, etc.) has not been examined in a systematic review.

### **2. What does this review attempt to show?**

This review evaluates the existing literature on medical screening of psychiatric patients in a methodologically robust manner. It subsequently aims to develop a set of guidelines for appropriate screening practices in Western-style emergency departments.

### **3. What are the key findings?**

For patients with known psychiatric disease, effective medical screening includes a full medical and psychiatric history, a targeted physical examination, and a mental status examination. Screening procedures that should not routinely be performed include urine toxicology screening and non-urine drug screen laboratory testing. Additional screening tests may be valuable in certain populations.

### **4. How is patient care impacted?**

This review presents a set of evidence-based guidelines for dispensable and indispensable medical screening procedures and encourages further research on the topic. Additional robust studies must be conducted to establish more definitive guidelines.