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# CAN MOBILE INTEGRATED HEALTH CARE PARAMEDICS SAFELY CONDUCT MEDICAL CLEARANCE OF BEHAVIORAL HEALTH PATIENTS IN A PILOT PROJECT? A REPORT OF THE FIRST 1000 CONSECUTIVE ENCOUNTERS

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## ABSTRACT

**Background:** Mental health patients wait lengthy periods in emergency departments for disposition. This delay is secondary to the process of medical clearance and then placement in an appropriate psychiatric specialty center. ACEP clinical policy questions the necessity of laboratory investigation for medical clearance and favors history and physical exam to determine safe disposition to mental health facilities. This manuscript explores if specially trained paramedics can effectively employ triage algorithms to determine proper disposition of patients suffering an acute mental health crisis in a 9-1-1 system. **Methods:** Six paramedics working for AMR in Stanislaus County, California underwent 180 hours of specialized training to become Mobile Integrated Healthcare Paramedics (MIHPs). Their training detailed the use of two algorithms designed to identify patients that require evaluation in an emergency department versus those that can be triaged directly to a licensed mental health facility. Patients aged 18–59 with a suspected mental health crisis who are encountered via the 9-1-1 system, law enforcement or who walk in to the mental health facility for treatment were eligible. All patients in the study were evaluated with the well person algorithm (WPA). Those that passed the WPA were evaluated using the mental

health clearance algorithm (MCHA). MIHPs directed patients to either the ED or the mental health facility based upon the evaluation results of the WPA and MHCA. **Results:** 1006 patients were evaluated between September 2015 and December 2017. 404 patients failed one or more components of the WPA or MHCA. 326 patients passed both the WPA and the MHCA, but were ultimately transported to a local emergency department, most often because of lack of available psychiatric beds in the community. 276 patients were transported directly to a psychiatric facility. Of these, 10 returned to the emergency department within 6 hours, but none of the 10 were admitted for a previously unidentified medical or traumatic condition. **Conclusion:** Specially trained paramedics can effectively employ triage algorithms to screen and select patients experiencing an acute mental health crisis for transport directly to psychiatric treatment facilities. **Key words:** community paramedic; mobile integrated healthcare; medical clearance; mental health

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## INTRODUCTION

In 2015, the American Hospital Association reported emergency department visits had risen by 45.8 million from 1994–2014, but 552 fewer emergency departments remained open in 2014 (1). Complicating this rise in patient volume is a national mental health care crisis. The National Institute for Mental Health reported that 43.6 million U.S. citizens aged 18 and over experienced at least one acute mental health crisis in 2014, representing 18.1% of the U.S. population (2). Mental health facilities, like emergency departments, have closed their doors resulting in even greater numbers of mental health patients presenting to emergency departments. These patients are transported to often-crowded acute care hospitals to be evaluated for co-morbidities that might preclude psychiatric inpatient hospitalization. This process, called medical clearance, typically employs the use of laboratory studies, which adds expense and time to a patient's evaluation. In addition to medical clearance, some patients are held for hours, even days, for placement in an inpatient psychiatric hospital, one study indicating it took 3.2 times longer to establish a disposition for a mental health patient

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compared to a medical patient, which ultimately translates to fewer ED beds available to care for other acute emergencies (3).

In 2000, Reeves et al. published a review of unrecognized medical problems in patients admitted to mental health facilities (4). Per the authors, intoxication, alcohol withdrawal, and prescription drug overdose were the 3 most common inadequately evaluated co-morbidities in psychiatric patients. Six years later, the American College of Emergency Physicians (ACEP) published an evidence-based clinical policy that challenged several of Reeves' claims (5). To summarize, ACEP's policy asserts that in a patient with stable vital signs, normal cognition, a history and physical that supports a non-medical cause, and an absence of risk factors for underlying medical conditions, laboratory evaluation is low yield and routine urine drug testing is not warranted. In addition, ACEP asserts that a patient's cognition, not his or her blood alcohol content, should dictate whether a mental health evaluation can occur. In 2008, Cheney et al. published the evaluation of the safety of a protocol and paramedic compliance in triaging mental health patients directly to behavioral health facilities (6). According to the author, the protocol successfully screened 96% of medical issues. Although Cheney's study enrolled just 174 patients, it is all that is currently available in the literature.

Emerging trends in medicine show promise in addressing the strain felt in health care. New models of patient care that reflect changes to where and how a patient receives his or her care are under development. Mobile integrated health care (MIH), one such new model, uses patient-centered, mobile resources, typically paramedics, physician assistants, or nurse practitioners (7). MIH may include services such as telephone advice to 9-1-1 callers, chronic disease management, preventive care, and post-discharge follow-up visits. MIH may also involve transport or referral to appropriate care outside the emergency department, such as clinics and specialty care facilities.

In 2012, the Emergency Medical Services Agency of California sought approval through the Office of Statewide Health Planning and Development (OSHPD) to trial 12 pilot projects investigating various MIH models. The overarching goal of these projects was to methodically evaluate various issues regarding MIH, including: 1) challenges to program implementation, 2) local effects on the health care system including emergency department utilization reduction, 3) effects on public health problems such as serial inebriation, 4) fiscal effects on both the pre-hospital care system and local health care resources, and 5) an evaluation of the safety of the programs.

The major focus of this study is to assess whether a paramedic who has undergone specialized, unique, focused training (referred to as a mobile integrated health care paramedic, or MIHP) can effectively use a decision instrument to safely triage patients with isolated psychiatric complaints directly to a psychiatric intake facility. The primary outcome in this study is how many patients triaged directly to a psychiatric facility were returned to the ED within 6 hours. We considered this to be a surrogate marker of how well the algorithm performed for patient safety. Secondary outcomes include an assessment of patient complaints and exam findings that prohibit transport directly to a psychiatric facility and reasons why patients who pass psychiatric screening are not transported directly to psychiatric facilities.

## METHODS

### Study Setting

Mountain Valley EMS Agency (MVEMSA) is a regional EMS authority with regulatory and statutory oversight of Stanislaus County in central California. The population base of Stanislaus County is 550,000, with Modesto and Turlock being the largest population centers. Modesto and Turlock are served by one private 9-1-1 ambulance provider, American Medical Response (AMR), which operates a paramedic/EMT response and transport model. All paramedics are state licensed and have successfully completed local accreditation for practice. Turlock has a city police department (TPD), as does Modesto (MPD). The bordering areas of Modesto and Turlock are served by the Stanislaus County Sheriff's Department (SCSD). There are 2 inpatient mental health facilities in Stanislaus County: Doctors Behavioral Health Center (DBHC), which is a private facility affiliated with a local private hospital; and the psychiatric health facility (PHF), which is a public, county funded mental health facility. The Community Emergency Response Team (CERT) is a state funded Stanislaus County Medicaid facility that conducts patient screening for the PHF. (In this manuscript, CERT does not provide basic disaster relief efforts, but instead serves mental health clients for Stanislaus County.) CERT also has an attached crisis stabilization unit (CSU) where patients can stay up to 23 hours for brief intensive mental health care, thereby avoiding inpatient hospitalization. Patients arrive at CERT one of 3 ways: walk in, police transport, or transport by AMR as part of this study. Patients then have one of the following destinations once they reach

CERT: inpatient hospitalization in the PHF, DBHC, or out of county mental health facilities; up to 23 hours stay in the CSU; or discharge home without inpatient or CSU care. Due to staffing and regulatory obstacles, DBHC was not able to receive patients as part of this study.

### California's Pilot Project Background

California state regulations do not permit any patient in the 9-1-1 system to be transported to alternate destinations, such as sobering centers, medical clinics, or behavioral health facilities. In 2015, the California Emergency Medical Services Authority and the California Office of Statewide Health Planning and Development, under a Health Workforce Pilot Project (HWPP), initially approved 12 community paramedicine projects to explore alternatives to the traditional model of prehospital care. After one year, one additional site was added bringing the total to 13. Each project tested and evaluated new or expanded roles for paramedics including the transport of patients to alternative destinations.

### Mobile Integrated Health Care Paramedics

The MIHPs selected for this study were employees of AMR Modesto or Turlock. MIHP candidates applied, were interviewed, and selected by a panel, then underwent 96 hours of mobile integrated health care training via WebEx video feeds from UCLA Center for Prehospital Care with scenario training conducted locally with partner instructors from both public health and behavioral health. The candidates also attended a 40-hour instructional curriculum in crisis intervention training (CIT) with local law enforcement, 8 hours of focused training on advanced medical assessment and documentation, 16 hours of clinical training at a local hospital with an emergency physician conducting psychiatric assessments and 16 hours of patient assessments at the CERT intake facility with behavioral health professionals. Six months into the project, breathalyzers were introduced which required an additional 2 hours of training.

One MIHP per 12-hour shift (2 in a 24 hour time period) staffed a fully equipped ALS response vehicle. The MIHP served dual roles as a single resource ALS provider to the AMR response area and as a MIHP response vehicle.

### Algorithm Development

There are 2 algorithms used in the study: the well person algorithm (WPA, [Figure 1](#)) and the mental health clearance algorithm (MHCA, [Figure 2](#)). The

WPA was adapted from policy ASP-21, Wellness Check, Wake County EMS, Wake County, North Carolina (8). The MHCA was developed in consultation and collaboration with the director of behavioral health in Stanislaus County. Every AMR paramedic in Stanislaus County received instruction on the proper use of the WPA, including what constituted inclusion versus exclusion criteria for the study. The MHCA, however, was used by the MIHPs only.

### Study Population

Persons aged 18–59 who sought psychiatric care by self-transport to the PHF, or who were suspected of a mental health crisis by MPD, TPD, SCSO, or AMR were eligible for the study. Only those that were ultimately evaluated by the MIHP were included in this study. Exclusion criteria are: any patient experiencing an acute medical or traumatic complaint; a patient who fails the WPA on initial contact by an AMR paramedic; any patient who refuses screening by the MIHP paramedic; any patient who requires physical restraint. Patients on a law enforcement initiated mental health hold were included in the study. The MIHPs are not authorized to write mental health holds in California, and a mental health hold was not required for enrollment in the study.

### Study Design

This is an unblinded, prospective, observational study design. The primary outcome of interest is the proportion of patients who receive evaluation from an MIHP and medically cleared, are transported to CERT, and then returned to the emergency department for perceived medical or traumatic concerns within 6 hours of arrival at CERT. Secondary outcomes of interest include reasons why subjects fail the WPA (fail medical clearance), reasons subjects are eligible for CERT (medically cleared) but transported to the ED, a description of the demographic makeup of patients triaged directly to a psychiatric facility, and an assessment of the referral sources for patients triaged directly to a psychiatric facility.

Study enrollment is ongoing. This manuscript used consecutive sampling of adult patients contacted by the MIHP for screening and potential enrollment from September 25, 2015 through December 11, 2017. The work flow is outlined in [Figure 3](#). Subjects could enter the study in one of 3 ways: contact with an AMR ambulance following a request for assistance via 9-1-1, as a walk-in at CERT, or via a request from law enforcement. Once identified as a potential study subject, a non-MIHP 9-1-1 paramedic unit was dispatched (unless the initial

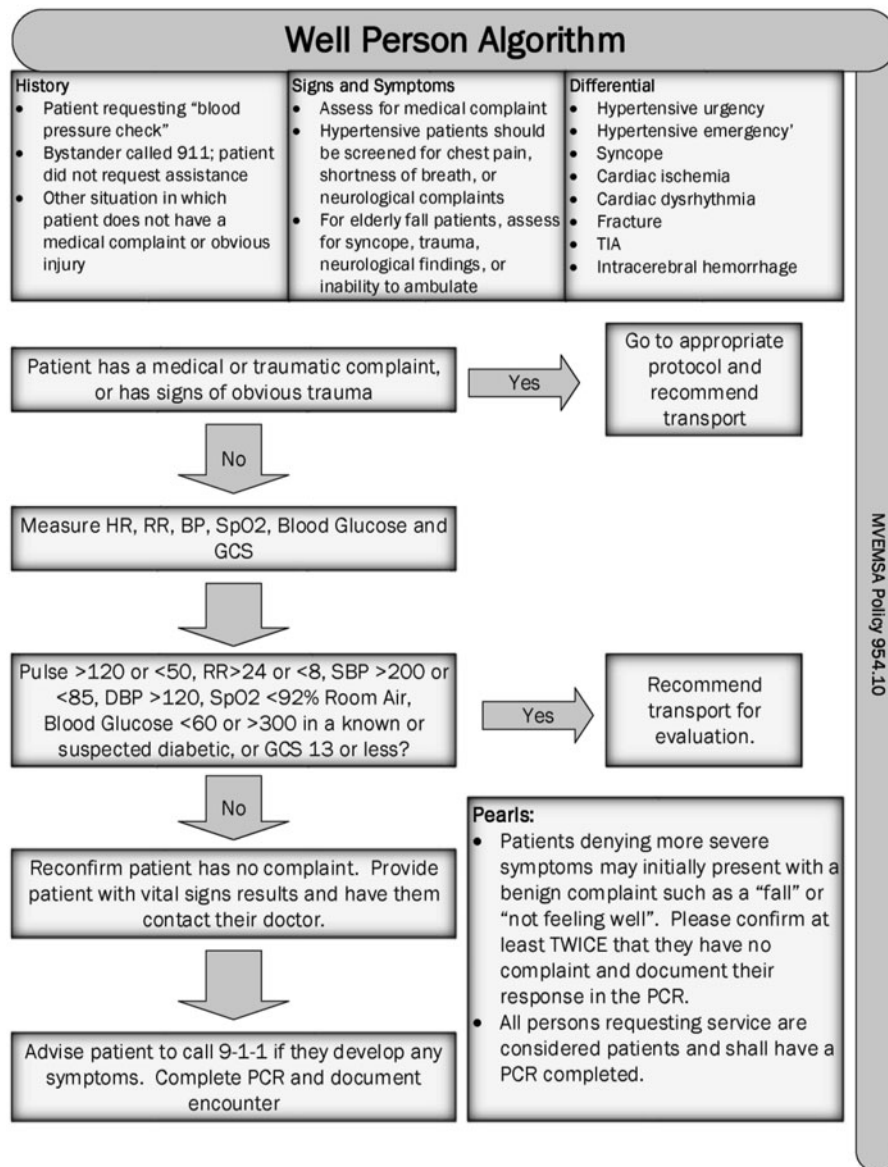


FIGURE 1. Well-person algorithm.

contact was a walk-in to CERT) to conduct an initial medical screen using the WPA. If the patient was felt to have a mental health complaint, the 9-1-1 paramedic unit requested the MIHP to be dispatched. MIHPs operated solo in a fully equipped, advanced life support, quick response vehicle. Once on scene, the MIHP reconfirmed the WPA and conducted the MHCA. For CERT patients, the MIHP was requested directly by the CERT staff via cell phone. The MIHP would conduct both the WPA and the MHCA alleviating the need to utilize a 9-1-1 resource. In all scenarios, if the MIHP found the subject was unable to pass either the WPA or the MHCA, a 9-1-1 ambulance transported the subject to the ED. These individuals were classified as "failed well person/mental health clearance algorithm."

If the study subject passed the WPA and the MHCA, the MIHP identified the subject's insurance. Because the CERT facility, by county contract, is only able to accept uninsured or state funded insurance (Medicaid) patients from Stanislaus County, subjects with private insurance or Medicare required transported to the ED. Those subjects who passed the WPA and MHCA, but could not be transported to CERT were classified as "eligible, not enrolled". If the subject passed both the WPA and MHCA, is uninsured or had Stanislaus county Medicaid, the MIHP contacted CERT to assess available bed space and whether the patient had prior behavioral issues (typically violence toward staff) at CERT that would preclude enrollment in the program. If CERT could not

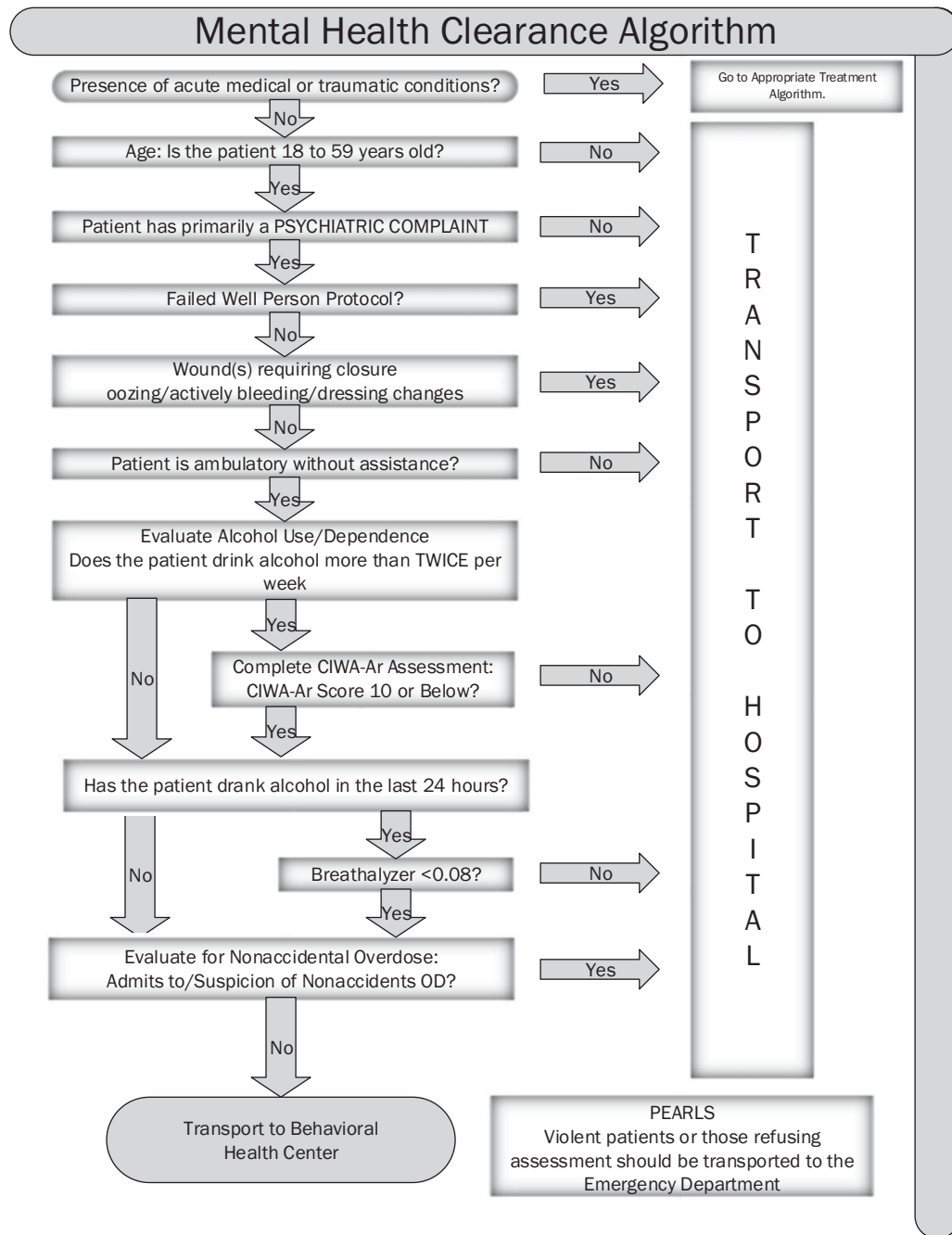


FIGURE 2. Mental health clearance algorithm.

accommodate the patient or if the patient was excluded from program participation for prior behavior, the patient was transported to the ED. These patients were also considered “eligible, not enrolled.”

Those patients eventually transported to CERT after clearance by the MIHP were considered “eligible, enrolled.” The study was granted Institutional Review Board (IRB) approval by the Western IRB and included waiver of informed consent for the study subjects.

### Statistical Analysis

This study used descriptive statistics to quantify, compare and measure the key aspects of interest in the study questions being asked. Statistics are reported both numerically and graphically, where appropriate.

### RESULTS

From September 25, 2015 through November 17, 2017 the MIHP conducted 1006 medical screening

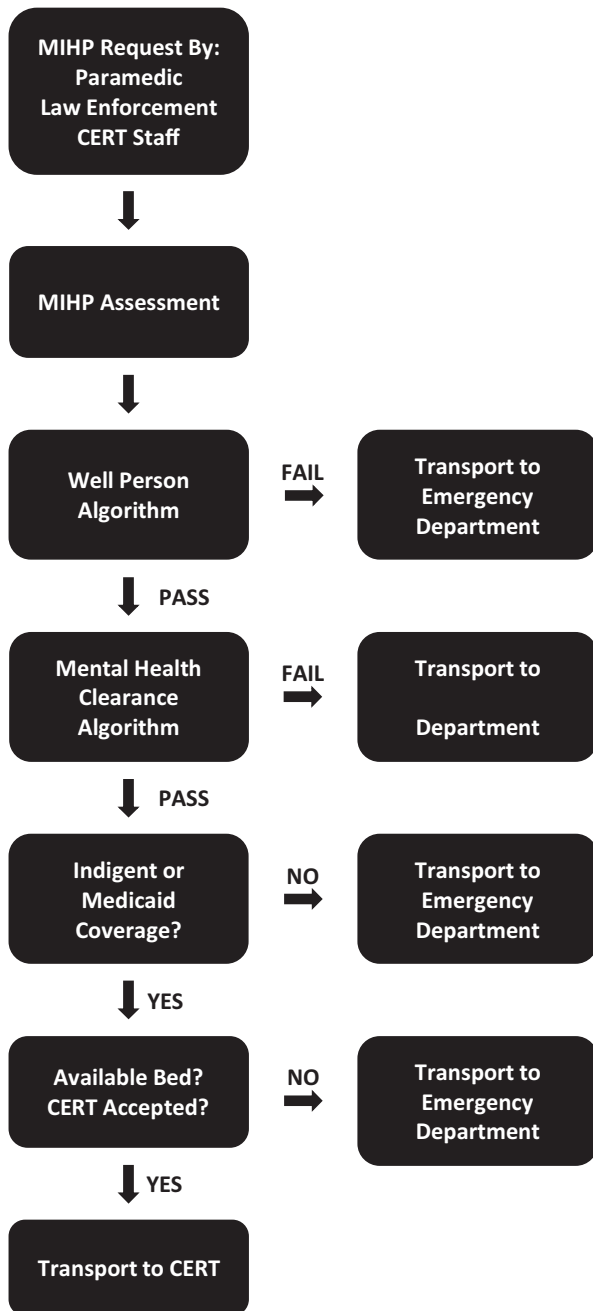


FIGURE 3. MIHP paramedic decision scheme.

evaluations of patients with suspected, isolated mental health conditions (Figure 4). The average patient age was 34.2 years (range 16–75), 62% were male, with a non-African American, non-Latino predominance (61%) and English as the primary language (64%). Four hundred four of the 1,006 total patients were excluded from participation after failing one or more components of the WPA or the MHCA. Reasons for failing the WPA (Table 1) included vital sign, Glasgow Coma Scale or blood glucose abnormalities (132 patients), medical/traumatic complaints (101 patients), and age <18 or >59

years old (30 patients). Failure to pass the MHCA (Table 2) included alcohol use (either CIWA scores >10 or current alcohol intoxication as indicated by a reading of 0.08% by breathalyzer) or known substance abuse (78 patients) or extreme agitation (63 patients).

Three hundred twenty-six of the 1,006 total patients passed both the WPA and the MHCA but, ultimately, could not be transported directly to the behavioral health facility, instead ending up in the ED. This group of patients is considered “eligible, not enrolled” (Table 3). The most common reasons for a patient to be eligible to participate but still be transported to an ED were lack of available psychiatric beds (169 patients), insurance restrictions (85 patients), prior violence at CERT (50 patients), and patient refusal to be transported to CERT (22 patients).

Ultimately, 276 of the 1,006 total patients were screened and transported directly to the psychiatric receiving facility (CERT), bypassing the ED. Ten of these patients were transported to an ED within the first 6 hours of arrival at CERT (Table 4). Two patients had elevated blood pressures, 2 developed incontinence, one patient had a cough, one had minor head trauma, and one was felt to be too intoxicated to safely remain at CERT. The non-medical reasons for return to the ED included a need for CPAP at night, a change in bed availability, and one who became excessively violent. None of the 10 patients ultimately required admission to the hospital. All underwent medical clearance at the ED. Four were discharged home from the ED and the other 6 were transported to another psychiatric hospital.

## DISCUSSION

Paramedics use decision instruments in their daily practice to screen patients and make destination decisions. For example, the Centers for Disease Control and Prevention Field Triage Decision Scheme released in 2009 provides specific guidance to paramedics about the proper disposition of trauma patients (9). The major focus of our study was to assess whether an MIHP who has undergone specialized, unique, focused training can safely and effectively use a decision instrument to triage patients with isolated psychiatric complaints directly to a psychiatric intake facility. The outcome of interest was how many patients triaged directly to psychiatric facilities were sent back to the ED within 6 hours, which we used as a surrogate marker for failure of the triage instrument. Of the 10 patients who were returned to the ED within the first 6 hours, we discovered one protocol violation. A 42-

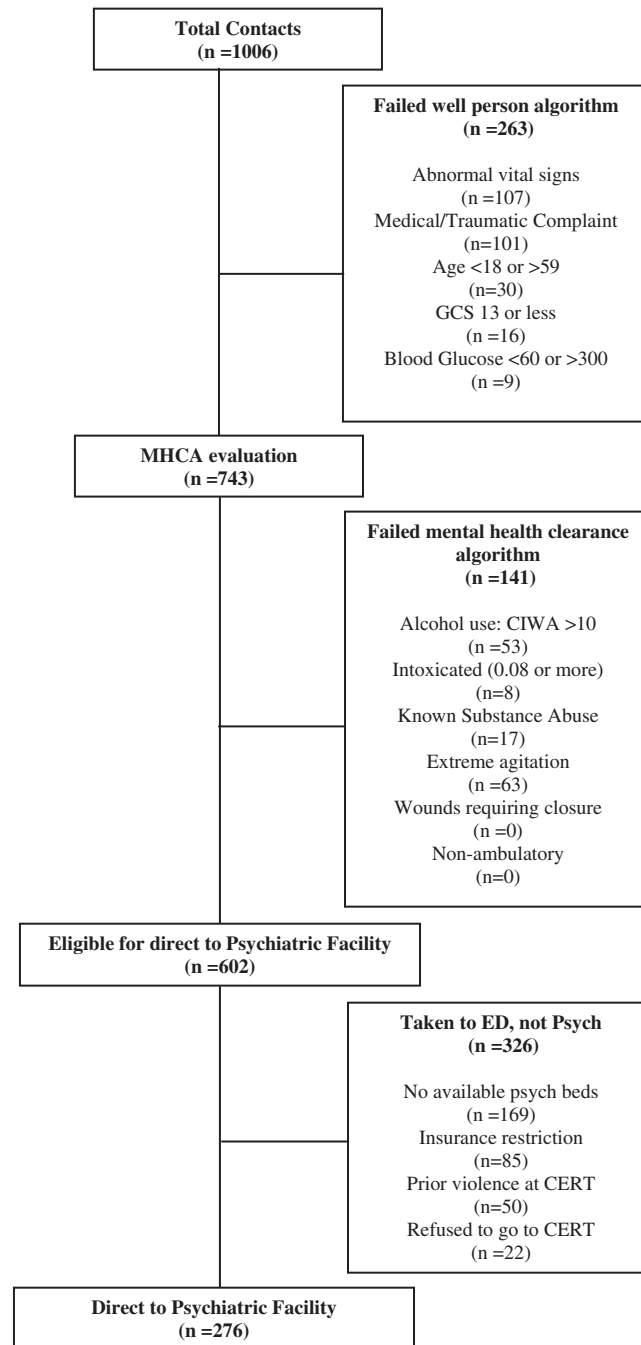


FIGURE 4. Consort diagram of patient enrollment.

year-old male was contacted by the MIHP after calling 9-1-1. He had been assaulted and had a periorbital hematoma as a result of that assault. He was returned to the ED from CERT, was evaluated, and ultimately discharged home. His psychiatric condition had resolved by the conclusion of his ED visit. None of the 9 remaining patients who returned to the ED within 6 hours were deemed protocol violations. Three were discharged home and the remaining 6 were referred for inpatient psychiatric evaluation.

There were 263 patients that failed the WPA when rescreened by the MIHP. Although all field personnel received training in the proper application of the WPA, and despite the intention of the WPA to be used by the field personnel to eliminate unnecessary utilization of the MIHP, we found that with turnover of field personnel and ongoing training requirements for the entire workforce was a difficult task to accomplish consistently. Therefore, having the MIHP repeat the WPA at initial contact added another layer of safety for the patient and



TABLE 1. Patients that failed the well person algorithm

Failing the WPA	Abnormal vitals (pulse, respiratory rate, blood pressure, or SPO2)	GCS 13 or less	Blood Glucose <60 or >300	Medical/ Traumatic Complaint	Age <18 or >59
Total number of patients (N = 263)	107	16	9	101	30
% of total patients failing the WPA	40.8	6.0	3.4	38.4	11.4

WPA: Well Person Algorithm; SPO2: pulse oximetry; GCS: Glasgow Coma Score.

TABLE 2. Patients that failed the mental health clearance algorithm

Eligible, but NOT enrolled	Lack of available psychiatric beds	Insurance restriction	Prior violence at CERT	Patient refusal to go to CERT
Total number of patients (N = 326 of 1,006)	169	85	50	22
% of patients eligible, not enrolled	51.8	26.2	15.3	6.7

CERT: Community Emergency Response Team.

prevented 26% of the patients initially going to a psychiatric facility without a more thorough medical evaluation in the ED.

There were another 326 patients who passed both the WPA and the MHCA, but because of lack of bed availability, insurance restrictions, prior behavioral incidents, or refusal to participate could not be enrolled in the study as part of the group who bypassed the ED. This group of patients was of interest as well because they represent individuals who could have potentially bypassed the ED and gone directly to our psychiatric facility. In tracking these patients, we did discover one patient who requiring admission for an acetaminophen overdose. In review of this case, we discovered the patient lied to the MIHP when asked, as part of the MHCA, whether or not he or she took an intentional overdose. The 404 remaining patients who failed the initial screening were not tracked through the ED.

In January 2017, ACEP released a guidance document titled "Clinical Policy: Critical Issues in the Diagnosis and Management of the Adult Psychiatric Patient in the Emergency Department" (10). In this policy statement, which included an author from the American Association of Emergency Psychiatry and carried endorsements from the Emergency Nurses Association, a Level C recommendation (lack of sufficient published literature, based on expert consensus) was given against routine or ancillary laboratory testing for psychiatric patients. This policy statement reaffirms a prior statement from the same organization. Although the core curriculum for MIHPs includes focused training in non-accidental poisoning with special focus on tricyclic antidepressants, aspirin and acetaminophen,

routine or ancillary laboratory testing of patients by MIHPs would add logistical and cost-prohibitive barriers to implementing such a program. Individual programs will need to decide for themselves what threshold represents reasonable and appropriate risk.

Other significant lessons we discovered in the implementation phase of this study was the requirement for prior agreement between the medical and psychiatric community on what is an acceptable threshold systolic and diastolic blood pressure range. Early in the study, 2 patients were returned to the ED for unacceptably high systolic blood pressures. Although both patients fell within the study's acceptable blood pressure ranges, the psychiatric community preferred a systolic cut off of 185 mmHg and a diastolic cutoff of 90 mmHg. When we adapted the WPA to this new systolic and diastolic blood pressure, no further patients were returned to the ED due to elevated blood pressure readings.

Future studies on this subject should focus on the time to disposition for patients evaluated by the MIHP compared to time to disposition for patients evaluated in the ED. In addition, there would be benefit in knowing the time to definitive care for the 2 populations, defining definitive care as initiation of psychiatric evaluation and treatment by a licensed behavioral health provider (social worker, psychiatrist, etc.). Finally, future studies should focus on the cost savings benefit of a MIHP program with focus on actual costs of boarding psychiatric patients in the ED versus bypassing the ED and freeing potential bed space capacity in the ED for the care of medical or traumatic patients.

TABLE 3. Patients that passed both WPA and MHCA (eligible), but not enrolled

Patient #	Age (years)	Gender	Mode of Arrival at CERT	Reason for return to ED	Length of Stay at CERT (minutes)	Final Disposition
1	59	F	Ambulance	Incontinence	183	Admit to Psych Facility
2	34	F	Ambulance	Hypertension	104	Discharged Home
3	45	F	Ambulance	Hypertension	133	Admit to Psych Facility
4	20	M	Ambulance	Intoxicated	72	Discharged Home
5	42	M	Walk-in to CERT	PHF Full, no beds	47	Admit to Psych Facility
6	42	M	Ambulance	Traumatic injury	18	Discharged Home
7	37	M	Ambulance	Incontinence	79	Admit to Psych Facility
8	44	M	Police	Requires CPAP at night	312	Admit to Psych Facility
9	25	F	Walk-in to CERT	Cough	182	Discharged Home
10	32	M	Police	Violent	78	Admit to Psych Facility

WPA: Well Person Algorithm; MHCA: Mental Health Clearance Algorithm; CERT: Community Emergency Response Team.

TABLE 4. Return to ED in the first 6 hours

Failing the MHCA	Alcohol Use: CIWA >10	Alcohol Use: Breathalyzer >0.08	Known Substance Abuse (not alcohol)	Extreme Agitation	Wounds Requiring Closure	Non-Ambulatory
Total number of patients $N = 141$	53	8	17	63	0	0
% of total patients failing MHCA	37.6	5.7	12.1	44.6	0	0

MHCA: Mental Health Clearance Algorithm.

## LIMITATIONS

Our study has the potential for selection bias. Not every patient in the prehospital environment with isolated psychiatric complaints underwent an evaluation by the MIHP. Some had been transported by law enforcement engaging neither the 9-1-1 EMS system nor the MIHP. In addition, the MIHP served a dual purpose in the overall 9-1-1 system as a quick response vehicle for more serious calls such as cardiac arrest, structure fires, and mass casualty incidents. There are patients who were potentially eligible for enrollment in the study, but because the MIHP was unavailable, could not complete the enrollment process and ultimately were transported to the ED. Also, the MIHP coverage became challenging 1 year into the study as the MIHPs promoted or changed job classifications. These left gaps in the schedule where there were days that lacked MIHP coverage.

## CONCLUSION

The screening and selection of patients experiencing an acute mental health crisis for the purpose of triage directly to mental health treatment facilities can be done safely using the triage algorithms described in this manuscript. In the hands of a trained MIHP, both algorithms, used together, provide a focused assessment of acute medical need, rapidly identify patients that require acute medical care in an

emergency department, and expedite the delivery of definitive mental health care to patients suffering isolated mental health crisis.

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