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Development and Evaluation of an Emergency Department-Based Psychiatric Nurse Practitioner

Care Delivery Model

Tiesha D. Johnson

University of Massachusetts, Amherst

College of Nursing

DNP Project Chair: Raeann LeBlanc

Capstone Mentor: Douglas Mullendore

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Abstract

Background: Acute mental health care needs are not always optimally managed in the Emergency Department (ED) with the traditional approach to care and management. The ED encounter for psychiatric patients is lengthy, costly, fragmented, inefficient and often ineffective, contributing to poor outcomes.. *Purpose:* To introduce the evidence- based advanced nursing practice model to ED professionals and staff for feedback and evaluation of an ED-based Psychiatric Nurse Practitioner care delivery model for the acute care of psychiatric patients. *Implementation:* The care delivery model was created based on evidence and presented to professionals and staff at one medical center ED. A focus group discussion followed the presentation and presentation attendees were provided with a link to an online survey the next day for evaluation of the proposed model. *Outcomes:* The care delivery model was well received to improve the quality, efficiency and effectiveness of acute mental health care in the ED. *Conclusion:* Future presentations of the ED-based Psychiatric Nurse Practitioner care delivery model will be necessary for a broader range of perspectives and a more accurate consensus.

Keywords: psychiatric nurse practitioner, emergency department, mental health crisis, psychiatric emergency

Development and Evaluation of an Emergency Department-Based Psychiatric Nurse Practitioner Care Delivery Model

Psychiatric emergencies can place a significant burden on community-based first responders and emergency health care providers in addition to being detrimental to the individuals and families experiencing them. Law enforcement and emergency medical personnel are often the initial access to care for individuals experiencing a mental health crisis (Cloud & Davis, 2015). If a crime has not been committed and the individual is not arrested, the individual is typically transported to the Emergency Department (ED) where they are likely to wait longer than non-psychiatric patients to be evaluated and treated (Busko, 2016; Castellucci, 2016). Emergency departments are an essential component of the healthcare system for patients who require rapid acute care. Frequent use of the ED for mental health needs that may not be optimally managed in that setting however, is costly and contributes to poor outcomes associated with fragmented care that is often inefficient and ineffective (American Hospital Association [AHA], 2012; Kutscher, 2013). Whether or not admission for inpatient psychiatric hospitalization is warranted, the patient may spend a substantial amount of time in the ED waiting for clinical decision-making, recommendations for follow up care, an available inpatient bed or transfer to an inpatient psychiatric unit. Patients who are not admitted to the hospital are typically discharged with a recommendation, but little or no care coordination, to seek outpatient mental health care, but often, the patient either does not follow up with an established mental health care provider or they do not have one. Barriers to access to outpatient mental health care can include provider shortage, financial hardship, lack of transportation, functional limitations in navigating the healthcare system and housing instability (Coffey, et al., 2010).

Inadequate access to essential mental health services increases the risk of psychiatric

emergencies among adolescents and adults and leads to increased rates of ED visits for mental health treatment. The Five-year average annual ED visits for mental health reasons in one Western Maryland County is 6895 and 1587 for addictions treatment (Maryland Department of Health and Mental Hygiene, 2014).

The average ED Length of Stay (LOS) for psychiatric patients is 11 hours for patients discharged home from ED and 15 or more hours for patients admitted to the hospital. Most psychiatric ED patients are admitted to the hospital, but many psychiatric inpatient admissions from the ED are not necessary (Zeller, Calma & Stone, 2014). Patients remaining in the ED for longer than 6 hours can cost the hospital \$100 per hour in lost revenue (Augustine, 2016; Kutscher, 2013). Assuming that 80% psychiatric ED patients are admitted to the hospital after an average 15-hour LOS and 20% are discharged home from the ED after an average 11-hour LOS, current management of 8400 patients annually with acute mental health care needs is resulting in approximately \$6,955,240 lost revenue projected to increase annually by 5.37% (YCharts, 2017). A 10% reduction in ED LOS for psychiatric patients could save over \$1.5 million per year.

Review of the Literature

A review of the literature was conducted to appraise the best evidence in addressing acute mental health care and psychiatric services in the ED setting. The databases PubMed, the Cumulative Index for Allied Health (CINAHL) and PsychINFO were searched using the keywords: psychiatric emergencies, mental health crisis and emergency department. Studies that were included were published from 2012-2017, full text available, English language and clinical trials. The initial search yielded 1336 articles. Those titles were reviewed for relevance. An additional search of the same databases was conducted using the key words psychiatric emergency department, psychiatric nurse practitioner, mental health nurse, emergency

department and mental health crisis. Studies were excluded if they were published prior to 1997, not related to mental health, full text unavailable or language other than English. Thirty-seven study titles were reviewed for relevance. The combined remaining 273 abstracts were further assessed for relevance. The remaining 109 studies were evaluated for quality using the Johns Hopkins nursing evidence-based practice model (Newhouse, Dearholt, Poe, Pugh & White, 2005). All databases were regularly scanned for additional relevant high-quality studies recently published or missed in the initial search.

The most relevant nineteen studies are included in this review. Fourteen studies support the need for an intervention to reduce emergency department visits for psychiatric or mental health reasons and five studies suggest that an ED-based Psychiatric/Mental Health Nurse Practitioner could significantly reduce ED LOS, prevent unnecessary inpatient psychiatric hospitalizations, but facilitate inpatient admission if necessary and improve patient access to outpatient mental health services in the community. The 19 articles used for this review include case-control (n = 5), retrospective cohort (n = 2), cross-sectional (n= 5), intervention case report (n = 1), review articles (n = 1) and qualitative or mixed-method quasi-experimental intervention studies (n=5). Four major themes were identified among the selected studies. These are mental health disorders and ED use, ED use for non-urgent mental health needs, ED length of stay (LOS) for mental health presentations and the effectiveness of an ED-based advanced practice psychiatric nurse. An evidence matrix (Table 1) was created to provide an outline the components of each study (Appendix A).

Mental Health Disorders and Emergency Department Use

Young adults with significant psychosocial stressors who also engage in health risk behaviors have been more likely to present to the ED with a chief complaint of serious

psychological distress (Lin, Burgess & Carey, 2012). Although Lin and colleagues identified this correlation, the cross-sectional data for the study did not allow for confirmation of a causal relationship. A prospective analysis of recurrent ED use by patient with anxiety disorders suggested that individuals with existing psychiatric disorders may be more likely to present to the ED with physical symptoms or mental health complaints. Adult male patients with anxiety disorders and at least one cardiovascular risk factor presenting with palpitations have had higher recurrence of panic attacks. Once a cardiovascular event is ruled out, the patient may receive benzodiazepine medication to treat the symptoms. The patient is then discharged with symptom relief, but not treatment of the disorder and is therefore likely to return (Buccelletti, et al., 2013). The authors acknowledge, however, analyzed a collection of data that was not originally created for the purpose of the study and therefore anxiety-like clinical manifestations of a medical condition for some patients could not be ruled out. Regardless of gender, it has been suggested that individuals with an existing psychiatric diagnosis can be twice as likely and those with a substance use disorder can be three times more likely than those without either condition to seek care for any physical or mental health need in the ED (Castner, Wu, Mehrok, Gadre & Hewner, 2015). These findings could only be generalized Medicaid insured, working-age (18-64) adults and the data were collected from records created for billing rather than research purposes.

Individuals with Autistic Spectrum Disorders (ASD) often have associated chronic functional health disorders. An analysis of ED use and visit urgency indicated that children with ASD may be more likely to visit the ED for non-urgent medical reason than those without ASD (Deavenport-Saman, Lu, Smith & Yin, 2016). Standard assessment procedures were not used to identify ASD for this study and rigor was further limited by the use of a comparison rather than control group. Regardless of urgency, Liu and colleagues concluded that ED use for medical and

behavioral complaints among children with ASD tends to increase with age, and more so for behavioral and mental health problems (Liu, Pearl, Kong, Leslie & Murray, 2017) although the authors acknowledge that the retrospective record review analyzing claims data from private insurers and not Medicaid, Medicare or self-pay records limited the generalizability of their findings. Kalb et al. did find that externalizing behavioral symptoms and psychosis are common reasons for ED visits for children and adolescents with ASD (Kalb, Stuart, Freedman, Zablotzky & Vasa, 2012) and adults with ASD have higher rates of ED visits for mental health and medical reasons reflected by more than twice the mean ED charges compared with adults without ASD (Vohra, Madhavan & Sambamoorthi, 2016). These conclusions were limited by a narrow scope of billing codes and claims data without extensive clinical data.

Emergency Department Use for Non-Urgent Mental Health Needs

Regardless of the nature of the chief complaint, a Nigerian study found that the majority of patients presenting to the ED are likely to have non-urgent needs (Adeosun, Adegbohun, Jeje, Oyekunle & Omoniyi, 2014). This study was conducted in one setting, however, limiting generalizability. Additional studies have also examined non-urgent ED utilization. Pediatric mental health-related visits to the ED are increasing while symptom acuity has decreased (Mapelli, Black & Doan, 2015) and many adult patients seeking mental health care in the ED have done so for non-urgent needs associated with chronic psychiatric disorders (Schmoll, Boyer, Henry & Belzeaux, 2015). Mapelli and colleagues did acknowledge that their study setting was the only pediatric emergency department in the area and results may not be generalizable to non-pediatric settings.

Length of Stay in the Emergency Department

In a study examining the length of stay (LOS) in the ED for patients awaiting inpatient admission, the authors concluded that the LOS in the ED for patients presenting for mental health reasons can be three times that of patients seeking non-psychiatric care (Nicks & Manthey, 2012) and LOS has been greater for both urgent and non-urgent psychiatric presentations as indicated in another study (Sheridan, et al., 2015). The authors of both studies acknowledge that they were conducted in single settings, but one setting had an associate inpatient psychiatric unit and the other did not, strengthening the generalizability of findings in both. Psychiatric patients have been five times more likely to board in the ED for long periods of time awaiting admission or transfer contributing to high cost, ED overcrowding and delay in care (Nolan, Fee, Cooper, Rankin & Blegen, 2015) in addition to an increased risk for adverse events (Rhodes, et al., 2016).

Psychiatric Advanced Practice Nurse in the Emergency Department

There is a paucity of literature specific to specialized ED-based nursing care for the management of psychiatric and behavioral crisis presentations. Wand and colleagues (2006a; 2006b; 2007; 2015; 2016) are the primary contributors to the existing evidence.

Specialty services, such as a Mental Health Liaison Nurse (MHLN), provide mental health care close to the point of triage, prior to or concurrent with medical assessment. Emergency Department-based MHLN services have been successful in reducing wait times from triage to initial assessment, reducing overall LOS and coordinating follow up care for patients presenting with mental health care needs to the ED (Wand & Schaecken, 2006). The scope of practice for MHLNs, however, is limited and does not allow for the autonomy required for

assessment and evaluation of differential diagnoses and clinical decision-making based on interpretation of findings.

Integrating the MHLN framework with an ED-based Psychiatric/Mental Health Nurse Practitioner (PMHNP) provides a more autonomous service that compliments existing emergency medicine and nursing services, removes significant workload from ED nursing and medical staff more effectively meets the mental health needs of the patient (Wand & Fisher, 2006).

The ED-based PMHNP practice model provides prompt and effective access to specialized mental health care prior to or concurrent with medical assessment (Wand & White, 2007). A PMHNP is trained and qualified to rule out medical conditions that may be the etiology of behavioral presentations and mental status changes, therefore eliminating the need for a full physical assessment for some patients and reducing the potential for excessive, unnecessary and costly diagnostic tests. The advanced components of nursing practice are incorporated into core nursing interventions to expedite initial symptom relief and care coordination and facilitate referrals for follow up care (Wand, D'Abrew, Barnett, Acret & White, 2015).

The therapeutic nurse-patient relationship and the emphasis on health education and health promotion that is inherent to nursing supports the positive patient outcomes associated with ED-based PMHNP practice. Patients who have experienced the PMHNP encounter upon presenting to the ED with mental health needs felt that they were receiving assistance rather than merely being assessed. Patients have also described respected, informed and having a sense of involvement with decisions about treatment (Wand, D'Abrew, Acret & White, 2016).

Theoretical Framework of the Evidence Based Practice Model

The evidence demonstrates that Emergency Department-based specialized mental health services provide timely access to acute care for the patient experiencing a mental health crisis, decrease ED length of stay, facilitate appropriate referral and coordination of care and ultimately reduce costs (Nicholls, Gaynor, Shafiei, Bosanac & Farrell, 2011). Established theories in the helping professions provide a framework for the advanced nursing care delivery model.

The ED-based Psychiatric Nurse Practitioner service is based on Imogene King's Theory of Goal Attainment and Solution-Focused Brief Therapy. The Theory of Goal Attainment describes the patient as an individual who can think, feel, choose, set goals, select means to achieve goals and make decisions. The goal of nursing is to partner with the patient to meet three fundamental needs: the need for health information when it is needed and can be used; the need for care that seeks to prevent illness; and the need for supportive care when he or she is unable to help him or herself (King, 1992). Solution-Focused Brief Therapy is based on solution-building rather than problem solving and holds the individual accountable for solutions rather than responsible for problems (de Shazer, 1985). The therapeutic relationship has always been central to nursing and remains the main intervention in nursing practice (King, 1992). Using the Solution-Focused approach the ED-based psychiatric nurse practitioner can join the patient by establishing rapport, trust and identifying strengths and goals. The aim is to build on strengths and social connections toward enhancement of health literacy, a sense of capability and self-efficacy with the ultimate objective independent life and coping skills (McAllister, 2010; Wand, 2010). The goal-oriented, solution-focused practice approach parallels the principles of ethical public health practice, that public health programs and policies should incorporate a variety of approaches that anticipate and respect diverse values, beliefs and cultures in the community and

that public health institutions and their employees should engage in collaborations and affiliations in ways that build the public's trust and the institutions effectiveness (Thomas, Sage, Dillenberg & Guillory, 2002). Figure 1 provides a visual depiction of this framework (Appendix B).

The ED-based psychiatric nurse practitioner service and practice approach reflects the essential values of appropriate mental health crisis response by addressing both physical and psychological safety in a manner that is person-centered, collaborative, acknowledges the traumatic nature of psychiatric emergencies and empowers the individual in crisis to draw from personal strengths with support and assurance of dignity and personal safety. Response to an individual experiencing a mental health crisis must be timely, delivered by competent professionals with a comprehensive understanding of psychiatric emergencies in a manner that is as unrestrictive as possible with a focus on assisting the individual to regain a sense of control (U.S. Department of Health and Human Services, 2009).

A psychiatric nurse practitioner is trained and qualified to assess the and evaluate the general physical condition of an individual as well as the state of mental health. This can be done immediately to rule out medical emergencies that may be manifesting as emotional or behavioral crises and therefore expediting the most appropriate care. From the point of triage to the final disposition, the psychiatric nurse practitioner can support and collaborate with the patient to acknowledge the urgency of the crisis, empower them to engage in the decision-making process as a therapeutic intervention.

Components of the Emergency Department-Based Psychiatric Nurse Practitioner Care Delivery Model

The advanced nursing practice model introduces a specialized approach to medical clearance, mental health risk assessment, discharge management for patients requiring outpatient mental health treatment and monitoring of community outpatient resource availability. The protocols are intended to be integrated into existing organizational policies for abuse and domestic violence screening and for inpatient admission or transfer.

Triaging Patients for Mental Health Evaluation

A modification of the Australasian College of Emergency Medicine, National Triage Scale (2000) is to be used to determine the degree of urgency and prioritize treatment of patients presenting with acute mental health care needs.

Level 1 is not applicable as this level describes a patient in physically unstable condition needing immediate lifesaving intervention. Level 2 is assigned to patients suspected of being dangerous to themselves or to others. This level includes patients who are expressing suicidal or homicidal ideation or displaying symptoms indicating actual or potential violence or aggression.

Patients who are not experiencing suicidal or homicidal ideation, but presenting with overt anxiety, agitation or intoxication will be assigned to level 3. This level will also be designated to any psychiatric patient over the age of 60 years or when there is any suspicion of an acute medical condition. Triage level 4 patients are those with no overt anxiety or agitation and no suicidal or homicidal ideation.

The evaluation of Level 2 and Level 3 patients will begin within 30 minutes of triage during time when the Emergency Department (ED)-based Psychiatric/Mental Health Nurse

Practitioner (PMHNP) is present. They will be triaged to an appropriate acute care bed within direct visual range of nursing staff.

The evaluation of Level 4 patients will begin within 60 minutes of triage when the ED-based PMHNP is present. They will be triaged to the waiting area for the first available acute care bed.

Medical Clearance of Psychiatric Patients in the Emergency Department

Most patients will not have a medical condition that is masquerading as an emotional or behavioral problem and a comprehensive medical workup is not usually necessary. An abbreviated history and physical exam is sufficient for medical screening and provides an opportunity to establish rapport and begin the therapeutic nurse practitioner-patient relationship.

Assessment for medical clearance begins with interpretation of vital signs. Fever, hypotension, hypertension, bradycardia or tachycardia with accompanying patient complaints such as chest discomfort, difficulty breathing, new onset visual disturbance, reported recent head trauma or reported ingestion will be referred to the emergency medicine provider for medical clearance.

The initial assessment is conducted concurrently with obtaining information from the patient about the chief complaint, current medications, medical history and determination of coherence. Patients who are not oriented to person, place, time or situation will be referred to the emergency medicine provider. Figure 2 illustrates the medical clearance protocol (Appendix B).

The neurological screening assessment can be completed in approximately 5 minutes. This is a general assessment of mental status, sensory, cranial nerve and motor function and reflexes. Figure 3 outlines the components of the neurological screening assessment (Appendix B).

Mental Health Risk Assessment in the Emergency Department

Once medical clearance has been completed, either by the ED-based psychiatric nurse practitioner or the emergency medicine provider, if indicated, a focused assessment of the patient's chief complaint and presenting problem will be initiated to include:

- The onset of symptoms at current severity
- Provoking or contributing factors
- A description of how current symptoms differ from usual behavior
- How current symptoms are affecting interpersonal, social and academic/occupational functioning
- Patient subjective measure of current symptom severity
- What has been done so far to address the symptoms

The level of risk for mental health decompensation and harm to self or others can be estimated using the psychiatric risk assessment tools and protocol for clinical decision-making (Appendix B).

The acute risk assessment tool (Figure 4) is designed to gauge the risk of imminent harm to one's self or others includes inquiry about suicidal or homicidal thinking, intent to act on suicidal or homicidal thoughts and means to carry out the intent. The acute risk assessment also includes observation of patient behavior that may reflect potential for physical aggression.

The expanded risk assessment tool (Figure 5) provides more detailed information about contributing factors to the current severity of symptoms. This tool provides a quantitative measure of established mental health risk and protective factors. Items included in the expanded risk assessment also direct coordination of services and pertinent documentation.

Calculated acute and expanded risk assessment scores guide the protocol for clinical decision making (Figure 6), disposition and coordinating follow up care.

Abuse and Domestic Violence Screening

Any individual receiving treatment in the Emergency Department will be screened for physical assault, rape or other sexual abuse, domestic abuse, exploitation or neglect. Assessment and intervention will be conducted in accordance with the existing organizational policy.

Managing Patients Requiring Inpatient Psychiatric Hospitalization

The ED-based PMHNP will follow current policy and procedures for patients in the ED requiring inpatient psychiatric hospitalization.

Managing Patients Requiring Outpatient Mental Health Treatment and Services

The ED-based PMHNP will determine the appropriate level of care (Partial Hospitalization, Intensive Outpatient, outpatient individual services, established outpatient provider, case management). A solution-focused process will be implemented to work with the patient to recognize areas of strength and develop a plan to minimize risk factors. The ED-based PMHNP will refer to the completed protocol for medical clearance, psychiatric risk assessment tools and record the patient encounter in the documentation form (Figure 7).

The ED-based PMHNP will consult the community mental health resource database for availability of appropriate follow up care. If the patient has an existing outpatient mental health care provider, contact information for the existing provider will be obtained. With consent from the patient or legal guardian to records from the ED encounter will be sent to the follow up provider. The patient will then be provided with verbal and written discharge instructions.

Monitoring of Community Outpatient Resource Availability

Major mental health care agencies and organizations in the county will be monitored for new patient availability, services provided and referral policies to ensure that follow up recommendations, care coordination and referrals are referencing up to date information. A database will be maintained and updated every 2 weeks to reflect and estimation of number of days to the first available appointment for each service.

Project Design

The scope of this quality improvement project was to introduce an evidence-based advanced nursing practice model (outlined above) for the acute care of psychiatric patients to be integrated into the ED setting. The purpose of the practice model is to reduce ED LOS, prevent frequent return ED visits, facilitate timely access to the most appropriate care to improve the quality, efficiency and effectiveness of emergency and long term mental health care.

Project Site and Sample

The project site for presentation of the advanced nursing practice model was a medical center ED in Maryland, serving approximately 3600 patients with acute mental health care needs for an average 30-hour length of stay.

The focus group discussion sample was a panel of ED professionals consisting of an Emergency Medicine Physician, and Emergency Psychiatrist and three Registered Nurses. The online evaluation survey was completed by participants in any ED position who attended the presentation of the practice model.

Ethical Considerations/Protection of Human Subjects

This project was reviewed and approved by the University of Massachusetts, Amherst (Umass) Internal Review Board (IRB). The DNP student obtained written informed consent from

focus group discussion participants. Participants completing the practice model evaluation survey reported answers on Survey Monkey and the responses were recorded. No personal information was included in the results or analysis.

Implementation

The proposed nursing practice model represents a coordinated approach to emergency management of patients with acute mental health care needs and cooperation among a psychiatric nurse practitioner, ED medical and nursing staff and outpatient mental health care services. Implementation consisted of procedures, data collection, data analysis and plan for evaluation.

Procedures

Intervention procedures included project set-up and activities involved in the development and final presentation of the ED-based advanced practice psychiatric nursing care model policies and procedures. All activities were conducted by the DNP student.

Project set-up. Prior to the start of the project, the DNP student developed the ED-based PMHNP policy and procedure content. At the start of the project, the DNP student contacted the Director of Behavioral and Community Health at the intended clinical site to identify potential participants and schedule the focus group presentation. Administrative conflicts and time constraints resulted in a change in venue after the Medical Director of and ED in another county expressed interest in having the practice model presented to ED physicians, nurses and professional staff at that organization.

Implementation Activities. Twelve days prior to the scheduled presentation date, an email invitation was sent by the administrative assistant to the ED director to 17 potential participants. They were provided with the date, time and location of the presentation. Potential

participants were informed that a focus group discussion would follow the presentation and that they would be asked to complete a post-presentation anonymous online survey.

On the day of the presentation, prior to the start, the DNP student reviewed the content of the consent forms, clarified any questions or concerns and asked participants to sign and return the consent forms. The DNP student then delivered an oral presentation with supplemental printed materials of the ED-based PMHNP policy and procedure content with the cost-benefit analysis detailed in figure 8 (Appendix B).

The post presentation focus group discussion began with the following hypothetical case scenario and demonstration of the risk assessment scales and clinical decision-making protocol (Appendix B): A 59-year old woman is brought to the ED by a co-worker after having an emotional outburst at work, followed by an episode of inconsolable crying and shortness of breath. Emergency medical conditions have been ruled out. She has a history of Bipolar Disorder and her last inpatient psychiatric hospitalization was three months ago. She is prescribed psychotropic medications, but she will be running out of her last refill in less than a week. She missed her last appointment with her psychiatrist three weeks ago and the rescheduled appointment is in one month. She has been experiencing increased anxiety and she reports drinking alcohol more often than usual to calm her nerves. She last drank alcohol 4-5 days ago. She lives alone, identifies her sexual orientation as heterosexual and she is not currently in a romantic relationship. She and two of her friends volunteer regularly at the local Humane Society. Her adult son died of an opiate overdose 18 months ago. She has a history of a prior suicide attempt at age 45 after her 15 year marriage ended in divorce. Her father completed suicide by hanging when she was 11 years old. She is overweight, has chronic hypertension that is being treated and she was diagnosed with glaucoma. She denies suicidal thinking, but she

often thinks about dying and over the past couple of weeks she has been feeling like she will never really be happy in life.

The ARA score was 2, indicating low acute risk (figure 9) and the ERA score was 20, indicating moderate risk for emotional and psychiatric decompensation (figure 10). Using the protocol to guide clinical decision making (figure 11), it was determined that referral for outpatient mental health care services was appropriate. Details of the encounter were documented (figure 12).

Data Collection and Analysis

Two main data collection tools were used for this project. Immediately after the presentation, the DNP student facilitated a focus group discussion with participants and documented key discussion points.

The day after the presentation, the DNP student contacted participants via email to thank them for their attendance to the presentation and participation in the focus group discussion and provided them with a link to the anonymous evaluation survey. A second email invitation was sent to all potential participants included in the initial invitation to the presentation. The first survey item was to agree or disagree to consent to participation. Participants could proceed only after agreeing to provide consent. They were then asked to complete the survey within one week.

Survey data were included in the analysis if there was consent for participation and at least one additional item response. Mean Likert scale scores were calculated for each stakeholder survey item to identify areas of stakeholder agreement with or opposition to policy and procedure content. A theme analysis was conducted for qualitative data collected from the focus group discussion.

Results and Outcomes

The presentation and focus group discussion took place during the day shift in a conference room located in the ED. Five participants attended the entire presentation and focus group discussion. Approximately 18-20 additional ED professionals arrived and left at various points during the presentation and discussion.

In reference to the case scenario, the psychiatrist was concerned that the ERA was broad and important details could be missed. He did agree with the decision to discharge the patient home with outpatient services. The emergency medicine physician in the focus group was not sure whether his assessment of the patient would have been the same and he indicated that he would likely defer to a mental health specialist. One of the nurses strongly indicated that the patient was appropriate for psychiatric hospitalization.

The discussion shifted to the medical clearance component of the practice model. The emergency medicine physician in the group was in favor of a psychiatric nurse practitioner conducting medical clearance of psychiatric patients. He also expressed confidence that a psychiatric nurse practitioner could recognize an emergency medical condition that is outside of the specialty scope of practice. The psychiatrist was also in favor of the medical clearance protocol. One of the nurses expressed skepticism that a psychiatric nurse practitioner is legally qualified to rule out emergency medical conditions.

The emergency medicine physician referenced the American College of Emergency Physicians position that laboratory tests and urine toxicology screens should not be routinely ordered for psychiatric patients and that there is little if any clinical utility in doing so, but that they are required for reimbursement. One of the nurses indicated that outside facilities for transfer of psychiatric patients “by law” cannot accept the patient without results of routine

laboratory tests. She added that delays in patient transfers to inpatient psychiatric units are very often due to waiting for laboratory test results.

One participant indicated that he felt that the cost-benefit analysis included in the presentation had an optimistic provision of bad debt. Two participants strongly indicated that one full time and two part-time ED-based PMHNP's would not be sufficient to implement the practice model as presented. The emergency medicine physician referenced the presented cost-benefit analysis as helpful and requested that the DNP student send him a revised version reflecting annual visits for that organization, a more accurate provision of bad debt and a greater number of ED-based PMHNP's.

Three main themes emerged from the focus group discussion. These were the ERA tool as a screening instrument, patient safety and administrative bureaucracy. Table 2 provides a matrix detailing extracted themes from qualitative data (Appendix C).

Email invitations to the online survey were sent to the 5 participants who attended the entire presentation and discussion, five opened the survey, 1 did not consent, 1 did not answer any questions. A second email was sent to the 17 people initially invited to the presentation asking them to complete the survey if they attended at all and haven't already done so. Fourteen individuals opened the second survey invitation, 8 consented and 6 did not. Two respondents answered the second question and 1 respondent answered all questions. Table 3 provides response details for each survey item (Appendix C).

Five participants provided consent and responded to at least 1 additional survey item. The valid percent is reported for survey items with missing data.

Two participants strongly agreed and three agreed that a PMHNP is qualified to rule out major medical conditions in patients with psychiatric presentations. Two participants strongly

agreed and two agreed that an ED-based PMHNP would improve the quality of care for patients with acute mental health care needs. Two participants agreed that an ED-based PMHNP would decrease LOS for psychiatric patients and reduce associated costs. Two participant neither agreed or disagreed. One participant strongly agreed and three agreed that an ED-based PMHNP would reduce workload and provide valuable assistance to ED medical and nursing staff. All participants agreed that and ED-based PMHNP would facilitate outpatient follow up mental health care. One participant agreed that an ED-based PMHNP would prevent frequent return ED visits for acute mental health care needs. Three participants neither agreed or disagreed.

Cost-Benefit Analysis

The presented cost-benefit analysis was revised and sent via email to the emergency medicine physician as requested one day after the presentation and focus group discussion. The analysis includes expected cash flow, net present value (NPV), internal rate of return (IRR), modified internal rate of return (MIRR) and payback period for an estimated 2,900 annual encounters with 4 full time and 2 part-time ED-based PMHNP's as illustrated in Figure 13 (Appendix D).

Expected cash flow. Startup costs New hire paperwork, administrative time, information technology network set up, 40-hour orientation per hire, time to achieve target productivity with a salary of \$50.00 per hour (Society for Human Resources Management, 2016; United States Department of Labor, 2017). Gross revenues are based on Current Procedural Terminology (CPT) code 99284, level IV encounter consisting of an expanded problem-focused history, expanded problem-focused examination and medical decision-making of moderate complexity or a detailed history, detailed examination and medical decision-making of moderate complexity

(Beacon Health Options Maryland, 2017; Centers for Medicare and Medicaid Services, 2017) and the current healthcare cost inflation rate (YCharts, 2017).

Net present value. The proposed advanced nursing practice model is likely to be a profitable investment. The projected earnings generated by establishing ED-based PMHNP's exceed the anticipated costs.

Internal rate of return. This project has a high anticipated IRR. Cash flows are not likely to be reinvested at the IRR, therefore an MIRR was calculated to reflect reinvestment at the cost of capital (Maryland Health Services Cost Review Commission, 2017).

Payback period. The calculated payback for this project at year three exceeds the initial startup investment by 62%. This suggests that the amount of time for the initial investment to be repaid by net cash flows is 28 to 30 months.

Discussion

One of the most prominent outcomes of this project was the level of interest in the management of psychiatric patients in the emergency department. Although there were few actual focus group discussion and survey participants, several additional individuals were present at various points during the presentation asking questions and providing unsolicited feedback that was not included in the results.

There was also genuine interest in the ERA tool as an innovative instrument in concept. The concerns expressed by participants inform future presentations to introduce the care delivery model. The ERA tool is intended to guide an efficient focused evaluation of risk in conjunction with clinical judgement.

The focus group discussion revealed an incongruence of standards with practice, particularly with regard to laboratory tests. It seemed to be generally accepted that routine

laboratory tests were not universally necessary for the provision of care but required for disposition and reimbursement. This indicates a need for an in-depth review of public policy and a call for clarification of standard procedures to provide appropriate medical screening in the best interest of the patient.

There was some uncertainty expressed about whether a PMHNP is legally authorized to medically clear a psychiatric patient, but no disagreement that a PMHNP is qualified to rule out major medical conditions in patients with psychiatric presentations. The survey results were consistent with these findings. It was also agreed that an ED-based PMHNP would reduce workload and provide valuable assistance to ED staff, most notably with the efficiency of the medical clearance component of the care delivery model.

Overall the ED-based PMHNP care delivery model was well received as a means to improve the quality of care for patients with acute mental health care needs. There was less of a consensus that it would decreased LOS or prevent frequent return ED visits for acute mental health care needs, although no one disagreed.

A larger sample size would capture a more accurate representation of ED professional staff opinions. Further inquiry should be directed to the validity and reliability of the ARA and ERA tools. This could be initiated by incorporating participant use of the scales to assess case scenarios in future presentations. Ultimately, formal evaluation of the assessment scales and protocols for sensitivity and specificity in predicting the degree of risk to mental health, safety and wellbeing will be the foundation for successful integration of the care delivery model using the Reach-Effectiveness-Adoption-Implementation-Maintenance (RE-AIM) framework (Glasgow, Vogt & Boles, 1999) for program planning to ensure the external validity and sustainability of this evidence-based public mental health intervention.

Conclusion

Emergency Departments are a vital component of the health care system for patients who require rapid acute care. Acute mental health care needs, however, are not optimally managed in the ED with the traditional approach to care and management. The lengthy encounter for psychiatric patients is costly, fragmented, inefficient and often ineffective, contributing to poor outcomes.

An ED-based PMHNP care delivery model can provide timely access to acute psychiatric crisis care to decrease length of stay, facilitate referral and coordination of care and reduce costs.

Local healthcare and service organizations that serve community members with acute mental health care needs will be approached to introduce the ED-based PMHNP care delivery model and present the findings in this project. As local community leaders in emergency medical services, mental health care, law enforcement and case management services become familiar with the practice model, valuable input from professionally diverse perspectives could promote successful implementation, improve the quality of mental health care and enhance the health of the community and its members.

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Appendix A

Table 1. Evidence Matrix of the Literature Review

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Adeosun, I.I., Adegbohun, A.A., Jeje, O.O., Oyekunle, O.O., Omoniyi, M.O. (2014). Urgent and nonurgent presentations to a psychiatric emergency service in Nigeria: pattern and correlates. <i>Emergency Medicine International</i> , 2014, 479081.	700 patients presenting to a neuropsychiatric hospital emergency department in Nigeria.	Prospective correlational design Assessed the level of correlates of urgency of mental health problems. Crisis Triage Rating Scale Clinical Global Impression Scale Supplementary questionnaire	29.1% were actual emergency 10.9% were urgent (23.8% of these were restrained by family, 12.9% of these were brought by ambulance or police) 60% were non-urgent Most common non-urgent need was for medication refills often attributed to insufficient funds to obtain prescribed medications.	Individuals presenting with non-urgent needs were more likely to be unaccompanied, in need of medications refills, employed and married. Individuals presenting with urgent needs were more common among patient with substance abuse, history of SI or attempt, noncompliant with outpatient treatment, restrained by family or brought in by police. Comment: Non-urgent could be given resource information for case management and rapid access to outpatient treatment. Urgent could be referred for IOP or PHP directly.

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Buccelletti, F., Ojetti, V., Merra, G., Carroccia, A., Marsiliani, D., Mangiola, F., Calabrò, G., Iacomini, P., Zuccalà, G., Franceschi, F. (2013). Recurrent use of the emergency department in patients with anxiety disorder. <i>European Review for Medical and Pharmacological Sciences</i> . 17(Suppl 1), 100-106.	469 adult patients presenting to the ED with panic attack from 2001 – 2009. 361 patients had multiple visits over time period. 108 patients presented to ED once over time period.	Case-control design. Univariate and multivariate analysis.	<u>Univariate analysis</u> : male prevalence ($p < 0.01$), neurological symptoms ($p = 0.02$), history of other psychiatric diagnosis ($p < 0.01$). <u>Multivariate analysis</u> : independent predictors of recurrence – male, under age 40, palpitations, 1 or more cardiovascular risk factor, previous other psychiatric diagnosis.	Male patients under 40 years old presenting with palpitations or cardiovascular risk factors and other psychiatric diagnosis have higher recurrence of panic attacks. Treatment with benzodiazepines in the ED does not prevent recurrence. Comment : Psychoeducation may be a possible additional community service of mobile crisis team.

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Castner, J., Wu, Y.W., Mehrok, N., Gadre, A., Hewner, S. (2015). Frequent emergency department utilization and behavioral health diagnoses. <i>Nursing Research</i> , 64(1), 3-12.	56,491 patients age 18-64 medicaid recipients with behavioral health diagnosis and/or frequent treat-and-release ED utilization in 2009.	Retrospective analysis. Logistic regression to analysis of 4 cohorts stratified based on disease complexity.	Significant odds ratios for factors increasing the likelihood for frequent treat-and-release ED utilization across stratified cohorts. Psychiatric diagnosis (OR = 1.4-2.3). Substance abuse (OR = 2.4-3.8). Smoking (OR = 1.7-4.0).	Psychiatric diagnosis, substance abuse and smoking significantly increases the odds of frequent treat-and-release ED utilization among Medicaid recipients regardless of disease complexity. Comment: Psychoeducation may be a good preventive intervention and possible additional community service of mobile crisis team.
Deavenport-Saman, A., Lu, Y., Smith, K., Yin, L. (2016). Do children with Autism overutilize the emergency department? Examining visit urgency and subsequent hospital admissions. <i>Maternal and Child Health Journal</i> , 20(2), 306-314.	115,443 children age 2-21 accounting for 157,902 ED visits to an urban, tertiary children's hospital level 1 trauma center. 1424 children with ASD accounting for 2426 ED visits.	Retrospective analysis of data 2006-2009. Framework: Anderson's model of health services utilization. NYU ED algorithm to predict non-urgent visits. Multivariate linear and logistic regression analysis of rate, urgency and subsequent hospital admission.	Top 3 reasons for ED visit: acute URI, viral infection and otitis media. ASD averaged 0.26 more ED visits annually (p < 0.01), 2.6% points more likely to have non-urgent needs (p < 0.01), less likely to result in hospital admission (OR 0, 61; p < 0.01). 38.7% ASD age 6-11. 44.8% without ASD age 2-5. 85.9% with ASD had public insurance. 78% without ASD had public insurance. 36.7% with ASD arrived during weekday hours. 32.4% without ASD arrived during weekday hours.	Compared with children without ASD, children with ASD presenting to the ED tend to be older, male, more likely to have public insurance and arrive during weekday hours. Compared with children without ASD, children with ASD are more likely to present to the ED for non-urgent reasons. Comment: Children with ASD may benefit from a specialized approach to primary health care to prevent ED use.

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
<p>Kalb, L.G., Stuart, E.A., Freedman, B., Zablotsky, B., Vasa, R. (2012). Psychiatric-related emergency department visits among children with an autism spectrum disorder. <i>Pediatric Emergency Care</i>, 28(12), 1269-1276.</p>	<p>Data from 2008 National ED sample.</p> <p>Children age 3-17.</p> <p>3,974,332 ED visits.</p> <p>13,191 involved a child with ASD.</p>	<p>Cross-sectional observational study.</p> <p>Multivariate analysis.</p>	<p>Among children with ASD, 13% ED visits due to psychiatric problems.</p> <p>Among children without ASD, 2% were due to psychiatric problems.</p> <p>Compared with children without ASD, children with ASD are:</p> <ul style="list-style-type: none"> • More likely to present with psychiatric problems (OR, 9.13; 95% CI, 8.61-9.70) • More likely to present with externalizing behaviors (OR, 1.58; 95% CI, 1.53-1.63) and psychotic symptoms (OR, 1.93; 95% CI, 1.58-2.35) <p>Children with ASD covered by private insurance, compared with public insurance, are at greater risk for psychiatric emergency department visit (OR, 9.13; 95% CI, 8.61-9.70)</p>	<p>Children with ASD are more likely to present to the ED for psychiatric problems.</p> <p>Children with ASD who are covered by private insurance are at a greater risk for psychiatric ED visits.</p> <p>Comment: Differences in coverage warrant an innovative approach to ED diversion for this population.</p>

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Liu, G.I., Pearl, A.M., Kong, L., Leslie, D.L., Murray, M.J. (2017). A profile on emergency department utilization in adolescents and young adults with Autism Spectrum Disorders. <i>Journal of Autism and Developmental Disorders</i> , 47(2), 347-358.	56,266,305 youth age 12-21 presenting to the emergency department from 2005-2013. ASD = 87,683 Non-ASD = 56,178,622	Univariate analysis: Chi-squared/Fisher's exact test, t test/Wicoxon rank sum test Multivariate analysis: logistic regression Retrospective design	Among adolescent with ASD 4:1 male to female Adolescent cohort: 60% early adolescence (12-14), 22% middle adolescence (15-17), 14% late adolescence (18-21) Significant increase in ED use over time for older adolescents (30%) Adolescents with ASD utilize the ED 4 times more than adolescents without ASD (aOR, 4.775; 95% CI, 4.678-4.875, p < 0.0001) Increased use over time from 3% in 2005 to 16% in 2013 Increase in behavioral presentations from 12% in 2005 to 22% in 2013.	ED use increases as adolescents with ASD get older. Comment: Transitional difficulties from adolescence to adulthood for individuals with ASD combined with diminishing services contribute to more ED use.
Lin, M.T., Burgess, J.F., Carey, K. (2012). The association between serious psychological distress and emergency department utilization among young adults in the USA. <i>Social Psychiatry and Psychiatric Epidemiology</i> , 47(6):939-947.	National Health Interview Survey, 2004 – 2006 16,873 male and female individuals age 18 – 29 2.56% (n=427) past 30d Serious Psychological Distress (SPD). 24.29% (n=4,062) current heavy smoker 6.66% (n=1,084) current heavy drinker	Bivariate analysis with Chi-square tests and logistic regression Cross-sectional	<u>Individuals with SPD:</u> More likely current smoker (51.41% vs 23.63%), More likely current heavy drinker (11.57% vs 6.55%) <u>More likely to present to ED:</u> SPD - 2.05 (95% CI: 1.53, 2.75), Females - 1.46 (CI: 1.31, 1.62), HS education or less - 1.22 (CI: 1.09, 1.37), Below poverty level – 1.23(CI: 1.09, 1.38)	Young adults with SPD frequently presenting to the ED contributes significantly to the healthcare burden of high cost and deteriorating ED quality care.

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Mapelli, E., Black, T., Doan, Q. (2015). Trends in pediatric emergency department utilization for mental health-related visits. <i>Journal of Pediatrics</i> , 167(4), 905-910.	8183 mental health-related visits by pediatric patients 17 years or younger presenting to a Pediatric Emergency Department (PED) from 2002 – 2012 Mean age 13.2 (95% CI: 13.1, 13.3) 52% female (CI: 50.8, 54.6) 50% presented 4pm-midnight 36% presented 8am-4pm 14% presented overnight	Retrospective cohort study reporting descriptive statistics, t-tests for correlation and comparison and regression analysis	MH-related visits 1.9% of 431,797 total visits 85.8% increase in MH-related visits from 2002 (n=529) to 2012 (n=983) 32.3% (CI: 29.3, 35.2) annual repeat visits with 12% occurring within 30 days of index visit High acuity decreased by 42.3% and mid-acuity increased by 30.7% from 2002-2012 2 most common complaints: Mood and anxiety disorders and SI in 2012 MH-related visits had longer LOS (279 minutes vs 183 minutes)	Mental health-related ED visits represent and growing burden to emergency department care. Decreasing acuity may represent decline in outpatient resources and services
Nicks, B.A., Manthey, D.M. (2012). The impact of psychiatric patient boarding in emergency departments. <i>Emergency Medicine International</i> , 2012,360308.	All psychiatric and non-psychiatric ED presentations (>68,000) from 2007-2008 1,438 psychiatric presentations Mean age 42.5 (SD 13.1)	Retrospective analysis of utilization and cost of boarding psychiatric patients in the ED	Psychiatric ED visits 2.7 times more likely to be women 35.1% (n=505) psychiatric visits admitted inpatient. Psychiatric LOS 1089 minutes (CI: 1039-1140) vs non-psychiatric 340 minutes (CI: 304-375); p<0.001 Psychiatric ED boarding department cost of \$2,264.00 per patient	Psychiatric presentations to the ED experience significantly longer ED LOS contributing to high cost and loss of revenue

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Nolan, J.M., Fee, C., Cooper, B.A., Rankin, S.H., Blegen, M.A. (2015). Psychiatric boarding incidence, duration, and associated factors in United States emergency departments. <i>Journal of Emergency Nursing</i> , 41(1), 57-64.	National Hospital Ambulatory Medical Care Survey (NHAMCS) 2008 data 34,134 patient ED visit records representing 124 million national visits	Cross-sectional descriptive design Multilevel multivariable logistic and linear regression ED LOS >6 hours considered boarded	4297 boarded ED patient (779 psychiatric, 3518 non-psychiatric) 29,837 not boarded (2030 psychiatric, 27,807 non-psychiatric) Psychiatric patients 5 times more likely to be boarded in ED Uninsured vs insured (OR 0.81) Average LOS 2.8 hours longer for psychiatric patients than non-psychiatric patients	Boarding psychiatric patients in the ED is a significant cause of ED overcrowding contributing to poor outcomes, delay in care and lost hospital revenue
Rhodes, S.M., Patanwala, A.E., Cremer, J.K., Marshburn, E.S., Herman, M., Shirazi, F.M., Harrison-Monroe, P., Wendel, C., Fain, M., Mohler, J., Sanders, A.B. (2016). Predictors of prolonged length of stay and adverse events among older adults with behavioral health-related emergency department visits: A systematic medical record review. <i>Journal of Emergency Medicine</i> , 50(1), 143-152.	All ED patients ≥65 years presenting to an ED for Behavioral Health (BH)-related complaints 5267 total, 213 (4%) BH presentations	Retrospective descriptive design Electronic health record review of BH ED presentation, descriptive statistics and association with LOS and AE	Median age 75 (IQR 70-82), 84.5% white, 58.7% female, 69.5% non-Hispanic 46.9% cognitively impaired, 71.5% involuntary evaluation Median LOS 16.2 hours (IQR 9.7-29.7) Increased LOS associated with: Involuntary status (12.4 hours, 95% CI: 6.4-18.4), Use of restraints (11.9 hours, CI: 5.7-18.2), Failed discharge (28.8 hours, CI: 21.2-36.6) For every 10 additional hours in ED, risk for AE (p=0.002) or potential AE (p=0.01) increased by 20%	Elderly patients presenting to the ED with BH-related complaints are more likely to be cognitively impaired and have multiple comorbidities. LOS is longer for BH presentations and increased LOS is associated with an increased risk for AEs.

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
<p>Schmoll, S., Boyer, L., Henry, J.M., Belzeaux, R. (2015). Frequent visitors to psychiatric emergency service: Demographical and clinical analysis. <i>Encephale</i>, 41(2):123-129.</p>	<p>8800 patients accounting for 16,754 psychiatric emergency department encounters</p>	<p>Retrospective review of psychiatric ED patient records over 6 years</p> <p>Univariate and multivariate analysis</p>	<p>2% (n=192) patients had 9 or more ED visits (21% total visits)</p> <p>Presenting complaint for frequent patients' vs non-frequent (p<0.001):</p> <p>Anxiety (37.6% vs 32.1%),</p> <p>Disruptive behavior (8.4% vs 12.9%),</p> <p>Depression (7.8% vs 17.2%),</p> <p>Suicide attempt (4.5% vs 11.1%)</p> <p>Patients with frequent visits (p<0.001):</p> <p>Schizophrenia or Schizophrenia spectrum disorders (OR=29.5, 95% CI: 11.4-76),</p> <p>Cluster B personality disorder (OR=5.5, CI: 3.6-8.4),</p> <p>Substance abuse (OR=4.6, CI: 3.1-7),</p> <p>Receiving government financial assistance (OR range: 9.1-2.4),</p> <p>Homeless (OR=2.7, CI: 1.8-4)</p>	<p>There is a need for alternative to use of the ED for many psychiatric complaints.</p>

Mental Health Crisis Management in the Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Sheridan, D.C., Spiro, D.M., Fu, R., Johnson, K.P, Sheridan, J.S., Oue, A.A., Wang, W., Van Nes, R., Hansen, M.L. (2015). Mental Health Utilization in a Pediatric Emergency Department. <i>Pediatric Emergency Care</i> , 31(8), 555-559.	646 patients ages 1-19 presenting to the emergency department for psychiatric complaints accounting for 732 visits from 2009-2013.	Retrospective study. Multiple mixed effects regression models.	Average age 13.8 years, 53% male 25% with suicidal ideation, 44% attempted suicide prior to arrival 33% required physical or chemical restraints Annual visit increase, LOS and charges (p<0.05) Increase charges associated with longer LOS (p=0.0062) No difference in charges (p=0.46) and LOS (p=0.62) between suicidal and non-suicidal patients 21% admitted or transferred	Resources required to meet the needs of pediatric patients with mental health conditions has increased as reflected in growing utilization of ED
Vohra, R., Madhavan, S., Sambamoorthi, U. (2016). Emergency Department Use Among Adults with Autism Spectrum Disorders (ASD). <i>Journal of Autism and Developmental Disorders</i> , 46(4), 1441-1454.	Adults age 22-64 with and without ASD (matched 1:3) presenting to the ED from 2006-2011. 102,108 patients 25,527 with ASD	Cross-sectional descriptive design Analysis using Nationwide Emergency Department Sample	ED visit rates for ASD > X2 from 2006-2011 (2549-6087 per 100,000) Presenting complaints: Primary psych disorder (15% ASD vs 4.2% non-ASD), Primary non-psych disorder (16% ASD vs 14% non-ASD), Any injury (24% ASD vs 28% non-ASD) Mean total charges for adult ASD > than 2.3 times higher than non-ASD	Mental health and physical health needs for patients with ASD may not be adequately met in the community settings.

Psychiatric Advanced Practice Nurse in Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Wand, T., D'Abrew, N., Acret, L., White, K. (2016). Evaluating a new model of nurse-led emergency department mental health care in Australia; perspectives of key informants. <i>International Emergency Nursing</i> , 24, 16-21.	ED in Sydney Australia teaching hospital; 75,000 annual emergency presentations; September 2012-September 2013. 46 individual interviews (patients, nurses, medical staff, psychiatry staff, mental health liaison nurses).	Qualitative mixed-method cross-sectional intervention evaluation. Data analysis for content categories.	Patients: Staff had patience and took time; perceived as professional and confident; therapeutic and calming; patients felt understood. ED staff: Patients could be seen more promptly; reduced escalating situations; decreased workload. Mental health staff: Felt pressure to reduce length of stay; felt pressure to discharge rather than recommend admission; expectation to manage all behavioral issues.	A NP-led mental health liaison nurse team in the ED provides prompt and effective access to specialized mental health care in the ED and removes significant workload from ED and psychiatry staff. Involvement at the point of triage expedited care coordination and was regarded by patients as receiving assistance rather than merely being assessed.
Wand, T., D'Abrew, N., Barnett, C., Acret, L., White, K. (2015). Evaluation of a nurse practitioner-led extended hours mental health liaison nurse service based in the emergency department. <i>Australian Health Review</i> , 39(1), 1-8.	ED in Sydney Australia teaching hospital; 75,000 annual emergency presentations; September 2012-September 2013. 1923 ED encounters. 51% male. Mean age 37 years (12-84 years)	Mixed-method descriptive cross-sectional design. Data collection: time of presentation, wait time to be seen, referrals made, total ED time, discharge outcome, follow up arrangements.	45% total sample was seen within 1 hour of arrival and 63% were seen within 2 hours. Of patients presenting during MHLN working hours, 55% were seen within 1 hour and 75% were seen within 2 hours. 70% were referred to community-based services. 55% were discharged home and 30% were admitted for observation.	ED-based MHLN service reduced ED wait times and expedited care coordination and referral.

Psychiatric Advanced Practice Nurse in Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
<p>Wand, T., Fisher, J. (2006). The mental health nurse practitioner in the emergency department: an Australian experience. <i>International Journal of Mental Health Nursing</i>, 15(3), 201-208.</p>	<p>Case report of a mental health nurse practitioner role established within an emergency department in Sydney, Australia.</p>	<p>ED-based mental health nurse practitioner role:</p> <ol style="list-style-type: none"> 1. expert mental health nursing care through direct contact with patients, family; support, education & advice to other healthcare professionals. 2. expanded, autonomous clinical role in decision-making, medication prescribing & interpreting tests & results. 3. Improves access & communication between mental health services, community organizations, general practitioners & main-stream medical services. 4. Promotes mental health awareness & primary prevention. 5. Facilitates access to care for people with mental health concerns. 6. psychotherapeutic & psychoeducational interventions to promote self-mastery. 7. professional practice & clinical leadership that incorporates education and research. 8. involvement in matters between the ED and mental health services. 	<p>Readily available access to expert assessment and management of mental health-related presentations was highly regarded as valuable by ED nursing and medical staff. Staff and ED patients felt that the MHNP provided therapeutic support that led to positive clinical outcomes. The mental health nurse practitioner was able to see 75% of ED mental health presentations within 1 hour of triage.</p>	<p>Developing and implementing the mental health nurse practitioner role in the emergency department within a nursing framework provided a service that complimented existing hospital psychiatric and emergency medicine services and more effectively met the mental health needs of patients.</p>

Psychiatric Advanced Practice Nurse in Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
<p>Wand, T., Schaecken, P. (2006). Consumer evaluation of a mental health liaison nurse service in the emergency department. <i>Contemporary Nurse</i>, 21(1), 14-21.</p>	<p>59 patients ages 19-82 who presented to an ED in Sydney, Australia over a 24-month period.</p>	<p>Mixed method cross sectional design. Surveys and individual interviews.</p>	<p>40% patient presenting with mental health needs were seen by the MHLN within 1 hour of triage regardless of time of day. 75% patients presenting during business hours with mental health needs were seen by the MHLN within 1 hour of triage. Themes: Someone who can see them soon after arrival and shorten the entire ED process. Someone who understood them and knew what to do. Someone who would listen and provide support.</p>	<p>MHLN role reduced waiting times, provided information and support and coordinated follow-up in the community. Participants in this study felt both respected and informed during their stay in the ED. They also had a sense of involvement in decisions about their treatment.</p>

Psychiatric Advanced Practice Nurse in Emergency Department				
Citation	Sample	Methods	Results	Conclusions/Comments
Wand, T., White, K. (2007). Examining the models of mental health service delivery in the emergency department. <i>The Australian and New Zealand Journal of Psychiatry</i> , 41(10), 784-791.	Consultation liaison psychiatric services. Psychiatric emergency centers. Dedicated mental health liaison nurses. Mental health nurse practitioners.	Systematic review of the literature 1990-2007.	Mental health liaison nurse framework is the most promising means for raising mental health awareness and integrating mental health care into mainstream services. Mental health nurse practitioner in the emergency department within the mental health liaison nurse framework has been successful.	The greatest advantage of the mental health nurse liaison framework is the ability to see patients close to the point of triage and prior to or concurrent with medical assessment. Mental health nurse practitioner within the mental health liaison nurse framework provides genuinely integrated advanced practice with a true nursing focus and can reduce wait times and overall ED LOS.

Appendix B
Practice Guidelines

Figure 1. Theoretical Framework of the Evidence-Based Advanced Nursing Practice Model

An open individual-professional-organizational system allows healthcare organizations to enhance institutional effectiveness through programs, policies and professional collaboration with an approach that respects diverse values, beliefs and cultures and empowers the patient to build and utilize personal strengths and resources.

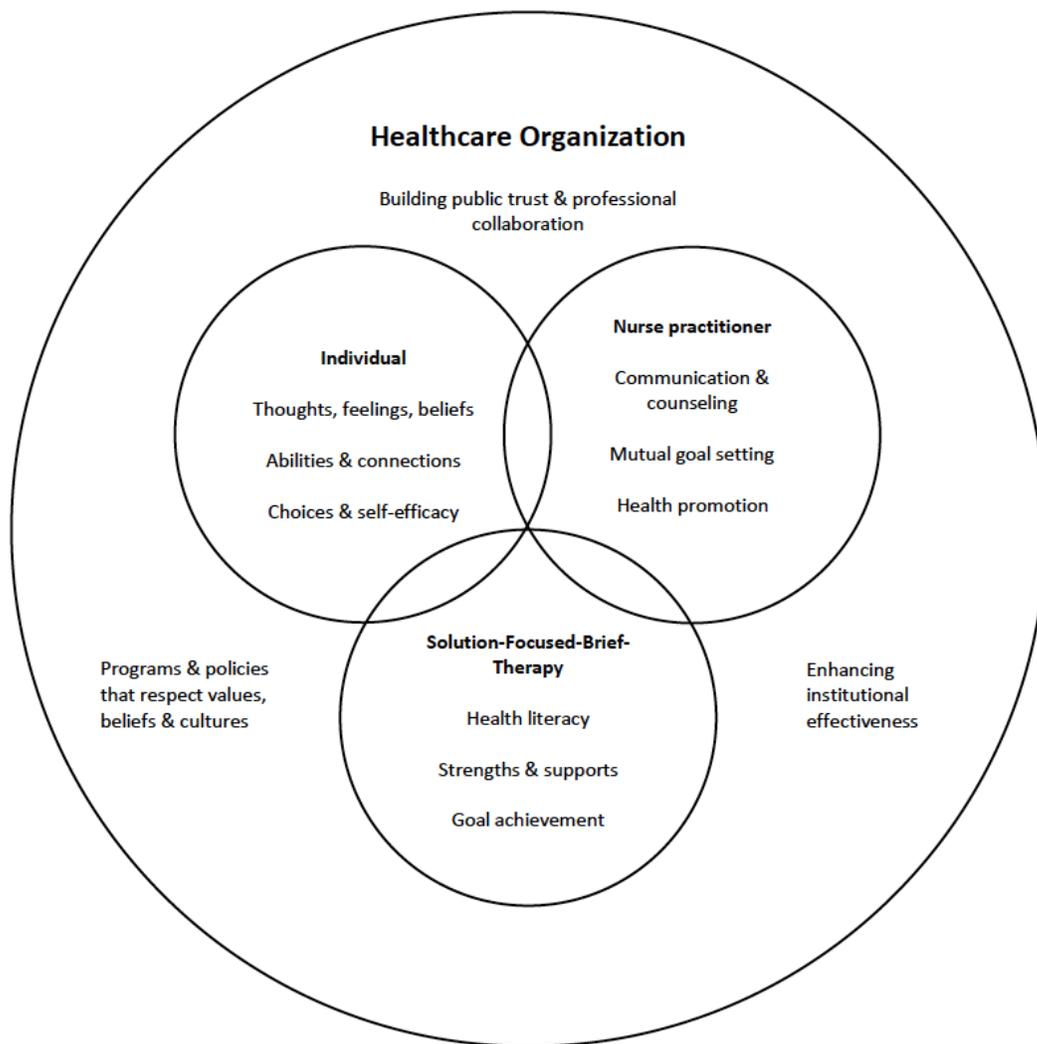


Figure 2. Protocol for Medical Clearance of Psychiatric Patients in the Emergency Department

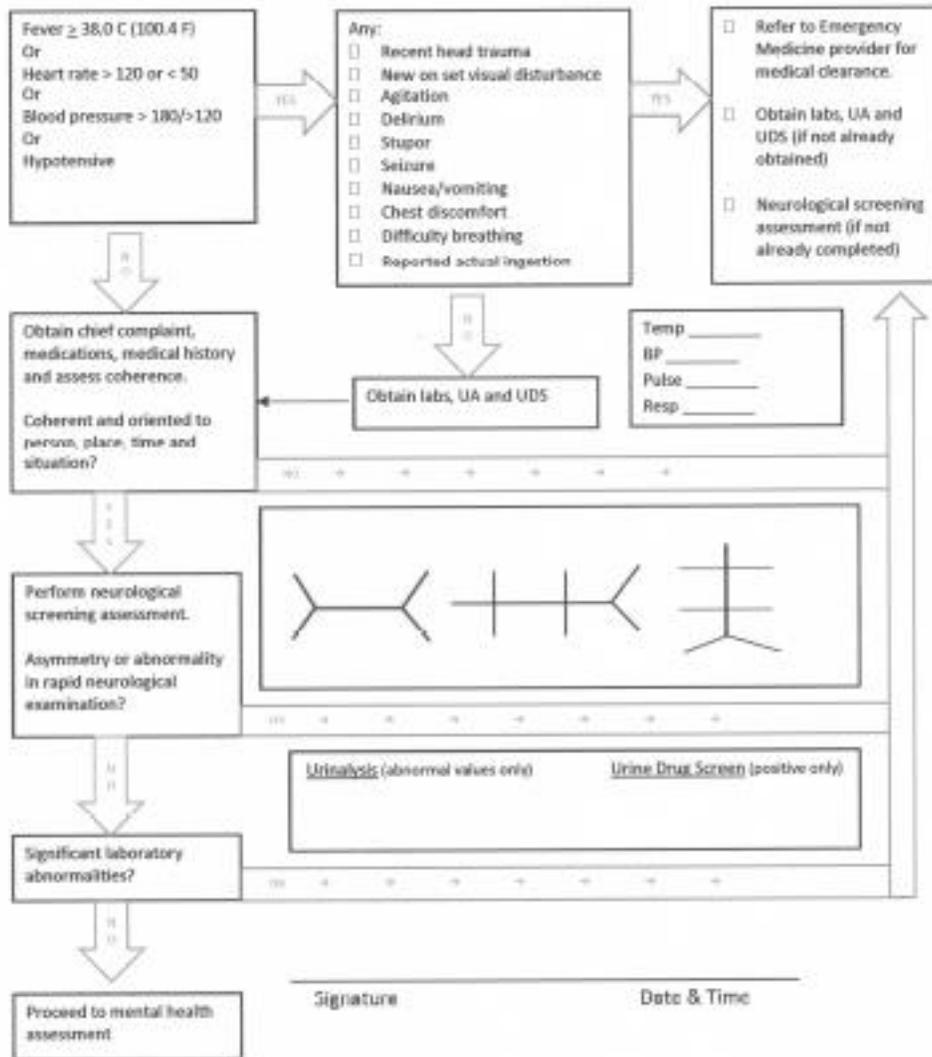


Figure 3. Brief Neurological Screening Examination

Mental Status
Orientation: Person Place Time Situation Comments: _____

Sensory
Light touch: Right hand Left hand Both hands Comments: _____
Right foot Left foot Both feet _____
Vibration: Right thumb Left thumb _____
Right great toe Left great toe _____

Cranial Nerves
Visual Fields (CN II): Symmetrical Asymmetrical Comments: _____
Pupils (CN II & III): Equal size & shape Reactive to light _____
Equal accommodation _____
Eye Movements (CN III, IV & VI): Phos? Left Right None _____
Nystagmus? Horizontal Vertical None _____
Facial Strength: Mastication (CN V): Symmetrical Asymmetrical _____
Facial expression (CN VII): Symmetrical Asymmetrical _____
Hearing (CN VIII): Symmetrical Asymmetrical _____

Motor
Gait: Steady Unsteady Proneator Drift: Left Right None Comments: _____
Strength: Deltoids: Symmetrical Asymmetrical _____
Triceps: Symmetrical Asymmetrical Wrist extensors: Symmetrical Asymmetrical _____
Hand Interossei: Symmetrical Asymmetrical Elbow flexors: Symmetrical Asymmetrical _____
Hamstrings: Symmetrical Asymmetrical Ankle dorsiflexors: Symmetrical Asymmetrical _____
Coordination: Finger tapping: Symmetrical Asymmetrical _____
Finger-to-nose: Symmetrical Asymmetrical _____
Heel-to-shin: Symmetrical Asymmetrical _____

Reflexes
Biceps: Symmetrical Asymmetrical Hypoactive Hyperactive Comments: _____
Triceps: Symmetrical Asymmetrical Hypoactive Hyperactive _____
Patellar: Symmetrical Asymmetrical Hypoactive Hyperactive _____
Ankle: Symmetrical Asymmetrical Hypoactive Hyperactive _____
Plantar: Symmetrical Asymmetrical Hypoactive Hyperactive _____

Signature Date

Figure 4. Acute Risk Assessment Tool

Acute Risk Assessment					Notes
	0	1	2	3	
Current suicidal thinking?	No	Passive	Yes		
Current suicidal intent?	No	Not sure	Yes		
Suicidal plan and access to means?	No		Plan	Plan & access to means	
Aggression risk?	No	Agitated	Threatening posture or statements	Combative	
Current homicidal thinking?	No	Passive	Yes		
Current homicidal intent?	No	Not sure	Yes		
Homicidal plan and access to means?	No		Plan	Plan & access to means	
		A =	B =	C =	

Score: _____ 0 – 7 Low risk
 Adjusted score: _____ 8 – 12 Moderate risk
 13+ High risk

Figure 5. Expanded Risk Assessment Tool

Expanded Risk Assessment				
	0	1	2	3
1. Discharge from psychiatric inpatient setting within the past 30 days?	No	Yes		
2. Psychiatric diagnosis?	Never	Past history	Yes current	
3. Prescribed psychotropic medications?	Yes and taking as prescribed or not prescribed or advised	Yes and recently started or changed	No, but feels they are necessary	Yes, but not taking or not taking as prescribed
4. Established outpatient mental health care provider?	Yes & has seen in the past 30 days	Yes & has not seen in over 30 days	Yes & has not seen in over 2 months	No
5. Hallucinations or delusions?	No	Yes		
6. Alcohol or drug use?	No	Yes, within the past month	Yes, within the past week	Current
7. Recent significant loss or traumatic event?	No	Yes, within the past 6 months	Yes, within the past 3 months	Yes, within the past month
8. Hopeless?	No	Yes, over the past 2 weeks	Yes, for more than 2 weeks	
9. Previous suicide attempts?	No			Yes
10. History of self-injurious behaviors?	No	Yes		
11. Family history of attempted or completed suicide?	No	Yes, attempted	Yes, completed	
12. Age		24 or younger	25-54	55+
13. Gender		Female	Male	
14. Married or committed partnership?	Yes and relationship is supportive	No	Yes and relationship is troubled	Yes, but separated within the past 3 months
15. Live alone?	No	Yes		
16. Part of a social network?	Yes	No		
17. Homosexual orientation or transgender?	No	Yes		
18. History of abuse?	No	Yes		
19. Physical health problems?	No	Yes, diagnosed 6 or more months ago	Yes, diagnosed within past 3-6 months	Yes, diagnosed within the past 3 months
		A =	B =	C =

Score: _____ 2 – 14 Low *Document details for scores 1, 2 & 3.
 15 – 26 Moderate
 27+ High

Figure 6. Mental Health Risk Assessment and Clinical Decision Making Tool

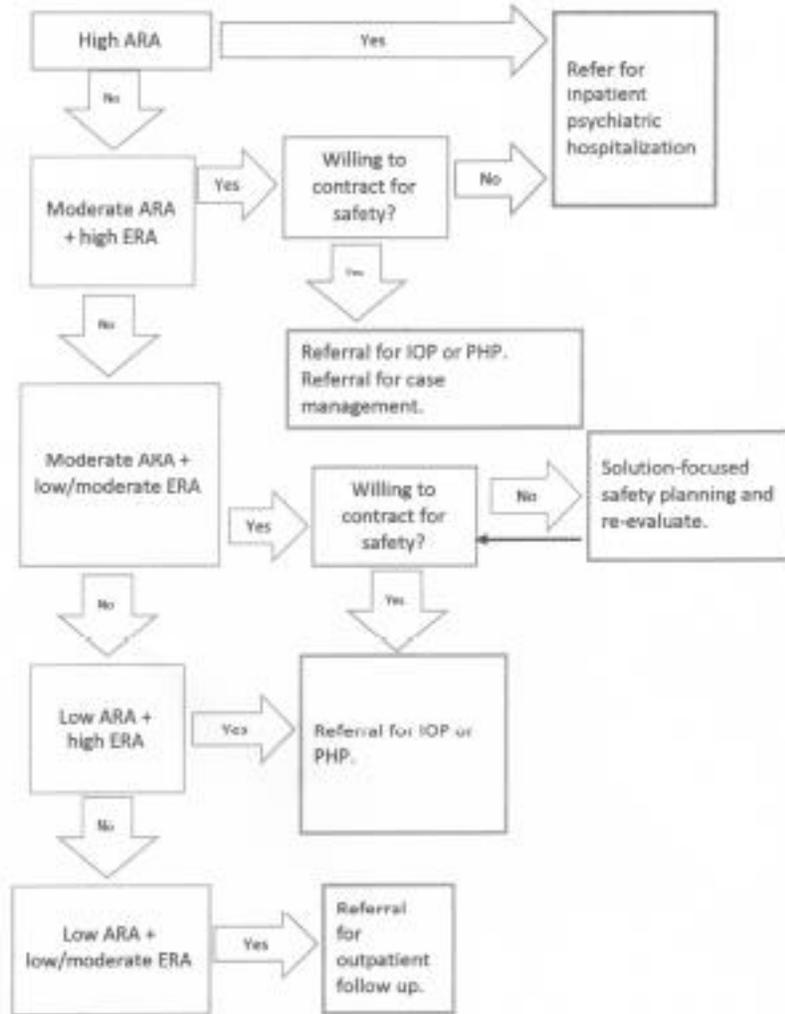


Figure 7. Documentation Form

Name:		MR#: _____		ALLERGIES:
<input type="checkbox"/> male (ERA item 13)	<input type="checkbox"/> female	Age: _____ (DOB: _____) (ERA item 12)		
Chief complaint & history of present illness:		Social/legal/family/trauma history: (ERA items 7, 11, 14, 15, 16, 17, 18)		
Psychiatric history: (ERA items 1, 2, 4, 9, 10)		Mental Status Exam: (ERA items 5, 8 and ARA items)		
Medical history: (ERA item 13)		Diagnostic Impression:		
Medications: (ERA item 3)		<ul style="list-style-type: none"> • Nursing: • Psychiatric: • Medical: 		
Family history: (ERA item 11)		Plan: (NOC)		
Substance abuse history: (ERA item 6)		Intervention: (NIC)		

Figure 8. Cost-Benefit Analysis as Presented

Three-Year Estimated Cash Flow				
<i>Values are rounded to the nearest whole dollar</i>				
	Year 0	Year 1	Year 2	Year 3
Start up	\$ (18,000)			
Gross revenues	\$ 368,119	\$ 387,887	\$ 408,716	
Deductions	\$ 27,609	\$ 29,092	\$ 30,654	
Net revenue	\$ 340,510	\$ 358,795	\$ 378,063	
Labor costs	\$ 219,000	\$ 226,096	\$ 233,421	
Operating cash flow	\$ 121,510	\$ 132,700	\$ 144,641	
Employer contribution	\$ 81,030	\$ 83,655	\$ 86,366	
Net cash flow	\$ (18,000)	\$ 40,480	\$ 49,044	\$ 58,276

NET PRESENT VALUE	\$106,384
IRR	235%
MIRR	105%

Payback		
Year	Net cash flow	Net startup
0		\$ (18,000)
1	\$ 40,480	\$ 22,480

Estimated annual visits (to be seen by NP)	5,937
Charge per patient	\$ 62.00
Healthcare cost inflation rate	5.37%
Anticipated uncollected revenue	8%
Recruiting and HR administrative per hire	\$ 4,000.00
Number of NP hours	4380
Hospital orientation per hire	\$ 2,000.00
Employer contribution for taxes and benefits	37%
NP hourly rate	\$ 50.00
Salary inflation rate	3.24%
Hours NP coverage per day	12
Annual days of operation	365
HSCRC discount rate	6%

Revenue Loss per Hour of ED Boarding				
	Year 0	Year 1	Year 2	Year 3
Current	\$ 10,178,400	\$ 10,724,980	\$ 11,300,912	\$ 11,907,770
With 10% reduction in LOS		\$ 8,651,640	\$ 9,116,233	\$ 9,605,775
Savings		\$ 2,073,340	\$ 2,184,678	\$ 2,301,996

Average annual visits	8482	Hours	Loss per Patient
Minimum LOS		7	\$ 100
Maximum LOS		34	\$ 2,800
Average LOS		18	\$ 1,200

Target average LOS	16.2
--------------------	------

Figure 9. Hypothetical Case Scenario Acute Risk Assessment

Acute Risk Assessment				Notes
	0	1	2	3
Current suicidal thinking?	No	Passive	Yes	
Current suicidal intent?	No	Not sure	Yes	
Suicidal plan and access to means?	No		Plan	Plan & access to means
Aggression risk?	No	Agitated	Threatening posture or statements	Combative
Current homicidal thinking?	No	Passive	Yes	
Current homicidal intent?	No	Not sure	Yes	
Homicidal plan and access to means?	No		Plan	Plan & access to means
		A = 2	B = 0	C = 0

Thinks about dying
 & access to a firearm
 anxiety

Score: 2 0-7 Low risk
 Adjusted score: 2 8-12 Moderate risk
 13+ High risk

Figure 10. Hypothetical Case Scenario Expanded Risk Assessment

Expanded Risk Assessment				
	0	1	2	3
1. Discharge from psychiatric inpatient setting within the past 30 days?	No	Yes		
2. Psychiatric diagnosis?	Never	Past history	Yes current	
3. Prescribed psychotropic medications?	Yes and taking as prescribed or not prescribed or advised	Yes and recently started or changed	No, but feels they are necessary	Yes, but not taking or not taking as prescribed
4. Established outpatient mental health care provider?	Yes & has seen in the past 30 days	Yes & has not seen in over 30 days	Yes & has not seen in over 2 months	No
5. Hallucinations or delusions?	No	Yes		
6. Alcohol or drug use?	No	Yes, within the past month	Yes, within the past week	Current
7. Recent significant loss or traumatic event?	No	Yes, within the past 6 months	Yes, within the past 3 months	Yes, within the past month
8. Hopeless?	No	Yes over the past 2 weeks	Yes, for more than 2 weeks	
9. Previous suicide attempts?	No			Yes
10. History of self-injurious behaviors?	No	Yes		
11. Family history of attempted or completed suicide?	No	Yes, attempted	Yes, completed	
12. Age		24 or younger	25-54	55+
13. Gender		Female	Male	
14. Married or committed partnership?	Yes and relationship is supportive	No	Yes and relationship is troubled	Yes, but separated within the past 3 months
15. Live alone?	No	Yes		
16. Part of a social network?	Yes	No		
17. Homosexual orientation or transgender?	No	Yes		
18. History of abuse?	No	Yes		
19. Physical health problems?	No	Yes, diagnosed 6 or more months ago	Yes, diagnosed within past 3-6 months	Yes, diagnosed within the past 3 months
		A = 5	B = 6	C = 9

Score: 20 2-14 Low *Document details for scores 1, 2 & 3.
 15-26 Moderate
 27+ High

Figure 11. Hypothetical Case Scenario Clinical Decision Making Protocol

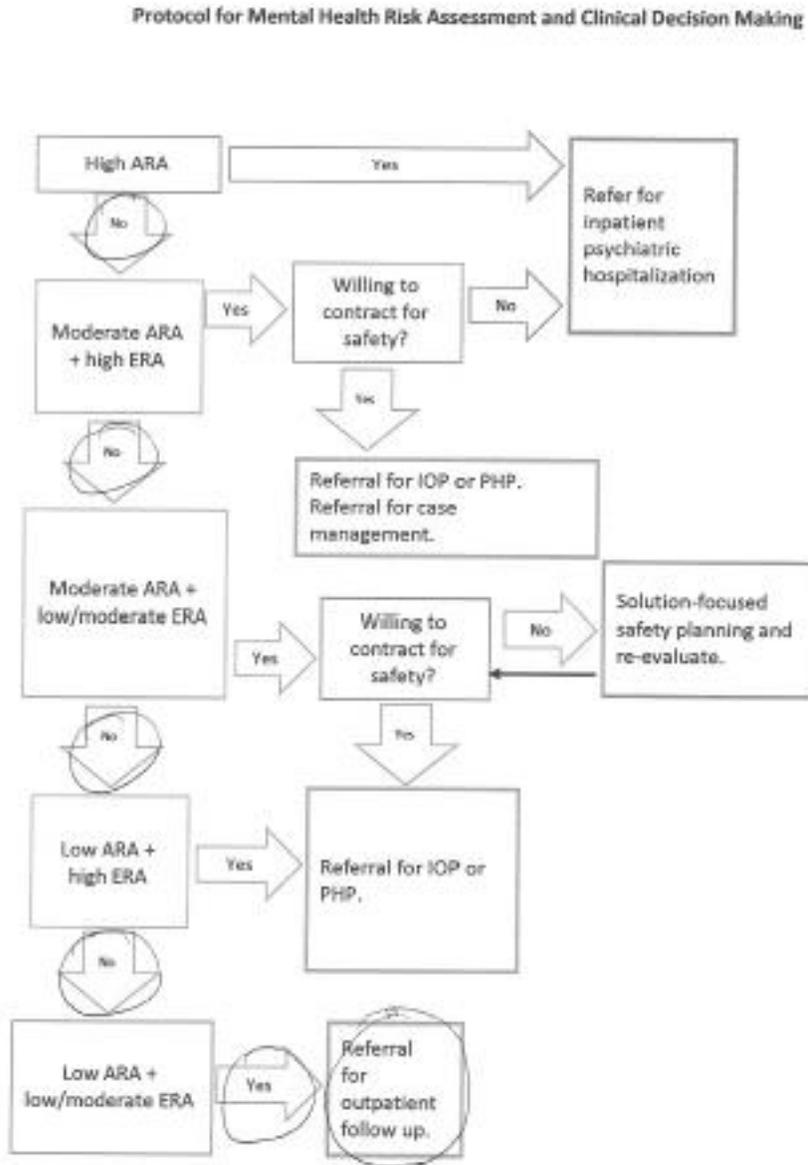


Figure 12. Hypothetical Case Scenario Documentation

Name: Patient Name		MR#: 99999	ALLERGIES: NKA/NKDA
<input type="checkbox"/> male	<input checked="" type="checkbox"/> female	Age: 59 (DOB: 03/18/1959)	
[ERA Item 13]		[ERA Item 12]	
Chief complaint & history of present illness: Emotional outburst, crying & panic dx at work, unprovoked, unable to calm down enough to continue work. Tried deep breathing. Has had thoughts of dying, feels hopeless. Denies suicidal ideation.		Social/legal/family/trauma history: (ERA items 7, 11, 14, 15, 16, 17, 18) Lives alone, divorced Employed full time. Volunteers with Friends at Humane Society.	
Psychiatric history: (ERA items 1, 2, 4, 9, 10) Current out patient psychiatrist, no current therapist. History of 3 psychiatric hospitalizations, last one 3 months ago.		Mental Status Exam: (ERA items 5, 8 and ARA items) A+ O+ 3. Easily engaged, good eye contact. Depressed, anxious, tearful. No hallucinations or delusions. Normal language. Memory grossly intact. Good insight + judgement. Denies suicidal or homicidal ideation.	
Medical history: (ERA item 19) Overweight unremarkable physical exam HTN glaucoma, dx approx 1 mo ago Temp 97.9F, HR 92, 88, Resp 20 + easy		Diagnostic impression: <ul style="list-style-type: none"> Nursing: Anxiety, ineffective coping Psychiatric: Bipolar II Disorder Medical: overweight, HTN, glaucoma 	
Medications: (ERA item 3) Amlodipine 5mg po qday Dorzolamide ophthalmic 2%, 1 qbid OU BID Aspirin 100mg po qday Sertraline 100mg po qday		Plan: (NOC) Coping/Depression level/hope/anxiety level: Continue current medications. Sit home. Keep pending psychiatrist app. Individual therapy.	
Family history: (ERA item 11) Son: deceased, unintentional overdose 16 mo ago Father: completed suicide by hanging 48 yrs ago		Intervention: (NIC) Medication management: 30 day Rx provided for Amlodipine 10mg po qday Coping enhancement: Planned daily telephone contact & social supports. Referral: obtained consent, faxed referral + pr info to Jane Smith LCSW. Counseling: Emotional support, validation of stressors.	
Substance abuse history: (ERA item 6) Moderate regular alcohol use			

Appendix C

Expert Panel Feedback and Survey Results

Table 2. Observation and Focus Group Discussion Data Matrix

Theme	Associated Content
<p><u>Expanded Risk Assessment Tool as a Screening Instrument</u> The ERA [demonstrated in the case scenario] was broad and important details could be missed. Uniqueness.</p>	<p>“Sexual orientation is an important factor, but the 40 year old man happily married to his husband of 20 years presents a different risk from the 16 year old who came out to his parents last week (psychiatrist participant).” “A diagnosis of cancer three months ago is going to have a different impact than high blood pressure last week (emergency physician participant).” “I don’t think I’ve ever seen anything like this in mental health (psychiatrist participant).”</p>
<p><u>Patient Safety</u> Concerns about patient safety with a range of opinions based on the scenario presented. Concerns about qualifications and scope of practice.</p>	<p>“She should be admitted. She has a history of attempted suicide and a family history (RN participant).” “This is a great example of an assessment that could go either way (emergency physician participant).” “I would be confident with a psychiatric nurse practitioner general assessment (emergency physician participant).” “A psychiatric nurse practitioner can’t do [a medical assessment]. I don’t think so, but I’d question that (RN participant).”</p>
<p><u>Administrative Bureaucracy</u> Perceived rules and requirements. Cost, savings and staffing requirements. Sequential process of medical and psychiatric assessment as a contributor to length of stay.</p>	<p>“ACEP’s position is that routine labs and urine tests are not necessary or useful, but you have to get them for reimbursement (emergency physician participant).” “By law, an outside psychiatric facility can’t accept a patient without laboratory results (RN participant).” “What holds up transfers is waiting for the labs (RN participant).” “You would need way more than three nurse practitioners (emergency medicine participant).” “I think the provision of bad debt is optimistic (emergency physician participant).” “So [the medical clearance protocol] essentially combines two providers (emergency physician participant).”</p>

Table 3. Frequency Distribution of Survey Responses

consent agreement				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	100.0	100.0

A PMHNP is qualified to rule out major medical conditions in patients with psychiatric presentations.				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	60.0	60.0
	strongly agree	2	40.0	100.0
	Total	5	100.0	100.0

An ED-based PMHNP would improve the quality of care for patients with acute mental health care needs.				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	2	40.0	50.0
	strongly agree	2	40.0	100.0
	Total	4	80.0	100.0
Missing	System	1	20.0	
Total		5	100.0	

An ED-based PMHNP would decrease length of stay for psychiatric patients and reduce associated costs.				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neither agree or disagree	2	40.0	50.0
	agree	2	40.0	100.0
	Total	4	80.0	100.0
Missing	System	1	20.0	
Total		5	100.0	

An ED-based PMHNP would reduce workload and provide valuable assistance to ED medical and nursing staff.				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	60.0	75.0
	strongly agree	1	20.0	100.0
	Total	4	80.0	100.0
Missing	System	1	20.0	
Total		5	100.0	

An ED-based PMHNP would facilitate outpatient follow up mental health care.				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	80.0	100.0
Missing	System	1	20.0	
Total		5	100.0	

An ED-based PMHNP would prevent frequent return ED visits for acute mental health care needs.				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neither agree or disagree	3	60.0	75.0
	agree	1	20.0	100.0
	Total	4	80.0	100.0
Missing	System	1	20.0	
Total		5	100.0	

Appendix D
Cost-Benefit Analysis

Figure 13. Revised Cost-Benefit Analysis

Three-Year Estimated Cash Flow				
<i>Values are rounded to the nearest whole dollar</i>				
	<u>Year 0</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
<u>Start up</u>	\$ (36,000)			
<u>Gross revenues</u>		\$ 342,720	\$ 361,124	\$ 380,516
<u>Deductions</u>		\$ 34,272	\$ 36,112	\$ 38,052
<u>Net revenue</u>		\$ 308,448	\$ 325,012	\$ 342,465
<u>Labor costs</u>		\$ 219,000	\$ 226,096	\$ 233,421
<u>Operating cash flow</u>		\$ 89,448	\$ 98,916	\$ 109,044
<u>Employer contribution</u>		\$ 65,700	\$ 67,829	\$ 70,026
<u>Net cash flow</u>	\$ (36,000)	\$ 23,748	\$ 31,087	\$ 39,017

<u>Estimated annual visits (to be seen by NP)</u>	2,880
<u>Charge per patient</u>	\$ 119.00
<u>Healthcare cost inflation rate</u>	5.37%
<u>Anticipated uncollected reveue</u>	10%
<u>Recruiting and HR administrative per hire</u>	\$ 4,000.00
<u>Number of NP hours</u>	4380
<u>Hospital orientation per hire</u>	\$ 2,000.00
<u>Employer contribution for taxes and benefits</u>	30%
<u>NP hourly rate</u>	\$ 50.00
<u>Salary inflation rate</u>	3.24%
<u>Hours NP coverage per day</u>	12
<u>Annual days of operation</u>	365
<u>HSCRC discount rate</u>	6%

NET PRESENT VALUE	\$44,180
IRR	61%
MIRR	40%

Payback		
<u>Year</u>	<u>Net cash flow</u>	<u>Cumulative net cash flow</u>
0		\$ (36,000)
1	\$ 23,748	\$ (12,252)
2	\$ 31,087	\$ 18,835
3	\$ 39,017	\$ 57,852

Revenue Loss per Hour of ED Boarding				
	<u>Year 0</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
<u>Current</u>	\$ 10,178,400	\$ 10,724,980	\$ 11,300,912	\$ 11,907,770
<u>With 10% reduction in LOS</u>		\$ 8,651,640	\$ 9,116,233	\$ 9,605,775
<u>Savings</u>		\$ 2,073,340	\$ 2,184,678	\$ 2,301,996

<u>Average annual visits</u>	8482	<u>Hours</u>	<u>Loss per Patient</u>
<u>Minimum LOS</u>		7	\$ 100
<u>Maximum LOS</u>		34	\$ 2,800
<u>Average LOS</u>		18	\$ 1,200

<u>Target average LOS</u>	16.2
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