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Psychological Prophylaxis: An Integrated Psychological Services Program in Trauma Care

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Abstract
The primary medical goals of acute care are restoration of physical health and return to physical function. However, in response to traumatic events and injuries, psychological factors are critical to one's overall recovery. Both pre-morbid psychiatric comorbidities and post-injury psychological compromise affect physical and psychological recovery in inpatient trauma populations. The Psychological Services Program (PSP), a model trauma/acute care program, addresses these critical factors in a Level 1 Trauma Center. The program routinely treats over one-quarter of the trauma patients at any given time. The incorporation of the PSP into treatment team care ensures that patients in need of mental health support can be identified and treated during their recovery. This unique model is recommended as a potential injury prevention and recovery intervention strategy for the myriad mental health comorbidities that may function as risk factors for poor post-injury adaptation and also as risk factors for possible future traumatic injury.

Keywords Acute care · Injury prevention · Integrative treatment · PTSD · Trauma

Traumatic injury occurs every day, across all socioeconomic levels, and without exclusions on the basis of culture, race, gender, or age. According to the National Center for Injury Prevention and Control, Non-Fatal Injury Report (2006), traumatic injury results in the hospitalization of over 2 million people in the United States annually, presenting a public health epidemic of dramatic proportion and fiscal consequences (as cited in Bryant et al., 2010). In fact, the net costs estimated for "intentional and unintentional injuries now approach half a trillion dollars a year" (American College of Surgeons Committee on Trauma, 2014, p. 139). Yet, merely valuing the impacts of the physical injury alone misrepresents the true personal and societal effects of trauma, as trauma not only results in broken bones, traumatic brain injuries, or collapsed lungs.

Traumatic events, such as car accidents, assaults, and falls to name a few, along with their subsequent injuries, interrupt daily routines, uproots family systems, casts doubt onto dreams, and burdens the human spirit. Unfortunately, healthcare has been slow to acknowledge psychological compromise, or the psychosocial consequences of traumatic events, and the psychological influence on injury occurrence, recovery, and recidivism. To view the impact of trauma in terms of physical injury alone is to miss the undeniable and well-documented psychological response to traumatic injury (ACSCT, 2014; Bryant et al., 2010). Early intervention, such as in the acute care medical context, within days following traumatic events, provides mental health professionals and medical practitioners the opportunity to collaboratively treat trauma patients holistically by ensuring the receipt of psychological care as medical inpatients (ACSCT, 2014), potentially avoiding the development and maintenance of psychological symptoms stemming from traumatic events.

To address such psychological aspects of traumatic injury, an innovative and comprehensive program (Psychological Services Program; PSP) was developed during 1995 in the Department of Surgery at a southeastern trauma hospital and Level 1 Trauma Center. This integrated care model, presented in this article, has been successfully adopted in this facility, replicated in several other hospital systems, and stands as an existing exemplary model for targeting the psychological sequelae of trauma within acute care, inpatient

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setting of trauma centers. The PSP model and mission, its distinctions from traditional consultation/liaison psychiatry services, and suggested adaptations are also presented.

Incidence and Role of Pre-morbid Psychiatric Comorbidities

Some have rightly posited that traumatic accidents and injuries are not entirely random in their occurrence (McAninchh, Greene, Sorkin, Lavoie, & Smith, 2014; Poole et al., 1997). Pre-existing psychopathology, for example, is a significant risk factor for traumatic injury. As will be explored, the literature clearly documents the comorbidities of psychopathology, substance use, and trauma, elucidating a link between both intentional and unintentional traumatic injury and psychopathology. In fact, screening for mental illness in a trauma center resulted in its identification as an independent risk factor for traumatic injury and reinjury (Dicker et al., 2011). Similarly, various studies have outlined the relationships between substance abuse, trauma, and injury recidivism (Brattström, Eriksson, Larsson, & Oldner, 2015; Mackersie, Davis, Hoyt, Holbrook, & Shackford, 1995; Poole et al., 1997; Soderstrom et al., 1992).

However, the impact of pre-morbid psychopathology is greater than the injury occurrence alone. Not only is mental illness an independent risk factor for injury and recidivism, but patients admitted following traumatic injury with a concomitant mental illness presented different injury patterns and lengthier hospital stays (Wan, Morabito, Khaw, Knudson, & Dicker, 2006). For instance, one study found that higher rates of acute stress and depressive symptoms in ICU patients were associated with greater likelihood of future hospitalizations in the 12-month post-initial discharge (Davydow, Hough, Zatzick, & Katon, 2014). These findings support the need for sufficient addressing of underlying psychological disorders as both a component of inpatient treatment post-injury and traumatic injury prevention (McAninchh et al., 2014; Poole et al., 1997).

Adults are not solely impacted by pre-morbid psychiatric comorbidities. Several studies have documented the role of psychopathology in pediatric trauma admissions. Merrill, Lyon, Baker, & Gren (2009) found that Attention Deficit Hyperactivity Disorder (ADHD) is positively related to childhood injury, with a stronger association found in children who were more severely injured. ADHD has also been shown to be a risk factor for repeated injury, suggesting the need for adequate screening and referral for treatment with the purpose of injury prevention (Maxson, Lawson, Pop, Yuma-Guerrero, & Johnson, 2009).

When considering the role of alcohol and substance abuse in trauma, one cannot ignore the prevalence of substance experimentation and usage among adolescents. Risk-taking behaviors are a normal component of adolescence and promote fulfillment of many developmental needs such as independence, autonomy, and mastery (Irwin & Millstein, 1986). When initiated during the trauma admission, interventions focused on decreasing risk-taking behaviors, while supporting the psychological and developmental needs of adolescents, may subsequently decrease trauma recidivism. These interventions address the environmental, social, developmental, and psychological factors that function as antecedents to risk-taking behaviors (Feldstein & Miller, 2006; Redeker, Smeltzer, Kirkpatrick, Parchment, 1995). Such interventions would also serve to reduce injury recidivism and the fiscal demands resultant from pre-morbid psychological and substance use factors. Consequently, treatment for the physical aspects of injury should include attention to these psychological factors.

Effects of Post-injury Psychological Compromise

The occurrence of unexpected injury results in a significant "load" to the coping repertoire of even the most psychologically stable individual. Survivors of trauma and their family systems often encounter many trauma-related personal, financial, medical, and even legal ramifications. Roles within the family system frequently shift, and there may be myriad losses: of confidence, function and independence, employment and income, time with family and friends, physical attributes, and, potentially, of life. The emotional responses to such psychosocial stressors are central to these individuals' overall recovery from the injury.

Many studies document the maladaptive recovery from trauma, including increased risk for many psychological issues such as depression, post-traumatic stress disorder (PTSD), and substance abuse (Holbrook, Hoyt, Stein, & Sieber, 2001; Sise, Sise, Kelley, Simmons, & Kelso, 2005; Wong et al., 2009). For example, in addition to increased anxiety and substance abuse following an unexpected injury, 10–20% of trauma survivors develop PTSD, and 9–15% develop Major Depressive Disorder (Bryant et al., 2010; O'Donnell, Creamer, & Pattison, 2004). These rates may be compared to an annual prevalence of 3.6% with PTSD and 6.8% with Major Depressive Disorder in the general population (National Comorbidity Survey, 2007).

In a prospective analysis of admissions to four Level I Trauma Centers, trauma survivors met criteria for the following diagnoses at 12-month post-trauma: depression (16.3%), Generalized Anxiety Disorder (11.1%), substance abuse (9.9%), PTSD (9.7%), Agoraphobia (9.7%), Social Phobia (6.9%), Panic Disorder (5.9%), and Obsessive–Compulsive Disorder (3.5%). Overall, 22.2% had met criteria for a new psychiatric diagnosis a year post-injury (Bryant et al., 2010).

Meanwhile, the American College of Surgeons Committee on Trauma (2014) reports that 20–40% of U.S. trauma center populations experience post-traumatic stress and/or symptoms of depression within a year after a traumatic injury. Other studies have identified relationships between traumatic brain injuries (TBI) and subsequent psychiatric illnesses (Fann et al., 2004) and increased somatic complaints within the first year post-injury that were related to higher levels of PTSD and depressive symptoms (Haagsma, Scholten, Andriessen, Vos, & Van Beeck, 2015; Zatzick, Russo, & Katon, 2003). Unfortunately, discrepancies between documented rates in psychiatric co-morbidities are common and likely attributed to disparities across studies with regard to measures used (e.g., validated and standardized or not) and the difficult nature of discerning data collected from this population [i.e., symptoms due to organic, such as TBI, or psychogenic causes (O'Donnell et al., 2004)].

Psychological compromise following traumatic injury often has long-term effects on overall adaptation and functional outcomes of survivors. Frequently, this psychological distress impairs the survivors' capacity to return to a functional life following injury (Gabbe, Sutherland, Hannaford, & Cameron, 2010; Holbrook, Anderson, Sieber, Browner, & Hoyt, 1998; Jurkovich et al., 1995; Michaels et al., 2000; Ponzer, Bergman, Brismar, & Johansson, 1996; Richmond, Kauder, & Schwab, 1998). Greater maladaptive emotional recovery post-injury results in greater likelihood of functional impairment, (Bryant et al., 2010) causing significant personal and societal financial burden.

After overcoming physical injury and recovery, survivors attempt to return to pre-injury life. This process can be made more difficult by the presence of issues such as PTSD and depression, which are related to long-term functional impairments and decreased quality of life (Bryant et al., 2010; Engel & Katon, 1999; Zatzick et al., 2001). Psychological compromise following traumatic injury can cause adverse effects not only on quality of life but also on the course of physical rehabilitation and the likelihood of return to work versus disability in adult patients (Jacoby, Shults, & Richmond, 2017; Michaels et al., 1999). In children, the psychological effects following traumatic injury are apparent yet frequently overlooked, despite the need and vulnerability of this population (Gold, Kant, & Kim, 2008; Zatzick et al., 2003). The primary focus within pediatric settings remains the physical recovery with minimal attention paid to the psychological effects of the injuries (Zatzick et al., 2003).

Despite the implications of psychological health with regard to functional outcomes, medicine and healthcare are slower to recognize the importance of psychological health to overall injury outcomes (Michaels et al., 1999). Medical providers typically view a particular outcome as successful based upon survival alone and/or preservation of physical function; however, the patient's definition of "success" may be very different. Patients' appraisals of outcomes post-traumatic injury, such as overall satisfaction, return to work, and general health condition, were contingent on their psychological response to traumatic events (Michaels et al., 1999).

Greater holistic treatment during the course of post-traumatic injury medical care increases patient satisfaction and, more importantly, optimizes patients' psychological and functional outcomes (ACSCT, 2014; Desan, Lee, Zimbrean, & Sledge, 2017). In fact, multiple studies have demonstrated the effectiveness of cognitive-behavioral interventions in reducing symptoms of acute stress for ICU patients (Bisson, Shephard, Joy, Probert, & Newcombe, 2004; Bryant, Harvey, Dang, Sackville, & Basten, 1998; Foa, Hearst-Ikeda, & Perry, 1995). Success associated with these interventions is attributed to cognitive and memory restructuring as well as meaning-making through narration among other processes that facilitate post-traumatic growth and recovery while simultaneously reducing the likelihood of later PTSD development (Bryant, 2007). In contrast, for those experiencing lower rates of psychological compromise, the provision of psychoeducation about and brief interventions targeting normative emotional distress in the wake of traumatic events and hospitalization aligns with the mission of well-rounded care. Involving mental health professionals helps to achieve this mission of improving patients' outcomes by ensuring comprehensive health care.

The Integrated Care Model in Healthcare

The interest in primary care mental health integration has led to the development of integrated and collaborative care models within medicine. Such models are based on the assumption that improving physicians' management of patients will have a great impact on the patients' overall quality and effectiveness of care (Bower, 2002), and integrative collaboration with alternate service providers such as psychology and psychiatry optimizes overall patient outcomes and health (ACSCT, 2014; Cummings, O'Donahue, & Cummings, 2009).

Numerous studies have evaluated the impact of integrated care models on patients with psychological issues, documenting improved patient satisfaction and increased compliance with medical treatments (Cummings et al., 2009). Patients receiving integrated treatment experience significant improvements in depression, anxiety, and stress, as well as improvements in general health as measured by wellbeing inventories (Vines et al., 2004). Similarly, integrated care models were associated with significant reductions of depression in adolescents (Richardson, McCauley, & Katon, 2009) and more effective pain management (Maiers, Westrom, Legendere, & Bronfort, 2010).

Furthermore, the effectiveness of integrated care has been documented by measuring recovery rates and cost-effectiveness when patients are offered medical and psychological treatments concurrently. More specifically, when medical patients were appropriately identified as requiring mental health intervention, overall hospital length of stay was significantly reduced and quality of life outcomes improved (Desan et al., 2017). Similarly, brief behavioral interventions have resulted in a 20–30% reduction in medical costs, excluding the costs of this behavioral healthcare (Cummings et al., 2009).

Studies examining the fiscal impact of alcohol use interventions in trauma centers and emergency departments found decreased recidivism and lowered net healthcare costs (Gentilello, Ebel, Wickizer, Salkever, & Rivara, 2005; Gentilello et al., 1999). In fact, for every dollar spent towards both screening and intervention, 3.81 US dollars was saved in expenditures (Gentilello et al., 2005). Psychological intervention during routine medical processes that have psychological and behavioral components also proves effective. For example, patients requiring mechanical ventilation who received collaborative care demonstrated a significant reduction in average days of hospitalization and significant decreases in overall costs (Baker et al., 2016; Young et al., 1998).

An Integrated Care Model in Inpatient Trauma

Given the documented psychological comorbidities and post-injury psychological manifestations within this patient population and the utility of integrated and collaborative care models, embracing an integrated care model within this specific inpatient population is an important adaptation of this model. The American College of Surgeons (American College of Surgeons, 2018a, b) has issued a statement recognizing the prevalence and significance of traumatic injury on mental health in adult and pediatric patients and recommends research, program development, intervention implementation, and education accordingly. Integrated and collaborative care approaches to address these recommendations facilitate the provision of mental health care in the acute medical setting.

Studies that have evaluated the utility of such approaches have shown promising results for overall patient care and functional outcomes (Wong et al., 2009; Zatzick et al., 2001). Despite the fact that trauma survivors frequently exhibit significant need for mental health services, both acutely and more long-term, as well as in light of recommendations from the ACS (2018a, b), these patients do not regularly receive such services (Chestnut et al., 1999; Horowitz, Kassam-Adams, & Bergstein, 2001). Minimal or no identification of psychological issues, lack of appropriate referrals, or incomplete follow-through on the part of the patient results in suboptimal care and likely longer-lasting psychosocial problems or re-hospitalization (Davydow et al., 2014).

Integrative care stands as a powerful mechanism to bridge such gaps in service and to improve patient encounters and treatment outcomes (ACSCT, 2014; Stiffman, Pescosolido, & Cabassa, 2004; Wong et al., 2009). After accounting for various patients' factors, the odds of subsequent mental health service utilization was eight times greater among injury survivors who received a physician referral than among those who did not (Wong et al., 2009). Psychologists' involvement in the acute phase would result in greater use of needed longer-term outpatient mental health services due to attention to acute mental health needs, reliable referrals made, and positive exposure to mental health services while inpatient. Psychological intervention during this stage ensures appropriate evaluation and treatment of comorbid psychopathology, promotion of post-injury adaptive emotional recovery, and targeted prevention efforts (Silander, 2018).

The Psychological Services Program (PSP)

In 1995 the University of Florida/Jacksonville, Department of Surgery, adopted an integrated care model for its inpatient trauma program by hiring a licensed psychologist as a full-functioning faculty member. The psychologist was hired specifically to develop the patient and family management program for trauma and critical care, focusing on effective patient evaluation, family liaison, inpatient psychological intervention to promote adaptive emotional recovery, and referral on discharge as needed for appropriate follow-up mental health care. Due to the high rate of utility of this service and its recognized benefits to patient and medical staff alike, this program has grown to include an additional psychologist, one psychology post-doctoral resident and, occasionally, one psychology pre-doctoral intern.

The Psychological Services Program (PSP) functions as an integral part of the overall multidisciplinary treatment team serving the trauma patient population and provides acute psychological interventions for a wide array of patient issues. Common consult requests include the following: traumatic brain injury; spinal cord injury; death of friend/family member in injury incident; traumatic amputation, disfigurement, or loss of function (e.g., vision); pre-morbid psychiatric history and/or alcohol/substance abuse history that interferes with current treatment; depression, anxiety, and adjustment difficulties; psychotic symptoms or acute mental status change; domestic/interpersonal violence; particularly unique and severe accidents (e.g., drowning); screening for psychotropic medication;

evaluations for suicidal attempt or ideation/dangerousness and capacity for medical decision-making; and family support. Additionally, ethical quandaries occasionally arise during patient treatment are often fielded to the PSP without formal consult referrals, as they do not generally require patient interaction.

Though the services provided by the psychology team are varied, trauma psychologists work toward the following goals:

1. Assess the psychological and behavioral factors that impact patient care and recovery;
2. Provide psychological interventions necessary to maximize functioning as appropriate in the acute phase of recovery;
3. Integrate psychological assessments and treatment goals with the multidisciplinary team so as to promote favorable outcomes of medical treatments;
4. Facilitate optimal adjustment for family members and significant others through ongoing assessment and supportive counseling;
5. Educate medical teams regarding potential psychological factors that may be impacting the patient's overall recovery.

During an average week, the PSP receives approximately 10–15 new patient consults. At any given time, the PSP is serving 15–30 patients on the trauma census and their families. Comprehensive psychological assessment includes the following: mental status and behavioral observations; psychosocial information pertinent to pre-morbid level of functioning; patient coping strategies and receptiveness to psychology involvement; factors affecting acute care outcomes and potential for rehabilitation including any anticipated psychological or behavioral problems; family and social support systems; and recommendations for maximizing acute care outcomes and potential for rehabilitation. If a patient's neurological status precludes evaluation due to the extent of injury, collateral information is obtained from the family so that the treatment planning process may begin.

Patients provide or deny consent for the PSP to communicate with and/or collect psychosocial information from family members if useful. At times, patients are unable to consent verbally (e.g., in cases of altered mental status or sedation/intubation). In such cases, patients' "next-of-kin" are legally permitted to obtain information and make medical decisions on patients' behalf. Psychoeducation is provided to receptive families (general and injury specific), and supportive contact/liaison services are ensured, as needed, throughout the duration of the hospital stay. Family members, or significant others, who are engaged with the PSP and involved in the rehabilitation process are assessed for their current emotional status and coping, as well as the familial interaction patterns that could impact the patient's overall outcomes.

Broadly, the PSP seeks to maximize outcomes to functional levels of recovery, both in the patient and the family system, and to decrease trauma recidivism. These goals are achieved through effective identification of pre-morbid psychopathology and post-injury maladaptive functioning and/or psychological compromise, appropriate acute care intervention and support, and patient-provided referral for outpatient mental health follow-up when appropriate. The program incorporates a definitive integrated care model within the acute care setting and promotes optimal outcomes by approaching traumatic injury in a comprehensive, proactive manner rather than a limited, reactive one.

The PSP maintains a HIPAA-compliant database on all patients treated, gathering information such as age (pediatric and adult), gender, ethnicity/race, education level, marital and employment statuses, and psychiatric and substance use history. All patients presented in the retrospective review below were seen and evaluated at UF Health-Jacksonville Medical Center, the urban teaching hospital for the University of Florida, College of Medicine/Jacksonville. UF Health-Jacksonville is a 678-bed, acute care medical facility and the Level I Trauma Center serving a large metropolitan and rural catchment area in north Florida and south Georgia.

From 2010 to 2017, UF Health-Jacksonville had 18,470 trauma hospital admissions in total. Of those patients admitted, psychology consults were ordered on 4197 patients (22.7%), resulting in the treatment of at least a quarter of the total trauma patient population at any given time, as patients are typically followed throughout their hospitalization. Table 1 depicts the frequencies of reason for the psychology consult, noting both raw numbers as well as frequency distributions for all patients evaluated.

"Other Loss" refers to loss of function, for example, and referrals in the "Other" category encompassed consult requests due to domestic/interpersonal violence, capacity concerns, and family support (including for all cases in which a patient receives treatment via ECMO; extracorporeal membrane oxygenation). Further evaluation of patient demographic data revealed that the greatest number of consult requests were made for male Caucasian patients who

Table 1 Reasons for consults

PSP consult reason	*N*	Percentage (%)
TBI/SCI	1459	34.8
Mood/anxiety/psych hx	1079	25.7
Suicide/dangerousness	578	13.8
Death/other loss	371	8.8
Other	619	14.7
Missing	91	2.2

were unemployed and unmarried at the time of injury. The average age of the patient population treated was 39 years (SD = 18.99).

The PSP Model Versus Consultation and Liaison Psychiatry

Despite its similarities with traditional consultation/liaison psychiatry services, the PSP is characterized by noteworthy differences in the extent of its involvement in patient care and multidisciplinary collaboration. Patients are monitored for the duration of their hospitalization, ensuring continuity of care versus a simple, "one shot" view of the patients' overall functioning. Behaviors, coping patterns, and overall adjustment are monitored over time, which is valuable given the stages through which patients progress during post-traumatic injury treatment (Silander, 2018). The PSP ensures a seamless provision of psychological services in addition to follow up with treatment teams, rather than a fragmented, one-time visit customary among consultation/liaison service models of care in similar settings. Of note, traditional consultation/liaison services are beginning to move towards a format that has characterized the PSP since its conception: proactive (early identification/screening and intervention), embedded (direct and involved operation within the broader medical service), and multidisciplinary (collaborative engagement with patients' treatment teams to provide psychosocial care) (Desan et al., 2017).

The PSP is typically consulted shortly after admission and follows most patients until discharge, consistent with recommendations for psychological intervention in this setting (ACSCT, 2014). Patients who are not followed until discharge may have declined involvement with the PSP, transferal of care to the Psychiatry Department for purpose of medication management, or demonstrated improvement in psychological wellbeing that the PSP services were no longer indicated (e.g., due to reported declines in distress and adequate use of other social supports). Early identification, permitted by the fact that all treatment providers may initiate a consultation, results in targeting of maladaptive coping acutely, with a focus upon development of a more effective coping repertoire, particularly in response to traumatic events. Medical providers often informally consult with the PSP to better discern normative emotional distress from more severe psychological compromise that may interfere with patients' treatment progress, which both educates the staff about mental health indicators and alerts the PSP to potential new patients.

Patient access to the PSP ensures that those who may not have received mental health services and/or those not previously diagnosed with any form of psychological compromise can be effectively identified and treated. Psychologists' expertise to identify and treat these emotional factors is paramount to early intervention that, in turn, enhances recovery to a more functional post-injury outcome. The PSP provides referrals for psychological follow-up after discharge to ensure a "safety net," should the patient evidence maladaptive coping beyond the acute phase of recovery. Often, such referral information provides patients and families with resources previously unknown to them. Such multifaceted involvement has been demonstrated to reduce the duration of hospitalizations and healthcare costs (Desan et al., 2017).

The PSP's Accomplishments and Recognition

Return on investment (ROI) is one of the key ways in which the economic utility of programs are assessed in healthcare. As previously described, alcohol use interventions in trauma centers and emergency departments decreased recidivism and lowered net healthcare costs with substantial returns on investment (Gentilello et al., 2005; Gentilello et al., 1999). Similarly, a RAND Corporation (2014) report outlines the success of workplace wellness programs. For every dollar invested in employee wellness via disease management and lifestyle management programs, the ROI was 1.50 US dollars. In primary care, it is established that behavioral interventions result in a 20–30% reduction in medical costs, excluding the costs of this behavioral healthcare (Cummings et al., 2009). The role of psychology in integrated healthcare results in more effective triage of mental health needs, which in turn allows physicians to perform the tasks for which they are trained more freely and ensures increased patient compliance with medical regimen (Cummings et al., 2009). In inpatient medicine, integrated care reduces the duration of patient hospitalization, benefitting both patients and facilities alike (Desan et al., 2017). The PSP operates according to an integrated healthcare model, being devoted to patient wellbeing and working in close collaboration with treatment teams.

In addition to satisfying the mission of integrated behavioral healthcare in medical/surgical practice recommended by many within the field of psychology (Cummings, O'Donohue, Hayes, & Folette, 2001), the authors of this article have reason to believe that the PSP satisfies the mission of the American College of Surgeons (ACS) (ACSCT, 2014). During 2018, the ACS recognized the PSP's services as an exceptional strength to the Department of Trauma Surgery and hospital as a whole, helping to re-secure the hospital's national designation as a Level 1 trauma center (ACS, 2018c). Moreover, the PSP has been recognized by other hospital systems which have requested presentations about the PSP and consultations regarding how to adapt the PSP model to their own programs and according to their own needs and system restrictions (Scott, 2012, 2013, 2017). In addition to recognition from the ACS, the Trauma Center

Association of America also recognized the PSP as a "best practice" nationally (Scott, 2013).

Future Model Suggestions

The PSP stands as an existing exemplary model that may be replicated by a handful of other Level 1 trauma centers, including but not limited to those treating strictly trauma surgery patients. Given differences in trauma center status, patient populations, funding/insurance restrictions, hospital specialty services, and the extent of funding specifically for psychology departments, other hospitals might consider a variety of adaptations to this model. Suggested adaptations are presented here.

A Larger Service

Depending on patient population needs and facility resources, a hospital may consider employing a larger number of psychologists, which would allow increased patient access to integrated, holistic care, including for those with milder psychological difficulties or presenting concerns that can more briefly be addressed. More patients could receive, at minimum, one-time consultations for brief assessment, intervention, and psychoeducation pertaining to one's psychosocial needs in the inpatient setting. Similarly, due to expertise in evaluation of and intervention for behavioral health issues, psychologists within a PSP model might develop specialized knowledge and skills to address unique patient challenges in the acute care, medical setting such as anxiety management during ventilation-weaning trials (Spiva et al., 2015; Tate, Dabbs, Hoffman, Milbrandt, & Happ, 2011).

Psychological Intervention in Other Specialty Services

A psychological services program could be extended to patients beyond the trauma surgery service. A facility might determine a need for psychological intervention within other related or subspecialty medical disciplines where patients and families are also vulnerable to psychological compromise (e.g., burn centers, neonatal ICU, obstetrics and gynecology/labor and delivery, HIV clinics, oncology, palliative care/hospice, etc.) (Connolly, Katz, Bash, McMahon, & Hansen, 1997; l-Mousawi, Mecott-Rivera, Jeschke, & Herndon, 2009; Lefkowitz, Baxt, & Evans, 2010; Lotterman, Lorenz, & Bonanno, 2018; Murray et al., 2007).

In such services, psychologists could seek to address grief/loss, obstacles to adaptive adjustment, and mood-related difficulties (e.g., depression, post-partum depression, anxiety). In NICU, for example, 24–35% parents experience acute stress within 5 days following an infant's NICU admission, and 8–15% meet criteria for post-traumatic stress after one month (Lefkowitz et al., 2010). Such patients and families would likely benefit from therapeutic support, family liaison and consultation, psychoeducation, and referrals to appropriate outpatient mental health providers if needed.

Psychological Support for Medical Staff

The need for mental health support amongst medical staff is well-established given high rates of burn-out, depression, and suicidal ideation (Mata et al., 2015; Shanafelt et al., 2011). According to one source, those in Emergency Medicine experience the highest rates of burnout at 59%, and Critical Care and Surgery are not far behind at 53% and 49% endorsing burn-out respectively (Peckham, 2017). Such a program would serve to support a wide range of medical staff members, from patient care assistants (PCAs) to surgeons. Nurses, who are serving in the trenches of medical care, for example, are often implicated with regard to symptoms of secondary traumatic stress (Beck, 2011).

A psychological services department, similar to the PSP, could be geared specifically to address their needs, such as preventing burnout and minimizing risk for vicarious traumatization, personal acute stress reactions, and a range of behavioral health interventions not unlike those frequently addressed in primary care. This need is particularly salient as physicians have one of the highest suicide rates (Anderson, 2018), but so few are willing to seek mental health support (Shanafelt et al., 2011). A proximal, embedded program would increase accessibility to such services given the limited time of most physicians. However, unlike peer support-driven programs with a similar mission (Edrees et al., 2016), a hospital might consider developing such a department to operate as a separate entity to ensure privacy/confidentiality and minimize risk for other ethical conflicts (e.g., dual relationships).

Follow-up Outpatient Services

If feasible, a psychological services program might offer outpatient therapy and consultation services for patients previously seen while inpatient. Follow-up outpatient services may be particularly beneficial for patients who will be re-hospitalized (e.g., in cases of multiple surgical or other procedures over time) by providing greater continuity of care, which is valuable as mental health needs may vary over the course of one's recovery following traumatic injury (Silander, 2018). Such interventions could be structured in such a way as to target individual needs according to diagnosis, symptom severity, medical needs, and proximity to the facility. As many trauma centers and other hospitals serve a relatively large catchment area, offering in a telehealth format to increase accessibility for patients residing further away.

These proposed adaptations utilize an integrated care model and/or seek to address issues of trauma for patients, or their families, who find themselves adjusting to severe physical and other circumstances, or for medical staff members who are exposed to daily crises and enormous workplace responsibilities and demands. Hospitals, and other like-facilities, and psychologists interested and sufficiently competent to provide such services can determine patient population needs, delineate internal and external referral procedures (e.g., perhaps even to include patients who had not been admitted but would benefit from consultative psychological support), and negotiate other financial parameters that inform the establishing of an integrated care model or other psychological services program.

Discussion

Evaluating the overarching success of such a program requires long-term, follow-up outcome measures of treated patients, though these data are often difficult to obtain due to patient attrition (patient relocation, contact information/telephone changes). Many studies specifically reviewing the effectiveness of consultation/liaison psychiatry models, including newer ones, are promising (Desan et al., 2017) and warrant optimism for the trauma-focused PSP within the acute care, medical setting. Longitudinal studies of patients treated by the PSP model are needed to understand their psychological status over time and in comparison to similarly matched inpatients who did not receive psychological services acutely or to those who received more traditional consultation/liaison services. Similarly, qualitative and survey data may help delineate in more detail the specific ways in which patients and their families benefit from a program such as the PSP. Such data would help to improve the program's efficacy in addressing clinical needs. Lastly, investigation into the impact of these psychological interventions on overall trauma recidivism is needed to evaluate this program model's utility as an injury prevention strategy.

The literature abundantly documents the need for psychological services in trauma care. Not only is there a high incidence of pre-injury psychopathology, there is also a significant degree of psychological compromise stemming from the emotional response to the unexpected injury. Excluding the role of psychological intervention results in missing the opportunity for more holistic care of patients undergoing the physical and psychological consequences of trauma in an acute phase post-injury. It also misses a golden opportunity to intervene and to promote adaptive post-injury recovery, thus potentially reducing trauma recidivism.

This unique treatment model is recommended as a recovery intervention and potential injury prevention strategy for the myriad mental health comorbidities that may function as not only risk factors for possible future traumatic injury but also as risk factors for poor post-injury adjustment. Innovative, integrated care approaches such as this are increasingly described as necessary to effectively address the on-going systemic demands for resource allocation and the existing significant societal fiscal burdens resultant from traumatic injury. However, optimal care in trauma should no longer be viewed as simply a return to physical function alone. There is increasing appreciation for significant impact of trauma on our patients' psychological functioning, quality of life, overall health and well-being, and general life satisfaction (ACSCT, 2014); however, without proactive involvement of psychological services, patients will miss the opportunity for comprehensive healthcare.

Compliance with Ethical Standards

Conflict of interest Nina C. Silander, David J. Chesire, and Kamela S. Scott declare that they have no conflict of interest.

Human and Animal Rights The procedures of this study were conducted in accordance with the institutional and national ethical standards of the responsible committee on human experimentation. No animal subjects were used.

Informed Consent Informed consent for collection of demographic data was obtained from all individual participants by virtue of consenting for medical treatment as patients. The authors received IRB approval to access and utilize this demographic information collected by the hospital.

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