

REVIEW

Medical Errors in Psychiatry

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Medical errors in the general medical sector result in significant patient deaths and injuries, as well as high costs to the health care system. Despite the growing literature on errors in medical and surgical specialties, few studies have examined the incidence, nature, predictors, and prevention of errors that may occur in mental health treatment settings. The purpose of the current review is to examine the lessons learned from patient-safety research in the general medical sector, provide examples of types of errors in psychiatry, review the errors identified in the literature, offer a discussion of error-reduction strategies for improving patient safety, and provide recommendations for future research. Increased attention to medical errors in psychiatry is necessary in order to build safer health systems and promote a culture of safety among providers, thereby producing better care for patients with mental disorders. (HARV REV PSYCHIATRY 2006;14:204–211.)

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Medical errors in the general medical sector are frequent and costly. *To Err Is Human*, a landmark report released by the Institute of Medicine (IOM) in 1999, estimated that medical errors cause injury in approximately 3% of hospital patients and that it results in a minimum of 44,000 deaths per year.¹ Medical errors also contribute significantly to the rising cost of medical care in the United States and abroad.² Patient injury related to medical errors adds an estimated 17 to 29 billion dollars annually in

U.S. health care expenditures and in disability-related lost income.¹

The IOM report challenged health systems, governmental bodies, and academic institutions to seek innovative strategies for error reduction. Despite this call to action over five years ago, psychiatry has had a “late arrival on the medical error scene.”³ Little evidence examining the incidence, types, and causes of errors in the treatment of persons with mental disorders is available. In contrast, large studies conducted in the general medical sector have yielded important evidence demonstrating the nature, impact, and causes of errors among hospitalized and ambulatory care patients.^{4–6} Unfortunately, these studies, while informing the conclusions of the IOM report, have consistently excluded patients with mental disorders; medical errors in psychiatry consequently demand closer attention. In medical settings, many of the same risk factors that place patients at risk for poor quality of care also place patients at risk for medical errors.^{7,8} These same risk factors, along with factors unique to the mental health system and patients with mental disorders, are likely to create a substantial risk of error in mental health settings.

The current article will discuss what is known about the incidence and impact, as well as the causes, of errors in the general medical sector. We will then examine the factors that

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place persons with mental disorders at risk for errors in specialty mental health settings. In addition, we offer examples of errors that may occur in mental health settings, and review the literature on errors in psychiatry. The article concludes with a discussion of error-reduction strategies in psychiatry and provides recommendations for future research.

ERRORS IN THE GENERAL MEDICAL SECTOR

The IOM report defines a medical error as “as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim.”¹ Reason⁹ uses the terms *slips* and *mistakes* to differentiate the role of practitioner intention in making errors. A slip occurs when an action is not carried out as intended, as in the case of a patient who is given 100 mg of a medication that was ordered to be given at 10 mg. Mistakes encompass errors that result when a planned action is not the correct course of action, as in the case of a provider who prescribes an inappropriate dose of a medication.

Another term, *adverse event*, is commonly used in the error literature. An adverse event is an undesirable, although not necessarily unexpected, outcome that occurs as a result of the medical management of disease (as opposed to resulting from the underlying medical condition).¹ Adverse events that are preventable result from errors. Errors often, but not always, result in adverse events.

Based on its analysis of the major studies in the medical error literature, the IOM report estimated that from 44,000 to as many as 98,000 patients die per year as the result of medical errors and that 3–4% of hospital admissions experience an injury related to errors. These figures were derived from two large studies examining adverse events in hospitalized patients. The first of these studies, the Harvard Medical Practice Study (HMPS), utilized a random sample of 31,000 medical records of nonpsychiatric patients discharged in 1984 from hospitals in New York State.^{5,10} Us-

ing nurse and physician reviewers, this study estimated the statewide incidence of adverse events to be 3.7%. Fifty-eight percent of these events resulted from medical error. Another study conducted in Utah and Colorado replicated the methods of the HMPS but included managed care organizations and for-profit hospitals.⁴ Similar to the HMPS estimates, nearly 3% of hospitalized patients in these states experienced an adverse event, 53% of which resulted from errors.

In both of these studies, nearly half of adverse events were complications from surgical procedures—such as wound infections, deep venous thrombosis, and pneumonia. The remainder of the injuries were nonoperative, including falls, fractures, and infections. From the results of the HMPS, Leape¹¹ classified medical errors into four categories; diagnostic error (22%), treatment error (61%), preventive error (16%), and an “other” category that included systems errors and the few remaining miscellaneous errors (1%). Diagnostic errors include any failure to make a diagnosis, including failure to order appropriate tests. Treatment errors include failures in the provision of medical interventions. Preventive errors include any failure in prophylaxis or in monitoring disease processes. Systems errors include defective equipment, inadequate staffing, and other failures in operating systems.

CAUSES OF ERRORS

In considering the causes of medical errors, Reason⁹ proposed two distinct parts of human error, one active and one latent. Active failures occur as the direct result of a failed action in an individual “frontline operator.” Latent failures are removed from the direct control of the operator and include factors related to design of a system, organization, or the workplace environment. It is common to name, shame, and blame a single individual as being responsible for an error, but a latent systems failure¹² is usually, at least in part, responsible.

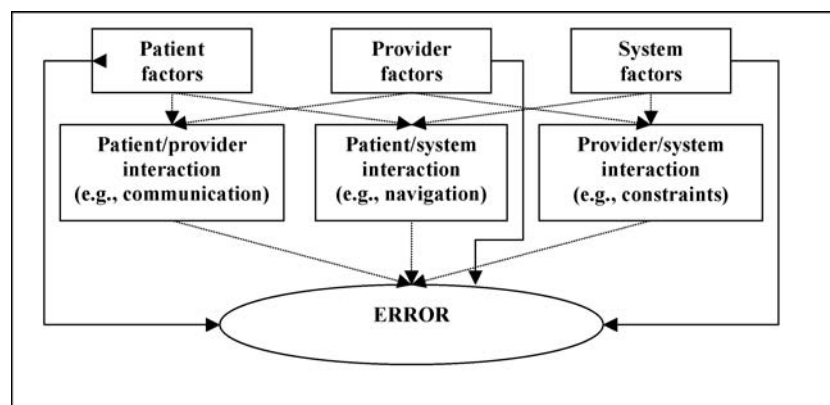


FIGURE 1. Conceptual overview of medical errors in psychiatry.

The chain of events leading to an error often involves a complex interaction of several factors.¹³ A conceptual overview (Figure 1), which is based in large part on research from the aviation industry,¹⁴ explains errors in their most basic form as a function of factors involving the patient, provider, and system. This approach was developed based in part upon accident investigations (in aviation and other industries) and has been endorsed by most experts in medical error.¹ It has also been applied in empirical research that has resulted in reductions in medical errors.^{15–17} Applying the model to the case of a patient's receiving the wrong medication dose, direct causes might include patient forgetfulness, lack of provider knowledge, or poorly equipped facilities—which are represented in the figure as solid lines.

As patient care is increasingly distributed over multiple practitioners, groups, locations, and organizations, there is a growing potential for mistakes and slips to occur.¹⁸ Poor communication between patients and providers can lead to incorrect dosing. Patients, particularly those with mental disorders, may have difficulty successfully navigating through a complex health care system, which could lead them to fail to fill prescriptions, or to fill them incorrectly. Constraints and requirements that health plans place on providers, such as large caseloads, limited time to see patients, formulary restrictions, and administrative requirements, may increase the risk of error. The model represents these interactions between patients, providers, and systems as dotted lines.

Previous research provides some examples of potential patient, provider, and system factors that put patients at risk for error. Patients with complex medical needs and coexisting conditions, such as the elderly, are at higher risk for errors, given that their illnesses require more interventions.^{5,19} Clinical settings involving complex and hurried care, such as the ICU and the emergency department, are commonly at risk for error.^{2,5} Similarly, polypharmacy has been cited as a chief risk factor for adverse drug events.⁶ In addition, inadequate provider knowledge regarding the correct dosage and use of medications is cited as a primary cause of medication misuse.^{6,20} Ambiguous communication strategies for sharing patient data, inadequate training for the use of medical devices, high workload, and staff burnout represent significant examples of systems-level risk factors regarding patient safety.^{2,21}

PATIENT, PROVIDER, AND SYSTEMS-LEVEL RISK FACTORS FOR ERRORS IN PSYCHIATRY

Evidence from the quality literature suggests that patient, provider, and system factors are likely to subject persons with mental disorders to high rates of active and latent failures resulting in errors in diagnosis, treatment, and illness prevention. While the medical-error conceptual model

applies broadly to behavioral health care, there are patient, provider, and system factors unique to mental health treatment settings. Patients with serious and persistent mental illness may be uniquely vulnerable to poor health care due to symptoms of, and attitudes about, their mental conditions.^{22–25} Behavioral health care involves a distinct set of services that overlap with, but are distinct from, those provided in medical settings. Each of these services needs to be considered in order to understand—and reduce—rates of errors in mental health settings.

Patient Factors

Acute psychiatric symptoms (e.g., suicidal, homicidal, impulsive, and poor-judgment behaviors) could either result in mistakes (due to inaccurate treatment planning) or slips (in which correct plans were not enacted). Cognitive and mood disturbances may preclude accurate reporting of symptoms to health professionals, delay help seeking, or complicate differential diagnosis of disease, as well as compromise self-care.²⁶ Patients with comorbid substance use disorders may be especially likely to be prescribed erroneous dosages of antipsychotic medications.²⁷ In addition, patients' agitation and personality disturbances heighten the risk for violence toward themselves or others.²⁸ Even providers who are aware of dosing guidelines may make mistakes by prescribing excessive doses in cases where patients are especially agitated or violent.^{29,30} Fear of violence and other difficulties in communicating with patients may impede providers' ability to prescribe dosages within guidelines.

Provider Factors

In general medical settings, Agius³¹ found that consultant physicians were increasingly strained by clinical responsibility for patient care, demands on time, organizational constraints, and personal confidence, all of which may, in turn, adversely affect diagnosis and treatment. Lack of provider knowledge is also widely believed to be an important reason for serious problems in quality of care.^{32,33} According to a recent review of 46 studies, an average of 54.5% of providers identified lack of knowledge as a barrier to providing appropriate care.³⁴

In mental health settings, diagnosis and treatment are particularly dependent on patient observation and communication. Providers might make mistakes in drug dosing if stigma or lack of cultural awareness lead to poor communication with patients.^{35–37} For mental health providers on inpatient units, decreased lengths of stay, coupled with administrative responsibilities, raise the likelihood of missing key clinical information, such as medication allergies or general medical comorbidities, that could result in allergic reactions, medication-dosing errors, or medical complications.

Reductions in social workers, nurses, and other ancillary staff may also compromise or impair appropriate treatment.³⁸ Nonpsychiatric providers may lack knowledge about treating persons with mental disorders and may hold stigmatizing beliefs about mental illness. Conversely, practitioners in psychiatry may be ill-equipped to diagnose and treat the comorbid medical conditions prevalent in this population.

System Factors

Institutional structures, processes, operations, and incentives can actually encourage or cause errors and decrease safety. By the same token, well-designed systems are critical in preventing medical errors, in detecting them early, and in mitigating their impact. Mental health systems may be especially, and increasingly, strained and vulnerable to medical errors. As compared to general medical services, mental health care has seen disproportionately large reductions in lengths of stay.³⁹ Inadequate health insurance coverage and a lack of community resources significantly limit the mental health system's ability to offer patients coordinated care as they move through inpatient, outpatient, and specialty-care settings;⁴⁰ for example, following their inpatient stays, patients might not have timely access to appropriate follow-up services.

ERRORS IN MENTAL HEALTH TREATMENT SETTINGS

Persons with mental disorders are at risk for the same broad types of error specified by Leape⁴¹ for the general medical sector—namely, errors in (1) diagnosis, (2) treatment, and (3) prevention, as well as (4) errors related to poor communication and other systems failures. The nature and causes of these errors will be influenced, however, by the unique clinical context relevant specifically to psychiatry. Below, we offer some examples of types of errors that may occur in inpatient and outpatient mental health treatment settings. Then we review the errors in psychiatry that have been discussed in the literature, and suggest methods for reducing these errors.

Errors in diagnosis include delays in formulating appropriate diagnoses, failures to use appropriate techniques for making diagnoses, and failures to act on the results of diagnostic tools.⁴¹ For example, without adequate patient histories available or knowledge of patients' previous levels of functioning, patients admitted on an emergent basis to inpatient psychiatric units complaining of depression could be misdiagnosed with a unipolar, instead of bipolar, depression. These patients, if subsequently treated with antidepressant medications, may be at risk for an aggrava-

tion of manic symptoms. As another example, when admitting patients, psychiatric units might not use the tests available to assess comorbid medical or substance abuse disorders: X-rays to test for tuberculosis in patients who have been homeless, urine drug screens to assess for substance abuse disorders, or blood tests to assess thyroid or other biological functions. A failure to use these diagnostic tools or to examine their results could lead to the mistaken attribution of a mental disorder when the underlying cause of symptoms is a physical health problem. Poor coordination of care between multiple settings—including emergency rooms, community crisis centers, or other levels of care—may place patients at risk for receiving suboptimal intake assessment and diagnostic workups before or after transfer.

Treatment errors include errors in performing procedures, errors in administering treatment and medications, avoidable delays in initiating treatments, and inappropriate care.⁴¹ For example, psychiatry's reliance on psychopharmacology may place patients at an increased risk for adverse drug events. There are few procedures used in psychiatry, but problems may arise in the use of ECT. Additionally, psychiatric units often rely on internal medicine consult services to assess the physical condition of patients. Any delays in the consultation, as well as poor communication between consult staff and attending psychiatrists, may result in significant delays in treating comorbid physical illnesses in psychiatric inpatients. Another example of a treatment error relates to patient oversedation. Inappropriate use of tranquilizers or other medications that may oversedate patients can result in dangerous patient falls.

Preventive errors involve failures to provide prophylactic treatments or other interventions, as well as inadequate monitoring of initiated treatment. These errors are evident in psychiatric inpatient settings with inadequate environmental protections against patient harm—such as no-sharps policies, locked wards, and breakaway hardware in closets. Failure to observe safety policies may result in self-inflicted patient injury, patient elopement, and other injuries. For example, failing to monitor suicidal patients or provide adequate assessment of suicide risk may place patients in danger.

Other errors in mental health treatment settings may result from inadequate communication among patients, family members, and practitioners. Effective communication between these parties is essential to obtain adequate patient histories, to conduct adequate assessments, and to ensure that psychiatric care is directed by patients and their advocates.⁴² Poor coordination of care between inpatient hospital services, or between inpatient, outpatient, and emergency treatment sources, is also a significant threat to adequate continuity of care.

REVIEW OF PSYCHIATRIC ERROR LITERATURE

Little empirical research exists regarding the incidence, types, and causes of medical errors in treating persons with mental disorders. Shore³ suggests medical errors have received less attention in psychiatry because psychiatric practice is intensely private and because a majority of previous research has been done in hospital settings, whereas most psychiatric care is delivered in the community. In addition, psychiatry does not involve the invasive procedures that have gained attention in the media. The minimal existing research examines the errors associated with the most common treatments and the most dangerous outcomes. We summarize these studies examining errors associated with medications, suicide, and seclusion and restraint. We also discuss the studies assessing the risk of error for psychiatric patients in general medical settings.

Medication Errors

A majority of psychiatric treatment involves the use of medications.⁴³ Grasso and colleagues⁴⁴ retrospectively examined the rate of medication errors in a state psychiatric facility during 1448 patient days from a randomly selected sample of discharged patients. This study detected 2194 medication errors, an error rate that is similar to those reported for general care units. Similar to findings from ambulatory and inpatient general medical care, many of the adverse drug events are the result of errors in transcribing prescription orders and in administering drugs. Indeed, a majority (66%) of the errors detected occurred in administering medications to patients. Haw and Stubbs⁴⁵ detected 311 medication-prescribing errors that occurred during one month at a forensic psychiatric hospital in Scotland. The majority of the prescribing errors—87%—resulted from errors in writing the prescriptions, including illegible writing, transcribing errors, and writing incomplete prescriptions. A recent survey of adverse drug events in an inpatient setting indicated the highest rate of adverse drug events occurred on the inpatient psychiatric unit; however, few studies have examined why this increased risk exists for psychiatric patients.^{44–46}

Suicide

Of the nearly 30,000 suicides each year, 5–6% occur in inpatient psychiatric settings.²⁸ In a review conducted by the Joint Commission on Accreditation of Healthcare Organizations²⁸ of 412 sentinel events that occurred in psychiatric hospitals or psychiatric units of general hospitals between 1995 and 1999, suicide was found to account for 89 of the events. The most common methods of suicide in these

settings were jumping from a roof or window, and hanging in a bathroom, bedroom, or closet.

Errors resulting in inpatient suicides may involve disruption of safety protocols such as 15-minute checks, one-on-one staff monitoring, completion of contracts for safety, and environmental protections such as locked units, break-away bars in closets, no-sharps policies, and others. An analysis of 78 inpatient suicides indicated nearly 50% of these patients were being monitored by 15-minute checks or had signed no-harm contracts.⁴⁷ Active and latent failures—such as missing a check on a suicidal patient, and poor documentation and assessment of a patient risk levels—may lead to decreased effectiveness of safety protocols in preventing suicides. In addition, environmental problems (such as break-away bars that do not work) may increase the risk of an inpatient suicide.

Restraint and Seclusion

Restraint and seclusion have been deemed effective strategies for preventing agitated or aggressive patients from harming themselves, other patients, or staff.^{48,49} As with any procedure, however, the use of restraints or seclusion carries risks, and inappropriate use may result in injury or death. Restraint and seclusion drew nationwide attention following an investigative report from the *The Hartford Courant* that between 1988 and 1998, 142 deaths occurred nationwide as a result of physical restraints in psychiatric facilities.⁵⁰

In a study to determine the extent of restraint and seclusion, Crenshaw and Francis⁴⁸ surveyed 101 psychiatric inpatient hospitals and reported that 72 patients were restrained over the course of 1000 patient days and that 66 patients were placed in seclusion during the same time period. Way and Banks⁴⁹ reported that patients who were in the hospital on an involuntary basis and those who were female, under 26, or mentally retarded were more likely to be placed in restraints or placed in seclusion. The Joint Commission,²⁸ in reviewing 20 cases of deaths in psychiatric facilities related to restraint use, reported that 40% were caused by asphyxiation. In that review, other causes of death included strangulation, cardiac arrest, and fires caused by patients trying to burn restraints.

Errors relating to restraint and seclusion result from active and latent failures from misuse of restraint devices or therapeutic hold techniques, as well as failures in monitoring patients in restraints who may be using sharp objects or cigarette lighters to release the restraint device. In addition, patients with asthma, cardiomyopathy, cocaine intoxication, pulmonary hypertension, or coronary artery disease are at increased risk for sudden death by restraint devices.²⁸ Failures in assessing and documenting these risk factors can increase the dangerousness of using restraints.

General Medical Errors Among Persons with Mental Disorders

Two studies have found that persons with mental disorders are likely to be at increased risk for medical errors in nonpsychiatric inpatient medical settings. One recent analysis of hospital discharge data showed that persons with primary diagnosis of schizophrenia were more than two times more likely to experience infections, postoperative respiratory failure, venous thrombosis, and sepsis.⁵¹ Another analysis using data generated from the HMPS indicated that general medical patients with a psychiatric comorbidity were 1.5 times more likely than patients without a psychiatric comorbidity to experience adverse events.⁵²

ERROR REDUCTION

A striking result of the HMPS and other studies is that a majority—58%—of medical errors in health care are preventable.¹² In considering the diffuse nature and causes of errors, the IOM challenged health systems to invest in strategies for the prevention of medical errors. The report shifted the focus of error reduction from blaming bad care on careless professionals, to the idea that well-designed systems will most effectively protect patients from harm. Safeguards put in place at the systems level improve safety by making it difficult for human error to occur, and increase the likelihood that errors will be detected and investigated, and that patient injury from error will be mitigated.

The health system comprises many components, including the physical environment, individual behavior, group behavior, management behavior, legal and regulatory rules, and societal and cultural pressures. Error-reduction strategies may target any one of these components, but must also consider interactions between them.⁵³ At the systems level these strategies should aim to reduce reliance on memory, improve the flow of communication, standardize treatments for specific clinical situations, and improve staff training in direct patient care and in the use of technology and medical devices.¹¹ Examples of error-reduction strategies that have been proposed in the general medical sector include the use of electronic medical records for storing and accessing patient information; use of PDAs to assist physicians in accessing information on medications; computerization of drug ordering; standardization in drug dosing; and decreased work loads.^{1,12,54}

Similar error-reduction strategies will likely be beneficial to mental health treatment settings. Many of the methods developed for reducing errors in general medical settings should be directly applicable to reducing error rates among persons with mental disorders treated in mental health settings. As in the case of any high-risk population, however, it is also important for these general health systems to iden-

tify persons with mental disorders, to monitor them closely, and to ensure they receive the care that they need. Recognizing that persons with mental disorders are a vulnerable population at elevated risk for errors is a critical first step in seeking to reduce those errors.

In order to decrease medication errors and thereby increase the safety of pharmacological treatment, recommended steps include eliminating errors in entering physician orders; increased pharmacist support; and standardized dosing. Improving clinical guidelines and disseminating these guidelines to mental health clinicians will also help to ensure appropriate dosing of medications. Grasso and colleagues⁵⁵ recently reported that use of PDA-generated post-discharge medication orders in a state psychiatric facility reduced the number of errors in these orders by 14%.

Risk-reduction strategies for suicide include using sensitive and standardized procedures to assess suicidality, training frontline staff on the use of assessment and safety precautions, removing ineffective or non-breakaway hardware, educating families on contraband that may heighten the risk of suicide, and designing safe environments by using adequate locking mechanisms, patient monitors, alarms, or technology that allows for continuous monitoring of suicidal patients.²⁸ Although research has identified a series of risk factors for suicide, more research is necessary to develop sensitive assessment and effective prevention techniques.^{56,57}

Reducing error in the use of restraint and seclusion requires that staff be adequately trained on alternative methods for deescalating patient violence and on the safe and correct use of devices or procedures for patient “take down.” Continuous monitoring of restrained patients may also reduce the risk of injury related to patients who try to deactivate restraint devices.

Error reduction and mitigation is dependent on learning from our mistakes. Adequate measurement of performance, collection of data on errors, and analysis of this data in mental health settings are crucial for improving safety.⁵⁸ Detection of medical errors is facilitated by independent review of medical records and through self-report from practitioners and staff. Several studies have demonstrated that independent review detects far more errors than self-report;^{44,59,60} for example, in a state psychiatric facility, an independent review of patient charts detected many more errors than self-report, by a ratio of 244 to 1.⁴⁴ Self-report of medical errors is hindered by providers’ fear of punishment or accusations of negligence; members of the public and many health professionals support significant sanctions for professionals perceived as causing serious medical errors.⁶¹ Consequently, although practitioners often report a great deal of willingness to report errors, few actually do.⁶² As such, error reduction in psychiatry and other fields will be facilitated by implementation of nonpunitive and anonymous reporting systems.

In the general medical sector, several national movements to reduce medical errors are building. The American Medical Association formed the National Patient Safety Foundation, which is aimed both at developing core knowledge on errors in medicine and at increasing public awareness of errors. The Agency for Healthcare Quality and Research recently identified a number of patient-safety indicators to be used for monitoring errors in health care settings.^{12,51} Other organizations, including the Veterans Health Administration and the Institute for Healthcare Improvement, are following suit by formulating error-reduction strategies.⁶³ Leape and Berwick¹² commented that while progress since the publication of *To Err Is Human* has been slow, it “changed the conversation to a focus on changing systems, stimulated a broad array of stakeholders to engage in patient safety, and motivated hospitals to adopt new safe practices.” However, none of these initiatives are examining error in psychiatry.

CONCLUSION

In order to determine why errors occur and to design measures for improving patient safety, it is necessary to understand the patterns underlying how people, teams, and organizations communicate information, coordinate activities, and solve problems.⁶⁴ Other medical disciplines have used research identifying and understanding medical errors to greatly improve the care they deliver. For instance, the field of anesthesiology has reduced its poor outcomes resulting from errors by 95% in 15 years.⁶⁵ This success may provide lessons for mental health care, and if we are to lower error rates, the first step is to use empirical data to better understand the patient, provider, and system factors contributing to errors in patients with mental disorders.

As we develop information on the nature, incidence, and impact of medical errors in psychiatry, we can begin to build, in the process, a culture of safety in mental health treatment settings. Future research should first describe the nature and incidence of errors in psychiatry in inpatient and community settings. Increased attention to medical error in psychiatry also calls for the mobilization of patient advocates and professional organizations to encourage increased funding and public support for addressing these crucial issues of patient safety. Further efforts within public and private interest groups, government agencies, and academic institutions are necessary to build a strategic plan for reducing errors in psychiatry.

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