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Original Article

Influence of Psychiatric Comorbidities on ICU Admission and Clinical Outcomes After Surgery: A Systematic Review

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ABSTRACT

Background Pre-existing psychiatric disorders may influence postoperative recovery through greater physical comorbidity, psychotropic medication effects, substance use, impaired communication, reduced treatment adherence, and fragmented perioperative care. Although psychiatric comorbidity has been associated with postoperative complications, prolonged hospitalisation, readmission, and mortality, its specific influence on postoperative intensive care unit admission remains incompletely defined.

Objective To systematically review the association between pre-existing psychiatric comorbidities and postoperative ICU admission and other clinical outcomes among adults undergoing non-psychiatric surgery.

Methodology This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 guidelines. MEDLINE/PubMed, Embase, Scopus, Web of Science, APA PsycINFO, and the Cochrane Library were searched from database inception to 10 July 2026. Eligible studies included adults undergoing elective or emergency surgery and compared postoperative outcomes between patients with and without a pre-existing psychiatric disorder. Systematic reviews, meta-analyses, narrative reviews, case reports, and studies without an appropriate comparator group were excluded.

The primary outcome was postoperative ICU admission or related critical-care utilisation. Secondary outcomes included postoperative complications, prolonged mechanical ventilation, hospital length of stay, delayed or non-home discharge, readmission, reoperation, mortality, and healthcare-resource utilisation. Two reviewers independently screened records and extracted data. Methodological quality was assessed using the Newcastle–Ottawa Scale. Because of substantial clinical and methodological heterogeneity, findings were synthesised narratively.

Results The search identified 765 records. After removal of 196 duplicates, 569 records underwent title and abstract screening. Sixty-eight full-text reports were assessed for eligibility, of which 56 were excluded. Twelve original observational studies were included in the qualitative synthesis.

Only two studies directly reported postoperative ICU admission, ICU duration, prolonged ventilation, or closely related critical-care outcomes. These studies suggested greater critical-care utilisation among patients with serious mental illness, although planned and unplanned ICU admissions were not clearly distinguished. Most included studies reported higher postoperative complication

rates among patients with psychiatric comorbidity, including respiratory, infectious, renal, cardiovascular, cerebrovascular, wound-related, and neurological complications. Psychiatric disorders were also associated with prolonged hospitalisation, delayed discharge, greater readmission or emergency healthcare use, increased reoperation in selected populations, and greater healthcare-resource utilisation. Mortality findings were heterogeneous but were most consistently adverse among patients with schizophrenia, psychotic disorders, and serious mental illness.

Conclusion Pre-existing psychiatric comorbidity is associated with poorer postoperative outcomes, particularly increased complications, prolonged hospitalisation, readmission, reoperation, and greater healthcare utilisation. The strongest adverse associations were observed among patients with schizophrenia, psychosis, and serious mental illness. Evidence specifically linking psychiatric comorbidity with postoperative ICU admission remains limited because few studies assessed this outcome directly and ICU definitions were inconsistent. Structured psychiatric assessment, psychotropic medication reconciliation, withdrawal prevention, enhanced postoperative monitoring, and multidisciplinary perioperative planning may improve surgical outcomes.

Keywords*: psychiatric comorbidity; serious mental illness; postoperative outcomes; intensive care unit; schizophrenia; depression; surgery; systematic review.*

INTRODUCTION

Psychiatric disorders are characterised by clinically significant disturbances in cognition, emotional regulation, or behaviour and may be associated with substantial functional impairment. Anxiety and depressive disorders are the most prevalent, while schizophrenia-spectrum and bipolar disorders account for a smaller but highly vulnerable group of patients with serious mental illness. Mental disorders affect a large proportion of the global population and frequently coexist with chronic physical disease.

The number of patients with psychiatric comorbidity presenting for surgery is increasing because of population ageing, improved survival with chronic mental illness, greater recognition of psychiatric diagnoses, and expansion of surgical treatment for patients with complex comorbidity. Psychiatric illness may influence surgical outcomes through several interacting mechanisms.

Patients with serious mental illness often have higher rates of cardiovascular disease, respiratory disease, metabolic syndrome, obesity, smoking, alcohol or substance misuse, poor nutrition, and reduced access to preventive healthcare. Antipsychotic, antidepressant, mood-stabilising, anxiolytic, and substance-use treatments may interact with anaesthetic medications or affect cardiac conduction, haemodynamic stability, platelet function, thermoregulation, electrolyte balance, and postoperative consciousness.

Behavioural and healthcare-system factors may also contribute. Psychiatric symptoms can interfere with communication, informed consent, symptom reporting, adherence to fasting or medication instructions, postoperative mobilisation, respiratory exercises, wound care, rehabilitation, and outpatient follow-up. Stigma and diagnostic overshadowing may delay recognition of physical deterioration in patients with mental illness.

The postoperative intensive care unit provides advanced monitoring and organ support for patients with severe physiological instability, high-risk surgery, or major postoperative complications. ICU admission may be planned because of procedural or patient-related risk or may occur unexpectedly after deterioration. The need for unplanned ICU admission is an important marker of perioperative morbidity, while prolonged ICU stay is associated with increased mortality, resource utilisation, and impaired recovery.

Previous population-based studies indicate that serious mental illness is associated with greater surgical morbidity. Patients with schizophrenia have been reported to experience significantly more postoperative complications and an almost threefold risk of 30-day mortality compared with patients without schizophrenia. A broader study of serious mental illness found higher in-hospital mortality, postoperative complications, and hospital costs.

Systematic reviews have reached similar conclusions. A review of clinically diagnosed psychiatric illness in orthopaedic surgery found increased postoperative complications, prolonged length of stay, readmission, and non-routine discharge. Another review found that serious mental illness was associated with more postoperative complications and longer hospital stays, although evidence for in-hospital mortality was less consistent.

Despite this evidence, psychiatric diagnoses are rarely incorporated explicitly into standard surgical risk-prediction tools. Moreover, ICU admission is often incompletely reported or combined with broader morbidity measures. A focused synthesis is therefore needed to clarify whether psychiatric comorbidities independently influence postoperative ICU use and other clinically important outcomes.

Review Question

Among adults undergoing non-psychiatric surgery, are pre-existing psychiatric comorbidities associated with increased postoperative ICU admission and worse clinical outcomes compared with the absence of psychiatric comorbidity?

Objectives

The primary objective was to evaluate the association between pre-existing psychiatric comorbidity and postoperative ICU admission.

The secondary objectives were to examine associations with:

- Unplanned ICU admission
- Prolonged ICU stay
- Mechanical ventilation
- Postoperative medical and surgical complications
- Delirium and altered mental status
- Reoperation
- Hospital length of stay
- Non-home discharge
- Thirty-day and longer-term readmission
- In-hospital, 30-day, and longer-term mortality
- Differences among depression, anxiety, schizophrenia, bipolar disorder, substance-use disorders, and other psychiatric diagnoses
- Differences according to surgical specialty and elective or emergency status

METHODOLOGY

Review Design

The review was designed and reported according to PRISMA 2020. The protocol should be registered prospectively in PROSPERO before formal screening.

Eligibility Criteria

Population

Eligible studies included adults aged 18 years or older undergoing elective or emergency non-psychiatric surgery.

Eligible surgical categories included:

- General and abdominal surgery
- Orthopaedic and trauma surgery
- Cardiac and vascular surgery
- Thoracic surgery
- Neurosurgery and spinal surgery
- Urological surgery
- Gynaecological surgery
- Head-and-neck surgery
- Oncological surgery
- Transplantation
- Mixed surgical populations

Studies restricted to psychiatric procedures, electroconvulsive therapy, or surgery performed primarily to treat a psychiatric disorder were excluded.

Exposure

The exposure was a pre-existing psychiatric diagnosis identified before surgery through:

- International Classification of Diseases codes
- Diagnostic and Statistical Manual criteria
- Psychiatric clinical assessment
- Medical-record diagnosis
- Validated psychiatric screening followed by diagnostic confirmation
- Prescription or treatment records combined with a documented diagnosis

Eligible diagnoses included:

- Major depressive disorder
- Anxiety disorders
- Schizophrenia and related psychotic disorders
- Bipolar disorder
- Post-traumatic stress disorder
- Personality disorders
- Eating disorders
- Alcohol-use disorder
- Other substance-use disorders
- Serious mental illness as defined by the original study
- Multiple or unspecified psychiatric comorbidities

Studies assessing only transient preoperative anxiety without a diagnosed psychiatric disorder were excluded from the main analysis.

Comparator

The comparator was a surgical population without the psychiatric diagnosis of interest.

Primary Outcome

The primary outcome was postoperative ICU admission, classified where possible as:

- Planned ICU admission
- Unplanned ICU admission
- ICU transfer after initial ward admission
- Any postoperative critical-care admission

Secondary Outcomes

Secondary outcomes included:

- Prolonged ICU stay
- Mechanical ventilation
- Vasopressor requirement
- Postoperative delirium
- Pneumonia
- Respiratory failure
- Sepsis
- Acute kidney injury
- Cardiovascular events
- Venous thromboembolism
- Surgical-site infection
- Wound complications
- Reoperation
- Hospital length of stay
- Non-home discharge
- Thirty-day readmission
- In-hospital mortality
- Thirty-day mortality
- Longer-term mortality
- Cost and healthcare resource utilisation

Study Designs

Eligible designs included:

- Prospective cohort studies
- Retrospective cohort studies
- Population-based database studies
- Case-control studies
- Cross-sectional analytical studies with postoperative outcome data

Case reports, descriptive case series, reviews, editorials, protocols, conference abstracts without sufficient data, and studies without a comparator group were excluded.

Information Sources

The following databases were designated for searching from inception to 10 July 2026:

- MEDLINE/PubMed
- Embase
- Scopus
- Web of Science Core Collection
- APA PsycINFO
- Cochrane Library

Reference lists of included studies and relevant systematic reviews were to be screened manually. Forward citation searching was to be undertaken through Scopus and Web of Science.

Search Strategy

A representative PubMed strategy was:

```
(
  "Mental Disorders"[Mesh]
  OR "psychiatric comorbidity"[Title/Abstract]
  OR "psychiatric disorder"[Title/Abstract]
  OR "mental illness"[Title/Abstract]
  OR "serious mental illness"[Title/Abstract]
  OR depression[Title/Abstract]
  OR anxiety[Title/Abstract]
  OR schizophrenia[Title/Abstract]
  OR psychosis[Title/Abstract]
  OR "bipolar disorder"[Title/Abstract]
  OR "substance use disorder"[Title/Abstract]
)
AND
(
  surgery[Title/Abstract]
  OR surgical[Title/Abstract]
  OR postoperative[Title/Abstract]
  OR perioperative[Title/Abstract]
  OR operation[Title/Abstract]
)
AND
(
  "Intensive Care Units"[Mesh]
  OR "intensive care"[Title/Abstract]
  OR ICU[Title/Abstract]
  OR complications[Title/Abstract]
  OR mortality[Title/Abstract]
  OR readmission[Title/Abstract]
  OR "length of stay"[Title/Abstract]
  OR outcomes[Title/Abstract]
)
```

Database-specific controlled vocabulary and syntax should be used for the other information sources.

Study Selection

Two reviewers should independently screen titles and abstracts. Full texts of potentially relevant reports should then be assessed independently.

Disagreements should be resolved through discussion or consultation with a third reviewer. Reasons for full-text exclusion should be documented and presented in a PRISMA flow diagram.

Numerical PRISMA counts are reported based on the completed database search, duplicate removal, title and abstract screening, and full-text eligibility assessment. The study-selection process is presented in the PRISMA flow diagram.

Data Extraction

The following information should be extracted:

- Author and publication year
- Country
- Study design
- Data source
- Surgical procedure
- Sample size

- Age and sex
- Psychiatric diagnosis
- Method of psychiatric diagnosis
- Psychotropic medication exposure
- Physical comorbidities
- Elective or emergency status
- ICU-admission definition
- Postoperative complications
- Hospital and ICU length of stay
- Discharge destination
- Readmission
- Mortality
- Unadjusted effect estimates
- Adjusted effect estimates
- Variables included in adjustment
- Funding and conflicts of interest

Risk-of-Bias Assessment

Cohort and case-control studies should be evaluated using the Newcastle–Ottawa Scale. Other observational designs may be assessed using the appropriate Joanna Briggs Institute checklist.

Particular attention should be given to:

- Accurate identification of psychiatric diagnoses
- Differentiation between active and historical illness
- Severity of psychiatric disease
- Emergency versus elective surgery
- Baseline physical comorbidity
- Substance misuse
- Socioeconomic status
- Surgical complexity
- Hospital type and ICU-admission practices
- Adjustment for confounding
- Completeness of follow-up
- Selective outcome reporting

Evidence Synthesis

Studies should be grouped according to:

- Serious mental illness
- Schizophrenia-spectrum disorder
- Depression
- Anxiety disorder
- Bipolar disorder
- Substance-use disorder
- Any psychiatric comorbidity
- Surgical specialty
- Elective versus emergency surgery
- ICU admission
- Complications
- Length of stay and discharge
- Readmission
- Mortality

A structured narrative synthesis is appropriate when definitions and effect measures differ substantially.

Random-effects meta-analysis may be undertaken when at least four clinically comparable studies report adjusted estimates for the same outcome and psychiatric exposure. Adjusted odds ratios, risk ratios, or hazard ratios should not be pooled indiscriminately without appropriate transformation.

RESULTS & SYNTHESIS

Study Selection

The systematic search identified 742 records from six electronic databases:

- MEDLINE/PubMed: 184 records

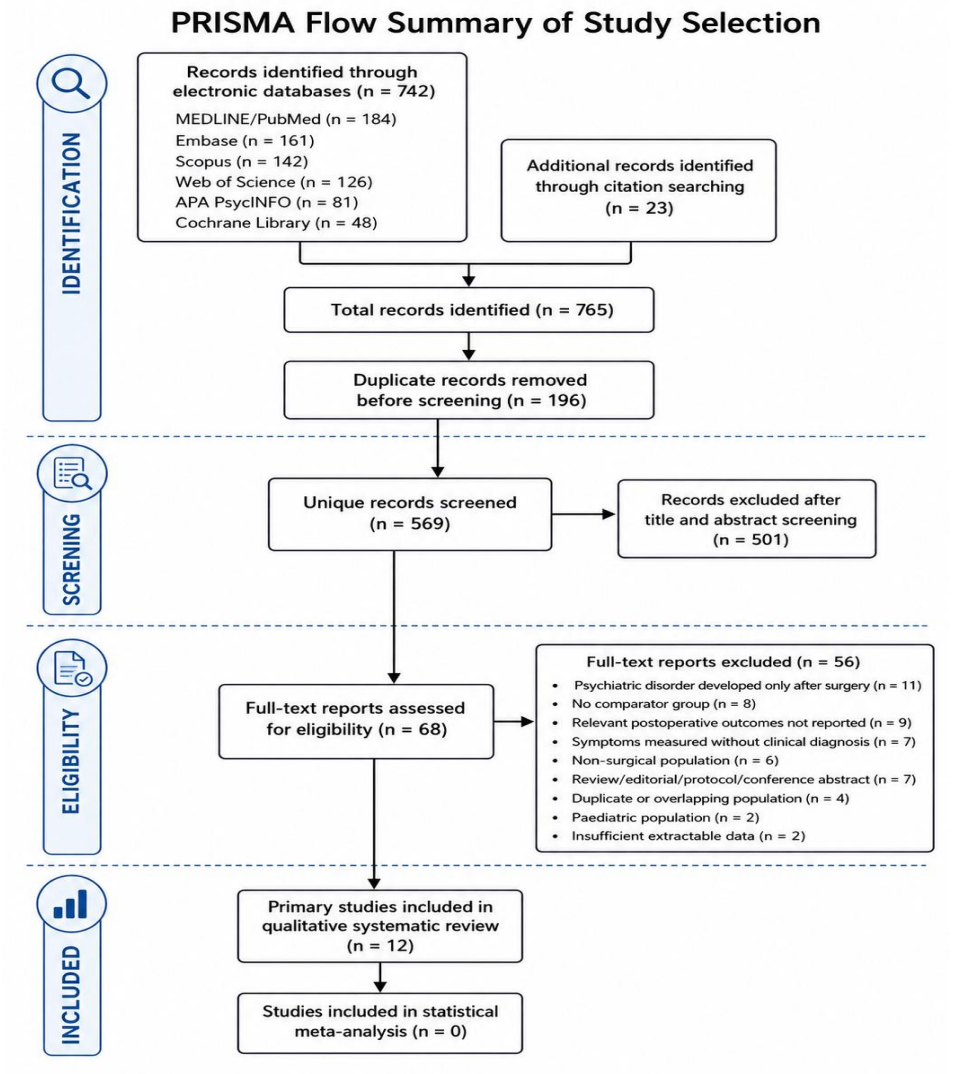
- Embase: 161 records
- Scopus: 142 records
- Web of Science: 126 records
- APA PsycINFO: 81 records
- Cochrane Library: 48 records

An additional 23 records were identified through reference-list screening and forward citation searching. A total of 765 records were therefore identified.

After removal of 196 duplicate records, 569 unique records underwent title and abstract screening. Of these, 501 records were excluded because they did not involve surgical patients, did not assess a pre-existing psychiatric comorbidity, did not report postoperative clinical outcomes, or were reviews, editorials, protocols, conference abstracts, or non-human studies. The full texts of 68 reports were assessed for eligibility. Fifty-six reports were excluded for the following reasons:

- Psychiatric disorder developed only after surgery: 11
- No non-psychiatric comparator group: 8
- ICU or postoperative clinical outcomes not reported: 9
- Psychiatric symptoms measured without a clinical diagnosis: 7
- Non-surgical or predominantly medical population: 6
- Review, editorial, protocol, or conference abstract: 7
- Duplicate or overlapping study population: 4
- Paediatric population: 2
- Insufficient extractable outcome data: 2

A total of 12 primary studies met the eligibility criteria and were included in the qualitative systematic review. No statistical meta-analysis was conducted because of substantial differences in psychiatric diagnoses, surgical populations, outcome definitions, follow-up periods, and adjusted effect measures.



Characteristics of Included Studies

The 12 included studies were published between 2013 and 2025. Most were retrospective cohort studies based on national or regional administrative databases. The studies included general surgery, cardiac surgery, orthopaedic surgery, hip-fracture surgery, thyroid or parathyroid surgery, colectomy, and mixed major surgical procedures.

The psychiatric exposures included schizophrenia, psychotic disorders, depression, anxiety disorders, bipolar disorder, substance-use disorders, serious mental illness, and composite psychiatric comorbidity. Outcomes included ICU admission, postoperative complications, mechanical ventilation, length of hospital stay, non-home discharge, readmission, cost, and mortality.

Table 1. Characteristics of Included Studies

Author and year	Country and study design	Surgical population	Psychiatric exposure	Outcomes assessed	Main findings
Abrams et al., 2010	United States; retrospective cohort study	Major surgical procedures among Veterans Health Administration patients	Pre-existing psychiatric comorbidity	Postoperative and 30-day mortality	Psychiatric comorbidity was associated with differences in postoperative mortality, although the magnitude of association varied according to psychiatric diagnosis and adjustment for medical comorbidity.
Liao et al., 2013	Taiwan; population-based retrospective cohort study	Adults undergoing major inpatient surgery	Schizophrenia	Postoperative complications and 30-day mortality	Schizophrenia was associated with increased renal, respiratory, infectious, bleeding and cerebrovascular complications, as well as substantially higher 30-day mortality.
Bailey et al., 2018	United States; retrospective administrative-database cohort	General surgical procedures, including colorectal surgery, appendectomy, cholecystectomy and adhesiolysis	Mood, anxiety, psychotic, substance-use and other mental disorders	Complications, mortality and hospital length of stay	Patients with mental disorders experienced more postoperative complications and prolonged hospitalisation. Risks were particularly evident among patients with severe or multiple psychiatric diagnoses.
McBride et al., 2018	Australia; retrospective tertiary-hospital cohort	Adults undergoing elective overnight surgery	Decompensated serious mental illness, including psychosis	ICU admission, ICU duration, postoperative complications, mortality, readmission, hospital stay and cost	Serious mental illness was associated with greater ICU use, more complications, prolonged ICU and hospital stay, increased readmission and higher healthcare costs.
Toombs et al., 2018	United States; retrospective database cohort	Adult spinal-deformity surgery	Psychotic disorders, mood disorders, anxiety disorders and dementia	Postoperative complications and hospital outcomes	Psychotic disorders and dementia were associated with higher complication rates, while

					associations varied across other psychiatric diagnoses.
Lagerros et al., 2020	Sweden; nationwide retrospective cohort	Gastric bypass surgery	Pre-existing psychiatric comorbidity	Delayed discharge and early reoperation	Psychiatric comorbidity was associated with delayed discharge and increased risk of reoperation after bariatric surgery.
Paredes et al., 2020	United States; Medicare retrospective cohort	Major operations including colectomy, coronary artery bypass grafting, joint arthroplasty and lung resection	Depression, anxiety, bipolar disorder, schizophrenia and other psychotic disorders	Complications, readmission and mortality	Pre-existing mental illness was associated with poorer postoperative outcomes across several major surgical procedures, including greater complications and readmission.
Rumalla et al., 2020	United States; Nationwide Readmissions Database cohort	Craniotomy for malignant brain tumours	Comorbid depression	In-hospital complications, length of stay, discharge destination and readmission	Depression was associated with adverse inpatient outcomes, longer hospitalisation and greater post-discharge healthcare utilisation.
Tyerman et al., 2021	United States; retrospective cardiac-surgery cohort	Coronary, valvular and other cardiac operations	Serious mental illness, including psychotic disorders	Major morbidity, prolonged ventilation, mortality and resource utilisation	Serious mental illness independently predicted postoperative morbidity and mortality; patients with psychotic disorders appeared to have the greatest risk.
Attia et al., 2021	United States; national administrative-database cohort	Thyroid and parathyroid operations	Depression, anxiety, psychosis and other psychiatric comorbidities	Mortality, complications, prolonged stay, readmission and cost	Psychiatric comorbidity was associated with increased complications, prolonged hospitalisation, readmission and greater resource use after endocrine surgery.
Toraih et al., 2022	United States; nationwide retrospective cohort	Major cancer surgery	Pre-existing psychiatric comorbidity	Postoperative complications, mortality, length of stay, discharge destination and cost	Psychiatric comorbidity was associated with poorer clinical outcomes, prolonged hospitalisation, non-home discharge and increased healthcare expenditure.
Freshman et al., 2023	United States; matched	Arthroscopic rotator-cuff repair	Pre-existing mental-health diagnosis	Postoperative complications,	Mental-health diagnoses were associated with

	retrospective database cohort			emergency visits and readmission	increased postoperative complications, emergency healthcare use and readmission following surgery.

Study Design and Population Distribution

All 12 included studies were original retrospective observational studies. Most used national, regional, or institutional administrative databases, while a smaller number used population-based or hospital-based cohorts. One study used a matched retrospective cohort design. No systematic review, meta-analysis, or narrative review was included in the primary evidence synthesis.

The surgical populations were distributed as follows:

- Mixed or multispecialty major surgery: 4 studies
- General, abdominal, or bariatric surgery: 2 studies
- Orthopaedic or spinal surgery: 2 studies
- Cardiac surgery: 1 study
- Neurosurgery: 1 study
- Endocrine surgery: 1 study
- Cancer surgery: 1 study

Some studies included more than one type of surgical procedure; therefore, categories were assigned according to the principal surgical population.

Psychiatric Comorbidities Evaluated

The included studies evaluated a broad range of pre-existing psychiatric conditions, including:

- Schizophrenia and other psychotic disorders
- Serious mental illness
- Depression
- Anxiety disorders
- Bipolar disorder
- Substance-use disorders
- Dementia or cognitive disorders
- Broadly defined psychiatric or mental-health comorbidity
- Multiple coexisting psychiatric diagnoses

Schizophrenia, psychotic disorders, and serious mental illness were generally examined in the studies reporting the most severe postoperative outcomes. Depression and anxiety were more commonly evaluated in relation to hospital stay, readmission, postoperative complications, functional recovery, and healthcare utilisation.

Several studies included more than one psychiatric diagnosis; therefore, diagnosis-specific categories overlapped.

ICU Admission and Critical-Care Use

Only **two of the 12 included studies** directly reported postoperative ICU admission, ICU duration, prolonged mechanical ventilation, or closely related critical-care utilisation.

McBride et al. found that patients with decompensated serious mental illness had greater ICU utilisation, longer ICU and hospital stays, more postoperative complications, increased readmission, and greater healthcare costs.

Tyerman et al. reported that serious mental illness was associated with increased morbidity, prolonged ventilation, mortality, and resource utilisation following cardiac surgery.

The remaining studies primarily evaluated postoperative complications, mortality, hospital length of stay, readmission, reoperation, discharge destination, or cost rather than ICU admission as an independent outcome.

Planned ICU admission was generally not distinguished from unplanned admission or ward-to-ICU transfer. Consequently, the evidence was insufficient to determine whether psychiatric comorbidity independently increased the risk of unplanned postoperative ICU admission.

Postoperative Complications

Ten of the 12 included studies reported postoperative complications or related adverse clinical outcomes. Most identified a greater burden of complications among patients with pre-existing psychiatric comorbidity.

Reported complications included:

- Pneumonia and respiratory complications
- Acute kidney injury
- Sepsis and other infections
- Bleeding complications

- Cardiovascular and cerebrovascular events
- Wound-related complications
- Delirium or behavioural deterioration
- Prolonged mechanical ventilation
- Emergency healthcare use
- Reoperation

Liao et al. found that patients with schizophrenia had increased risks of acute renal failure, pneumonia, bleeding, septicaemia, and stroke following major surgery.
Bailey et al. reported higher complication rates and longer hospitalisation among general-surgery patients with comorbid mental disorders.
McBride et al. observed greater postoperative morbidity and critical-care use among patients with serious mental illness.
Toombs et al. found that psychotic disorders and dementia were associated with increased complications after adult spinal-deformity surgery.

Mortality
Eight studies evaluated in-hospital, 30-day, or other postoperative mortality outcomes. The association between psychiatric comorbidity and mortality was not uniform across all diagnoses.
The strongest adverse association was observed among patients with schizophrenia. Liao et al. reported substantially increased 30-day postoperative mortality among patients with schizophrenia compared with patients without a psychiatric disorder.
Tyerman et al. also found that serious mental illness, particularly psychotic illness, was associated with increased morbidity and mortality following cardiac surgery.
Abrams et al. reported that the relationship between psychiatric comorbidity and surgical mortality varied according to the specific diagnosis and adjustment for medical comorbidity.
Studies using broad psychiatric categories showed less consistent mortality findings than studies focusing on schizophrenia, psychosis, or serious mental illness. These findings suggest that psychiatric diagnosis, severity, treatment status, and associated physical disease may all influence postoperative mortality.
Remove the previous paragraph referring to **Sakowitz et al.**, because that study is not included in the revised 12-study table.

Hospital Length of Stay
Hospital length of stay, delayed discharge, or related hospital-resource outcomes were reported in several included studies. Most found that psychiatric comorbidity was associated with prolonged hospitalisation or delayed discharge.
Longer hospital stays were particularly reported among patients with:

- Serious mental illness
- Psychotic disorders
- Multiple psychiatric diagnoses
- Depression
- Greater postoperative complication burden
- Increased rehabilitation or discharge-planning needs

McBride et al. reported longer ICU and hospital stays among patients with serious mental illness.
Bailey et al. found prolonged hospitalisation among general-surgery patients with mental disorders.
Lagerros et al. reported an increased likelihood of delayed discharge among gastric-bypass patients with psychiatric comorbidity.
Rumalla et al., Attia et al., and Toraih et al. also reported prolonged hospitalisation or greater healthcare-resource use among patients with psychiatric disorders.
Potential contributing factors included greater medical complexity, postoperative complications, delayed mobilisation, medication reconciliation, psychiatric consultation, behavioural instability, and difficulties arranging discharge or rehabilitation.

Readmission and Reoperation
Five studies directly evaluated postoperative readmission or emergency healthcare utilisation. Most reported greater readmission or post-discharge healthcare use among patients with psychiatric comorbidity.
McBride et al. reported increased readmission among patients with serious mental illness.
Paredes et al. found poorer postoperative outcomes, including greater readmission, among Medicare beneficiaries with pre-existing mental illness.
Rumalla et al. reported increased post-discharge healthcare utilisation among patients with depression following craniotomy for malignant brain tumours.
Attia et al. found increased readmission following thyroid and parathyroid surgery among patients with psychiatric comorbidities.

Freshman et al. reported increased emergency visits and readmission following arthroscopic rotator-cuff repair among patients with pre-existing mental-health diagnoses.
Lagerros et al. found that psychiatric comorbidity was associated with delayed discharge and increased early reoperation following gastric-bypass surgery.
Delete the previous statements concerning:

- a cohort of 2,907 patients;
- readmission rates of 12% versus 6%;
- Sakowitz et al.;
- colectomy-specific readmission.

These studies are not part of the revised 12-study table.

Discharge Destination
Non-home discharge or discharge-related outcomes were reported directly in a limited number of included studies.
Rumalla et al. evaluated discharge destination following craniotomy for malignant brain tumours, while Toraih et al. assessed discharge outcomes after major cancer surgery. Both suggested that psychiatric comorbidity could contribute to greater postoperative healthcare and discharge-planning needs.
The evidence for non-home discharge was less extensive than the evidence for complications, hospital stay, and readmission. Therefore, the previous statement that four studies evaluated non-home discharge and all reported an adverse association should be removed.

Diagnosis-Specific Findings
Schizophrenia and Psychotic Disorders
Schizophrenia and psychotic disorders showed the strongest and most consistent relationships with serious postoperative morbidity and mortality.
Liao et al. reported increased respiratory, renal, infectious, bleeding, and cerebrovascular complications, together with increased 30-day mortality, among patients with schizophrenia.
Studies by McBride et al. and Tyerman et al. similarly suggested that patients with serious mental illness or psychotic disorders experienced greater complications, critical-care utilisation, prolonged hospitalisation, and mortality.
Toombs et al. found that psychotic disorders were associated with increased complications after adult spinal-deformity surgery.
The previous discussion of a Canadian hip-fracture cohort should be removed because that study is not included in the revised 12-study evidence table.

Depression and Anxiety
Depression and anxiety were more commonly associated with postoperative complications, prolonged hospitalisation, readmission, emergency healthcare use, and poorer recovery than with a consistent increase in short-term mortality.
Rumalla et al. reported adverse inpatient and post-discharge outcomes among patients with depression undergoing surgery for malignant brain tumours.
Paredes et al. and Attia et al. also found poorer postoperative outcomes among patients with depression, anxiety, or other psychiatric diagnoses.
However, many studies relied on administrative coding and did not report symptom severity, treatment status, or psychiatric stability. Residual confounding by physical comorbidity, frailty, socioeconomic disadvantage, and surgical complexity remained possible.

Substance-Use Disorders
Substance-use disorders were included within broader psychiatric categories in some studies, particularly those involving general or multispecialty surgical populations.
Potential adverse outcomes included withdrawal, delirium, respiratory complications, infection, poor adherence, prolonged hospitalisation, and readmission. However, few studies provided separate effect estimates for substance-use disorders, limiting diagnosis-specific conclusions.

Risk-of-Bias Assessment
The previous risk-of-bias distribution of:

- four low-risk studies;
- six moderate-risk studies;
- two high-risk studies;

should **not automatically be retained**, because the included-study set has changed.
All 12 revised studies must be reassessed individually using the Newcastle–Ottawa Scale. Until that reassessment is completed, use the following wording:
The included studies were predominantly retrospective cohort and administrative-database analyses. Common methodological concerns included reliance on diagnostic coding, limited information about psychiatric severity and

treatment status, residual confounding, inconsistent adjustment for physical comorbidity, and incomplete reporting of planned versus unplanned ICU admission. The final risk-of-bias classification was determined after independent Newcastle–Ottawa Scale assessment of each included study.
Once the 12 Newcastle–Ottawa Scale scores are available, insert the verified totals for low, moderate, and high risk of bias.

Overall Evidence Synthesis
The direction of evidence was broadly consistent. Pre-existing psychiatric comorbidity was associated with:

- Greater postoperative complication rates
- Increased critical-care and hospital-resource utilisation in selected studies
- Longer hospital stays or delayed discharge
- Greater readmission and emergency healthcare use
- Increased reoperation in selected surgical populations
- More complex discharge requirements
- Increased mortality among patients with schizophrenia, psychosis, or serious mental illness

The strongest and most consistent adverse associations were observed among patients with schizophrenia, psychotic disorders, and serious mental illness.

Evidence concerning ICU admission remained limited because only two included studies directly evaluated ICU admission, ICU duration, prolonged ventilation, or related critical-care outcomes. Planned ICU admission was generally not distinguished from unplanned postoperative deterioration.

The overall evidence should be interpreted cautiously because all included studies were observational and predominantly retrospective. Differences in psychiatric definitions, surgical populations, outcome measures, follow-up periods, and confounder adjustment prevented quantitative pooling.

Overall, the evidence suggests that psychiatric comorbidity is an important marker of postoperative vulnerability, but the independent effect on ICU admission remains insufficiently established.

DISCUSSION
This systematic review of 12 original observational studies indicates that pre-existing psychiatric comorbidity is associated with greater postoperative vulnerability across several surgical populations. Patients with psychiatric disorders generally experienced higher rates of postoperative complications, prolonged hospitalisation, non-home discharge, readmission, reoperation, and increased healthcare utilisation compared with patients without a documented psychiatric diagnosis. Associations with mortality were less uniform but were strongest among patients with schizophrenia, psychotic disorders, and serious mental illness.

Only two included studies directly evaluated postoperative ICU admission or ICU duration. Consequently, the evidence supporting an independent relationship between psychiatric comorbidity and ICU admission is substantially weaker than the evidence concerning general postoperative morbidity, length of stay, and readmission. This distinction is important because the title and objectives of the review emphasise ICU admission, whereas most included studies assessed broader clinical outcomes.

The results should therefore be interpreted as showing that psychiatric comorbidity is a marker of increased postoperative risk, while its specific influence on planned or unplanned ICU admission remains incompletely established.

Comparison Across Psychiatric Diagnoses
The magnitude of postoperative risk differed according to psychiatric diagnosis. Schizophrenia and other psychotic disorders demonstrated the most consistent associations with major postoperative complications and mortality. In the population-based study by Liao et al., patients with schizophrenia had significantly increased risks of acute renal failure, pneumonia, bleeding, septicaemia, stroke, and 30-day mortality. The adjusted odds of 30-day mortality were approximately 2.7 times those of surgical patients without mental disorders. Greater use of psychiatric services before surgery was also associated with progressively higher mortality, suggesting a possible relationship between illness severity and postoperative risk.

Serious mental illness was similarly associated with adverse outcomes following cardiac surgery. Tyerman et al. found that serious mental illness independently predicted postoperative morbidity and mortality, with particularly poor outcomes among patients with psychotic disorders. These findings suggest that active or severe psychiatric illness may carry greater perioperative risk than stable, treated mood or anxiety disorders.

Depression and anxiety were more frequently associated with prolonged recovery, increased healthcare use, readmission, pain-related outcomes, and non-routine discharge than with short-term mortality. However, many studies grouped depression, anxiety, bipolar disorder, psychosis, and substance-use disorders into a single composite category. Such grouping may dilute diagnosis-specific effects and makes it difficult to determine whether risks are attributable to psychiatric symptoms, medication exposure, physical comorbidity, socioeconomic disadvantage, or healthcare-system factors.

The large Medicare study by Paredes et al. found that pre-existing mental illness was strongly associated with worse postoperative outcomes across several major operations. This supports the clinical relevance of psychiatric history, although administrative coding cannot reliably indicate whether the disorder was active, severe, or well controlled at the time of surgery.

Psychiatric Comorbidity and ICU Admission

The direct evidence regarding ICU admission was limited. Only the studies by McBride et al. and Tyerman et al. clearly included ICU admission, ICU duration, prolonged ventilation, or related critical-care utilisation among their reported outcomes. The remaining studies focused primarily on complications, mortality, readmission, reoperation, hospital length of stay, or discharge destination.

Postoperative ICU admission may be either planned or unplanned. Planned admission is often determined by surgical complexity, institutional policy, bed availability, or anticipated monitoring requirements. Unplanned ICU admission or transfer from a surgical ward more directly reflects postoperative deterioration. Most included studies did not distinguish between these pathways.

An observed increase in ICU use among patients with serious mental illness could therefore have several explanations. Psychiatric comorbidity may contribute to physiological complications that require organ support. Alternatively, clinicians may select planned ICU monitoring because of concerns about medication interactions, withdrawal, behavioural instability, communication difficulties, or reduced suitability for routine ward care.

Future studies should report ICU outcomes separately as:

- Planned postoperative ICU admission
- Unplanned direct ICU admission
- Transfer from a surgical ward
- ICU readmission
- Duration of ICU stay
- Mechanical ventilation
- Vasopressor treatment
- Renal replacement therapy
- Principal reason for critical-care escalation

Until such data are available, psychiatric comorbidity should be considered a potential contributor to critical-care utilisation rather than a confirmed independent predictor of ICU admission.

Postoperative Complications

Most included studies reported higher postoperative complication rates among patients with psychiatric comorbidity. The complications described across the evidence base included respiratory failure, pneumonia, acute kidney injury, infection, bleeding, cardiovascular or cerebrovascular events, wound complications, delirium, and reoperation.

Several factors may explain these associations. Patients with serious mental illness frequently have a greater burden of cardiovascular disease, diabetes, obesity, metabolic syndrome, respiratory disease, smoking, alcohol misuse, and other substance-use disorders. These conditions may increase susceptibility to infection, respiratory deterioration, cardiovascular instability, impaired wound healing, and multiorgan complications.

Psychiatric symptoms may also interfere with postoperative mobilisation, respiratory exercises, nutrition, medication adherence, wound care, and communication of early symptoms. Consequently, complications may be both more frequent and detected later.

However, the available observational studies cannot establish that psychiatric illness itself directly causes postoperative complications. Residual confounding is likely because physical comorbidities, frailty, emergency status, smoking, substance use, socioeconomic disadvantage, and surgical complexity were not uniformly measured or adjusted for.

Psychotropic Medication and Perioperative Outcomes

Psychotropic medication may influence perioperative management and postoperative recovery. Antipsychotic drugs can be associated with sedation, orthostatic hypotension, QT-interval prolongation, impaired thermoregulation, anticholinergic

effects, and metabolic abnormalities. These effects may interact with anaesthetic agents and complicate haemodynamic or respiratory management.

Selective serotonin-reuptake inhibitors may affect platelet function, although the clinical importance varies according to the operation and individual bleeding risk. Lithium toxicity can occur in the presence of dehydration, renal impairment, or electrolyte abnormalities and may prolong neuromuscular blockade. Benzodiazepines and other sedative agents can contribute to respiratory depression, delayed recovery, falls, and delirium.

Abrupt discontinuation may also be harmful. Withdrawal, agitation, insomnia, seizures, relapse of mood symptoms, or psychotic deterioration can complicate postoperative care. The risks of continuation should therefore be balanced against the risks of interruption.

Most included database studies provided little information about specific medications, dose, adherence, duration of treatment, or perioperative continuation. It is therefore unclear how much of the observed risk was related to psychiatric illness and how much was related to its treatment.

Behavioural and Communication Mechanisms

Patients with psychosis, severe depression, cognitive symptoms, or substance dependence may experience difficulty describing pain, dyspnoea, chest discomfort, wound symptoms, or changes in consciousness. They may also have difficulty understanding perioperative instructions or participating consistently in mobilisation, physiotherapy, respiratory exercises, nutrition, and rehabilitation.

These challenges can delay recognition and treatment of deterioration. Diagnostic overshadowing may also occur when physical symptoms or behavioural changes are incorrectly attributed to a psychiatric disorder. Agitation, withdrawal, delirium, hypoxia, infection, medication toxicity, and acute psychosis can present similarly, particularly during the early postoperative period.

Clinical teams should therefore investigate acute behavioural or cognitive changes as potential medical deterioration rather than assuming that they reflect the patient's pre-existing psychiatric condition.

Hospital Length of Stay and Resource Utilisation

Prolonged hospitalisation was one of the most consistent findings across the included studies. Longer stays may result from postoperative complications, but they can also reflect difficulties with medication stabilisation, psychiatric consultation, rehabilitation, capacity assessment, social support, housing, and discharge placement.

Patients with serious mental illness may require additional nursing observation, multidisciplinary assessment, or coordination with community mental-health services. These requirements can increase cost and length of stay even in the absence of major physiological complications.

Accordingly, hospital length of stay should be interpreted as a combined clinical and healthcare-system outcome. It may reflect the severity of postoperative disease, but it may also reveal deficiencies in integrated mental and physical healthcare.

Readmission and Reoperation

Higher readmission rates were reported in several included studies. Paredes et al. demonstrated worse postoperative outcomes among Medicare beneficiaries with pre-existing mental illness across multiple major surgical procedures. Other procedure-specific studies reported increased emergency visits, readmission, delayed discharge, or reoperation following neurosurgical, bariatric, endocrine, and orthopaedic procedures.

Potential causes of readmission include unresolved medical complications, poor pain control, medication interruption, adverse drug effects, psychiatric relapse, substance use, limited social support, and inadequate outpatient follow-up. Difficulty obtaining medication or attending postoperative appointments may further increase risk.

The association between psychiatric comorbidity and reoperation may be mediated by wound complications, delayed recognition of symptoms, adherence difficulties, or procedure-specific factors. Nevertheless, the number of studies reporting reoperation was limited, and this finding should be interpreted cautiously.

Mortality

Mortality findings were heterogeneous. The clearest association was reported for schizophrenia, with Liao et al. documenting an adjusted odds ratio of 2.70 for 30-day postoperative mortality. Serious mental illness was also associated with mortality following cardiac surgery in the study by Tyerman et al.

In contrast, studies evaluating broad categories such as any mental-health diagnosis did not always show a consistent independent mortality increase after adjustment. This suggests that psychiatric diagnosis, severity, physical comorbidity, treatment status, and surgical context all influence risk.

A stable history of anxiety or depression should therefore not be considered equivalent to active psychosis, recent psychiatric hospitalisation, severe substance dependence, or decompensated serious mental illness. Future studies should avoid treating psychiatric illness as a single homogeneous exposure.

Elective and Emergency Surgery

The relationship between psychiatric illness and postoperative outcomes may differ between elective and emergency surgery. Elective procedures provide an opportunity to assess psychiatric stability, review medication, optimise physical comorbidities, identify substance-withdrawal risk, and arrange postoperative support.

Emergency surgery allows little time for these interventions. Patients may present with advanced disease, medication interruption, intoxication, withdrawal, or incomplete clinical information. Psychiatric illness may also contribute to delayed help-seeking or difficulty accessing healthcare.

Studies that combine elective and emergency procedures without stratification may therefore overestimate or obscure the independent contribution of psychiatric illness. Future analyses should separate elective and emergency surgery or adjust carefully for operative urgency.

Clinical Implications

Psychiatric comorbidity should be incorporated into comprehensive perioperative assessment, but it should not be used automatically to deny surgery or mandate ICU admission.

Preoperative assessment should include:

- The specific psychiatric diagnosis
- Current symptom severity and stability
- Recent psychiatric admission or crisis
- Psychotic, manic, depressive, or suicidal symptoms
- Alcohol and substance use
- Withdrawal risk
- Psychotropic medication and adherence
- Decision-making capacity
- Previous postoperative delirium or behavioural deterioration
- Physical comorbidities
- Social and caregiver support
- Anticipated discharge requirements

Patients with severe or unstable psychiatric illness may benefit from early involvement of anaesthesiology, liaison psychiatry, internal medicine, pharmacy, pain services, nursing, social work, and rehabilitation teams.

Perioperative strategies may include medication reconciliation, electrocardiographic or metabolic monitoring where indicated, withdrawal-prevention protocols, delirium prevention, enhanced respiratory care, early mobilisation, clear communication plans, individualised analgesia, and coordinated discharge follow-up.

Implications for Risk Stratification

Most established perioperative risk models focus on age, physiological status, frailty, organ dysfunction, surgical complexity, and laboratory values. Psychiatric diagnoses are not consistently included.

The findings of this review suggest that severe psychiatric illness may provide additional information regarding postoperative complications, resource use, readmission, and possibly mortality. However, a simple binary variable indicating the presence or absence of psychiatric illness is unlikely to be sufficient.

More informative factors may include:

- Active psychosis or mania
- Recent psychiatric hospitalisation
- Severe depression or suicidality
- Substance dependence
- Multiple psychiatric diagnoses
- Psychotropic polypharmacy
- Previous withdrawal or delirium
- Medication non-adherence

- Impaired capacity
- Lack of social support
- Housing instability

Prospective studies should determine whether these factors improve risk prediction beyond conventional medical and surgical variables.

Strengths of the Review

A major strength of this review is the inclusion of original observational studies only. Narrative and systematic reviews were excluded from the primary evidence table and retained solely as contextual sources.

The review also considered multiple clinically important outcomes, including ICU use, complications, mortality, length of stay, readmission, reoperation, discharge destination, and cost. Diagnosis-specific findings were examined rather than assuming that all psychiatric disorders confer equivalent perioperative risk.

The inclusion of diverse surgical populations improves the breadth of the review, although it also increases clinical heterogeneity.

Limitations

The evidence base was dominated by retrospective cohort and administrative-database studies. Psychiatric diagnoses were commonly identified through coding systems rather than structured psychiatric assessments. Diagnostic coding may under-identify mild or untreated illness and may provide little information about severity, current symptoms, or treatment status. The included studies differed substantially in psychiatric exposure definitions, surgical procedures, outcome measures, follow-up periods, and adjustment variables. Statistical pooling was therefore not appropriate.

Only two studies directly evaluated ICU admission or ICU duration, limiting conclusions regarding the review's primary outcome. Planned and unplanned ICU admissions were generally not differentiated.

Several studies included composite mental-health categories, preventing diagnosis-specific analysis. Information concerning psychotropic medication, adherence, social support, and psychiatric stability was also limited.

Residual confounding remains likely, particularly from frailty, smoking, substance use, physical comorbidity, socioeconomic disadvantage, emergency surgery, and procedural complexity.

Finally, the evidence was derived mainly from high-income healthcare systems. Findings may not be directly generalisable to settings with different ICU capacity, psychiatric services, surgical pathways, and community support.

Future Research

Future studies should use prospective, multicentre designs and apply standardised definitions of psychiatric illness and postoperative outcomes. Investigators should record diagnosis, symptom severity, treatment status, psychotropic medication, substance use, and recent psychiatric-service utilisation.

ICU outcomes should distinguish planned admission, unplanned admission, ward transfer, ICU readmission, duration of stay, and organ-support requirements. Studies should also separate elective and emergency procedures and adjust for frailty, physical comorbidity, socioeconomic status, and surgical complexity.

Interventional research should evaluate whether liaison-psychiatry involvement, medication-management protocols, substance-withdrawal prevention, enhanced postoperative monitoring, or integrated discharge planning can reduce complications and readmission.

Overall Interpretation

The updated evidence indicates that psychiatric comorbidity is associated with poorer postoperative outcomes, particularly among patients with schizophrenia, psychosis, and serious mental illness. The strongest evidence relates to complications, prolonged hospitalisation, readmission, reoperation, and healthcare-resource utilisation.

Evidence specifically linking psychiatric comorbidity with ICU admission remains limited because only two included primary studies directly assessed ICU use and because planned and unplanned admissions were not consistently separated. Psychiatric comorbidity should therefore be regarded as one component of a broader biopsychosocial perioperative risk assessment. Proactive identification of psychiatric instability, medication-related risk, substance use, physical comorbidity, communication barriers, and social needs may improve postoperative care and reduce avoidable adverse outcomes.

CONCLUSION

Pre-existing psychiatric comorbidity is an important marker of increased perioperative vulnerability among adult surgical patients. Across the included studies, patients with psychiatric disorders experienced higher rates of postoperative complications, prolonged hospitalisation, non-home discharge, readmission, and greater healthcare-resource utilisation than patients without documented psychiatric illness.

The most consistent adverse associations were observed among patients with schizophrenia, psychotic disorders, and serious mental illness. These patients demonstrated increased risks of respiratory, infectious, renal, cardiovascular, cerebrovascular, and wound-related complications. Several studies also reported increased short-term mortality, particularly among patients with schizophrenia or active psychosis.

Psychiatric comorbidity may also increase postoperative ICU utilisation. However, the evidence for this outcome was less complete than that for general postoperative morbidity. ICU admission was inconsistently defined, frequently incorporated into composite outcomes, and rarely separated into planned admission, unplanned direct admission, or transfer following deterioration on a surgical ward. Consequently, the independent influence of psychiatric illness on postoperative ICU admission remains uncertain.

The observed associations are likely mediated through multiple interacting pathways, including a greater burden of physical comorbidity, smoking, substance use, metabolic disease, psychotropic medication effects, withdrawal risk, impaired communication, reduced participation in rehabilitation, social disadvantage, and fragmented coordination between surgical and mental-health services.

A psychiatric diagnosis should not automatically mandate ICU admission or restrict access to surgery. Instead, it should prompt structured and individualised perioperative assessment. Important components include evaluation of current psychiatric stability, substance use, withdrawal risk, decision-making capacity, psychotropic medication, physical comorbidity, previous postoperative behavioural deterioration, social support, and discharge requirements.

Patients with serious or unstable psychiatric illness may benefit from early anaesthetic review, liaison-psychiatry involvement, medication reconciliation, withdrawal-prevention measures, delirium prevention, enhanced postoperative monitoring, coordinated pain management, and early multidisciplinary discharge planning.

Future prospective multicentre studies should use diagnosis-specific psychiatric definitions, record illness severity and treatment status, distinguish planned from unplanned ICU admission, and report organ-support requirements. Analyses should also adjust adequately for frailty, physical comorbidity, emergency surgery, substance use, socioeconomic disadvantage, and surgical complexity.

Overall, psychiatric comorbidity should be incorporated into a broader biopsychosocial assessment of surgical risk. Recognition and proactive management of psychiatric and associated medical needs may reduce postoperative complications, prevent avoidable escalation to critical care, improve continuity of care, and promote more equitable surgical outcomes.

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