THE RELATIONSHIP BETWEEN PSYCHOLOGY AND SURGERY: OPPORTUNITIES AND IMPLEMENTATION MODELS

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Abstract: Background: Psychological factors (anxiety, depression, expectations, social support) influence surgical outcomes including pain, complication rates, length of stay and recovery trajectories. Despite theoretical rationale, integration of psychological care into surgical pathways remains variable. Objective: To synthesize existing evidence on psychological interventions in surgical settings and to propose a practical, multilevel biopsychosocial model for integrating psychology into the perioperative continuum.

Keywords: psychology, surgery, preoperative preparation, psychoneuroimmunology, perioperative care, non-technical skills, ERAS.

Introduction. Surgical care traditionally emphasizes technical competence and management of physical pathology. However, psychological factors—preoperative anxiety, depressive symptoms, expectations about pain and recovery, and social support—consistently influence perioperative trajectories and patient-reported outcomes. The biopsychosocial model frames illness and recovery as emergent from interactions among biological, psychological and social domains, providing a rationale for integrating psychological care into surgical practice (Engel, 1977). Mechanistic work in psychoneuroimmunology suggests plausible biological pathways by which stress and mood can alter inflammation, immunity and wound healing (Ader & Cohen, 1975; Dantzer et al., 2008). Separately, team psychology and non-technical skills influence intraoperative safety and coordination (Yule et al., 2006). Despite this, integration is inconsistent across systems. This paper aims to (1) synthesize available evidence for psychological interventions in surgical settings, and (2) propose a practical, scalable model to embed psychology across the perioperative continuum.

Methods: We performed a targeted narrative review of literature (1975–2025) across PubMed/MEDLINE, Cochrane Library and PsycINFO using terms: “psychology AND surgery”, “preoperative anxiety”, “psychoneuroimmunology AND surgery”, “preoperative preparation randomized”, “non-technical skills surgery”, and “perioperative psychological intervention”. Inclusion criteria: systematic reviews, meta-analyses, randomized trials, implementation studies and key conceptual papers addressing psychological interventions or team psychology in surgical populations. Evidence was summarized thematically and used to derive a pragmatic integration model at system, clinical and educational levels.

Design: Targeted narrative review with model development informed by thematic synthesis of the literature. Search strategy: We searched PubMed/MEDLINE, Cochrane Library and PsycINFO for English-language publications from 1975 to 2025 using combined keywords and MeSH terms: “psychology” OR “psychological” AND “surgery” OR “perioperative”, “preoperative anxiety”, “psychoneuroimmunology”, “preoperative preparation randomized”, “postoperative pain cognitive behavioral”, “non-technical skills surgery”, and “surgical safety checklist”. Reference lists of key reviews were screened. Selection criteria: Included systematic reviews, meta-analyses, randomized controlled trials, implementation studies and high-impact conceptual papers addressing psychological interventions for surgical patients or psychological interventions targeting surgical teams. Excluded:

single-case reports, pediatric-only behavioral studies not generalizable to adult surgical care, and papers without empirical or conceptual relevance. Data synthesis: Extracted data on intervention type, target population, reported outcomes (clinical, pain, length of stay, PROMs), and implementation details. Thematic synthesis identified core intervention domains and implementation barriers/facilitators. These informed a practical integration model.

Limitations: This was not a systematic review; search was targeted and narrative; effect sizes were not meta- analytically pooled. Results. Evidence domains and key findings. Preoperative psychological preparation. Multiple systematic reviews and Cochrane analyses report that preoperative informational and psychological preparation (procedural information, coping strategies, relaxation, brief CBT components, and where available, hypnosis) reduce preoperative anxiety and postoperative pain/analgesic consumption, with modest but clinically relevant effects on early recovery metrics. Pain expectation and chronic pain prevention. Interventions focused on expectation management, coping skills and early pain self- management reduce acute pain intensity and are associated with lower incidence of persistent postoperative pain in some RCTs and cohort studies. Psychosocial support in chronic surgical populations. For patients undergoing surgery in oncologic or chronic pain contexts, structured psychosocial programs (psychological counseling, group interventions) improve quality-of-life measures and treatment adherence. Team psychology and non-technical skills. Implementation of structured communication tools (briefings/debriefings), team training (crew resource management), and surgical checklists is associated with improved teamwork and reductions in surgical morbidity and mortality in multicenter studies (e.g., evidence supporting WHO Surgical Safety Checklist). Provider well-being. Interventions for staff—peer support, supervision, organizational changes—reduce burnout indicators and can indirectly benefit patient care. Mechanistic evidence. Psychoneuroimmunology literature links stress and mood states with neuroendocrine and immune alterations that plausibly impact wound healing, infection risk and inflammation-mediated complications. Proposed integration model. We propose a three-level Biopsychosocial Perioperative Integration

Model:

• System level: embed psychologists in perioperative services; adopt screening protocols; align with ERAS and safety programs.

• Clinical level: universal screening (e.g., GAD- 7, PHQ- 9); tiered interventions from universal information to brief CBT/self-management (3–6 sessions) to specialist referral; standardized perioperative briefings and patient education modules.

• Educational/research level: regular non-technical skills training, simulation-based team exercises, outcome tracking and pilot evaluation of cost-effectiveness.

Implementation considerations. Key facilitators: use of brief validated instruments, stepped-care allocation of scarce psychological resources, integration into existing clinical workflows (pre-admission clinics, ERAS), and measurable pilot objectives. Barriers: staffing, funding, data confidentiality, and role clarity.

Discussion. This narrative synthesis indicates that psychological interventions across the perioperative pathway have beneficial effects on anxiety, pain, early recovery, and team performance. Evidence is strongest for preoperative preparation and team-level interventions; RCTs addressing longer-term outcomes and specific psychotherapies in diverse surgical populations are fewer. Mechanistic plausibility through psychoneuroimmunologic pathways strengthens the rationale for integration. For implementation, a pragmatic stepwise approach is recommended: begin with a time-limited pilot in one surgical service, implement routine brief screening, provide universal informational modules and group preparations, offer targeted brief psychological interventions for at- risk patients, and embed psychology expertise into multidisciplinary meetings. Parallel staff training in non- technical skills and monitoring of staff well- being should be included. Research priorities include pragmatic cluster randomized trials comparing stepped-care perioperative psychological programs versus usual care, mechanistic biomarkers linking psychological state and healing, and implementation-science studies evaluating fidelity, reach and cost-effectiveness. Limitations of this work include the narrative (non-systematic) approach and lack of pooled quantitative effect estimates; nonetheless the synthesis is consistent with multiple systematic reviews and high-quality implementation studies.

Results: The literature supports several domains where psychological input improves outcomes: (1) preoperative psychological preparation (information, relaxation, brief CBT, hypnosis) reduces anxiety, analgesic use and short-term recovery time (systematic reviews/Cochrane evidence); (2) targeted interventions addressing pain expectations and coping lower acute pain intensity and decrease risk of chronic post-surgical pain; (3) psychosocial support for patients with chronic surgical conditions improves quality-of-life and adherence; (4) training in non-technical skills (communication, situational awareness, team resource management) enhances team performance and is associated with reduced adverse events (WHO Surgical Safety Checklist evidence); (5) staff-focused psychological support reduces burnout and may indirectly improve patient safety. Mechanistic literature (psychoneuroimmunology) provides biologically plausible pathways linking stress and immune/inflammatory responses to wound healing and complications. Based on this evidence, we propose a Biopsychosocial Perioperative Integration Model involving: routine psychosocial risk screening (e.g., GAD-7, PHQ-9), tiered interventions (universal information → targeted brief therapy → specialist referral), embedding psychologists in multidisciplinary perioperative clinics, incorporation of psychological modules into ERAS pathways, and regular training and simulation for non-technical skills. Discussion: Evidence quality varies: robust meta-analyses support preoperative preparation and team interventions, while RCT data for some targeted psychotherapies in specific surgical subpopulations remain limited. Implementation barriers include workforce constraints, funding, role boundaries and data privacy. Recommendations to facilitate uptake include piloting integration in a single surgical service with clear process metrics, using brief validated screening tools, applying stepped-care approaches to target resources, linking psychological care to existing ERAS and safety programs, and evaluating outcomes across clinical, patient-reported and economic domains. Future research should emphasize pragmatic cluster-RCTs, mechanistic studies linking psychological state and inflammatory/healing markers, and implementation-science evaluations of scalability.

Conclusions: Integrating psychological care into surgical pathways is evidence-informed and pragmatically feasible. A multilevel biopsychosocial perioperative model—combining routine screening, brief targeted interventions, embedded psychology expertise and team training—promises to improve patient outcomes, team functioning and health-care value. Pilot implementations with rigorous outcome assessment are recommended to refine protocols and demonstrate cost-effectiveness. Integration of psychological care into surgical practice is evidence-informed and practically feasible. A multilevel biopsychosocial perioperative model—incorporating routine screening, stepped psychological interventions, embedded psychology expertise, and team training—can enhance patient outcomes and safety. Pilot implementation with rigorous outcome measurement is the next step toward scalable adoption.

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