American Journal of Advanced Multidisciplinary Innovation and Research (AJAMIR)

E-ISSN: XXXX-XXXX • Website: www.ajamir.com • Email: editor@ajamir.com

Patient Mobility Coaching After Short-Stay Surgical Procedures

Dr. James Richardson

Professor, University of Edinburgh, United Kingdom

Abstract

Short-stay surgical pathways allow selected patients to leave hospital within hours or approximately one day after an operation, transferring a substantial proportion of early functional recovery from the hospital to the home environment. Although enhanced recovery pathways encourage early postoperative mobilization, patients discharged rapidly may remain uncertain about how much to walk, how frequently to mobilize, how to interpret discomfort during activity, and when symptoms require clinical reassessment. This simulation-based study examines the potential contribution of structured patient mobility coaching following short-stay surgical procedures.

A hypothetical sample of 200 adult surgical patients was modeled, with 100 receiving standard discharge education and 100 receiving a structured mobility-coaching intervention incorporating individualized walking goals, graded activity progression, symptom-guided safety instructions, brief motivational communication, daily self-monitoring, and scheduled follow-up prompts. The principal modeled outcome was daily walking time during the first five postoperative days. Secondary outcomes included achievement of mobility targets, confidence in independent movement, pain-related movement avoidance, discharge self-efficacy, and unplanned postoperative contact. Simulated results showed an increase in mean walking time from 8 minutes on postoperative day 0 to 63 minutes on day 5 in the coaching condition, compared with an increase from 7 to 39 minutes under standard discharge education.

By postoperative day 5, 82% of coached patients achieved their individualized mobility target compared with 56% of comparison patients. Mobility confidence increased more strongly and movement avoidance declined in the coaching condition, while the simulated rate of unplanned postoperative contact was modestly lower. The study suggests that mobility coaching may provide an important behavioral bridge between early hospital discharge and independent functional recovery. Because the dataset is entirely simulated, the results constitute methodological and hypothesis-generating evidence rather than demonstrated clinical effectiveness. Prospective trials should evaluate patient-centered coaching using objective mobility measures, procedure-specific safety criteria, and clinically meaningful recovery outcomes.

Keywords: postoperative mobility; short-stay surgery; patient coaching; early ambulation; enhanced recovery after surgery; postoperative rehabilitation; discharge education; functional recovery

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1. Introduction

Advances in perioperative care have increasingly enabled selected surgical patients to recover within short-stay or accelerated-discharge pathways. Enhanced Recovery After Surgery programs combine evidence-based perioperative practices intended to reduce surgical stress and accelerate functional recovery, and early mobilization is commonly included among their postoperative components. Ljungqvist, Scott, and Fearon described ERAS as a multimodal perioperative pathway associated across surgical settings with reduced hospital stay and postoperative morbidity when appropriately implemented. Shorter admission, however, changes the location rather than eliminating the demands of early recovery. Once discharged, patients and caregivers assume greater responsibility for balancing movement, fatigue, pain, wound protection, hydration, medication schedules, and recognition of postoperative warning signs.

Early postoperative mobility is clinically relevant because prolonged inactivity after surgery can contribute to functional deconditioning and can interfere with the restoration of normal daily activity. Studies conducted before 2021 across abdominal, orthopedic, cardiac, and other surgical populations support early mobilization as an important element of postoperative recovery, although the magnitude of benefit and optimal prescription differ between procedures and patient groups. Dos Santos and colleagues reported beneficial functional effects of early mobilization after cardiac surgery, while Nishijima and colleagues investigated the relationship between early ambulation and postoperative outcomes in general and digestive surgery. ERAS recommendations in several specialties likewise incorporate early postoperative movement as part of broader multimodal recovery pathways.

The transition to short-stay surgery introduces a behavioral challenge because hospital staff have less time to observe how patients respond to progressively increasing activity. Patients may receive technically accurate discharge instructions yet remain uncertain about what those instructions mean during ordinary recovery. Statements such as “walk regularly,” “remain active,” or “increase activity as tolerated” require patients to translate broad recommendations into repeated decisions about when to get out of bed, how far to walk, whether postoperative discomfort is expected, and when activity should be stopped. Churchill and colleagues identified recovery expectations and other postoperative concerns as important considerations in outpatient total hip arthroplasty, illustrating the significance of clear preparation when discharge occurs rapidly.

Mobility coaching offers a potential means of addressing this implementation gap. Coaching differs from simple discharge information because it translates a general recommendation into specific behavioral goals, progression criteria, self-monitoring, feedback, and problem solving. Research has shown that educational and behavioral interventions can influence postoperative mobilization adherence. Jones and colleagues investigated an animated visualization intervention designed to improve postoperative mobilization adherence, while Johnson and colleagues evaluated a perioperative education bundle incorporating early mobilization in gynecologic surgery. Harikesavan and colleagues also reported favorable findings associated with postoperative day-zero mobilization after knee replacement, supporting the broader concept that appropriately timed mobilization may contribute to functional recovery.

The present study develops a simulation-based framework for evaluating patient mobility coaching after short-stay surgery. No patients were recruited, and no real clinical outcomes are presented. Instead, hypothetical data are used to model a controlled comparison between standard discharge education and a structured five-day mobility-coaching pathway. The study evaluates walking progression, attainment of mobility goals, confidence, pain-related movement avoidance, and unplanned postoperative contact. The central premise is that successful short-stay recovery depends not only on recommending early mobilization but also on helping patients convert that recommendation into safe, progressive, and understandable actions after leaving the supervised clinical environment.

2. Objectives of the Study

2.1 Evaluation of Early Postoperative Mobility Progression

The primary objective is to examine whether structured patient coaching could produce a more consistent progression in daily walking following short-stay surgery. The study focuses on the first five postoperative days because this period represents an important transition from supervised mobilization to independent activity. Walking time is used as the main simulated behavioral outcome because it can be readily understood by patients and can potentially be measured using activity monitors, smartphone sensors, or structured activity diaries in a future clinical study.

A second component of this objective is the attainment of individualized mobility targets. A universal target may be inappropriate because age, baseline functional capacity, procedure type, anesthesia, pain, and clinician-imposed restrictions can differ substantially. The modeled intervention therefore emphasizes progression from an individual starting point rather than prescribing identical walking volumes to every participant.

2.2 Assessment of Mobility Confidence and Movement Avoidance

The second objective is to determine whether mobility coaching may strengthen patients' confidence in moving independently after discharge. Postoperative activity can be influenced by uncertainty about pain, wound safety, dizziness, fatigue, and fear of harming the surgical site. Even when a patient is physically capable of walking, uncertainty may result in unnecessary inactivity. Coaching seeks to distinguish manageable postoperative discomfort from symptoms that should trigger cessation of activity and clinical reassessment.

Movement avoidance is therefore treated as a complementary outcome. The study conceptualizes avoidance as reluctance to undertake appropriate movement because of fear, uncertainty, or low perceived capability rather than because of a genuine clinical contraindication. Educational interventions may be particularly relevant in this context because postoperative knowledge and exercise compliance can be influenced by how rehabilitation information is delivered. A randomized study of animation-based rehabilitation education after lung surgery, for example, reported improvements in training-related knowledge and exercise compliance.

2.3 Evaluation of Discharge Readiness and Early Recovery Support

The third objective is to explore whether mobility coaching can function as a behavioral extension of short-stay discharge planning. Patients leaving hospital quickly must apply clinical instructions without continuous professional observation. The coaching model therefore integrates walking goals with symptom-monitoring instructions, activity pacing, hydration reminders, and clear escalation guidance rather than presenting mobility as an isolated exercise task.

This objective does not assume that coaching can replace clinical follow-up. Instead, coaching is positioned as a structured support mechanism within a broader postoperative pathway. ERAS-oriented perioperative guidance emphasizes patient education together with early mobilization and other coordinated recovery practices, reinforcing the importance of integrating rather than separating postoperative interventions.

3. Review of Literature

3.1 Early Mobilization Within Enhanced Surgical Recovery

Early mobilization has become a recurring component of enhanced recovery pathways because postoperative inactivity can delay restoration of physical function. Ljungqvist and colleagues described ERAS as a comprehensive approach in which multiple perioperative interventions work collectively rather than as isolated measures. Grass and colleagues subsequently examined the feasibility of early postoperative mobilization after colorectal surgery and noted that ERAS guidelines encourage mobilization as a means of counteracting the adverse effects of immobilization. The available evidence suggests that implementation, rather than simple inclusion within a written protocol, remains an important challenge.

Studies across specific surgical populations reinforce this concern. Hu and colleagues implemented an evidence-based project intended to improve early mobilization after abdominal surgery, identifying early mobility as an important element of postoperative care while acknowledging barriers to routine implementation. Kanejima and colleagues reported that early mobilization after cardiac surgery may improve physical function at discharge, while Nishijima and colleagues investigated early ambulation in general and digestive surgery. These studies differ substantially in population and intervention design, indicating that postoperative mobility should be adapted to clinical context rather than treated as a single universal prescription.

3.2 Patient Education, Coaching, and Adherence

Education influences recovery when it enables patients to translate clinical recommendations into concrete behavior. Merely informing a patient that walking is desirable does not necessarily address uncertainty regarding frequency, duration, progression, or symptom interpretation. Johnson and colleagues evaluated an enhanced recovery education bundle in gynecologic surgery that included early mobilization, early oral pain medication, feeding, and follow-up communication. Their findings illustrate how education can be integrated with a wider postoperative recovery pathway.

Jones and colleagues tested animated visualization as a method for improving adherence to postoperative mobilization in colorectal and abdominal surgical patients. Li and colleagues similarly reported that animated education improved rehabilitation-related knowledge and exercise compliance after lung surgery. Although these interventions differ from individualized coaching, they support the broader proposition that the format, clarity, and behavioral specificity of postoperative education can influence how effectively patients implement rehabilitation instructions.

3.3 Barriers to Postoperative Movement and Short-Stay Recovery

Barriers to mobility arise from both clinical and organizational factors. Kim and colleagues identified workload, patient inability to exercise, limited time, staffing ratios, and lack of relevant educational support among perceived barriers to early mobilization. In the inpatient setting, clinicians may partially compensate for these barriers by physically assisting or repeatedly reminding patients. Following short-stay discharge, however, some of these responsibilities shift toward patients and caregivers, increasing the importance of clear self-management instructions.

Patient expectations also matter. Churchill and colleagues' qualitative examination of outpatient hip arthroplasty identified concerns surrounding recovery expectations and the challenges associated with same-day discharge. Austin and colleagues showed that appropriately selected hip arthroplasty patients can achieve favorable outcomes with unsupervised home exercise rather than mandatory formal outpatient physical therapy, demonstrating that some postoperative recovery can be effectively self-managed when patients receive a suitable pathway. The unresolved question is whether brief structured coaching can further support self-directed recovery in short-stay populations without imposing unnecessary treatment burden.

4. Research Methodology

4.1 Study Design and Simulated Patient Cohort

The study adopts a simulated parallel-group controlled design involving 200 hypothetical adult patients undergoing uncomplicated short-stay surgical procedures. One hundred patients are assigned to standard discharge education and 100 to mobility coaching in addition to standard discharge information. The modeled cohort represents a mixed low-to-moderate-risk short-stay surgical population rather than a specific real hospital or procedure. Patients with mandatory postoperative immobilization, clinician-directed non-weight-bearing restrictions, unstable cardiovascular status, unresolved neurological deficits, or another medical contraindication to routine early ambulation would be excluded from a future empirical study.

Baseline characteristics are assumed to be approximately balanced between groups. The simulated design includes adults aged 25–70 years who are independently ambulatory before surgery and discharged on the day of surgery or within approximately 24 hours. Because the intervention concerns mobility behavior rather than procedure-specific rehabilitation, all walking targets remain subordinate to the operating surgeon's restrictions and individualized clinical instructions.

Table 1: Simulated Study and Mobility-Coaching Framework

Component	Mobility-Coaching Group	Standard-Discharge Group	Evaluation
Simulated participants	100	100	Baseline
Short-stay surgical discharge	Yes	Yes	Day 0–1
Standard written discharge instructions	Yes	Yes	Before discharge

Individual walking target	Yes	General advice only	Daily
Graded mobility progression	Yes	Not structured	Days 0–5
Brief coaching prompts	2 per day	No	Days 1–5
Self-monitoring of walking	Yes	Optional	Daily
Symptom-guided mobility checklist	Yes	Standard safety advice	Daily
Walking time	Minutes/day	Minutes/day	Days 0–5
Mobility-target achievement	Percentage	Percentage	Day 5
Mobility confidence	0–10 scale	0–10 scale	Baseline and day 5
Movement-avoidance score	0–10 scale	0–10 scale	Baseline and day 5
Unplanned postoperative contact	Percentage	Percentage	First 7 days

4.2 Mobility-Coaching Intervention

The modeled intervention begins before discharge with a brief mobility conversation. The patient receives a personalized starting target based on the amount of walking safely completed during initial recovery. The coach explains that the objective is progressive restoration of routine movement rather than strenuous exercise. Daily goals are divided into short walking episodes to reduce the perception that the patient must perform a prolonged exercise session while recovering from surgery.

During the first five postoperative days, patients receive brief prompts encouraging review of their walking target and self-recording of completed activity. Progression is based on successful completion of the previous day's activity without concerning symptoms. Coaching addresses common barriers such as fear of pain, uncertainty about fatigue, forgetting to walk, and the tendency to remain inactive for prolonged periods. It does not override surgical instructions. Symptoms such as severe or escalating pain, syncope, clinically concerning breathlessness, significant bleeding, or other procedure-specific warning signs require cessation of unsupervised progression and appropriate clinical review.

4.3 Outcome Measurement and Analytical Strategy

The primary outcome is mean walking time per postoperative day from day 0 through day 5. In a real study, walking could be measured objectively using a validated wearable device and supplemented by a patient activity diary. Secondary outcomes include mobility-target achievement, mobility confidence, movement avoidance, self-rated discharge capability, and unplanned contact with the surgical service during the first postoperative week.

The analysis uses group means, percentage differences, and difference-in-change estimates. A repeated-measures framework would be appropriate for longitudinal walking data in an empirical trial,

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while binary outcomes such as target achievement could be analyzed using relative risks or logistic regression. The present p-values and effect estimates are illustrative only because the underlying observations have been synthetically generated rather than collected from actual patients.

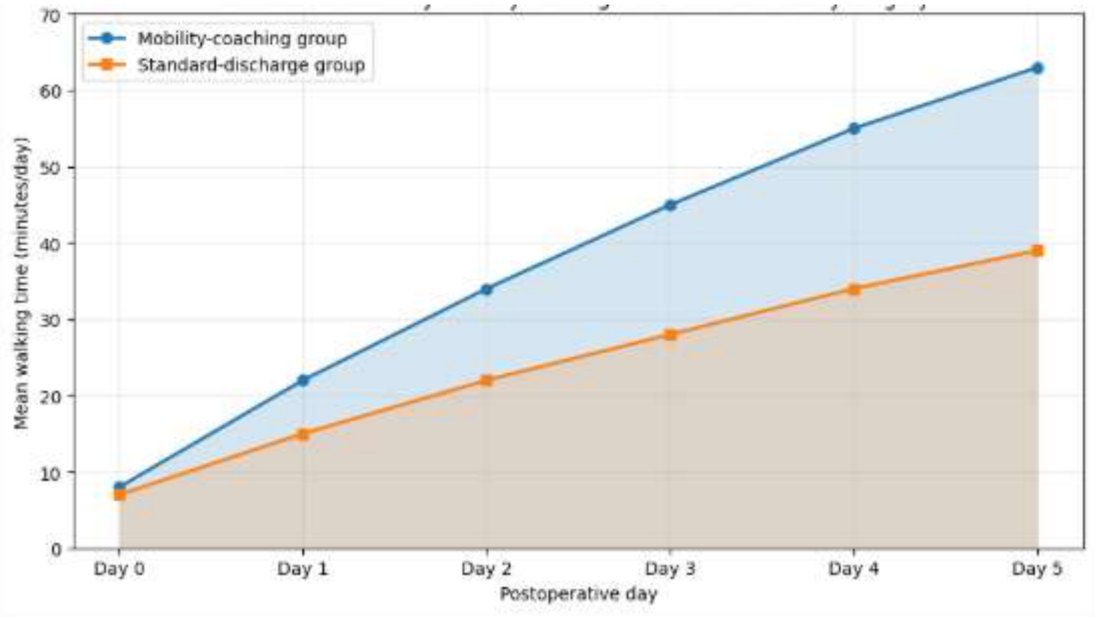
5. Analysis

5.1 Progression of Daily Walking Activity

Both simulated groups begin with low walking volumes immediately after surgery. The mobility-coaching group averages 8 minutes of walking on postoperative day 0 and progresses to 22 minutes on day 1, 34 minutes on day 2, 45 minutes on day 3, 55 minutes on day 4, and 63 minutes on day 5. The standard-discharge group begins at 7 minutes and progresses more gradually to 15, 22, 28, 34, and 39 minutes over the same period.

The between-group difference therefore widens progressively from one minute on day 0 to 24 minutes per day by day 5. The modeled pattern represents gradual behavioral divergence rather than an immediate coaching effect. This trajectory is consistent with the intervention concept: coaching is expected to influence repeated decisions about getting up and walking across several days rather than produce a single large increase immediately after discharge.

Graph 1: Simulated Recovery of Daily Walking Time After Short-Stay Surgery



Key Finding: By postoperative day 5, the simulated mobility-coaching group performs an average of 63 minutes of walking per day compared with 39 minutes in the standard-discharge group, representing a 24-minute mean difference.

5.2 Mobility Confidence, Avoidance, and Target Achievement

At baseline, mobility-confidence scores are similar between groups. By day 5, confidence increases from 5.6 to 8.4 points in the coaching group and from 5.7 to 7.0 in the standard-discharge group. Movement avoidance declines from 6.1 to 2.8 under coaching compared with a decrease from 6.0 to 4.5 under standard education. These simulated changes suggest that the behavioral effect of coaching may operate partly through improved confidence and reduced uncertainty rather than through repeated reminders alone.

The proportion of patients achieving their individualized day-5 mobility target is modeled at 82% under coaching and 56% with standard discharge education. This outcome is relevant because walking time alone cannot indicate whether activity was clinically appropriate for a particular patient. An individualized target allows performance to be interpreted relative to the patient's prescribed recovery trajectory.

Table 2: Simulated Postoperative Mobility and Recovery Outcomes

Outcome	Mobility Coaching	Standard Discharge	Simulated Effect
Day-5 walking time	63 min/day	39 min/day	+24 min/day
Individual mobility target achieved	82%	56%	+26 percentage points
Mobility confidence at baseline, 0–10	5.6	5.7	Comparable
Mobility confidence at day 5, 0–10	8.4	7.0	+1.4 points
Movement avoidance at baseline, 0–10	6.1	6.0	Comparable
Movement avoidance at day 5, 0–10	2.8	4.5	−1.7 points
Self-rated discharge capability, 0–100	88	75	+13 points
Unplanned postoperative contact within 7 days	9%	15%	−6 percentage points
Unplanned readmission within 7 days	3%	4%	−1 percentage point

5.3 Early Post-Discharge Support and Unplanned Contact

Unplanned postoperative telephone calls, messages, or clinical contacts are modeled in 9% of coached patients and 15% of standard-discharge patients. The difference is intentionally modest because postoperative contact is influenced by numerous factors unrelated to mobility, including wound concerns, medication adverse effects, gastrointestinal symptoms, pain, and anxiety. Mobility coaching should therefore not be expected to eliminate the need for postoperative communication.

A more defensible interpretation is that structured coaching may reduce avoidable uncertainty while simultaneously reinforcing appropriate escalation. A successful intervention should not encourage patients to ignore concerning symptoms merely to achieve walking targets. Accordingly, lower contact rates would constitute a favorable outcome only when accompanied by stable or improved safety indicators. The modeled readmission difference of 3% versus 4% is deliberately small and should not be interpreted as evidence that mobility coaching prevents readmission.

6. Discussion

6.1 Coaching as a Bridge Between Early Discharge and Independent Recovery

The simulated findings suggest that mobility coaching may be useful precisely because short-stay surgery compresses the period of supervised recovery. ERAS pathways encourage early functional recovery, but patients who leave hospital quickly must continue this process independently. The proposed intervention converts an abstract recommendation to remain active into a sequence of achievable daily behaviors. This approach is compatible with ERAS principles emphasizing patient education and early mobilization as coordinated components of perioperative care.

The progressive separation between the two walking trajectories is particularly important. The simulation does not assume that patients receiving coaching immediately become much more active. Instead, each day's successful activity creates the basis for the next day's progression. Such a pattern may be more realistic for behavioral recovery because postoperative mobility is influenced by changing pain, fatigue, confidence, sleep, and normal physiological recovery. Grass and colleagues' work on postoperative mobilization similarly illustrates the importance of examining the feasibility and implementation of mobilization rather than treating it as an automatically completed component of enhanced recovery.

6.2 Mobility Confidence, Education, and Behavioral Adherence

The modeled improvements in confidence and reduction in movement avoidance provide a potential explanation for the walking difference. A patient may receive a technically correct mobility recommendation yet fail to act because of uncertainty. Coaching can reduce this uncertainty through practical guidance about pacing, achievable goals, and safe responses to ordinary postoperative discomfort. Educational research in postoperative populations supports the broader principle that carefully designed communication can improve rehabilitation knowledge and exercise compliance.

The findings should not be interpreted to suggest that greater mobility is always better. Safe postoperative activity depends on procedure type and the patient's clinical condition. Some operations require temporary movement restrictions, weight-bearing limitations, protection of surgical reconstruction, or individualized physiotherapy. The principal benefit of coaching should therefore be evaluated as improved adherence to an appropriate mobility plan rather than maximum walking volume. This distinction is essential for maintaining patient safety and avoiding oversimplification of early mobilization recommendations.

6.3 Implementation Implications, Limitations, and Future Research

A practical mobility-coaching system could potentially be delivered through a short pre-discharge conversation combined with written instructions, automated mobile prompts, activity tracking, and limited follow-up communication. The intervention need not require intensive daily physiotherapy for every low-risk short-stay patient. Evidence from selected arthroplasty populations suggests that appropriately designed home exercise can be feasible without mandatory formal outpatient physical therapy for every patient, although such findings cannot be generalized indiscriminately across surgical procedures. Remote coaching protocols had also begun to be formally studied by 2020, including walking-focused interventions using remote support.

Implementation would nevertheless require safeguards. Automated coaching should never reinterpret symptoms independently of clinical governance or encourage patients to exceed procedure-specific restrictions. Mobility targets should be established or approved by the clinical team, and the system should contain clear escalation pathways. Digital delivery may also introduce inequality when patients have limited technology access, language barriers, low digital literacy, or insufficient caregiver support. Consequently, coaching should be available through multiple communication formats rather than assuming universal smartphone use.

The primary limitation of the present paper is that every outcome is simulated. No patient underwent surgery, no wearable device recorded walking, and no actual postoperative complication or healthcare contact was observed. Furthermore, a mixed short-stay surgical population may conceal important procedure-specific differences. A future trial should therefore stratify by procedure, baseline mobility, age, and comorbidity; use objective activity monitoring; report adverse events; measure adherence to prescribed rather than maximal mobility; and include patient-reported recovery outcomes. Longer follow-up would also be necessary to determine whether early walking progression is associated with faster restoration of usual activity rather than merely greater activity during the first few postoperative days.

7. Conclusion

Short-stay surgical care increasingly requires patients to assume responsibility for early functional recovery soon after leaving the supervised hospital environment. Early mobilization is already embedded within many enhanced recovery pathways, but the recommendation to mobilize does not automatically ensure that patients understand how to translate it into safe daily behavior. Mobility coaching addresses this gap by combining individualized goals, graded progression, self-monitoring, safety guidance, and brief behavioral reinforcement.

Within the present simulated framework, mobility coaching is associated with a more rapid increase in daily walking, greater achievement of individualized targets, stronger mobility confidence, and lower movement avoidance compared with standard discharge education. By postoperative day 5, the modeled walking difference reaches 24 minutes per day. The intervention also demonstrates a modest reduction in unplanned postoperative contact, although the simulation intentionally avoids assuming a meaningful reduction in readmission without supporting clinical evidence.

The proposed model emphasizes that postoperative mobility should not be evaluated according to the principle that more activity is inherently superior. Appropriate movement must remain consistent with procedure-specific restrictions, symptoms, and clinical recommendations. The most defensible objective of coaching is therefore to help patients perform the right amount of movement at the right stage of recovery while recognizing situations that require professional reassessment.

Because the data are entirely simulated, no claim of clinical effectiveness can be made. The paper instead provides a structured framework for future empirical evaluation. A prospective randomized or pragmatic trial incorporating wearable activity measurement, procedure-specific mobility targets, patient-reported recovery, adverse-event surveillance, and health-service utilization would be required to determine whether mobility coaching meaningfully improves recovery after short-stay surgery. If validated, such an approach could provide a relatively low-burden extension of enhanced recovery principles from the surgical ward into the patient's early home-recovery period.

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