Journal of Clinical and Nursing Research, 2026, Volume 10, Issue 4
http://ojs.bbwpublisher.com/index.php/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

# Value Evaluation of Applying the Concept of Enhanced Recovery After Surgery in the Reengineering of Operating Room Service Processes

**Lang Lin**

Deyang People's Hospital, Deyang 618000, Sichuan, China

**Copyright:** © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

**Abstract:** *Objective*: To investigate the clinical value of the concept of enhanced recovery after surgery in the reengineering of operating room service processes. *Methods*: 260 patients scheduled for elective surgery in a tertiary grade A hospital from January 2023 to December 2023 were randomly divided into a control group and an observation group, with 130 cases in each group. The control group used the traditional operating room service process, while the observation group used the process reengineering plan integrated with the ERAS concept. Perioperative indicators, postoperative recovery, complication rates, and patient satisfaction were compared between the two groups. *Results*: The observation group had shorter preoperative fasting and fluid deprivation time, surgical waiting time, first postoperative ambulation time, first anal exhaust time and hospital stay than the control group, lower intraoperative hypothermia, postoperative nausea and vomiting and total complication rates than the control group, and higher patient satisfaction than the control group. The differences were statistically significant. *Conclusion*: ERAS concept for operating room service process reengineering can improve perioperative management, accelerate postoperative recovery speed, reduce the incidence of complications, enhance patients' medical experience, and has good clinical application value.

**Keywords:** Enhanced recovery after surgery; Operating room; Service process reengineering; Perioperative care; Postoperative recovery

**Online publication:** Apr 30, 2026

## 1. Introduction

With the development of modern surgery and the increasing demands of patients for the quality of medical services, how to shorten hospital stays, reduce surgical stress and lower medical costs while ensuring surgical safety has become a clinical concern. Enhanced Recovery after surgery is a systematic treatment model that relies on evidence-based medical evidence and integrates multiple perioperative optimization measures. Its aim is to reduce the physical and psychological stress caused by surgery and anesthesia to the body, reduce

the occurrence of complications, and speed up postoperative recovery. The operating room is an important part of perioperative management, and its service process will directly affect the safety of the surgery and the postoperative condition. The traditional operating room service process also has problems such as long waiting times for preoperative preparation, intraoperative management, and postoperative connection, inconsistent measures and standards, and low synergy efficiency, which reduce the overall management efficiency. In recent years, the ERAS concept has been applied to operating room nursing and has achieved results in temperature control, multimodal analgesia and process improvement, but there are few systematic studies on the reengineering of operating room service processes. This paper uses a randomized controlled design to evaluate the clinical value of service process reengineering in operating rooms under the ERAS concept, providing some reference for the improvement of operating room quality [1].

## 2. Data and methods

### 2.1. General information

A total of 260 patients who underwent elective surgery in a tertiary grade A hospital from January 2023 to December 2023 were selected as the study subjects.

#### 2.1.1. Inclusion criteria

(1) 18–75 years old
(2) American Society of Anesthesiologists (ASA) grade I–III
(3) Undergoing elective general anesthesia surgery
(4) Basically, normal preoperative examination indicators
(5) Conscious
(6) Cooperative with the investigator

#### 2.1.2. Exclusion criteria

(1) Those with severe heart, lung, liver or kidney insufficiency
(2) Those with severe preoperative infection or fever
(3) Those who underwent emergency surgery
(4) Those with abnormal coagulation function
(5) Those with a history of mental illness or communication disorders
(6) Women who are pregnant or lactating.

#### 2.1.3. Study design

A total of 260 patients were randomly divided into a control group and an observation group, with 130 cases in each group, using a random number table. There was no statistically significant difference ($p > 0.05$) between the two groups of patients in terms of general information such as gender, age, BMI, ASA classification, and surgical type, and they were comparable [2].

### 2.2. Methods

The control group used the traditional operating room service process. Routine fasting for 12 hours and abstaining from water for 8 hours before the operation; Routine bowel preparation (with laxatives in some

patients); A gastric tube and catheter are routinely placed in the morning of the operation; Analgesics are not routinely used before the operation; Routine heat preservation (covering with a blanket) during the operation; After being transferred from the anesthesia recovery room to the ward after the operation, analgesia was administered as directed by the doctor; Postoperative routine fasting until the anus is vented before resuming diet; Catheters and drainage tubes are removed at the traditional time limit; Encourage patients to get out of bed and move around 24 to 48 hours after the operation [3].

The observation group adopted an operating room service process reengineering program that incorporated the ERAS concept. The program systematically improved the traditional process in three aspects: preoperative, intraoperative and postoperative.

(1) Preoperative

A multidisciplinary team is formed, with the participation of surgeons, anesthesiologists, operating room nurses, nutritionists, rehabilitation therapists, etc. Before the operation, provide systematic health education to the patient, explaining the surgical process, anesthesia methods, and key points of postoperative rehabilitation to the patient in the form of illustrated manuals, video explanations, etc., to reduce the patient's anxiety. The preoperative fasting period was shortened to 6 hours, the no-drink period to 2 hours, and patients were given 400 mL of 12.5% carbohydrate drinks 2 hours before the operation. Bowel preparation is generally not done except for colorectal surgery. Selective indwelling of gastric tubes and catheters is not routinely performed.

(2) Intraoperative procedures

Operating room nurses should make adequate preparations of surgical instruments and equipment in advance, minimize unnecessary installation and removal of instruments, and ensure smooth transitions during the operation. Intraoperative composite insulation measures include adjusting the operating room temperature to 23–25 ℃, using inflatable heating blankets, infusing heating fluids (37 ℃), and heating intraoperative irrigation fluids to 37 ℃, etc. Goal-directed fluid therapy was implemented, with the volume and speed of fluid infusion precisely adjusted according to the hemodynamic indicators of the patient. A variety of analgesic methods were promoted. Non-steroidal anti-inflammatory drugs were administered for prophylactic analgesia before the operation, and regional block methods such as incision infiltration anesthesia and nerve block were used in combination during the operation to reduce the use of opioids. Strictly control the operation time, reduce unnecessary operation steps during the operation, and perform fine operations to minimize tissue damage.

(3) Postoperative procedures

Operating room nurses and ward nurses make standardized handows to patients to ensure the continuity of perioperative information. After anesthesia recovery, the patient's state of consciousness and swallowing function were evaluated. Within 2 to 4 hours, a small amount of water was administered, gradually transitioning to liquid, semi-liquid, and normal diets. Multimodal analgesia was used after the operation, mainly patient-controlled analgesia combined with non-steroidal anti-inflammatory drugs, supplemented by non-pharmacological analgesia methods such as local cold compress, and the pain score was dynamically adjusted (NRS score) to be kept below 3.4 to 6 hours after the operation, the patient sat up with the assistance of an assistant; 6 to 8 hours after the operation, the patient stood beside the bed with the assistance of an assistant; 12 to 24 hours after the operation, the patient got out of bed with the assistance of an assistant. The catheter was removed within 24 hours after the operation,

and the abdominal drainage tube was removed early depending on the volume and shape of the drainage [4].

### 2.3. Observation indicators

(1) Perioperative indicators

Preoperative fasting time, preoperative fluid deprivation time, surgical waiting time (time from entering the operating room to the start of surgery), incidence of intraoperative hypothermia (core body temperature < 36 ℃), intraoperative infusion volume.

(2) Postoperative recovery indicators

Time to first get out of bed after surgery, time to first anal exhaust, time to first oral feeding, length of hospital stays.

(3) Occurrence of complications

Incidence of complications such as postoperative nausea and vomiting, incision infection, urinary tract infection, deep vein thrombosis, pulmonary infection, etc.

(4) Patient satisfaction

A self-made operating room nursing service satisfaction questionnaire was used for assessment before discharge, with a full score of 100. A score of ≥ 90 was considered very satisfied, 70–89 was considered basically satisfied, and < 70 was considered dissatisfied [5].

### 2.4. Statistical processing

Data analysis was conducted using SPSS 26.0 statistical software. Measurement data were expressed as mean ± standard deviation ($\bar{x} \pm s$), and the independent sample t-test was used for comparison between the two groups. Count data were expressed as frequency and percentage (%), and the $\chi^2$ test was used for comparison between the two groups. A difference was considered statistically significant when $p < 0.05$.

## 3. Results

### 3.1. Comparison of perioperative indicators between the two groups

In the observation group, the preoperative fasting time, fluid deprivation time, and surgical waiting time were shorter than those in the control group, and the incidence of intraoperative hypothermia was lower than that in the control group, with statistically significant differences ($p < 0.05$). There was no statistically significant difference in the intraoperative infusion volume between the two groups ($p > 0.05$), as shown in **Table 1**.

**Table 1.** Comparison of perioperative indicators between the two groups

| Indicators | **Preoperative fasting time (h, $\bar{x} \pm s$)** | **Preoperative fasting time (h, $\bar{x} \pm s$)** | **Surgical waiting time (min, $\bar{x} \pm s$)** | **Intraoperative infusion volume (mL, $\bar{x} \pm s$)** | **Intraoperative hypothermia [cases (%)]** |
|---|---|---|---|---|---|
| Control group (n = 130) | 11.24 ± 1.52 | 7.56 ± 1.18 | 45.32 ± 12.64 | 1520.35 ± 245.68 | 16 (12.31) |
| Observation group (n = 130) | 6.38 ± 0.85 | 2.15 ± 0.46 | 28.46 ± 8.37 | 1485.62 ± 231.47 | 4 (3.08) |
| $t/\chi^2$ values | 31.970 | 48.824 | 12.679 | 1.157 | 8.090 |
| $p$ value | < 0.001 | < 0.001 | < 0.001 | 0.249 | 0.005 |

## 3.2. Comparison of postoperative recovery indicators between the two groups

The first time to get out of bed, the first time to exhaust gas through the anus, the first time to eat orally, and the length of hospital stay in the observation group were all shorter than those in the control group, and the differences were statistically significant ($p < 0.05$), as shown in **Table 2**.

**Table 2.** Comparison of postoperative recovery indicators between the two groups ($\bar{x} \pm s$)

| Indicators | First time out of bed (h) | First anal exhaust time (h) | Time of first oral feeding (h) | Length of stay (d) |
|---|---|---|---|---|
| Control group (n = 130) | 36.42 ± 8.56 | 32.18 ± 7.42 | 28.35 ± 6.84 | 10.52 ± 2.86 |
| Observation group (n = 130) | 18.35 ± 5.27 | 20.56 ± 5.18 | 12.47 ± 4.26 | 7.18 ± 1.92 |
| *t* value | 20.307 | 14.857 | 22.627 | 11.015 |
| *p* value | < 0.001 | < 0.001 | < 0.001 | < 0.001 |

## 3.3. Comparison of postoperative complications between the two groups

The total incidence of postoperative complications such as nausea and vomiting, incision infection, urinary tract infection, and deep vein thrombosis in the observation group was lower than that in the control group, and the difference was statistically significant ($p < 0.05$), as shown in **Table 3**.

**Table 3.** Comparison of postoperative complications between the two groups [cases (%)]

| Complication types | Postoperative nausea and vomiting | Incision infection | Urinary tract infection | Deep vein thrombosis | Pulmonary infection | Total complications |
|---|---|---|---|---|---|---|
| Control group (n = 130) | 20 (15.38) | 6 (4.62) | 8 (6.15) | 4 (3.08) | 5 (3.85) | 43 (33.08) |
| Observation group (n = 130) | 8 (6.15) | 2 (1.54 | 2 (1.54) | 1 (0.77) | 1 (0.77) | 14 (10.77) |
| $\chi^2$ value | 6.052 | 2.105 | 4.000 | 1.831 | 2.666 | 19.025 |
| *p* value | 0.014 | 0.147 | 0.046 | 0.176 | 0.103 | < 0.001 |

## 3.4. Comparison of patient satisfaction between the two groups

The overall satisfaction rate of patients in the observation group with operating room nursing services was 95.38%, which was higher than 83.08% in the control group, and the difference was statistically significant ($\chi^2 = 10.429$, $p = 0.001$).

# 4. Discussion

While the traditional operating room service process has played a fundamental safeguarding role in clinical practice, its shortcomings have gradually emerged with the development of concepts such as evidence-based medicine and enhanced recovery after surgery. Prolonged fasting and abstinence before surgery can exacerbate discomfort such as hunger and thirst in patients, and increase insulin resistance and catabolism, thereby exacerbating postoperative stress response; Insufficient insulation during the operation can lead to hypothermia, interfere with coagulation function, and increase the risk of incision infection and delayed anesthesia recovery; A single postoperative analgesic method, delayed feeding recovery and activity guidance also have an impact on overall recovery. Therefore, in this study, the ERAS concept was systematically integrated into the reengineering of operating room service processes, starting with the integration and

optimization of various aspects such as preoperative education, diet management, anesthesia optimization, intraoperative heat preservation, fluid therapy, analgesia management, early postoperative activity, early feeding, and early extubation. The results showed that the observation group had shorter preoperative fasting, water deprivation, and surgical waiting times than the control group, and the incidence of intraoperative hypothermia was significantly lower, indicating that process reengineering can reduce unnecessary waiting, physiological stress, and improve the refinement of perioperative management.

In terms of postoperative recovery, the observation group had better first time out of bed, first anal exhaust, first oral feeding, and hospital stay than the control group. In particular, the first time out of bed was much earlier than in the traditional mode, indicating that optimizing the process has a direct promoting effect on accelerating functional recovery. Early activity can improve lung function, gastrointestinal peristalsis, reduce the occurrence of deep vein thrombosis and pulmonary infection, and also enhance patients' confidence in recovery. Early oral feeding can reduce the adverse effects of long-term fasting on nutritional status and intestinal barrier function. The length of hospital stay is significantly shortened, which, on the one hand, reduces the economic burden on patients and, on the other hand, increases the turnover rate of hospital beds and the utilization rate of medical resources. In terms of complication control, the total incidence of postoperative complications in the observation group was significantly lower than that in the control group. Complications such as nausea and vomiting and urinary tract infection were reduced, which was closely related to multimodal analgesia with reduced opioid dosage, selective indwelling catheterization with early extubating, and combined heat preservation with goal-directed fluid therapy. The ERAS process reengineering has significant benefits for the prognosis of patients.

The results of patient satisfaction once again demonstrated the clinical value of the model. The overall satisfaction rate of the observation group with the operating room nursing service was higher than that of the control group, indicating that process reengineering, in addition to alleviating patients' physical discomfort, can also relieve perioperative anxiety and enhance recognition of the entire diagnosis and treatment process. The smooth implementation of the plan relied on close cooperation among various departments such as surgery, anesthesiology, operating room nursing, nutrition, and rehabilitation, with standardized handover procedures and continuous quality feedback to ensure the implementation of all measures. There was no statistically significant difference in intraoperative infusion volume between the two groups, indicating that the reengineering of operating room processes under the ERAS concept does not increase the medical burden and has good safety and feasibility. Applying the concept of enhanced recovery after surgery (ERAS) to the reengineering of operating room service processes can systematically improve perioperative management, promote postoperative recovery, reduce the incidence of complications, shorten hospital stays, increase patient satisfaction, and has strong clinical promotion value.

## 5. Conclusion

In summary, the traditional operating room service process is no longer sufficient to meet the modern clinical needs of evidence-based medicine and enhanced recovery after surgery. Problems such as unreasonable preoperative fasting and drinking, insufficient intraoperative heat preservation, and delayed postoperative rehabilitation intervention can exacerbate the stress response of patients, increase the risk of complications, and delay the recovery process. In this study, the ERAS concept was systematically integrated into the reengineering of the operating room service process. Through the full-process integration and improvement of preoperative education and diet management optimization, intraoperative precise heat preservation and fluid therapy, postoperative multimodal analgesia, early feeding, early activity and early extubating, the deficiencies of the traditional model were effectively compensated.

The research results confirm that process reengineering based on the ERAS concept can significantly shorten preoperative fasting and fluid deprivation as well as the waiting time for surgery, reduce the incidence of intraoperative hypothermia, and improve the refined level of perioperative management. At the same time, it effectively promotes postoperative functional recovery, significantly advances the time of getting out of bed, anal exhaust and oral feeding, significantly shortens the length of hospital stay, reduces the economic burden on patients, and improves the efficiency of medical resource utilization. In terms of complication control and patient safety, this model can significantly reduce the total incidence of postoperative complications, and there is no statistically significant difference in intraoperative infusion volume, demonstrating good safety and feasibility. In addition, the optimized service process effectively alleviated patients' perioperative anxiety, significantly enhanced the satisfaction of nursing services, and achieved a dual improvement of physical rehabilitation and psychological comfort.

The smooth implementation of ERAS operating room process reengineering relies on the efficient collaboration and standardized quality control of multiple disciplines including surgery, anesthesiology, nursing, nutrition and rehabilitation. The comprehensive application of the concept of enhanced recovery after surgery (ERAS) to the optimization of operating room processes can systematically improve the quality of perioperative management, accelerate postoperative recovery, reduce complications, shorten hospital stays and increase patient satisfaction. It is in line with the development direction of modern surgical nursing and has significant clinical application value and wide promotion significance.

## Disclosure statement

The author declares no conflict of interest.

## References


[1] Sun J, Wei J, 2021, The Application Status of Enhanced Recovery After Surgery in Operating Room Nursing. Journal of Laparoscopic Surgery, 26(02): 153–154.

[2] Chinese Clinical Practice Guidelines for Enhanced Recovery After Surgery (2021) (Part One), 2021, Chinese Clinical Practice Guidelines for Enhanced Recovery After Surgery (2021) (Part One). Peking Union Medical College, 12(05): 624–631.

[3] Chinese Clinical Practice Guidelines for Enhanced Recovery After Surgery (2021) (Part II), 2021, Chinese Clinical Practice Guidelines for Enhanced Recovery After Surgery (2021) (Part II). Peking Union Medical College, 12(05): 632–640.

[4] Li H, Fu X, Zhang C, et al., 2022, Research Progress on Evidence-Based Nursing in the Operating Room Based on the Concept of Enhanced Recovery After Surgery. Nursing Research, 36(02): 275–279.

[5] Hou M, Yue L, Zhang W, et al., 2022, Interpretation of the Consensus Guidelines on Perioperative Nursing for Lumbar Fusion Surgery by the European Association of Enhanced Recovery After Surgery in 2021. Nursing Research, 36(04): 565–571.



**Publisher's note**

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.