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Review Article

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Postoperative Care Principles

Gülsüme SATIR[*a]

[a] Vocational School, Anesthesia Program, Biruni University, Istanbul

Corresponding Authors and Address: Gülsüme Satır, gsatir@biruni.edu.tr

Abstract

Surgical interventions cause many physiological and psychological changes in the human body. The postoperative period is the process that starts with the end of the surgical intervention. The aim of care in the postoperative period is to help the patient by restoring homeostatic balance. Postoperative practices based on current guidelines accelerate the healing process, provide earlier discharge and reduce costs. Therefore, the aim of our study is to provide information about the principles of postoperative care based on guidelines and to contribute to the nursing literature.

Keywords: Surgery, After surgery, Nursing care

Introduction

The postoperative period, which starts with the end of the surgical intervention, is a process that lasts until all body functions of the patient are normalized. The aim of care in the postoperative period is to help and support the patient in reestablishing the impaired homeostatic balance, preventing complications and ensuring return to normal life in a short time (1). The goal of care after surgery is to protect the respiratory system, ensure adequate nutrition, encourage early mobilization, prevent complement growth, accelerate wound healing, and support early discharge.

a) Surgical site infection: Surgical Site Infection (SSI) has been defined as infections observed in the surgical site that may develop within 30 or 90 days after surgical intervention (the day of surgical intervention is taken as the first day). It is estimated that approximately half of SSIs are preventable by applying evidence-based strategies (2). Considering that prevention of SSIs is a priority for patient safety, WHO has developed evidence-based and expert consensus-based recommendations based on a comprehensive list of preventive measures. In the guideline, which is based on a review of preoperative, intraoperative and postoperative evidence for the prevention of SSIs through 28 systematic reviews, the level of evidence for each recommendation is grouped as “Very low”, “Low”, “Moderate” and “High”. The strength of the recommendation was expressed as “Conditional” and “Strong” (3).

Topic	Research Questions	Suggestions	Power	Level of Evidence
Advanced level dressings	In surgical patients, should advanced dressings be used instead of standard dressings for the prevention of SSI?	* The panel does not recommend the use of any type of advanced wound dressing, other than a standard wound dressing, in the surgical wound that is primarily closed to prevent SSI.	Conditional	Low
Prolonged Surgical antibiotic prophylaxis	Does continuation of postoperative Prolonged Surgical antibiotic prophylaxis reduce the risk of SII compared with preoperative and intraoperative prophylaxis?	* The panel recommends against prolonging Prolonged Surgical antibiotic prophylaxis after completion of surgery for the prevention of SII.	Strong	Moderate
Antimicrobial prophylaxis in the presence of a drain and optimal timing for drain removal	1. In the presence of drains, does prolonged antibiotic prophylaxis prevent SII? 2. How long should the drain be kept to minimize SII?	1. The panel recommends against continuing preoperative antibiotic prophylaxis in the presence of a drain to prevent SII. 2. No evidence was found to allow a recommendation to be made on the optimal timing of drain removal.	Conditional Low	Conditional Very Low

National Health Institute for Health and Care Exellence (2017) Surgical site infection prevention recommendations for the postoperative period;

Dressing change: Aseptic non-touch technique should be used to change or remove the surgical wound dressing.

Wound Cleaning: Sterile saline should be used for wound cleansing until 48 hours after surgery, and patients should be told that they can shower safely 48 hours after surgery. If the wound has been surgically separated or opened to drain the surgical wound, tap water should be used for wound cleaning 48 hours after surgery.

Antibiotic Treatment of Surgical Site Infection and Treatment Failure: When a surgical site infection is suspected (e.g. cellulitis), the patient should be given antibiotics. Microbiologic test results should be taken into consideration when choosing antibiotics.

Debridement: EUSOL for debridement in the management of surgical site infection: Edinburgh

University Solution of Lime: Dakin's solution (antiseptic solution: 0.4% boric acid and 0.5% of sodium hypochlorite), gauze, dextranomer (hyaluronic acid) or enzymatic treatment should not be used (4).

b) Use of nasogastric catheter and urinary catheter: The presence of nasogastric catheter has no place in routine practice because it will delay oral feeding of the patient. Even if it is placed intraoperatively, it should be removed at the end of surgery (5). Bladder catheter should be removed in the early period because of its disadvantages including urinary infection and restriction of mobilization (6). However, since the possibility of urine accumulation will increase as a result of epidural blockage, the catheter should remain in place as long as the blockage continues (7,8).

c) Nausea and vomiting after surgery: Nausea is an unpleasant sensation that causes discomfort in the stomach area, leading to the need to vomit or retch. Vomiting is the involuntary, forced expulsion of stomach contents through the mouth and/or nose. The incidence of nausea and vomiting ranges from 30% to 80% after surgery, depending on the type of anesthesia and surgery, as well as the patient's predisposition to risk factors. Postoperative nausea and vomiting (PONV) describes nausea and/or vomiting or retching that occurs in the postanesthesia care unit or within the first 24-48 hours after surgery (9). The simplified risk score Apfel includes four factors and is widely used to identify risk factors associated with postoperative nausea and vomiting. According to the risk score, it is considered to be in the category of 0-1 (low), 2-3 (moderate), and when there are more than 3 risk factors (high risk) (10). The most reliable independent predictors of PONV are female gender, history of PONV or motion sickness, non-smoker, younger age, choice of anesthetic technique (opioids, nitric oxide, halogenated anesthetics), duration of anesthesia, and opioids used postoperatively (11, 12, 13). Postoperative nausea and vomiting can cause patient discomfort, care costs and complications such as aspiration and wound dehiscence. Drugs such as Decort (dexamethasone) or Serotonin (5HT3 receptor antagonist), Droperidol (Fentanyl Citrate) or Metpamide (metoklopramid) can be administered to the patient near the end of the surgical procedure. These drugs are also recommended because they reduce postoperative drowsiness and the effect of anesthetics on gastrointestinal tract motility (14).

d) Prevention of postoperative ileus: Enhanced Recovery After Surgery (ERAS) protocols aim to initiate peristaltic movements with early postoperative mobilization and thus prevent postoperative ileus (15). In the literature, practices such as use of thoracic epidural anesthesia, use of laparoscopic method, avoidance of fluid loading and nasogastric use, chewing gum and oral magnesium use are recommended for the prevention of ileus before, during and after surgery. Postoperative ileus is a condition that results in distension, nausea, vomiting and pain caused by a decrease in gastrointestinal motility due to many factors (16). Topçu and Öztekin (2016) conducted a study titled “The Effect of Chewing Gum Chewing on Recovery After Colorectal Surgery and Reduction of Postoperative Ileus: A Randomized Controlled Study”, the time of chewing gum was determined as the morning of surgery and patients were asked to chew gum for fifteen minutes three times a day. As a result, it was found that chewing gum decreased the development of ileus in patients after colorectal surgery and shortened the time of gas output and defecation (17).

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e) Postoperative pain control: Pain is a factor that has a negative impact on patients after abdominal surgery. The effects of pain cause a decrease in respiratory muscle mobility, inspiratory and expiratory pressures. Respiratory muscle strength decreases by approximately 50% on the first postoperative day and by approximately 25% on the second postoperative day. As the patient's pain decreases, hemodynamic parameters, including respiratory rate, blood pressure and pulse rate, improve. It is very important to manage pain effectively as it allows early mobilization and getting out of bed, increases general activity levels, and encourages deep breathing exercises and the use of spirometry (18, 19). In the guideline published by the American Pain Society (2016), there are recommendations regarding surgical pain management in adults and children according to the level of evidence. These recommendations are as follows:

Health care professionals:

- Provide information to the patient and family about treatment options for surgical pain management (strong recommendation, low quality evidence).

- Conduct a preoperative assessment, including medical and psychiatric comorbidities, concomitant medications, history of chronic pain, substance use and previous surgical treatment, to guide the intra- and postoperative pain management plan (strong recommendation, good quality evidence).

- They are advised to adjust the pain management plan based on the adequacy of pain relief and the presence of adverse events (strong recommendation, low quality evidence).

- It is recommended that they use a valid pain assessment tool to monitor responses to postoperative pain treatments and adjust their treatment plan accordingly (strong recommendation, low quality evidence)

Recommendations on the Use of Physical Methods

- In addition to surgical pain management, no recommendation can be made for the use or non-use of acupuncture, massage, cold application due to insufficient evidence, while the use of TENS is recommended (weak recommendation; moderate evidence).

Recommendations on the Use of Systemic Pharmacological Treatment Methods

- Patients who can use the oral route are advised to prefer the oral route to the intravenous route for surgical analgesia (strong recommendation, moderate quality evidence).

- Patients are advised not to use the intramuscular route for analgesic use in the management of surgical pain (strong recommendation, moderate evidence)

- They are advised to use patient-controlled analgesia for systemic analgesia after surgical intervention when a parenteral route is required (strong recommendation, moderate quality).

- Accurate monitoring of sedation, respiratory arrest and other adverse effects in patients receiving systemic opioids for analgesia after surgical intervention is recommended (strong recommendation, low quality evidence).

- For the management of post-surgical pain, the administration of acetaminophen and/or nonsteroidal anti-inflammatory drugs (NSAIDs) as part of multimodal analgesia is recommended, unless contraindicated (strong recommendation, high quality evidence).

Regular evaluation of the presence of pain and the patient's response to the treatment plan, consistent use of a valid pain scale such as a numeric or visual analog scale, determination of factors that may affect the patient's perception of pain, application of the recommended multimodal pain treatment and re-questioning the patient's pain after all these applications, and if the pain is not controlled as a result of this, it is recommended that the pain plan should be reviewed again (20).

f) Postoperative nutrition: In the human body, tissue destruction and construction is a balanced process that takes place simultaneously. Energy is needed for the regular functioning of these mechanisms. In order to be healthy, the source of energy taken into the body is met from nutrients (21). It has been reported that early postoperative enteral nutrition reduces infection, hospitalization time, cost and anastomotic leakage more than standard treatment. Nasogastric and nasoenteric tubes are recommended for four to six weeks of feeding. In long-term feeding, percutaneous gastrostomy or jejenostomy tube is used (22). The head of the bed is raised 30 degrees to reduce the risk of aspiration during feeding. Diarrhea, abdominal distension, nausea and vomiting, and restlessness are observed during feeding. It is monitored whether the tube is in place. Gastric content is aspirated with a syringe and the pH of the content is checked. The feeding set is changed every 24 hours to prevent infection. Gastric residue control is performed every 4-8 hours. In cases where the gastric content is 100-150 cc or more, the physician is informed (23).

European Enteral and Parenteral Nutrition Nutrition (ESPEN) Nutrition Recommendations for Surgical Patients (2017)

- Postoperative oral intake should generally be continued without interruption (Strong Evidence).

- Nutritional support should be initiated for patients who have received less than 50% of their body's nutritional requirements for more than 7 days and are malnourished. Enteral nutrition is preferred (Strong Evidence).

- Patients for whom early oral feeding is not possible should be identified. These include cancer patients undergoing major head and neck or gastrointestinal surgery, severe injuries including brain trauma, and patients with severe malnutrition identified during the perioperative period (Strong Evidence).

- If patients are to be tube fed after surgery, it should be started within 24 hours (Strong Evidence).

- PEG is recommended if tube feeding is required for longer than 4 weeks. (Strong Evidence).

- Nutrition after transplantation is an important factor affecting the outcome, so tube feeding

is recommended if additional oral food supplementation is deemed necessary in the postoperative period (Strong Evidence).

- Normal food intake or enteral nutrition is recommended within 24 hours in the early period after heart, lung, liver, pancreas and kidney transplantation (Strong Evidence) (22).

Blood glucose control: Morbidity and mortality after major gastrointestinal surgery are associated with insulin resistance and plasma glucose levels. The most prominent protocol items are: prevention of preoperative fasting and oral bowel preparation; use of oral carbohydrate therapy and stimulation of bowel function with fluid balance; and avoidance of opioids (24). Diabetic patients should be well prepared preoperatively and closely monitored in the postoperative period. As recommended in many guidelines, the goal should be to maintain blood glucose levels around 140-180 mg/dL (25).

g) Hypothermia: Undesirable effects due to hypothermia lead to prolonged stay in intensive care unit and hospital, thus increasing morbidity, mortality and patient care costs.

- In the postoperative period; body temperature should be measured every 15 minutes while in the recovery unit. Patients with a body temperature below 36˚C should not be transferred to the ward and should be actively heated with hot air blowing methods.

- Patients should be kept warm even after being transferred to the ward and if their body temperature is below 36˚C, they should be warmed with hot air blowing methods. Temperature should be measured and recorded every 30 minutes.

- If the hypothermic patient is warmed slowly and in a controlled manner after surgery, potassium excretion from the kidneys is facilitated and hyperkalemia can be prevented.

- In patients with anuria or severe oliguria, warming should not be started without renal replacement therapy.

- Since heart rhythm may be disrupted due to hypothermia, electrocardiogram should be monitored at regular intervals and heart rhythm should be monitored continuously when necessary.

- If the body temperature of the patient in the ward is stable (i.e. within normal limits), it should be checked and recorded at four-hour intervals.

- Institutional policies should be established on issues such as which heating equipment to use in the surgical process and how to clean it, and healthcare workers should be trained in this regard (26).

h) Early mobilization: Bed rest after surgery; It is not recommended because it increases muscle loss, reduces muscle strength, and impairs respiratory functions and tissue oxygenation. Blood pressure is evaluated before the patient stands up, in the supine position, and then in the sitting position. With gradual position change, the adaptation of the circulatory system to the change is facilitated. If there are signs of orthostatic hypotension, a drop of 20 mmHg in systolic blood pressure, a drop of 10 mmHg in diastolic blood pressure, weakness and dizziness, getting

the patient to stand up should be postponed for a few hours (27). According to the ERAS protocol, the patient should wait 2 hours on the day of surgery and at least 6 hours on other days. Mobilization should be ensured outside the bed for hours (7). Postoperative loss of muscle mass, early mobilization according to ERAS should be implemented to prevent atelectasis, pneumonia and deep vein thrombosis. Level of evidence: High Recommendation grade: Strong (28). According to AORN 2018 updates; After surgery, the patient should be mobilized as soon as possible (Strong Evidence), and the nurse should work with the perioperative team to minimize obstacles to postoperative ambulation (Strong Evidence) (6).

ı) Discharge planning, follow-up and control of results: According to the ERAS protocol, the three most important factors affecting the decision on the patient's discharge time are; being able to take food orally, providing analgesia with oral analgesics, and being able to have adequate mobilization (29). Discharged patients should be called by phone 24 - 48 hours later and their status should be learned. If no problems occur, the patient should be invited to check the wound and remove the stitches on the 7th - 10th postoperative day. Since the pathology report will be prepared during this period, additional oncological treatment should be planned if necessary. It should be kept in mind that 1-3% of patients discharged home will develop anastomotic leakage or another major complication, and each complaint should be examined carefully. The next interview can be made by phone on the 30th postoperative day (25).

Audit of results;

• A systemic audit is essential to determine clinical outcome and ensure successful implementation of the protocol.

• If the results do not reach the desired quality standards, it is important to distinguish between unsuccessful implementation and failure to achieve the desired effect from the implemented protocol.

• It is necessary to make comparisons with other centers that use similar protocols and the same recording methods (25).

Conclusion

As a result, nurses should evaluate the patient as a whole in the postoperative period. To prevent SII, the guidelines should be taken into consideration, the Apfel risk score should be used to evaluate postoperative nausea and vomiting, the patient should be encouraged for early mobilization to prevent ileus, the patient's pain should be managed as recommended by the guidelines, oral nutrition should be started as soon as possible, and great attention should be paid to hypothermia. It has been stated that when the recommendations of the guidelines are taken into account in post-surgical care, the hospital stay of patients, complication rates are reduced and recovery is accelerated.

Disclosure Statement

The author declare that they have no conflict of interest.

References

1. Akyolcu N. Ameliyat sonrası hemşirelik bakımı. Akyolcu, N, Kanan, N, & Aksoy, G. (Eds.). Cerrahi Hastalıkları Hemşireliği I. Nobel Tıp Kitabevleri, İstanbul. 2012;335-366.

2. Berrios-Torres SI, Umscheid CA, Bratzler DW, Leas B, Stone EC, KelzRR, Reinke CE. Centers for disease control and prevent quideline fort he prevention of surgical site infection, 2017. JAMA Surg. 152(8):784-91. doi: 10.1001/jamasurg.2017.0904.

3. World Health Organization. Preventing surgical site infections: İmplementation approaches for evidence-based recommendations. 2018. Avaible at: http://apps.who.int/iris/ handle/10665/273154, accessed 21 November 2023).

4. Özbayır, T. Cerrahi alan enfeksiyonunda güncel rehberlerin önerileri. 2.Uluslararası 10.Ulusal Türk Ameliyathane ve Cerrahi Hemşireliği Kongresi. 2017.

5. Ersoy E, Gündoğdu H. Cerrahi sonrası iyileşmenin hızlandırılması. Ulusal Cerrahi Dergisi. 2007; 23(1): 35-40.

6. Harper MG, Whiteside D, Warren JI, MacDonald R, Ulrich B. The Association for Nursing Professional Development National Preceptor Practice Analysis Study: An Exploration of Precepting in Perioperative Settings. AORN journal. 2023;118(1): 24-34. https://doi.org/10.1002/aorn.13950

7. Demirhan İ, Pınar G. Enhanced recovery after surgery and nursing practices enhanced recovery and nursing. Yıldırım Beyazıt Üniversitesi Sağlık Bilimleri Fakültesi Hemşirelik EDergisi. 2014;2(1):43-53

8. Karabulut, N. Kolorektal cerrahide kanıta dayalı yeni yaklaşımlar: Hızlı izlem protokolleri. Türkiye Klinikleri Hemşirelik Bilimleri Dergisi. 2013;5(1): 42,-46.

9. Elvir-Lazo OL, White PF, Yumul R, Eng HC, 2020, Management strategies for the treatment and prevention of postoperative/postdischarge nausea and vomiting: An updated review. F1000 Res. 2020;13:9. https://doi.org/10.12688/f1000research.21832.1

10. Aktaş Y, Gürçayır D, Atalay C. Ameliyat Sonrası Bulantı Kusma Yönetiminde Kanıta Dayalı Uygulamalar. Dicle Tıp Dergisi. 2018;45(3), 341-351.

11. Scott MJ, Baldini G, Fearon KCH, Feldheiser A, Feldman LS, Gan TJ, Carli F. Enhanced Recovery After Surgery (ERAS) for gastrointestinal surgery, part 1: pathophysiological considerations. Acta Anaesthesiologica Scandinavica. 2015;59(10):1212-1231. https://doi.org/10.5798/dicletip.457268

12. Apfel CC, Heidrich FM, Jukar-Rao S, Jalota L, Hornuss C, Whelan RP, Cakmakkaya OS. Evidence-based analysis of risk factors for postoperative nausea and vomiting. British Journal of Anaesthesia. 2012;109(5):742-753.

13. Naeem Z, Chen IL, Pryor AD, Docimo S, Gan TJ, Spaniolas K. Antiemetic prophylaxis and anesthetic approaches to reduce postoperative nausea and vomiting in bariatric surgery patients: A systematic review, Obes Surg.2020;30(8):3188-3200. https://doi.org/10.1007/s11695-020-04683-1

14. Sánchez-Jiménez AB, Álvarez JT, López A, Sánchez-Jiménez FG, Conde JA. ERAS (Enhanced Recovery after Surgery) in colorectal surgery. In Colorectal cancer-surgery, diagnostics and treatment. IntechOpen. 2014. DOI: 10.5772/57136

15. Thorell A, MacCormick AD, Awad S, Reynolds N, Roulin D, Demartines N, Lobo DN. Guidelines for perioperative care in bariatric surgery: Enhanced recovery after surgery (ERAS) society recommendations, World Journal of Surgery. 2016; 40(9):2065-2083. https://doi.org/10.1007/s00268-016-3492-3

16. Tuna P, Kurşun Ş. Kolorektal Cerrahisinde Hızlandırılmış Bakım Protokolleri ve Hemşirelik Bakımı. Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi. 2018;11 (2):180-188.

17. Topcu SY, Öztekin SD. Effect of gum chewing on reducing postoperative ileus and recovery after colorectal surgery: A randomised controlled trial. Complementary Therapies in Clinical Practice. 2016;23:21-25.

18. Puplampu T, Simpson S. Nursing care of the bariatric surgery patient. Obesity, Bariatric and metabolic surgery: A practical guide. 2016;147-154. https://doi.org/10.1007/978-3-319-04343-2_16

19. Luchesa CA, Lopes AJ. Role of transcutaneous electric nerve stimulation in pain and pulmonary function in patients after bariatric surgery. Rehabilitation Research and Practice. 2022. https://doi.org/10.1155/2022/9138602

20. Özbaş A, Tohumat G. Cerrahi hastasında ağrı. 2.Uluslararası 10.Ulusal Türk Ameliyathane ve Cerrahi Hemşireliği Kongresi. 2017.

21. Sivrikaya SK, Eryılmaz A. Nütrisyonel destek ekibinde hemşirelik, Samsun Sağ Bil Der. 2018;3(2):33-37.

22. Özbaş A. Oral/enteral beslenme güncel yaklaşımlar. 3. Uluslararası 11. Ulusal Türk Cerrahi ve Ameliyathane Hemşireliği Kongresi. İzmir. 2019.

23. Çelebi D, Yılmaz, E. Cerrahi hastalarda enteral ve parenteral beslenmede kanıta dayalı uygulamalar ve hemşirelik bakımı. Istanbul Gelisim University Journal of Health Sciences. 2019;7: 714-731.

24. Mortensen K, Nilsson M, Slim K, Schäfer M, Mariette C, Braga M. Enhanced Recovery After Surgery (ERAS®) Group. Consensus guidelines for enhanced recovery after gastrectomy: Enhanced Recovery After Surgery (ERAS®) Society recommendations. British Journal of Surgery. 2014;101(10):1209-1229. https://doi.org/10.1002/bjs.9582

25. ERAS Guidelines (2019). Avaible at: :https://erassociety.org/guidelines/list-of;-guidelines/ accessed 15 November 2023.

26. Aygin D, Yaman Ö. Ameliyat sonrası vücut sıcaklığı komplikasyonları ve hemşirelik bakımı. Turkiye Klinikleri Surgical Nursing-Special Topics. 2019;5(2):59-65.

27. Eti Aslan F. Postoperative care. Eti Aslan F, Karadakovan A, editörler. Dahili ve Cerrahi Hastalıklarda Bakım. 3. Baskı. Ankara: Akademisyen Tıp Kitabevi; 2014;279-306.

28. Nanninga H, Bonnal A, Jean-Charles Le Huec, Fawcett WJ, Ljungqvist O, Lonjon G, de Boer HD ERAS Guideline Consensus statement for perioperative care in lumbar spinal fusion: Enhanced Recovery After Surgery (ERAS) Society recommendations. The Spine Journal. 2021;21(2021) 729-752. https://doi.org/10.1016/j.spinee.2021.01.001

29. Bozkırlı BO, Gündoğdu H, Ersoy E. ERAS protokolü kolorektal cerrahi sonuçlarımızı etkiledi mi? Turkish J Surg. 2012; 28(3):149-52.