Surgery Research Journal
ISSN: 2768-0428

Review Article

Excellence in Surgical Care: A Review of Preoperative and Postoperative Management

Edilmar de Moura Santos, Ph.D.[1,2], Amália Cinthia Meneses do Rêgo, Ph.D.[1,2], Irami Araújo-Filho, Ph.D.[1-3]

[1]*Institute of Teaching, Research, and Innovation, Liga Contra o Câncer – Natal/RN, Brazil*
[2]*Full Professor of the Postgraduate Program in Biotechnology at Potiguar University, Potiguar University (UnP) – Natal/RN, Brazil.*
[3]*Full Professor, Department of Surgery, Potiguar University. Ph.D. in Health Science/ Natal-RN - Brazil.*

Correspondence

Prof. Dr. Irami Araújo-Filho

Av. Hermes da Fonseca, 1444 - Apto. 1302 - Tirol - Natal - State of Rio Grande do Norte - Brazil. Zip code: 59020-650.
Phone: +55 84 98876-0206
E-mail: irami.filho@uol.com.br

CV: http://lattes.cnpq.br/3975706297235540 https://www.researchgate.net/profile/Irami_Filho https://publons.com/researcher/1338886/irami-araujo-filho/ https://orcid.org/0000-0003-2471-7447

- Received Date: 07 Dec 2023
- Accepted Date: 14 Dec 2023
- Publication Date: 18 Dec 2023

Keywords

surgery, surgical procedures, perioperative procedures, preoperative care, postoperative care, perioperative care, patient care management.

Abstract

A retrospective study aimed to analyze and identify the main components involved in patients' preoperative and postoperative management, recognizing the importance of knowledge in approaching the complexities inherent to surgical procedures. Search was conducted in the PubMed, Embase, SCOPUS, Web of Science, and Google Scholar databases to identify relevant studies. Patients with compromised organic functional reserve, when undergoing surgical procedures, often face an increased risk of morbidity and mortality. In this context, obtaining a comprehensive medical history and a meticulous physical assessment are crucial in decision- making. Laboratory tests are recommended only when clinical findings justify their performance. This review highlights fundamental aspects, including surgical indication, clinical history, physical examination, surgical risk assessment, continuous use medications, sedation approaches, antibiotic prophylaxis, unique preparations, and postoperative care. In conclusion, this comprehensive literature review significantly contributed to the in-depth and well-founded understanding of the preoperative preparation and postoperative care of patients with surgical pathologies within a scientifically validated context.

Introduction

The preoperative preparation of patients begins with the indication of surgical treatment. In most cases, patients are referred to surgeons by other specialists, generally clinicians from a wide range of specialties [1,2].

Patients seek the surgeon with a suspected surgical disease diagnosis and clinical investigation exams in hand. Additional tests and imaging exams may be necessary, and the need for surgical intervention should be discussed with the patient and their family members [2].

The surgeon must explain the risks and benefits of surgical treatment, non-surgical alternatives, etc. During the initial contact, the surgeon must demonstrate knowledge and establish a good doctor-patient relationship, with enough time to listen to the doubts and concerns of the patients and their families [1-3].

Once it has been decided that surgical intervention is the best or only alternative for the patient's disease, the type of operation, surgical time, location of the intervention, technique, and preoperative preparation with clinical and laboratory exams must be explained, as well as surgical risk assessment [4].

Good preoperative preparation is essential for the success of any surgical procedure.

Objectively, it can be divided into [5]:

- general.
- specific to certain operations.
- preparation of patients with previous illnesses.

The general preoperative period comprises an excellent clinical approach (anamnesis and physical examination), necessary preoperative exams, when indicated, and care before surgery4.

Preoperative management

Clinical history and physical examination

If the preoperative assessment identifies significant comorbidity, consultation with a clinician or a doctor from another specialty may be necessary to facilitate the direction of management [3,6].

Vital information to guide the assessment of surgical risk includes information about the disease indicative of the surgical procedure; personal history (previous surgeries, myocardial infarction, angina, arrhythmia, low oximetry, diabetes, heart and kidney failure, acute lung edema, bleeding, positive serology for hepatitis C virus, psychological/psychiatric state, allergies, among others; determination functional capacity; location of surgery and availability of technical support (personnel and equipment); type of anesthesia; estimated surgical time; in addition to

Citation: de Moura Santos E, do RêgoACM, Araújo-Filho I. Excellence in Surgical Care: A Review of Preoperative and Postoperative Management. Surg Res J. 2024;4(1):1-8

sociodemographic and cultural factors, such as age, sex, blood type and possibility of transfusion [2,7].

A young patient who will undergo a minor or medium-sized surgical procedure does not need any laboratory tests if the history and physical examination show that he is healthy. Emphasis should be placed on a thorough anamnesis, with careful assessment of organic systems, pathological history, and use of medications [3,8].

The physical assessment must be thorough, complete, and never replaced by complementary exams. Performing "routine" preoperative exams is not recommended at the surgeon's discretion, as only a tiny percentage of patients (0.2%) will benefit from them [4,9].

The following complementary tests in asymptomatic patients, therefore, should only be requested in some circumstances, based on the patient's age, the type of surgery, and changes evidenced in the history or physical examination [2-4]:

- **Blood count:** Request in cases of major interventions, clinical suspicion of anemia or polycythemia, renal failure, neoplasms, splenomegaly, use of anticoagulants, infection, recent radio, or chemotherapy.
- **Coagulogram:** history of abnormal bleeding in vascular, ophthalmological, neurological, or extracorporeal circulation operations, liver disease, advanced neoplasms, splenomegaly. Request coagulogram I and II.
- **Blood typing:** It is justified in major elective surgical procedures with the possibility of high blood loss. Always provide a blood reserve.
- **Glycemia:** Request for patients over 40 years of age, history of diabetes, use of hyperglycemic agents, corticosteroids or thiazides, parenteral nutrition.
- **Creatininemia:** for patients over 40 years of age with a history of nephropathies, high blood pressure, and diabetes.
- **Electrolyte dosage:** patients using diuretics or corticosteroids with nephropathies, secondary hyperaldosteronism, and edema.
- **Urine culture:** patients with indication for bladder catheterization during the operation and for groups at risk for bacteriuria.
- **Simple chest X-rays (posteroanterior and profile):** for patients over 60 years of age, thoracic or upper abdominal operations, heart disease, pneumopathies and cancer patients, smokers.
- **Electrocardiogram:** patients > 40 - 50 years old, with heart disease, coronary heart disease or symptoms of angina, diabetics, hypertensive patients, and those with other heart diseases or using cardiotoxic drugs.

Table 1. Classification of the American Society of Anesthesiologists – ASA

CLASSIFICATION	DEFINITION	PATIENTS	
ASA I	A normal and healthy patient	Adult	Healthy, non-obese (BMI≤30), non- smoking patient, no or minimal alcohol use with good exercise tolerance.
ASA II	Patient with mild systemic disease	Adult	Mild illnesses only without substantive functional limitations. Current smoker, social alcohol drinker, pregnancy, obesity (BMI≤30-35), well-controlled DM/hypertension, mild lung disease.
		Pregnant	Normal pregnancy, well-controlled gestational hypertension, controlled pre-eclampsia without severe features, gestational DM controlled by diet.
ASA III	Patient with moderate systemic disease	Adult	Substantive functional limitations: One or more moderate to severe illnesses. DM or poorly controlled hypertension, COPD, morbid obesity (BMI ≥40), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction in ejection fraction, ESRD (End-stage renal disease) undergoing regularly scheduled dialysis, history (> three months) of AMI, CVA or CAD (coronary artery disease) / STENS.
		Pregnant	Pre-eclampsia with severe characteristics, gestational DM with complications or high insulin requirements, and a thrombophilic disease that requires anticoagulation.
ASA IV	Patients with severe systemic disease that is a constant threat to life	Adult	AMI, stroke, recent CAD/stents (<3 months), ongoing cardiac ischemia or severe valve dysfunction, severe reduction in ejection fraction, shock, sepsis, and ESRD not undergoing regularly scheduled dialysis
		Pregnant	Pre-eclampsia with severe features complicated by HELLP or another adverse event, peripartum cardiomyopathy with EF <40, uncorrected/decompensated heart disease, acquired or congenital.
ASA V	A dying patient who is not expected to survive without the operation	Adult	Ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleeding with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ/system dysfunction
		Pregnant	Uterine rupture
ASA VI	Brain-dead patients whose organs are being removed to transplant them to another patient.		

Source: American Society of Anesthesiologists – ASA - Physical Status Classification System (Approved by the ASA House of Delegates in December 2020).

Surgical risk

The number of surgical procedures in the world is large, and in Brazil, it has shown a growth trend higher than population growth. In this context, perioperative cardiopulmonary risk assessment safeguards the optimization of the outcomes sought by the procedures (Table 1) [3,10].

Nutritional assessment

Reducing postoperative complications and early recovery have been two fundamental pillars driving improvement in surgical techniques and perioperative management. Malnutrition, both preoperative and resulting from the surgery itself, substantially increases the length of hospital stay and the costs of procedures [4,5].

Nutritional assessment is indicated for malnourished, emaciated patients, candidates for surgical treatment of morbid obesity, with consumptive diseases or diseases that affect the absorption capacity of the gastrointestinal tract, and patients with gastrointestinal losses due to fistulas, vomiting, diarrhea, or infections. The assessment includes anthropometric and laboratory parameters and aims to quantify body reserves [6,11].

Weight loss suggests intense protein depletion and reduced immunity, with increased pre- and postoperative morbidity. Anthropometric measurements, such as assessment of tricipital skinfold thickness, arm circumference, and body mass, must be performed [7,12].

Nutritional status is probably among the best-studied and best-known determinants of surgical results. Around 40% and 50% of patients undergoing surgery have some degree of malnutrition6. Preoperative malnutrition is associated with a higher rate of infections, worse evolution and poor healing of the surgical wound, development of pressure ulcers, and prolonged hospital stay, both in the intensive care unit and in the conventional hospitalization unit [7,8,13].

Major surgery results in a catabolic response that results in inflammation, protein catabolism, and nitrogen losses. Albuminemia less than 3.5g/dL and lymphocyte count below 1,500/mm3 have a poor prognosis4. Serum transferrin dosage (average>250mg/%) is also essential. In malnourished patients in whom nutritional support cannot be provided through the digestive tract, prior parenteral nutrition is indicated for at least 15 days [6-8].

The immunological status will be guaranteed by acute phase proteins (fibrinogen, fibronectin, ceruloplasmin) that are synthesized in the short term, around ten days. Early postoperative feeding administered orally or enterally can reduce postoperative complications and length of hospital stay. There are also indications that perioperative immunonutrition can reduce postoperative infectious complications and length of hospital stay [9,14].

Diet

The dietary restriction is due to the type of anesthesia, disease, and the type of surgical

procedure that will be performed. Under general anesthesia, preoperative fasting should be eight hours to avoid broncho-aspiration during anesthetic induction or orotracheal intubation. Patients who are obese, pregnant, have a hiatal hernia or have large intra-abdominal tumors are at greater risk of broncho-aspiration and should always fast for 12h [10,15].

Usual medicines

They must be suspended preoperatively [16].

- Oral anticoagulants must be replaced by heparin approximately five days beforehand. This, in turn, must be suspended six hours before the surgical procedure and restarted 24- 48 hours later. In emergency operations, fresh plasma (15-20mI/Kg) must be transfused [11].
- Platelet anti-adherents [10].
- Acetylsalicylic acid (ASA) and non-steroidal anti-inflammatory drugs must be suspended ten days before the intervention, as they alter platelet function. However, there are reports contrary to this conduct [12].
- Antidepressants: in particular, monoamine oxidase inhibitors (MAOIs) should be withdrawn 3-5 days before surgery [6].
- Oral hypoglycemic drugs must be replaced with regular insulin or NPH the day before surgery. Patients using NPH insulin: half the dose on the morning of the operation, followed by infusion of 5% glucose solution [8].
- Medications that must be maintained until the day of the operation: Beta-blockers, antihypertensives, cardio tonics, bronchodilators, corticosteroids, anticonvulsants, insulin, antiallergics, potassium, psychiatric medication [4].

Trichotomy

Shaving the skin with a razor is contraindicated due to the greater risk of abrasions and surgical wound infection. Hair removal, preferably with a barber's clipper, should be carried out as close as possible to the time of the operation and even in the operating room [10].

Skin preparation

The patient should be advised to practice good hygiene and bathe on the day of the intervention, using antiseptic degerming solutions to wash, particularly in the region that will be incised. In the operating room: degerming the skin in the surgical incision area using polyvinyl-pyrrolidone- iodine or chlorhexidine solutions. Then, antisepsis with alcoholic solutions of the same degermation agents [13].

Colon preparation

Mechanical bowel preparation and oral antibiotics for elective colorectal surgery in adults: a Cochran review (2014) recommended that antibiotics be administered orally with mechanical bowel preparation and intravenously 1h before surgery to reduce surgical site infection [14]. Mechanical bowel preparation and oral antibiotic preparation are recommended for all elective colorectal surgeries in adults [15].

Catheterizations

Bladder catheterization is only when there is an absolute need to monitor tissue and renal perfusion in pelvic or urinary tract operations, constantly routinely in the operating room, with the patient anesthetized. Preoperative gastric aspiration with a nasogastric tube: in patients with gastric dilation, with pyloric stenosis, distended due to intestinal occlusion or sub-occlusion, and in surgical emergencies [17].

Sedation

All patients must be medicated preoperatively to reduce the degree of anxiety. The routine is to use benzodiazepines, such as Diazepam 10mg orally (PO) on the days before the

Table 2. Classification of surgical wounds according to the degree of contamination and infection rates

Degree of Contamination	Operations	Infection rate
CLEAN (class I)	Non-traumatic, No infection, No break-in surgical technique, Respiratory, alimentary, or genitourinary tract not penetrated	2,1%
CONTAMINATED CLEAN (Class II)	The alimentary or respiratory tract penetrated without significant fluid spillage.	3,3%
CONTAMINATED (Class III)	An extensive break-in technique is a significant spillage of liquid—gastrointestinal, recent traumatic wound < 6h old. Entry into the genitourinary or biliary tract with infected urine or bile.	6,4%
INFECTED (Class IV)	Acute bacterial infection without pus Clean tissue section for pus collection Traumatic wound with retained devitalized tissue, foreign bodies, treatment 6 hours after trauma. Fecal contamination.	7,1%

operation, and sedation with sublingual midazolam (SL) for 30min. before the operation [18].

Antibiotic prophylaxis

Appropriate antibiotics for infection prevention in surgery depend on the pathogens most frequently encountered during surgical procedures. Knowledge of the type of surgical intervention, according to the degree of contamination, is instrumental in deciding whether to use prophylactic antibiotics. Table 2 breaks down the operations' classification according to their contamination degree (Table 2) [18,19].

In clean operations, there is no indication of antibiotic prophylaxis. However, there are exceptions: herniorrhaphies with prosthesis, breast, vascular, and orthopedic intervention with prosthesis, cardiac, neurosurgery without prosthesis, and thoracic surgery involving the mediastinum. As the most common germ is S.aureus, use first-generation cephalosporins (cefazolin, cephalothin) [19].

In potentially contaminated operations (tracheobronchial tree, stomach/duodenum with hypochlorhydria, jejunum without obstruction, bile ducts, hysterectomies, cesarean sections: the most frequent germs are enterobacteria. Antibiotic of choice: first-generation cephalosporin18.

Potentially contaminated operations (neurosurgery through mucous membranes, head, neck, esophagus: most frequent germs - Gram-positive and negative aerobes + anaerobes from the oral cavity: drug to use amoxicillin/clavulanate. Prostate and urinary tract with a negative preoperative urine culture. The most common germs are enterobacteria. Drug for prophylaxis: ciprofloxacin [17-19].

Contaminated operations (jejunum with obstruction, ileum, colon, rectum, acute appendicitis without perforation). The most frequent germs Are Gram-negative aerobic and anaerobic. Drugs: gentamicin+cindamycin or metronidazole; amoxicillin/clavulanate; ampicillin sulbactam; cefoxitin [18-20].

In most cases, the single dose of antibiotic used for prophylactic purposes corresponds to a single intravenous dose. Start immediately before anesthetic induction, 30-60min. Before surgical incision [21]. Therefore, the prophylaxis regimen with cephalothin (half-life of 1h) would be 2g during anesthetic induction followed by 1g every two hours for as long as the surgery lasts. If the drug used is cefazolin (half-life of 2 hours), subsequent doses must be administered every four hours, allowing prophylaxis in most procedures [14-16].

Extending prophylaxis to the first 24 postoperative hours or more should be justified in defined clinical situations when the risk of postoperative infection is high. Any decision to extend prophylaxis beyond the period established by the guidelines must be explained in the medical record [20-22].

Special conditions

Jaundiced patient

They present high morbidity and mortality because of hepatocyte damage, immunosuppression, imbalance of the intestinal bacterial microbiota with a higher incidence of bacterial translocation and absorption of endotoxins, damage to the renal tubules, with consequent renal failure, liver failure, and sepsis [2].

Prescribe intravenous hydration; decompression of the bile ducts (to recover hepatocytes and the immune response); vitamin K; antibiotic prophylaxis [23].

Diabetic patient

Average blood glucose must be maintained. The operation on diabetic patients should, whenever possible, be performed in the morning. Replace the long-acting oral hypoglycemic agent with regular insulin two days before surgery [15].

NPH insulin with regular insulin as follows: On the morning of the intervention, measure your blood glucose beforehand; Start an infusion of 5% glucose serum; monitor blood glucose during the operation [21].

Colon surgery

Residue-free diet 5-7 days before; liquid diet the day before; zero diet on the day of the operation. Mechanical cleaning with 20% mannitol orally (750ml+750mL of orange juice, ingested over two hours), administered in the afternoon of the day before the surgery. Hydrate with 0.9% saline solution concomitantly using mannitol in the volume necessary for each case. An alternative is the use of oral polyethylene glycol. Intestinal lavage: can be performed with glycerinated enemas, saline solution, or commercially prepared enemas [22,24].

However, it is worth highlighting that recent studies have demonstrated no prior need for colon preparation, arguing that the rate of postoperative fistulas in colonic surgeries did not vary between the groups with initial colon preparation and the control groups. One explanation for this phenomenon is that working with solid feces causes less fecal leakage through the anastomotic sutures [25].

Antibiotic prophylaxis: as part of colon preparation and surgical site infection prophylaxis, antibiotics with action against Gram-negative germs and Bacteroides fragilis should be used orally (neomycin and erythromycin or metronidazole, administered the night before the operation) or systemic: association of aminoglycosides and metronidazole or with single drugs, such as ampicillin/sulbactam or cefoxitin [23,26].

Postoperative management

Pain, fasting, blood loss, reduced tissue perfusion due to extensive surgical trauma, and functional disorders of vital organs generate organic and humoral changes that aim to reestablish homeostasis [21].

Clinical examination

Postoperative (PO) clinical examination must be thorough and, at least, daily, as subtle changes are only evident with repeated assessments and allow early complications diagnosis [5-7].

Level of consciousness, hemodynamic status: vital signs, urine output, degree of hydration; Urine: volume, color, density; Examine the cardiorespiratory system and abdomen; Operative wound: inspection, palpation; nasogastric tube: volume and aspect of drainage; Drains: volume and appearance of secretions [27].

Complementary exams

Most surgical patients do not require routine additional examinations in the postoperative period unless the clinical examination suggests abnormalities that require investigation. In more severe cases, they may require daily or even more frequent checks, depending on the underlying disease, the operation size, and possible complications risks [6,28].

Doctor's prescription

The medication prescription and medical orders or postoperative care are made separately and sequentially. The prescription must include fluid and electrolyte replacement and analgesia. Prophylaxis of deep vein thrombosis (DVT), stress gastritis, and antibiotics deserve precise indications and specific medications for the underlying diseases. Postoperative care includes diet, care with catheters and drains, mobilization and breathing exercises, and dressings [15,29].

Hydro Electrolyte Replacement

Usually, water consumption by an average individual (60-80Kg) is in the order of 2,000- 2,500mL/day, of which approximately 1,500 is ingested as liquids and the remainder extracted from solid foods and oxidized. Another fluid source in patients undergoing prolonged fasting is endogenous water produced by cellular catabolism, which can reach 500mL/day [30].

Daily fluid losses include 800-1,500mL of urine, 250mL of feces, and 600 - 900mL of insensible perspiration, which increase postoperatively with hypermetabolism, hyperventilation, and fever [18].

Analgesia

Several types of available medications can provide a comfortable postoperative period, particularly opioid derivatives, non-steroidal anti-inflammatory drugs, and different types of analgesics. Analgesia must be performed regularly and not just during painful symptoms [3,31].

Antiemetics

A frequent symptom in the immediate postoperative period of patients undergoing general anesthesia and especially surgical procedures on the upper digestive tract and bile ducts, vomiting, in addition to being uncomfortable, increases pain and can put the abdominal wall sutures at risk. It can be minimized by using metoclopramide and, more recently, in more severe cases, ondansetron [19,32].

Prophylaxis of Deep Vein Thrombosis (DVT)

Studies using labeled fibrinogen indicate a prevalence of deep vein thrombosis (DVT) of more than 40% in patients undergoing general surgery. Around 1% of these patients develop pulmonary embolism, a potentially fatal complication [26,34].

The risk of DVT is increased in older, obese individuals or in those who use oral contraceptives, have cardiovascular diseases (mainly heart failure and atrial fibrillation), have cancer, have undergone procedures on the lower extremities, and have prolonged periods of immobilization [11-13].

Operations involving the pelvis and hip are among those with the highest risk for developing DVT. It is important to note that embolism cases often occur around the seventh day after surgery [10].

DVT prophylaxis is the most effective strategy for preventing these complications. Risk assessment of patients undergoing surgery, according to the Caprini score, is essential. Based on this assessment, mechanical and pharmacological prophylaxis measures should be initiated according to the degree of risk. The main recommendation for very low-risk patients (<0.5%) is early mobilization. In low-risk cases (<1.5%), elastic or pneumatic compression devices should be used [33,35].

In moderate (3%) or high (6%) risk situations, the indication is the use of prophylactic subcutaneous heparin 5,000 IU every 12 hours or low molecular weight heparin (enoxaparin) 40 mg in a single dose. Daily administration results in a lower incidence of bleeding complications and heparin-related thrombocytopenia. Anticoagulant therapy should be continued until the patient is fully ambulant, and in selected cases, direct-acting oral anticoagulants (DOAC) may be considered for extended prophylaxis [26].

For patients classified as being at very high risk for thrombosis and who have contraindications to anticoagulation, such as bleeding, it may be necessary to implant a temporary or permanent filter in the inferior vena cavam[34-36].

In summary, adequate DVT prophylaxis is essential to reduce severe and potentially fatal complications in patients undergoing surgery, and risk stratification and the choice of prophylactic measures must be based on a careful assessment of each case [24].

Antibiotics

Antibiotics are used daily in surgery, whether to prevent infection in at-risk patients, treat established diseases requiring a surgical procedure, or emerge as postoperative (PO) complications. In the first case, it is restricted to the

preoperative period. Patients operated on for infection may need to maintain the drug in the PO. The best antibiotic choice and respective dose depends on the predominant bacterial flora in each case [21-23].

Nutrition

In operations on the abdominal cavity, the propulsive activity of the gastrointestinal tract is temporarily reduced due to the handling of the intestinal loops and the increased sympathetic activity of the splanchnic nerves. This temporary ileus can be intense, depending on the degree of operative manipulation and the underlying disease, being minimal in elective laparoscopic interventions and prolonged in laparotomies due to peritonitis or resection of large tumors of the digestive tract [29-31].

In most patients, peristalsis of the small intestine resumes within the first 24h, gastric peristalsis within 24-48h, and finally the colon after 48h. The presence of early bowel sounds in the small intestine does not guarantee, therefore, a complete recovery of the propulsive capacity of the entire gastrointestinal tract. Thus, the resumption of oral feeding must consider the type of surgical procedure performed [8,14].

In large operations, with digestive sutures, it is convenient to wait for complete resumption of bowel movements, with the elimination of flatus, and only then start feeding, which, in turn, does not need to follow the classic evolution of test liquid, liquid total, pasty, etc., even free diet [8-11].

The initial diet may be free in patients with bowel sounds and the presence and elimination of gases. Parenteral nutrition or, preferably, through mesenteric catheters, should be considered if the prospects are for prolonged fasting. Other factors are also crucial in this decision, such as preoperative conditions, nutritional status, the intensity of operative trauma, the occurrence of complications such as fistulas and infections, and the patient's age [25,37].

Nasogastric tube

PO ileus is also the main reason for using gastric aspiration. Decompression reduces distension and the occurrence of vomiting, but it is uncomfortable, favors gastroesophageal reflux, and facilitates broncho-aspiration and atelectasis [32].

Selectively indicated in upper digestive tract operations, it should be removed once the drainage volume is less than 400mL and bowel sounds resume. Esophago-gastroduodenal interventions usually require a more extended drainage period, but this rarely needs to be longer than 72h [26-28].

Bladder catheter

When indicated, it requires appropriate handling during the PO period and should be removed as soon as possible as soon as the normal hemodynamic state is re-established and maintained [17].

Drains

Cavity drainage can be prophylactic to prevent the accumulation of biological fluids after certain operations or therapeutic, drain collections or abscesses, and prevent reaccumulation of secretions. Closed drainage systems should always be chosen, inserted through a counter-incision, and removed as early as possible [2-4,37].

Conclusion

The present scientific review on the preoperative and postoperative management of patients revealed the intrinsic complexity of this area of medicine. When we examine the main aspects of this process, it becomes clear that a careful and scientifically validated approach is fundamental to improving the clinical results and quality of life of patients undergoing surgical procedures.

Understanding the surgical indication, collecting a detailed clinical history, and carrying out a thorough physical examination are essential pillars in the preoperative evaluation. This allows the identification of individual risk factors and the adaptation of the surgical plan according to the needs of each patient, reducing perioperative complications.

However, it is equally crucial to highlight that modern medicine requires a multidisciplinary approach involving not only surgeons but also anesthesiologists, nurses, pharmacists, and other healthcare professionals. Appropriate medication administration, appropriate selection of sedation techniques, and antibiotic prophylaxis are constantly evolving areas that require ongoing collaboration and updating.

Furthermore, we cannot underestimate the importance of postoperative care. Adequate monitoring and support in the postoperative period plays a fundamental role in the patient's recovery, prevention of late complications, and achievement of satisfactory long-term results.

In conclusion, this review highlights the need for holistic, evidence-based, and individually tailored approaches to the preoperative and postoperative management of patients. The constant search for knowledge, interprofessional collaboration, and commitment to the patient's well-being should guide clinical practice, always aiming to improve the quality and safety of surgical care.

Conflict of interests

The authors report no conflicts of interest.

Acknowledgments

The authors thank the Federal University of Rio Grande do Norte, Potiguar University, and Liga Contra o Cancer for supporting this study.

References

1. Bignami E, Castella A, Pota V, et al. Perioperative pain management in cardiac surgery: a systematic review. Minerva Anestesiol. 2018;84(4):488-503.
2. Wacker J. Measuring and monitoring perioperative patient safety: a basic approach for clinicians. Curr Opin Anaesthesiol. 2020;33(6):815-822.
3. Moraes CMT, Corrêa LM, Procópio RJ, Carmo GALD, Navarro TP. Tools and scores for general and cardiovascular perioperative risk assessment: a narrative review. Rev Col Bras Cir. 2022;49:e20223124.
4. Abizanda P, Sinclair A, Barcons N, et al. Costs of malnutrition in institutionalized and community dwelling older adults: A systematic review. J Am Med Dir Assoc. 2016;17(1):17-23.
5. Agarwal E, Ferguson M, Banks M, et al. Malnutrition and poor food intake are associated with prolonged hospital stay, frequent readmissions, and greater in-hospital mortality. Clin Nutr. 2013;32(5):737-745.
6. Ho JWC, Wu AHW, Lee M, et al. Malnutrition risk predicts surgical outcomes in patients undergoing gastrointestinal operations: Results of a Prospective Study. Clin Nutr.

2015;34(4):679-684.
7. Thomas MN, Kufeldt J, Kisser U, et al. Effects of malnutrition on complication rates, length of hospital stay, and revenue in elective surgical patients in the G-DRG-System. Nutrition. 2016;32(2):249-254.
8. Burgos R, Joaquín C, Blay C, Vaqué C. Disease-related malnutrition in hospitalized chronic patients with complex needs. Clin Nutr. 2020;39(5):1447-1453.
9. Martínez-Ortega AJ, Piñar-Gutiérrez A, Serrano-Aguayo P, et al. Perioperative nutritional support: a review of current literature. Nutrients. 2022;14(8):1601.
10. Ali Abdelhamid Y, Chapman MJ, Deane AM. Peri-operative nutrition. Anaesthesia. 2016;71 Suppl 1:9-18.
11. Whinney C. Perioperative medication management: general principles and practical applications. Cleve Clin J Med. 2009;76 Suppl 4:S126-32.
12. Ong W, Shen T, Tan WB, Lomanto D. Is preoperative withdrawal of aspirin necessary in patients undergoing elective inguinal hernia repair? Surg Endosc. 2016;30(12):5542- 5549.
13. Leaper D, Ousey K. Evidence update on prevention of surgical site infection. Curr Opin Infect Dis. 2015;28(2):158-163.
14. Nelson RL, Gladman E, Barbateskovic M. Antimicrobial prophylaxis for colorectal surgery. Cochrane Database Syst Rev. 2014;(5):CD001181.
15. Zarnescu EC, Zarnescu NO, Costea R. Updates of risk factors for anastomotic leakage after colorectal surgery. Diagnostics (Basel). 2021;11(12):2382.
16. McIntosh S, Hunter R, Scrimgeour D, et al. Timing of urinary catheter removal after colorectal surgery with pelvic dissection: A systematic review and meta-analysis. Ann Med Surg (Lond). 2021;73:103148.
17. Bignami E, Castella A, Pota V, et al. Perioperative pain management in cardiac surgery: a systematic review. Minerva Anestesiol. 2018;84(4):488-503.
18. Leaper D, Ousey K. Evidence update on prevention of surgical site infection. Curr Opin Infect Dis. 2015;28(2):158-163.
19. Bratzler DW, Dellinger EP, Olsen KM, et al. American Society of Health-System Pharmacists (ASHP); Infectious Diseases Society of America (IDSA); Surgical Infection Society (SIS); Society for Healthcare Epidemiology of America (SHEA). Clinical practice guidelines for antimicrobial prophylaxis in surgery. Surg Infect (Larchmt). 2013;14(1):73-156.
20. Calise F, Capussotti L, Caterino S, et al. Perioperative antibiotic prophylaxis in adults. Outline of the principal recommendations. National reference guidelines. Minerva Anestesiol. 2009;75(9):543-547.
21. Grant B, Chowdhury TA. New guidance on the perioperative management of diabetes. Clin Med (Lond). 2022;22(1):41-44.
22. Hansen RB, Balachandran R, Valsamidis TN, Iversen LH. The role of preoperative mechanical bowel preparation and oral antibiotics in prevention of anastomotic leakage following restorative resection for primary rectal cancer - a systematic review and meta- analysis. Int J Colorectal Dis. 2023;38(1):129.
23. Koo CH, Chok AY, Wee IJY, Seow-En I, Zhao Y, Tan EJKW. Effect of preoperative oral antibiotics and mechanical bowel preparation on the prevention of surgical site infection in elective colorectal surgery, and does oral antibiotic regime matter? a bayesian network meta-analysis. Int J Colorectal Dis. 2023;38(1):151.
24. Sachdeva A, Dalton M, Lees T. Graduated compression stockings for prevention of deep vein thrombosis. Cochrane Database Syst Rev. 2018;11(11):CD001484.
25. Wiznia DH, Swami N, Nguyen J, et al. Patient compliance with deep vein thrombosis prophylaxis after total hip and total knee arthroplasty. Hematol Rep. 2019;11(2):7914.
26. Hirsch KR, Wolfe RR, Ferrando AA. Pre and post-surgical nutrition for preservation of muscle mass, strength, and functionality following orthopedic surgery. Nutrients. 2021;13(5):1675.
27. Nelson R, Edwards S, Tse B. Prophylactic nasogastric decompression after abdominal surgery. Cochrane Database Syst Rev. 2007;2007(3):CD004929.
28. Berwanger O, Garces FR, Lopez-Jaramillo P, et al. Perioperative enalapril and outcomes in patients undergoing non-cardiac surgery (POISE-3): a randomised controlled trial. Lancet. 2022;399(10329):1735-1744.
29. Feldheiser A, Hunsicker O, Kaufner L, et al. Comparative effectiveness of intraoperative surgical care providers' warming interventions during non-cardiac surgery in adults: A systematic review with network meta-analysis of randomized controlled trials. PLoS One. 2021;16(11):e0259819.
30. Engelman DT, McBride WT, Keane D, et al. Postoperative hemodynamic optimization using cardiovascular function indices in high-risk patients: A multicenter, double-blinded, randomized trial comparing the NICOM™ noninvasive cardiac output monitor and standard clinical hemodynamic monitoring (CI-SONIC): Study protocol for a randomized controlled trial. Trials. 2023;24(1):14. doi:
31. Coimbra R, Pasupuleti V, Song F, et al. Perioperative lidocaine infusion on postoperative recovery after surgery: A systematic review with meta-analysis and trial sequential analysis. Anesth Analg. 2023;136(1):94-107.
32. Hornero-Méndez D, Guerra-García P, González-Valverde FM, et al. Impact of enhanced recovery after surgery on postoperative cognitive dysfunction: A systematic review and meta-analysis of randomized controlled trials. J Clin Anesth. 2022;80:110722.
33. Cai Y, Yu D, Liang X, et al. Effects of goal-directed fluid therapy on postoperative ileus after major abdominal surgery: A systematic review and meta-analysis of randomized controlled trials. World J Surg. 2022;46(5):1421-1432.
34. Jain AK, Pawaskar A, Jagtap SR. Comparison of effect of preoperative oral midazolam versus gabapentin as anxiolytic on perioperative hemodynamics and postoperative pain in patients undergoing laparoscopic

cholecystectomy: A randomized controlled trial. Saudi J Anaesth. 2022;16(4):334-340.

35. Manchikanti L, Singh V, Kaye AD, et al. Comprehensive review of chronic postsurgical pain prevention and treatment: A comprehensive review of medications utilized in prevention and treatment of chronic postsurgical pain. Pain Physician. 2022;25(Suppl 2):S311-S345.
36. Yu C, Jin S, Shang F, et al. The effect of perioperative blood transfusion on long-term survival in patients undergoing gastric cancer surgery: A systematic review and meta-analysis. J Surg Oncol. 2022;125(2):118-129.
37. Malik OA, Alsager SM, Tariq MN, et al. Impact of perioperative steroids on postoperative pain and hospital length of stay in patients undergoing laparoscopic cholecystectomy: A systematic review and meta-analysis of randomized controlled trials. Surg Endosc. 2022;36(5):2094-2102.