

SURGICAL POSITIONING: NURSING CARE IN THE TRANSOPERATIVE PERIOD

Posicionamento cirúrgico: cuidados de enfermagem no transoperatório

Posicionamiento quirúrgico: cuidados de la enfermería en el período transoperatorio

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ABSTRACT: During the operation room activities, it was observed that the nursing team did not actively perform patient positioning on the operating table, which encouraged us to investigate the issue. Objective: To identify the nursing care routine in patient positioning, reporting complications. **Methods:** This is an integrative literature review, with search in LILACS (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*) and SciELO (Scientific Electronic Library Online) databases, from August to September 2014. **Results:** We found 20 articles and selected 10 according to the criteria. **Conclusion:** The positioning can cause complications, with pressure ulcers being the most frequent. Effective interventions are those that relieve the pressure during the patient's stay at the table. The nurse is responsible for nursing care and, together with the team, for actively promoting actions that ensure patient safety, considering the circumstances and available resources.

Keywords: Patient positioning. Nursing care. Pressure ulcer.

RESUMO: Durante a atuação em centro cirúrgico observou-se que a enfermagem não atuava no posicionamento do paciente na mesa cirúrgica, o que nos incentivou a investigar sobre o tema. **Objetivo:** Identificar os cuidados de enfermagem no posicionamento, relatando as complicações. **Método:** Trata-se de revisão integrativa da literatura, com busca nos bancos de dados LILACS (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*) e SciELO (*Scientific Electronic Library Online*), no período de agosto de 2004 a setembro de 2014. **Resultados:** Foram encontrados 20 artigos e selecionados 10 conforme critérios. **Conclusão:** O posicionamento pode ocasionar complicações, sendo a úlcera por pressão a mais frequentemente apontada. As intervenções eficazes são aquelas que aliviam as pressões durante a permanência na mesa. O enfermeiro é o responsável pelos cuidados de enfermagem e juntamente com a equipe deve promover ações que garantam a segurança do paciente, considerando as particularidades e os recursos disponíveis.

Palavras-chave: Posicionamento do paciente. Cuidados de enfermagem. Úlcera por pressão.

RESUMEN: Durante la actuación en el centro quirúrgico, se observó que la enfermería no trabajaba en el posicionamiento del paciente en la mesa quirúrgica, lo que alentó a investigar la cuestión. **Objetivo:** Identificar los cuidados de enfermería en el posicionamiento, haciendo un informe sobre las complicaciones. **Método:** Se trata de una revisión integradora de la literatura, utilizándose la búsqueda en las bases de datos LILACS (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*) y SciELO (*Scientific Electronic Library Online*), en el período comprendido entre agosto de 2004 hasta septiembre de 2014. **Resultados:** Se encontraron 20 artículos y se seleccionaron 10 de ellos, basándose en criterios. **Conclusión:** El posicionamiento puede causar complicaciones, y las úlceras por presión son las más frecuentes reportadas. Las intervenciones eficaces se relacionan con el alivio de las presiones en la mesa quirúrgica. El enfermero es responsable por los cuidados de enfermería y debe promover acciones juntamente con su equipo que garanticen la seguridad del paciente, teniendo en cuenta las particularidades y los recursos disponibles.

Palabras clave: Posicionamiento del paciente. Cuidados de enfermería. Úlcera por presión.

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INTRODUCTION

Perioperative nursing is a concept that has been consolidating in Brazil. Its sense is broad, covering the preoperative, intraoperative, and postoperative periods¹. In this context, perioperative nursing is based on six principles: integrity, individuality, participation, continuity, documentation, and evaluation².

The nurse is responsible for planning and implementing nursing interventions to prevent complications from anesthesia and surgery, assisting the patient together with the multidisciplinary team, that is, with the surgeon, the anesthesiologist, and nursing technicians. They decide the best positioning for the patient, thus facilitating the activities during the anesthetic and surgical procedures. Thus, the nurse identifies the anatomical and physiological changes of the patient associated with the type of anesthesia, surgical time, and procedure to be carried out, to avoid complications in the postoperative period³.

Patients may spend a long time on the operating table, undergoing the effects of analgesics and muscle relaxants, which, although necessary, submit the patient to a condition of frailty and physical dependence⁴. There is still the need to put and keep the patient in different positions that meet the requirements of the operative technique and expose the surgical site. Therefore, carefully planned actions must be carried out by the nursing staff, in order to obtain success in the anesthetic-surgical procedure^{1,3,5}.

The surgical patient positioning is an act that requires competence and must be precise and judged as a major factor in the safe surgical procedure⁵, which is a key factor for the promotion of welfare and security, preventing adverse events⁶. In this context, care planning, teamwork, and the use of devices and positioning equipment specific for each patient are essential to perform the positioning with quality^{3,4}. Therefore, records and documentation of all care delivered, mobilization, protection features used, sites and clinical condition of the patient are crucial².

It is especially incumbent upon nurses to implement the care that best suits the patient and to recognize the risk factors related to surgical positioning, so that they can take effective measures to contribute to the recovery⁴.

The interest in conducting this study was due to observations in the operating room, as a surgical instrumentation technician, of occasional failures of the circulating nurses to participate in this procedure, perhaps

for lack of scientific evidence on the positioning and the complications it can cause if not performed properly. This fueled the desire to investigate the literature in order to provide more support for the nursing staff in the operating rooms.

Given the above, the objective of this study is to identify the literature on nursing care related to surgical positioning of adult patients during the transoperative period.

METHODS

The method adopted in this study was the integrative literature review, a resource of evidence-based practice, which allows the synthesis and analysis of scientific knowledge produced on the subject investigated⁸. It is a method that calls for the use of research results for the nurse's decision-making process in their daily practice⁸. For the development of the integrative review, six stages were covered, which will be discussed further.

The first stage is the formulation of the guiding question: What are the care activities performed by the nursing team regarding adult patient positioning in the transoperative period?

In the second stage, surveys were conducted in the LILACS (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*) and SciELO (Scientific Electronic Library Online) databases, from August 18 to September 30, 2014, using the keywords: "posicionamento do paciente" (patient positioning) and "enfermagem" (nursing). Inclusion criteria were articles published in Portuguese, with text available in full and which were published from 2004 on. Exclusion criteria were articles that were not compatible with the purpose of this integrative review and duplicates.

In the third stage, the information was extracted from articles to be included in the integrative review and a database containing the relevant information was developed.

In the fourth and fifth stages, we evaluated the articles, and the topics that emerged from the reading were discussed.

Finally, the sixth stage included the analysis of the selected articles. It is noteworthy that both the analysis and synthesis of information extracted from articles were made in a descriptive manner, which allowed observing, describing, and classifying the information, in order to gather knowledge on the topic selected for this review⁹.

RESULTS

With regard to the descriptor “posicionamento do paciente”, 161 articles were found, 112 in the LILACS database and 46 in the SciELO database. Combining with the descriptor “enfermagem”, 20 articles were found, 15 in the LILACS database and 2 in the SciELO database. Moreover, three articles were found that were published in a specific magazine about nursing in the operating room, which were used in this review, as shown in Table 1. Of the 20 studies found, 10 were used for the integrative review, after application of preestablished criteria, as shown in Table 2.

Of the 10 (100%) studies included in the review, 5 (50%) were field researches with a quantitative approach, 3 (30%) were integrative literature reviews, and 2 (20%) were systematic literature reviews. Regarding the types

of journals these articles were published in, the nursing journals stand out with the largest number of publications, 9 (90%). Regarding the authors of the study, all are nurses (100% of the sample). Among the places of origin of the publications, São Paulo was the predominant location, with 8 (80%) articles. The year of 2011 was the one with most publications, with 4 (40%) studies.

Chart 1. Results of searches in databases by descriptor – São Paulo, 2014.

Descriptors	Database			
	LILACS	SciELO	Others	Total
Patient Positioning	112	46	3	161
Patient Positioning and Nursing	15	2	3	20

Chart 2. Presentation of the summary of selected articles – São Paulo, 2014.

Authors (year)	Journal/ location	Type of study	Article summary
Matos FGO, Picoli M (2004)	Ciência, Cuidado e Saúde/ Maringá (PR)	Quantitative	The sample consisted of 30 surgical patients of both sexes, aged between 20 and 60 years. During follow-up of patients in the perioperative period, the nursing diagnosis of Risk for Perioperative Positioning Injury was identified in 100% of the sample. The main recommendations are: each operating room must have an individual temperature control to adapt it to the needs of the patient, keeping the patient covered to avoid unnecessary heat loss and making use of heated solutions.
Ursi ES, Galvão CM (2006)	Rev. Latino-Am. Enfermagem/ Ribeirão Preto (SP)	Integrative literature review	The sample consisted of 14 articles selected in CINAHL and MEDLINE databases. In the review, the results of the articles indicated that the devices considered most effective in preventing skin lesions were micropulsating air mattress, the dry viscoelastic polymer mattress cover, and gel pads.
Lopes CMM, Galvão CM (2010)	Rev. Latino-Am. Enfermagem/ Ribeirão Preto (SP)	Integrative literature review	The sample consisted of 20 articles selected in the PubMed, CINAHL, and LILACS databases. All articles reviewed showed that the surgical patient positioning causes some negative impacts on bodily systems and can cause complications such as musculoskeletal pain, dislocation of joints, damage to peripheral nerves, skin lesions, cardiovascular and lung involvement, and even compartment syndrome.
Scarlatti KC, Michel LM, Gambas MA, Gutierrez MGR (2011)	Rev. Esc. Enferm. USP/São Paulo (SP)	Quantitative	The sample consisted of 199 patients. Of these 199, 20.6% showed pressure ulcers (PUs), 98.6% in stages I and II, with the front torso being the predominant location (35.1%). The variables, position, duration of surgery, general anesthesia, and use of devices showed a statistically significant association.
Grigoletto ARL, Avelar MCQ, Lacerda RA, Mendonça SHF (2011)	Esc. Anna Nery/São Paulo (SP)	Systematic literature review	The sample consists of seven studies selected in the PubMed/MEDLINE, Ovid, CINAHL, Cochrane, and LILACS databases. It can be inferred that the responsibility of the nurse with the other team members in the operating room is first to evaluate the client as a whole, as well as to observe the conditions of the support brackets, the time of use during the procedure, and any changes that might be related to the positioning on the operating table.

Continue...

Chart 2. Continuation.

Authors (year)	Journal/location	Type of study	Article summary
Barbosa MH, Oliva AMB, Sousa Neto ALS (2011)	Revista Cubana de Enfermería/Uberlândia (MG)	Quantitative	The sample consisted of 50 adult patients who underwent surgeries in different specialties. It was observed that 37 (74.00%) patients had skin lesions at the end of the surgical procedure, all classified as Grade I. The perioperative nursing care to the surgical patient is a responsibility of the nurse, and the positioning is one of the key factors for obtaining a safe and effective procedure.
Carneiro GA, Leite RCBO (2011)	Rev. Esc. Enferm. USP/São Paulo (SP)	Quantitative	The sample consisted of 182 patients. The incidence of patients undergoing cardiac surgery who developed skin lesions owing to the intraoperative period was of 20.9%. A total of 19.2% of the lesions were presented as PUs in stage I; 1.1% of the lesions were characterized as abrasion; 1.1%, incised wounds; 0.5%, lacerations; 0.5%, superficial electrical burn; and 0.5%, stage II PUs. This work reveals the incidence of skin lesions in the intraoperative period on a small number of patients but urges nurses to think more carefully about the type of assistance they will provide to the patient.
Rodrigues RTF, Lacerda RA, Leite RB, Graziano KU, Padilha KG (2012)	Rev. Esc. Enferm. USP/São Paulo (SP)	Integrative literature review	The sample consists of 12 articles selected in electronic databases. The analysis of the articles led to the conclusion on the relevance of studies to primarily evaluate the impact and resoluteness of resources in meeting the needs, as well as improvement or generation of other innovative resources.
Bentlin AC, Grigoletto ARL, Avelar MCQ, Sundfeld MCK (2012)	Rev. SOBECC/São Paulo (SP)	Quantitative	The sample consisted of 14 elderly individuals of both sexes. Of these, 6 showed skin alterations, which were not present in the first stage of the study (hyperemia, abrasions, and bruises). These elderly individuals remained at the operating table for about 50–130 minutes without the proper protection features.
Sergio FR, Cameron LE, Vital ICO (2012)	Rev. SOBECC/São Paulo (SP)	Systematic literature review	The article presents the importance of the nurse's role in the early recognition of complications arising from surgical positioning, contributing to disease prevention. Among the risk factors for the development of compartment syndrome are: obesity, peripheral vascular disease, prolonged surgery (longer than 3 hours), and the lithotomy position.

DISCUSSION

Three main topics were found during the assessment of the articles, namely:

1. risk factors for the development of complications;
2. complications arising from surgical positioning; and
3. nursing care related to the surgical positioning of the patient.

This integrative review provides health-care professionals with detailed information about the aforementioned topics.

Risk factors for the development of complications

Preexisting conditions should be considered when planning nursing care to surgical patients, especially those affecting

the vascular, respiratory, circulatory, neurological, and immune systems⁵. All risk factors should be identified in the preoperative evaluation and documented, contributing to the care plan³.

Surgical patients are the first candidates to developing skin lesions intraoperatively, owing to decreased capillary blood flow, prolonged immobility, and pressure². One of the most common complications is the development of pressure ulcers (PUs). There are several risk factors related to the pathogenesis of PUs that develop during surgical procedures and can be grouped into intrinsic and extrinsic factors. Among the intrinsic factors are: age (very young and elderly individuals may have more sensitive skin), body weight (overweight and underweight may lead to an increase in the incidence of lesions), nutritional status (malnutrition and dehydration), and chronic diseases such as diabetes mellitus, vasculopathy, neuropathy, hypertension, and anemia.

Among the extrinsic factors are, type and duration of surgery (procedures lasting longer than 2 hours can impair the oxygenation of compressed tissues), anesthesia (loss of compensatory physiological protection), problems in controlling body temperature (hypothermia causes body structures to depend more on oxygen, and the lack of necessary supply may favor the appearance of lesions), surgical positions, and immobilization owing to positioning.

Some positions associated with patient characteristics may increase the risk of complications, such as the lithotomy position on an obese patient, which may compromise their respiratory function and may even cause compartment syndrome. Thus, all surgical patients should be considered at high risk for developing PUs^{3,7,10}.

Complications resulting from surgical positioning

The volume of the pulmonary capillary blood flow decreases with prolonged immobility. Lung expansion is limited by the position's pressure on the ribs or the by ability of the diaphragm to force the abdominal contents down. Anesthesia causes peripheral vasodilation, resulting in hypotension and decreasing venous return. It also reduces the ability of the normal defenses to protect against excessive manipulation².

Undoubtedly, the skin as a natural barrier is the organ more prone to injuries arising from surgical positioning, with erythema, bruising, risk of PUs, electrical burns, injuries from chemical substances, and focal alopecia⁴. The tissue and skin may be injured owing to excessive pressure or bruising owing to contact with a hard surface. The external pressure of 32 mmHg is considered the threshold. Besides this, the small vessels collapse, causing thrombosis, which results in the occlusion of tissue blood flow and deprivation of enough oxygen and nutrients. Therefore, the production of toxic metabolites occurs at the cellular level, leading to tissue acidosis, increased capillary permeability, edema, cell death, and formation of PUs³. PUs, as any lesion caused by unrelieved pressure resulting in damage to the tissues, usually occur in areas of bony prominences and are graded in stages I, II, III, and IV. In addition to the PUs, other aggressive events are present in the operating environment that could affect the patient, such as electrical burns owing to the use of electrocautery⁸.

The analyzed studies showed that surgical patient positioning can cause some negative impact on body systems,

causing various complications, such as musculoskeletal pain, dislocation of joints, damage to peripheral nerves, skin lesions, cardiovascular and lung involvement, and even compartment syndrome³.

Compartment syndrome, although being most often associated with trauma, has been reported as a consequence of surgical placement during prolonged surgeries. It is characterized by an increase in pressure within a body compartment, which reduces capillary perfusion below a level necessary for the tissues viability, leading to ischemia. This may cause a permanent neuromuscular deficit if there is a delay in diagnosis and treatment, consisting in performing decompressive fasciotomy⁷.

The presence or installation of pathological processes may result in changes that cause impairment of its functional structure, and, consequently, increased hospital stay for treatment⁵.

Nursing care related to surgical positioning of the patient

Patient positioning for surgery is essential to perform a safe and efficient procedure, so all team members should protect patients from any harmful effects resulting from improper positioning. Nurses, along with other members of the team, are responsible for first evaluating the patient as a whole, observing the conditions of the support brackets and any situation that could compromise patient positioning on the operating table and cause complications^{5,7}.

Effective interventions in the prevention of skin lesions are related to the relief of pressure during and immediately after the patient's stay on the operating table, on the standard mattress⁵. The most effective devices in preventing skin lesions, in descending order, are: micropulsing air mattress, dry viscoelastic polymer mattress cover and gel pads⁸.

The use of protective features in patient positioning during surgery ensures the maintenance of the integrity of skin and osteoarticular and neuromuscular pressures, aiming to avoid friction, thus preventing skin lesions such as PUs, neuromuscular compression, or stretches, and contact with the desk metal, which can cause burns (due to the use of electrocautery) and other damages⁶.

The studies that were analyzed presented nursing care in the surgical positioning of the patient and the recommendations according to the positions on the operating table, listed further.

Dorsal decubitus or supine position: padding the calcaneus, the sacrum and coccyx, the olecranon, the scapula, the ischial tuberosity, and the occiput. Keeping arms at the sides of the body with palms facing down (pronation) or forming a “cross” with an arm supported by a splint in an angle lower than 80° relative to the body, in order not to cause stretching of the muscles and nerves in this region, as well as compression of the subclavian and axillary arteries under the choroid process of the scapula or compression between the clavicle and the first two ribs. No tourniquetting the extremities to secure hands. The sheet of the surgical table can be used to secure the arms in their entire length and prevent that they are, if it that is the case, pending to the sides of the table. The head should be aligned with the spine and the hip. A small cushion under the head allows the relaxation of the trapezius muscle and prevents stretching of the neck; bending and twisting can cause contractures and interfere with the airway patency. The lower limbs (LL) must remain extended and feet slightly apart^{3,6}.

Ventral decubitus or prone position: protecting the hips and thighs with big pillows. Protecting the breasts. Accommodating male genitalia in a lateral position. Protecting the back of the feet, the shoulder girdle, the olecranon, the iliac spine, and the patella³.

SIMS (lateral) position: maintaining spinal alignment, observing the ears, placing a support under the head, the armpit region, and between the legs, keeping the leg in contact with the table flexed at the hip and the upper one stretched. Using an adhesive tape of 10 cm width fixed to one side of the table, over the iliac crest, to the other side^{2,3}.

Lithotomy: using padding on the stirrups. Having two people slowly lift the legs with a slight rotation of the hips, positioning knees with a slight flexion. Covering the legs with cotton boots. Placing arms on the splints or relaxed over the abdomen, supported by a sheet. Slowly reversing the positioning to favor the physiological adaptation of the organism to a new position since the abrupt change can cause severe hypotension owing to sudden change of the circulatory flow. Coating the metallic leg protectors with soft cushions, with height adjusted to the length of the patient’s lower limbs, positioning the two legs at the same time, that is, two professionals must be performing the procedure, also caring for a safe and slow positioning, flexing knees and supporting one hand on the foot plant region^{3,6}.

Each operating room must have an individual temperature control to adapt it to the needs of the patient, and body temperature should be maintained above 35.5°C¹.

It is worth mentioning that there are limitations to this study owing to the absence of specific and current articles on the subject. It is important to conduct further studies using protective devices to prove their effectiveness in preventing complications from patient positioning on the operating table.

CONCLUSION

We can conclude that nursing care during surgery is vitally important, given that the evaluation of the patient is carried out considering the risk factors for developing complications that can compromise their physical integrity. Several factors may contribute to the occurrence of adverse events, including some characteristics of the patient, such as age, weight, nutritional status, and preexisting conditions. The nurse, as a professional responsible for the patient in the operating room, must ensure their safety and protection, making use of the SAEP (Systematization of Perioperative Nursing Care), which is an available, indispensable and highly important tool. This tool allows a better assessment, as well as a full assistance according to the needs of the patient, consisting of different phases, which, if well developed, constitute an individualized and quality nursing care. These phases are: anamnesis and physical examination, nursing diagnosis, care plan, nursing prescription and, hence, the evolution of nursing based on a correct assistance.

It is important for nurses to be prepared to prevent complications that may occur, from burns and skin injuries to the impairment of nerves and tissues owing to improper positioning on the operating table or even a severe hypotension caused by the physiological response to the position, because if they occur and are not diagnosed quickly, they may cause serious damage to the patient.

Nurses should promote actions to prevent complications from the anesthetic-surgical procedure, monitor the patient at all stages of their treatment, provide all the necessary resources for a successful procedure, and oversee all nursing team’s actions. For this, it is necessary to keep constantly updated and promote continuing education to its employees.

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