

SERIOUS ADVERSE EVENTS IN SURGICAL PATIENTS: OCCURRENCES AND OUTCOMES

Eventos adversos graves em pacientes cirúrgicos: ocorrência e desfecho

Eventos adversos graves en pacientes quirúrgicos: ocurrencia y desenlace

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ABSTRACT: Objective: To identify the occurrence of serious adverse events (SAE) in surgical patients and their possible outcomes. **Method:** Retrospective quantitative study, performed by the analysis of records and data of perioperative patients, who suffered SAE in 2016 at a private hospital in São Paulo. **Results:** There were 19 SAEs, mostly in female patients aged 40 to 49 years, hospitalized by gastroenterological pathologies. The most frequent occurrences were damage in digestive organs, hemorrhagic shock and vascular lesion. Regarding outcomes, patients were referred to the intensive therapy unit, medical-surgical clinic and hemodynamics; two patients died. **Conclusion:** The nursing staff should be aware of factors that may lead to SAE and receive guidance on notification, so they can improve surgical patients' safety and care.

Keywords: Perioperative nursing. Patient safety. Medical errors.

RESUMO: Objetivo: Identificar a ocorrência de eventos adversos graves (EAG) em pacientes cirúrgicos e seus possíveis desfechos. **Método:** Estudo retrospectivo, quantitativo, realizado pela análise de prontuários e banco de dados de pacientes no perioperatório, que sofreram EAG em 2016, em um hospital privado de São Paulo. **Resultados:** Ocorreram 19 EAG, com predominância de pacientes do sexo feminino, entre 40 e 49 anos, internados por patologias do sistema gastroenterológico. As ocorrências mais incidentes foram: lesão de órgãos digestórios, choque hemorrágico e lesão vascular. Quanto aos desfechos, os pacientes foram encaminhados à unidade de terapia intensiva, clínica médico-cirúrgica e hemodinâmica; dois pacientes evoluíram a óbito. **Conclusão:** Os profissionais da equipe de enfermagem devem estar atentos aos fatores que podem contribuir para a ocorrência de EAG e orientados em relação à notificação, a fim de aperfeiçoar a segurança e a qualidade da assistência prestada aos pacientes cirúrgicos.

Palavras-chave: Enfermagem perioperatória. Segurança do paciente. Erros médicos.

RESUMEN: Objetivo: Identificar la ocurrencia de eventos adversos graves (EAG) en pacientes quirúrgicos y sus posibles desenlaces. **Método:** Estudio retrospectivo, cuantitativo, realizado por el análisis de prontuarios y banco de datos de pacientes en el perioperatorio, que sufrieron EAG en 2016, en un hospital privado de São Paulo. **Resultados:** Ocurrieron 19 EAG, con predominancia de pacientes del sexo femenino, entre 40 y 49 años, internados por patologías del sistema gastroenterológico. Las ocurrencias más incidentes fueron: lesión de órganos digestivos, choque hemorrágico y lesión vascular. Quanto a los desenlaces, los pacientes fueron encaminados a la unidad de terapia intensiva, clínica médico-quirúrgica y hemodinámica; dos pacientes evolucionaron a óbito. **Conclusión:** Los profesionales del equipo de enfermería deben estar atentos a los factores que pueden contribuir para la ocurrencia de EAG y orientados con relación a la notificación, a fin de perfeccionar la seguridad y la calidad de la asistencia prestada a los pacientes quirúrgicos.

Palabras clave: Enfermería perioperatoria. Seguridad del paciente. Errores médicos.

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INTRODUCTION

Around 234 million highly complex surgical procedures are performed per year. As the traumatic injuries, the occurrence of cancers and cardiovascular diseases continues to grow, and surgical interventions tend to grow¹.

In 2004, the World Health Organization (WHO) launched the World Alliance for Patient Safety, aiming at the improvement of patient care and quality of health services¹.

Surgical procedure is the only treatment that aims at relieving the disabilities and reducing the risk of death caused by diseases. Despite saving countless lives, the lack of access to quality surgery is a problem worldwide¹.

Seven million surgical complications are registered every year, covering at least one million patients who died immediately after or during surgery¹.

Lately, patient safety has become a constant concern for the health sector, for it is a major principle in patient care. Safety failure during medical care can cause considerable damages to the patient. This issue has been debated due to the impact that adverse events bring to health systems².

Serious adverse events (SAE) are defined as incidents that take place in patient care during hospitalization, which may result in surgical site infections, inadequate surgical positioning, procedures in the wrong side of the body, incorrect medicine administration and anesthetic-surgical problems. Such events make hospitalization longer, more expensive, and, in more serious cases, increase the risk of death³.

Adverse events related to surgical procedures require special attention, as the Surgical Center (SC) is the place where they most frequently occur. Due to the intense transit of professionals and the diversity of anesthetic-surgical and diagnostic procedures, it is one of the hospital's most complex units. Around 50% of SAEs are related to surgical assistance and could be prevented^{1,3}.

When adverse events take place, they must be informed. Notification has become an important instrument to improve the quality of the health system. The notification system is a set of interconnected actions to check and verify SAEs aiming at improving patient safety during hospitalization⁴.

However, some of these events are not notified by the nursing staff. These under-reports are related to the

lack of understanding about the importance of notification and the required procedures to do it. Besides, some professionals do not want to have their identity revealed, because they are afraid of receiving oral or written retaliation. Thus, under-reports can mask the total number of adverse events⁵.

For a surgical treatment to be successful, it is necessary to fully implement individual assistance throughout the complete perioperative period. Its purpose is to provide the possibility for the patient to experience faster and more efficient recovery, which is, in other words, high-quality care. Patient safety is an obligation for all health professionals, including the nursing staff, which plays a major role in SAE prevention³.

The nursing staff is responsible for preparing the patients, setting specific and individual care for each type of surgery. This type of care includes adequate orientation as to the upcoming procedure, patient's physical and emotional preparation, administration of preanesthetic, when required, referral to the SC, and many other attributions⁶.

In this scenario, it is extremely important to recognize SAEs and verify their outcomes for the patients, who are the victims of such events.

OBJECTIVE

To identify the occurrence of serious adverse events in the perioperative period and their outcomes to the patients.

METHOD

This is a documental, descriptive, exploratory, retrospective research, with qualitative analysis, performed by primary documents, in records and surgery data of patients who had been hospitalized in a large private hospital, located in the south of São Paulo. The hospital has 728 beds and performs around three thousand anesthetic surgical procedures per month.

This study's sample was composed of record and data of 19 patients who have suffered SAE in 2016, during the perioperative period. Considering an average of 3 thousand surgeries per month, the SAE occurrence in this study's host institution was of 0,053% during this one-year period.

The collection of information in the data of patients' records was performed in the first semester of 2017, using a form specially designed for this study, which contains 14 items, divided in 3 parts:

- Part I: characterization of the sample (gender, age, main pathology);
- Part II: information on the anesthetic surgical procedure (type and duration of anesthesia, performed surgery, surgery's classification related to the risk of contamination, duration of surgery and hospitalization period);
- Part III: information on SAE (place of occurrence/ notification, type of SAE, conclusion after its occurrence and interventions towards it).

The data was only collected after the approval of the Institution's Ethics Committee (CEP) via Plataforma Brasil (CAAE 62113016.9.0000.0071). Because of the sample composition, we asked and received the permission of the institution's CEP coordinator to not use the Informed Consent Form (TCLE). The researchers committed to keep the obtained information in secrecy and use the data exclusively for this study.

Results were analyzed by quantitative descriptive statistics according to mean and percentages, demonstrated through charts and graphics in absolute numbers in order to facilitate and organize the data.

To obtain the results of patients' characterization, each sample linear was divided as described and, therefore, it allowed the calculation of each item's average: gender, subdivided into female and male; age, subdivided in 10-year intervals; and main pathology, subdivided into cardiovascular, aesthetic, gastroenterological, gynecological, musculoskeletal, neoplasia, pulmonary and respiratory conditions.

The following events were delimited to obtain the results: unnecessary surgical approach, anesthetic block in wrong limb, inadequate catheter, hemorrhagic shock, oropharyngeal foreign body, digestive organ damage, urinary organ injury, vascular injury, cardiorespiratory arrest (CRP), burn by electric scalpel, bleeding after myocardial revascularization (MR), and compartment syndrome.

To obtain the results of SAE outcomes, the subsequent areas were defined: medical-surgical clinic, pediatric clinic, hemodynamics, death, infectious disease and intensive care unit (ICU).

Other data were registered, such as: performed anesthesia and its duration, classification of surgery (elective,

urgency and emergency), classification of surgery regarding the contamination potential (clean, potentially contaminated, contaminated and infected), performed surgery and its duration and hospitalization time.

RESULTS

Sample Characterization

Table 1 presents the sample's characterization data, composed of 19 patients who suffered SAE in 2016 at the host institution.

Eleven (57,89%) of these patients were female, mostly aged between 40 and 49 years (n=05; 26,32%) and 50 to 59 years (n=04; 21,05%). Seven patients (36,84%) were hospitalized with a gastroenterological system's main pathology, which are: acute cholecystitis, intestinal sub occlusion, intestinal endometriosis, enteric fistula, inguinal hernia, and gastroesophageal reflux disease (Table 1).

Table 1. Patients who suffered SAE – sample characteristics.

Variable/Category	n	%
Gender		
Female	11	57.89
Male	08	42.11
Age Group (years)		
0 to 9	01	5.26
10 to 19	01	5.26
20 to 29	-	-
30 to 39	02	10.53
40 to 49	05	26.32
50 to 59	04	21.05
60 to 69	02	10.53
70 to 79	03	15.79
80 to 89	01	5.26
Main pathology		
Gastroenterological	07	36.84
Cardiovascular	04	21.05
Skeletal muscle	02	10.53
Neoplasm	02	10.53
Esthetics	01	5.26
Gynecological	01	5.26
Pulmonary	01	5.26
Respiratory	01	5.26
Total	19	100.00

Information on anesthetic surgical procedure

Table 2 presents the data on the anesthetic surgical procedures of 19 patients who underwent surgery and suffered SAE.

Sixteen (84,21%) of these 19 patients performed the surgical procedure under general anesthesia, 10 (52.63%) of which were urgency surgeries and 11 (57.89%) were classified as clean, according to contamination potential (Table 2).

Occurrence and outcome after serious adverse event

To verify the occurrence and outcome of the SAE's with the patients in the sample, the type of SAE was also verified (Table 3).

The most frequent adverse events in these patients were: four (21.05%) lesions in digestive organs, 2 patients (10.53%) had hemorrhagic shock and 2 (10.53%) suffered vascular lesions (Table 3).

The main outcomes after SAE are presented in a graph (Figure 1), considering that eight of them (42.11%) were transferred to the ICU, 5 (26.32%) were hospitalized in the medical-surgical clinic, 2 (5.26%) were referred to hemodynamics and 2 (5.26%) died.

DISCUSSION

In any of the operative stages, nursing care for the surgical patient causes a series of actions which require the team's attention to maintain his/her safety⁷.

Table 2. Information on anesthetic-surgical procedure.

Variable/Category	n	%
Performed Anesthesia		
General	16	84.21
Local	01	5.26
Spinal anesthesia	01	5.26
Spinal anesthesia + sedation	01	5.26
Surgery classification		
Urgency	10	52.63
Elective	06	31.58
Emergency	03	15.79
Surgery classification regarding contamination potential		
Clean	11	57.89
Potentially contaminated	06	31.58
Contaminated	01	5.26
Infected	01	5.26
Total	19	100.00

SC is the place where most of the adverse events occur. Many factors contribute with their causes, due to the high complexity of the procedures⁸.

In the present study, 4 SAEs (21.05%) related to digestive organ lesions were observed during video laparoscopic

Table 3. Serious Adverse Events Characteristics.

Serious Adverse Events	n	%
Digestive organ injuries	04	21.05
Vascular lesion	02	10.53
Hemorrhagic shock	02	10.53
Catheter allocated in inappropriate location	01	5.26
Anesthetic block performed on the wrong limb	01	5.26
Foreign body in oropharynx	01	5.26
Unnecessary surgical approach	01	5.26
Urinary organs injury	01	5.26
Cardiorespiratory arrest	01	5.26
Burn by electric scalpel	01	5.26
Bleeding after myocardial revascularization	01	5.26
Compartment syndrome	01	5.26
Use of non-sterile material during surgery	01	5.26
Divergence in the counting of compresses	01	5.26
Total	19	100.00

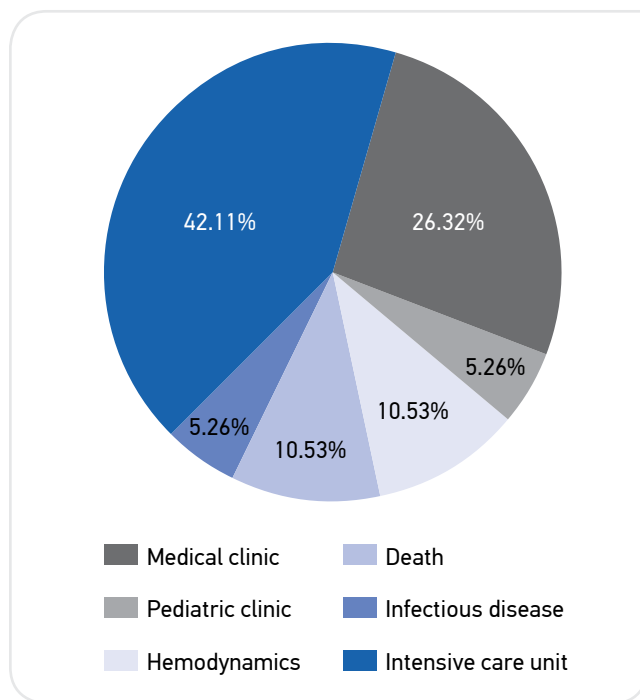


Figure 1. Outcomes after the occurrence of SAE.

surgeries, such as jejunum, liver and stomach. The jejunal lesion had an important impact on the patient's life, leading to an increase in hospitalization time and the necessity of ileostomy. The use of different instruments to perform abdominal cavity laparoscopic surgeries may cause perforation of some organs. Most of the complications resulting from the access to this cavity occur through maneuvers without direct visualization by the surgeon.⁹

Two other SAEs (10.53%) were related to the abdominal aortic aneurysm repair surgery, and both patients died due to injuries in the iliac arteries and mesenteric ischemia. Endovascular surgery for the correction of abdominal aortic aneurysm is not free of complications, which may occur during or after the procedure. The increasing morbidity and mortality of patients who have undergone this type of surgery is undefined; and it is not yet known whether it is related to the surgical technique or not¹⁰.

There were two SAEs (10.53%) related to hemorrhagic shock in this study. One of them occurred during the MRI surgical procedure, when there was an accidental disconnection of the extracorporeal circulation circuit (ECC), with significant blood loss. Some complications may occur during or after surgery, such as hemorrhage, which presents the rupture of some ligations or inefficiently performed hemostasis as etiologic factors. The clinical consequence depends on the size of the vessel, type of bleeding, and the amount of blood lost in a fraction of the time. Hypovolemia puts the life of patients at risk, and requires early diagnosis and definitive hemostasis, often performed in a new surgical intervention (reoperation)¹¹.

There was an event referring to the present research, in which the patient underwent an elective esthetic surgery and suffered a second-degree burn caused by the electric scalpel (ES). A study with the purpose of evaluating ES incidents in the SC, carried out in a public school in Ceará, involving 40 health professionals, observed the lack of familiarity with the equipment or its maintenance, which was performed only in a situation of defect.¹²

A SAE occurred with a patient who was referred to the SC for central venous catheter passage (CVC) and, after that, presented with somnolence and loss of left motor strength. Some tests, as the X-ray and the angiotomography, showed the catheter was misplaced. Central venous access is often used for monitoring and infusing fluids and vasoactive drugs. Despite its benefits, it involves risks, such as arrhythmia, collection of mediastinal fluid, hemothorax, perforation of cardiac chambers and cardiac tamponade^{13,14}.

In the present study, a case was reported in which the counting of compresses was not effective, leading to a new surgical approach in which a compress was found in the patient's abdominal cavity. To certify the prevention of object retention or intracavitary foreign bodies during the intraoperative period, the surgical counting process must be performed in all surgeries. It is a manual process and a responsibility of the attending nurse and the nursing technician circulating with the technicians¹⁵.

In this study, there was a cardiorespiratory arrest (CRA) during a surgical procedure, in which the team approached a brain tumor. In this case, the patient, a child, was reestablished hemodynamically and referred to the pediatric ICU. The Brazilian Journal of Anesthesiology published a survey showing that the incidence of intraoperative CRP varied from 2.56 to 44 cases per 10,000 procedures. CRP is the most serious, although potentially reversible, adverse event that may take place during surgery¹⁶.

This study showed that in the postoperative period of pulmonary segmentectomy and adrenalectomy, with duration of 10 hours, the patient evolved with compartment syndrome (CS), requiring surgical reassembly to perform fasciotomy. Despite being more frequently associated with trauma, CS has been reported as a consequence of the positioning of operating tables during prolonged surgeries, as in the reported case. Intraoperative CS caused by prolonged positioning has a subtle beginning; and the absence of symptomatic findings while the patient is anesthetized leads it to becoming a complication that can easily go unnoticed both intra and postoperatively¹⁷. However, a study reported the occurrence of this complication after medium-length surgeries, between 3 and 4 hours¹⁸.

In the current study, after the first postoperative day, a patient who underwent MRI had to return to the SC (reoperation) due to major bleeding. In a study performed in a general hospital in the city of Cascavel, Paraná, with 119 patients who underwent MRI surgery, 28 (23.5%) had complications in the postoperative period.¹⁹

In one event, the patient underwent hysterectomy and salpingectomy; on the second postoperative day, the drainage flow increased, and a creatinine sample was collected from the material, with positive result. She returned to the SC (reoperation) to undergo exploratory laparotomy and bladder raffia / suture. Bladder injury is the most common complication of vaginal hysterectomy, with an estimated incidence of 0.4 to 1.86%. The posterior wall of

the bladder is usually the most damaged, either by devascularization or laceration.²⁰

Other events occurred during surgeries, including anesthetic block in the wrong limb, gauze in the oropharynx, unnecessary surgical approach and use of non-sterile material. Even though these events were considered as SAEs, they did not bring major damages or increased time of hospitalization.

After the occurrence of SAE, the patients were referred to different sectors, according to their clinical status. Of the 19 patients who composed the sample, 8 (42.11%) were transferred to the ICU due to hemodynamic instability; 5 (26.32%) were led to the medical-surgical clinic to continue treatment; 2 (5.26%) were referred to hemodynamics, where a rapid diagnosis was conducted and in which the initiation of treatment is often a factor for patient's survival; and 2 (5.26%) patients died, 1 by mesenteric ischemia and 1 by lack of bilateral iliac artery flow.

Regarding the information about the anesthetic surgical procedure, 16 (84.21%) patients underwent the procedure under general anesthesia. Its average duration was 3 hours and 48 minutes, the longest being 8 hours and 45 minutes, and the shortest being 50 minutes.

According to their urgency, surgical procedures are classified as: urgency, emergency and elective²¹. In this work, 10 (52.63%) were urgency surgeries; 6 (31.58%) were elective; and 3 (15.79%) emergency. Their average duration was 3 hours and 57 minutes, the longest being 8 hours and 15 minutes, and the shortest, 30 minutes.

According to their contamination potential, surgeries are classified as: clean, potentially contaminated,

contaminated and infected. Of the 19 patients in the sample, 11 (57.89%) surgeries were classified as clean, 6 (31.58%) as potentially contaminated, 1 (5.26%) as contaminated and 1 (5.26%) as infected.

Patients' hospitalization time was, on average, 10.6 days, with the longest being 43 days, and the shortest, 1 day. According to the National Supplementary Health Agency (ANS), the ideal length of hospitalization time for large hospitals varies from 4 to 5 days²².

CONCLUSION

This study shows us that in the 19-patient sample, there was a predominance of female patients, aged between 40 and 49 years, and presenting gastroenterological pathology as the main hospitalization cause.

The most prevalent SAEs were digestive organ lesions followed by hemorrhagic shock and vascular injury. Regarding outcomes, patients were referred to the intensive care unit, medical-surgical clinic and hemodynamics; two patients died.

Because it is a high complexity environment with intense flow of people, the whole team must be aware of the factors that can harm safety, individualizing each surgical patient care.

The number of events found during the survey was low (0.053%) compared to the high demand and the movement in the SC (about 3 thousand procedures per month). Nevertheless, the host institution of this research looks for implementing constant improvements and notification strategies, so that SAEs become increasingly scarce.

REFERENCES

1. Brasil. Organização Mundial da Saúde. Cirurgias seguras salvam vidas: segundo desafio global para a segurança do paciente: Manual – cirurgias seguras salvam vidas [Internet]. Rio de Janeiro: ANVISA; 2009 [citado 17 set. 2016]. Disponível em: http://bvsms.saude.gov.br/bvs/publicacoes/seguranca_paciente_cirurgias_seguras_guia.pdf
2. Souza LP, Bezerra ALQ, Camargo e Silva AEB, Carneiro FS, Paranaguá TTB, Lemos LF. Eventos adversos: instrumento de avaliação do desempenho em centro cirúrgico de um hospital universitário. *Rev Enf UERJ*. 2011;19(1):127-33.
3. Bohomol E, Tartali JA. Eventos adversos em pacientes cirúrgicos: conhecimento dos profissionais de enfermagem. *Acta Paul Enferm*. 2013;26(4):376-81. <http://dx.doi.org/10.1590/S0103-21002013000400012>
4. de Paiva MCMS, Popim RC, Melleiro MM, Tronchim DMR, Lima SAM, Juliani CMCM. Motivos da equipe de enfermagem para notificação de eventos adversos. *Rev Latino-Am Enferm*. 2014;22(5):747-54. DOI: 10.1590/0104-1169.3556.2476
5. Waldman EA. Usos da vigilância e da monitorização em saúde pública. IESUS [Internet]. 1998 [citado 18 set. 2016];7(3):8-26. Disponível em: <http://scielo.iec.pa.gov.br/pdf/iesus/v7n3/v7n3a02.pdf>

6. Cristóforo BEB, Carvalho DS. Cuidados de enfermagem realizados ao paciente cirúrgico no período pré-operatório. *Rev Esc Enferm USP*. 2009;43(1):14-22. <http://dx.doi.org/10.1590/S0080-62342009000100002>
7. Lima AM, Sousa CS, da Cunha ALSM. Segurança do paciente e montagem de sala operatória: estudo de reflexão. *Rev Enferm UFPE*. 2013;7(1):289-94. DOI: 10.5205/reuol.3049-24704-1-LE.0701201337
8. Secanell M, Orrego C, Vila M, Vallverdú H, Mora N, Oller A, et al. A surgical safety checklist implementation: experience of a start-up phase of a collaborative project in hospitals of Catalonia, Spain. *Med Clin (Barc)*. 2014;143(Suppl. 1):17-24. <https://doi.org/10.1016/j.medcli.2014.07.007>
9. Campos FGCM, Roll S. Complicações do acesso abdominal e do pneumoperitônio em cirurgia laparoscópica - causas, prevenção e tratamento. *Rev Bras Videocir*. 2003;1(1):21-8.
10. Ribeiro ALC, Pereira ER, Farias MSQ, Pontes SMM, de Vasconcelos TB, Bastos VPD. Morbi-mortalidade em cirurgia de correção de aneurisma de aorta em um hospital público de Fortaleza-CE: estudo retrospectivo. *Saúde Santa Maria*. 2015;41(1):111-6.
11. Stracieri LDS. Cuidados e complicações pós-operatórias. *Medicina (Ribeirão Preto)* [Internet]. 2008 [citado 09 nov. 2017]; 41(4):465-8. Disponível em: <https://www.revistas.usp.br/rmrp/article/viewFile/288/289>
12. Cabral LAL. Avaliação de acidentes com bisturi elétrico no centro cirúrgico de um estabelecimento assistencial de saúde pública no município de Fortaleza, Ceará [trabalho de conclusão de curso]. Fortaleza: Escola de Saúde Pública do Ceará; 2008.
13. Pelicano JF, Abrantes RCG, Pegoraro FA, Amorim ERB, Lima Júnior JA. Complicação de acesso venoso central: hidrotórax. *Med J* [Internet]. 2005 [citado 05 nov. 2017];123(Suppl.):25. Disponível em: <http://www.scielo.br/pdf/spmj/v123sspe/v123s1a20.pdf>
14. Búrigo CCP. Posicionamento do cateter venoso a central em pacientes de UTI: um estudo prospectivo [trabalho de conclusão de curso]. Florianópolis: Universidade Federal de Santa Catarina; 1995 [citado 08 nov. 2017]. Disponível em: <https://repositorio.ufsc.br/bitstream/handle/123456789/113407/253040.pdf?sequence=1>
15. Freitas PS, Mendes KDS, Galvão CM. Processo de contagem cirúrgica: evidências para a segurança do paciente. *Rev Gaúcha Enferm*. 2016;37(4):1-8. <http://dx.doi.org/10.1590/1983-1447.2016.04.66877>
16. Vane MF, Nuzzi RXP, Aranha GF, da Luz VF, Malbouisson LMS, Gonzalez MMC, et al. Parada cardíaca perioperatória: uma análise evolutiva da incidência de parada cardíaca intraoperatória em centros terciários no Brasil. *Rev Bras Anesthesiol* [Internet]. 2016 [citado 08 nov. 2017];66(2):176-82. Disponível em: http://www.scielo.br/pdf/rba/v66n2/pt_1806-907X-rba-66-02-00176.pdf. <https://doi.org/10.1016/j.bjan.2016.01.001>
17. Sérgio FR, Cameron LE, Vital ICO. Síndrome compartimental relacionada ao posicionamento cirúrgico: um inimigo silencioso. *Rev SOBCEC*. 2012;17(3):71-80.
18. de Godoy JMP, de Godoy MF, da Silva AM, Reis LF. Síndrome compartimental e minifasciotomia diagnóstica. *Cir Vasc Angiol* [Internet]. 1998 [citado 05 nov. 2017];14:99-102. Disponível em: http://jvascbras.com.br/revistas-antigas/1998/3/02/1998_a14_n3-2.pdf
19. Carvalho ARS, Matsuda LM, Carvalho MSS, de Almeida RMSSA, Schneider DSLG. Complicações no pós-operatório de revascularização miocárdica. *Maringá* [Internet]. 2006 [citado 09 nov. 2017];5(1):50-9. Disponível em: <http://eduem.uem.br/ojs/index.php/CiencCuidSaude/article/viewFile/5111/3326>
20. Barboza LMS. Histerectomia vaginal: uma revisão sobre complicações e métodos profiláticos [trabalho de conclusão de curso]. Goiás: Pontifícia Universidade Católica. [citado 09 nov. 2017]. Disponível em: <http://www.cpgls.pucgoias.edu.br/6mostra/artigos/SAUDE/L%C3%8DDIA%20MARTINS%20SPADONI%20BARBOSA%20E%20RUI%20GILBERTO%20FERREIRA.pdf>
21. de Carvalho R, de Moraes MW. Inserção do centro cirúrgico no contexto hospitalar. In: de Carvalho R, Bianchi ERF, eds. *Enfermagem em centro cirúrgico e recuperação*. 2ª ed. Barueri: Manole; 2016. p.1-18. Capítulo 1.
22. Brasil. Ministério da Saúde. Agência Nacional de Saúde Suplementar. Média de permanência geral [Internet]. Rio de Janeiro: ANS; 2013 [citado 20 nov. 2017]. Disponível em: <http://www.ans.gov.br/images/stories/prestadores/E-EFI-05.pdf>