

Monitoring of postoperative complications in the home environment

Monitorização de complicações pós-operatórias no ambiente domiciliar

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ABSTRACT

Objective: to propose a guideline for monitoring postoperative complications in patients in the home environment. **Methods:** research developed using the Delphi technique with 45 Brazilian health professionals. *Google Forms* were used for data collection and a Likert scale was used for consensus purposes. The data were analyzed using qualitative (content analysis) and quantitative (frequency and percentage analysis) techniques. **Results:** sixteen complications eligible to aid in the monitoring of surgical patients after discharge were listed, as well as signs and symptoms to be observed, and frequency and time of monitoring. According to the judges, surgical patients must be monitored at least once a day (68.8%). The maximum monitoring time varied from 48 hours to 30 days in case of risk of infection. **Conclusion:** the guideline is valid to be used to detect complications in surgical patients in the home environment and to anticipate the need for readmission.

Descriptors: Surgical Procedures, Operative; Postoperative Complications; Epidemiological Monitoring; Infection; Home Nursing.

RESUMO

Objetivo: propor uma diretriz de monitorização de complicações pós-operatórias de pacientes no ambiente domiciliar. **Métodos:** pesquisa desenvolvida por meio da técnica Delphi com 45 profissionais de saúde brasileiros. Utilizaram-se o *Google Forms* para coleta de dados e a escala Likert para fins de consenso. Os dados foram analisados utilizando técnicas qualitativas (análise de conteúdo) e quantitativas (análise de frequências e percentuais). **Resultados:** foram elencadas 16 complicações elegíveis para serem utilizadas no monitoramento de pacientes cirúrgicos no pós-alta, sinais e sintomas a serem observados, frequência e tempo de monitoramento. De acordo com os juízes, é necessário o monitoramento, ao menos uma vez por dia (68,8%), do egresso cirúrgico. O tempo máximo de monitoramento apresentou variação de 48 horas até 30 dias, no caso de risco de infecção. **Conclusão:** a diretriz se mostra válida para ser usada na detecção de complicações em egressos cirúrgicos no domicílio e antever a necessidade de reinternação.

Descritores: Procedimentos Cirúrgicos Operatórios; Complicações Pós-Operatórias; Monitoramento Epidemiológico; Infecção; Assistência Domiciliar.

Introduction

The need to increase bed turnover and optimize the use of resources and expenses resulting from hospitalization has a significant influence on discharge decisions. As a result, there is an increase in early hospital discharge and consequent transfer of care to the home environment. Discharge may happen without proper planning, exposing the patient to complications and, consequently, readmissions and/or death. In the case of surgical patients in the postoperative period, this is an increasingly frequent and problematic event, mainly due to the high probability of complications in the patient's home⁽¹⁾.

The postoperative period represents a period of high risk of complications and comprises three specific stages: immediate, mediate and late postoperative. The first stage, after anesthesia, lasts up to 24 hours post-surgery. The second stage is intermediate and corresponds to the period between the post-anesthetic phase and hospital discharge (between 24 hours and seven days). Finally, the third is the recovery phase, which comprises the continuum from hospital discharge to the expected recovery⁽²⁾.

Although the risks tend to predominate in the first postoperative days, they are not exclusively present in this moment. Complications in the late postoperative period can have serious repercussions, especially if the patient is at home. Therefore, the severity of complications influences the need for monitoring of the patient by the health team, and it is essential to prevent its consequences⁽¹⁻³⁾.

Scholars explain that there are common complications that can occur to every surgical patient in the postoperative period, including problems related to the airways, hypoxemia and pulmonary embolism, circulatory disorders such as hemorrhage and shock, urinary disorders, surgical site infection, dehiscence and evisceration⁽²⁻³⁾. These complications tend to vary in terms of frequency and severity, depending on the type of surgery, pre- and postoperative conditions and events, as well as factors intrinsic to the patient.

However, the lack of a standardized surveillance system of post-discharge complications hinder the establishment of a real picture of the situation⁽³⁻⁵⁾ in terms of prevalence, interventions and outcome. Furthermore, there is no standardized recommendation by national surveillance agencies about the surveillance and notification process of these complications⁽⁴⁻⁵⁾. Thus, it is understood that there is still a gap between the post-surgical patients in the home context and the health team. This gap is caused by the difficulty to contact the patient, classify the level of severity and then systematize actions to provide care⁽⁵⁾.

The objective of this study was to propose a guideline for monitoring postoperative complications in patients in the home environment.

Methods

This is a research developed using the Delphi technique. This technique allows researchers to control and manipulate the conditions in which they are interested, so that, based on knowledge and professional experience, a change in the value of an independent variable (expert opinion) is sought and the effect of this change on another dependent variable (complications) is observed⁽⁶⁾. This technique was chosen due to the absence in the literature of standardized recommendations for monitoring complications in the postoperative period at the home environment⁽⁵⁾.

Initially, a review of the international literature⁽⁵⁾ was carried out in order to provide an adequate reference about the common complications in the late postoperative period of surgical patients, their occurrence, time and intensity of manifestation. The results of this review were used to support the content proposed by the judges.

In the methodological stage of construction of the guideline, an intentional sample was used. The Lattes Platform of the National Council of Science and Technology was consulted to search for specialists, using the curriculum vitae and the following keywords as a search tool: "Surgeries" AND "complications"

with a filter for “Professional practice”. The following criteria were applied: being a medical professional or nurse; having at least one article or abstract published on the topic in a national or international event in the last five years; being a teacher of a *lato sensu* postgraduate course in the area for more than five years; and being a participant of research groups/projects involving topics of interest. Researchers who were registered on the Lattes Platform but belonged to other countries were excluded. One hundred and fifty-two invitations were sent, of which 107 did not respond. Thus, 45 medical professionals and nurses responded to the first version of the instrument.

Three rounds took place between September 2018 and January 2019, according to the flowchart (Figure 1). In the first round, an email was sent to the judges containing a hyperlink to a form created by the authors, hosted on Google Forms. A preliminary ver-

sion of the form was validated (face-content) by three judges, who did not participate in the next stages.

The online form was divided into two sections: one of sociodemographic characterization with information that included training and professional performance; and the other with structured questions in which the professionals should indicate at least three surgical complications common to their specialty that could occur to surgical patients already at home (late postoperative phase). At the end of this round, there was a total of 58 complications indicated with respective time required for monitoring, deadline of the follow-up, and signs and symptoms to be observed. The researchers compiled these complications, listed them and excluded the repeated items, and grouped and analyzed the material based on the previous results of the review⁽⁵⁾ and principles of content analysis⁽⁷⁾.

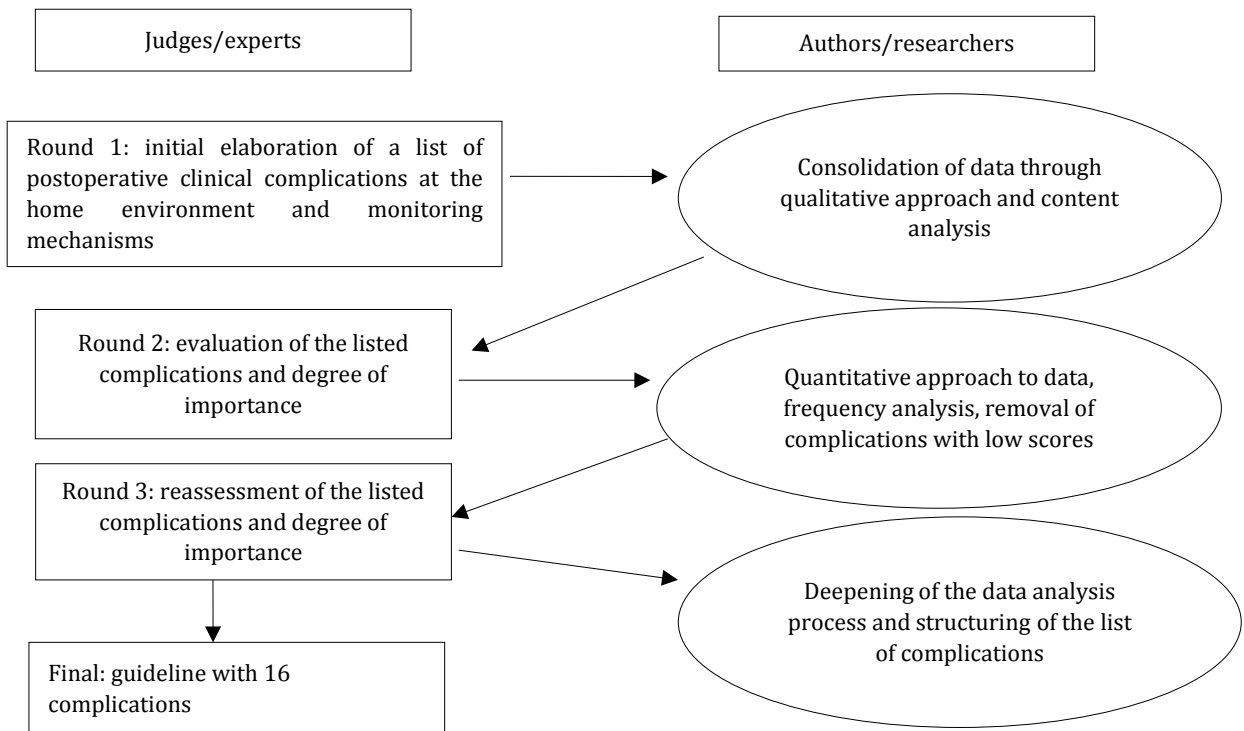


Figure 1 - Flowchart of operationalization of the Delphi technique. Ribeirão Preto, SP, Brazil, 2019

After systematic analysis, the list had 18 complications that made up the form to be analyzed by the judges in the second round. In this round, the suggested complications were provided for the judges to attributed a degree of importance to each complication using a Likert scale (0 - none, 1 - very small, 2- small, 3 - reasonable, 4 - large, and 5 - very large). Thirty-seven judges from the initial 45 adhered to the study in this round. At the end, the complications were analyzed according to the content validity index (CVI) and each complication remained as long as it had been scored "important" or "very important" in a minimum percentage of 75.0% of the evaluations, according to literature recommendations⁽⁸⁾. Two complications were excluded because they did not reach this percentage.

In this context, in the third round of evaluation of agreement, a list of 16 complications that reached the minimum agreement percentage was sent to the judges. Complications that did not reach the level of importance required in the previous round were excluded. In this round, 34 judges participated and all complications had scores above 80.0%.

At each round, the list of complications was analyzed descriptively, according to its content, frequency and median. In the content validation, the proposed content was meticulously analyzed with the objective of verifying whether the contemplated items constituted a representative sample of the subject to be measured⁽⁹⁾.

The research project was approved by the ethics committee of the Ribeirão Preto School of Nursing (Certificate of Presentation for Ethical Apprecia-

tion nº 83275618,3,0000,5393 and protocol nº 2,756,298/2017), with online Informed Consent Form.

Results

Twelve physicians and 33 nurses belonging to Health and Higher Education Institutions in the Midwest (n=3), North (n=2), Northeast (n=13), South (n=9), and Southeast (n=18) regions participated in this study. The judges were professionals in the area of teaching and health care, with experience and qualification in the surgical area.

Among the judges, 38 (84.4%) were female, 35 (77.8%) had a PhD, and 28 (62.2%) worked in Higher Education Institutions for less than 20 years, focusing on the following surgical specialties: general, orthopedics, digestive tract, head and neck, and thoracic, cardiovascular, urological and gynecological surgery.

The refinement process resulted in 16 complications eligible to be used in the monitoring of surgical patients after hospital discharge. Figure 2 shows these complications, the frequency of monitoring to be performed by the health team, signs and symptoms to be observed/investigated, and the time of monitoring.

According to the consensus of the judges, monitoring is necessary at least once a day, because most complications (68.8%) require monitoring every 12 hours. On the other hand, the maximum time of monitoring showed a greater variation, from 48 hours to 30 days in the case of infection (Figure 2).

Diagnostic hypothesis\ Complication	Possible signs and symptoms	Monitoring frequency (hours)	Deadline (End of monitoring)
Risk of infection	High fever; presence of purulent secretion in the surgical wound; localized pain; flushing; and presence of abscesses	12/12	30 days
Sepsis	High fever; arterial hypotension; and tachycardia	12/12	48 hours
Hyperthermia	Lethargy; somnolence; sensation of cold and shivering (chills); sweating and pale skin	12/12	72 hours
Pain	Verbal report of pain	12/12	72 hours
Dehydration	Dizziness; asthenia; muscle fatigue; xerostomia; xerophthalmia; and oliguria	12/12	72 hours
Reduced diuresis (Oliguria)	Lowering of the level of consciousness; respiratory change; metabolic disorders due to hydroelectrolytic alteration; and edema	Daily	72 hours
Hypothermia	Sensation of cold; tremors; muscle spasms; cold skin; and cyanotic extremities	12/12	48 hours
Atelectasis	Compromised respiratory rate; low oxygen saturation; and impaired lung auscultation	12/12	72 hours
Pulmonary thromboembolism	Dyspnea; fatigue; low saturation; and tachycardia	Daily	5 days
Congestive heart failure	Dyspnea (chest pain; shortness of breath or dizziness); signs of infection in the incisions (excretion of pus)	12/12	5 days
Ischemia (lower limbs)	Pain; burning sensation; muscle cramps during gait; cutaneous pallor of the limb; and decreased perfusion	12/12	5 days
Deep vein thrombosis	Redness or discoloration of the skin; local pain; edema; heat in the leg; and distended veins on the surface of the affected area	12/12	7 days
Hypovolemic shock	Compromised respiratory rate; elevated temperature; low oxygen saturation; impaired lung auscultation; and dry mucous membranes	Daily	72 hours
Cardiac arrhythmia	Altered heart rate; precordial pain; and dyspnea	Daily	72 hours
Dehiscence	Bloody serous (bright red) or purulent secretion from the surgical wound; opening of stitches	12/12	72 hours
Delayed surgical recovery	Nausea; vomiting; bleeding; impaired physical mobility; edema; problems with catheter or prosthetic material	Daily	15 to 20 days

Figure 2 - Main clinical complications of post-surgical patients in the home environment to be investigated according to the nature/type, frequency of monitoring, deadline and signs and symptoms observed. Ribeirão Preto, SP, Brazil, 2019

Discussion

This study had limitations related to the dependence of the results on the correct choice of judges due to the possibility of introducing selection bias. The possibility of unduly forcing a consensus is another relevant aspect, because the researcher is responsible for compiling the results in each round before submitting them again to the judges. To circumvent these limitations, we reinforced the criterion of randomization in the choice of judges from the Lattes platform.

In addition, in each round, the results were compared with the literature to avoid undue manipulation.

In several countries, there has been a movement for timely home hospitalization, especially of post-surgical patients. Thus, despite the possible limitations, presenting a consensus on which complications for how long they should be monitored in the Brazilian context contributes to clinical practice. This knowledge can be used to improve the outcomes and quality of care provided, as well as to new ways of provision of care.

Surgical intervention is never exempt from the risk of complications in any of its moments⁽³⁾, which is why attention from the health team is required. National and international studies⁽¹⁰⁻¹¹⁾ show that surveillance of surgical patients has occurred primarily during the period in which they are in the hospital, and when care is extended to the home environment, it is provided in a non-systematic way, usually with telephone support and without valid scientific support regarding the most serious complications and for the time necessary for monitoring them. In this sense, the present research is pioneering in proposing a series of complications common to certain surgical specialties and a systematic way of evaluating them.

Our findings reinforce this statement, because the complications listed here were pointed out in a series of other studies on prevalence rates^(3,11-12). The main complications were grouped into general, respiratory, cardiocirculatory, infections, cognitive disorders and others, following the example in the literature^(3,5,11).

Among the listed complications, postoperative pulmonary complications are the most common cause of postoperative morbidity, especially in people over 60 years of age, among whom they are the second most common cause of death^(3,13). The relevant role of pulmonary complications in the postoperative period is due to the fact that they are common to various surgical specialties, having as main representatives pneumonia, atelectasis, respiratory failure and pulmonary thromboembolism, also pointed out in our study. The complications that are part of this group have an incidence varying from 5 to 35.0% according to recent data from multicentric studies, with high mortality, around 30.0%, due to the rapid worsening of the clinical condition⁽¹³⁻¹⁴⁾.

On the other hand, postoperative cardiocirculatory complications have a lower incidence and occur in an earlier postoperative moment than severe pulmonary complications, encompassing situations such as acute myocardial infarction, congestive heart failure, ischemia (lower limbs) and deep vein thrombosis.

These complications retard recovery and significantly delay the return to normal activities and, consequently, decrease the quality of life⁽¹⁵⁻¹⁶⁾.

After surgery, patients remain fasting for a certain period of time, but with parenteral hydration maintained by surgical anesthesia and adynamic ileum, even in cases that do not involve the digestive system. For this reason, hydroelectrolytic disorders are very often present after discharge, with dehydration being highlighted in the literature^(1,3,5).

Infections, represented here by the "risk of infection and sepsis", in general, represent a serious problem because they can increase lethality and mortality, and cause hospital readmission and more hospital costs. Good patient follow-up after discharge is associated with lower rates of complications. In the late postoperative period, meta-analysis and review studies^(5,10) point to infection as the most common complication, which almost always requires reintervention or healing by second intention. The presence of an infectious condition can also favor the occurrence of other complications. An example of this is dehiscence, partial rupture, or even total rupture of all layers of the wall of the surgical incision^(3,5,10,17).

Temperature disorders (hyperthermia and hypothermia) are important and frequent complications throughout the postoperative period. Mild changes in temperature can result in unfavorable outcomes, especially in major surgeries. Thus, temperature is one of the physiological parameters that must be more strictly controlled. According to the findings of a Chinese clinical trial⁽¹⁸⁾, the variation in body temperature during the perioperative period significantly affects the immune function of patients in a long post-surgery period, thus increasing the chances of death.

Pain was also listed as an important complication to be monitored after discharge. It is a multidimensional and subjective parameter that is difficult to measure, but that is the main cause of readmission after outpatient surgery. In this sense, a study with patients of knee and hip arthroplasty⁽¹⁹⁾ pointed out pain as the main complication in the late postoperative

ve period (31.3%). The evaluation of this parameter in the postoperative period must be implemented using validated scales and this care measure must be expanded to the home.

Based on the above, it is clear that the transition from hospital to home can bring uncertainty and risk for many patients. Thus, a correct follow-up becomes a fundamental tool to ensure that the continuity of care is guaranteed with the same quality as it would be in a hospital environment⁽⁴⁾. In this sense, nurses are the professionals who are best suited to ensure care outside hospital organizations^(5,17).

This follow-up can be done even by mean of telephone calls. There is scientific evidence that contacting the patient after surgery provides peace of mind, safety, as well as monitoring of the recovery, contributing to a considerable reduction of costs and resources for people and their families, and also for healthcare organizations⁽²⁰⁾.

Conclusion

We listed a set of complications with respective signs and symptoms, frequency and deadline of monitoring, common to surgical patients in the home environment. Monitoring is required at least once a day, for at least 30 days. The guideline is valid to be used to detect complications in surgical patients at home and to anticipate the need for readmission.

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Collaborations

Sousa AFL, Hermann PRS, Fronteira I and Andrade D collaborated with the design of the research project, analysis and interpretation of data, writing and relevant critical review of the intellectual content and final approval of the version to be published.

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