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Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

#### Empfohlene Zitierung / Suggested Citation:

Costa, T. P., Santos, C. P. d., & Silva, R. F. A. d. (2014). Correlation between the post-cardiac arrest care algorithm and the nursing interventions classification (NIC). *Revista de Pesquisa: Cuidado é Fundamental Online*, 6(1), 241-248. <https://doi.org/10.9789/2175-5361.2014.v6i1.241-248>

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# Journal of Research Fundamental Care Online

ISSN 2175-5361  
DOI: 10.9789/2175-5361

## REVIEW

### Correlation between the post-cardiac arrest care algorithm and the nursing interventions classification (NIC)

Correlação entre o algoritmo de cuidados pós-parada cardiorrespiratória e a classificação das intervenções de enfermagem (NIC)

Correlación entre el algoritmo de cuidados después de paro cardiorrespiratorio y la clasificación de intervenciones de enfermería (NIC)

Thatiane Pinheiro Costa <sup>1</sup>, Cristiane Pastor dos Santos <sup>2</sup>, Renata Flávia Abreu da Silva <sup>3</sup>

### ABSTRACT

**Objective:** To correlate American Heart Association (AHA) post-cardiac arrest care algorithm to the classification system recommended by the Nursing Interventions Classification (NIC) and their consequent Nursing activities, both published in 2010. **Method:** Narrative review, using the references above mentioned as sources for data collection performed in July 2012. **Results:** AHA's 2010 post-cardiac arrest care algorithm analyzed and nursing classifications and activities have suggested for each of its steps. **Conclusion:** from the interpretation of care algorithm it is possible to suggest nursing interventions, founded on the NIC, in order to optimize Nursing care for clients with return of spontaneous circulation. **Descriptors:** Heart arrest, Nursing, Nursing care.

### RESUMO

**Objetivo:** Correlacionar o algoritmo de cuidados pós-PCR da American Heart Association (AHA) ao sistema de classificação sugerido pela Nursing Interventions Classification (NIC) e suas consequentes atividades de Enfermagem, ambos publicados em 2010. **Método:** Estudo narrativo de revisão de literatura que utilizou como fonte de coleta de dados as referências citadas anteriormente e foi realizada em julho de 2012. **Resultados:** Analisou-se o algoritmo de cuidados pós-PCR da AHA 2010 e foram sugeridas classificações e atividades de enfermagem para cada etapa do algoritmo de cuidados. **Conclusão:** A partir da interpretação do algoritmo de cuidados pós-PCR é possível sugerir intervenções de enfermagem, fundamentadas em NIC, para otimizar a assistência de enfermagem prestada ao cliente com retorno à circulação espontânea. **Descritores:** Parada Cardíaca, Enfermagem, Cuidados de enfermagem.

### RESUMEN

**Objetivo:** Correlacionar el algoritmo de cuidados después de PCR de American Heart Association (AHA) al sistema de la clasificación propuesto por la Nursing Interventions Classification (NIC) y sus consecuentes actividades de enfermería, ambas publicadas en 2010. **Método:** Revisión narrativa, que utilizó como fuente de colección de datos las referencias citadas anteriormente y fue llevada a cabo en julio del 2012. **Resultados:** El análisis del algoritmo de cuidados después de PCR de la AHA 2010 sugirió clasificaciones y actividades de enfermería para cada etapa del algoritmo de cuidados. **Conclusión:** A partir de la interpretación del algoritmo de cuidados después del PCR es posible sugerir las intervenciones de enfermería, fundamentadas en el NIC, para optimizar la asistencia de enfermería proporcionada al cliente con retorno a la circulación espontánea. **Descriptor:** Paro cardíaco, Enfermería, Atención de enfermería.

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## INTRODUCTION

**T**he cardiac arrest understood as the sudden cessation of heartbeat, unresponsiveness to stimuli, apnea or breath respirations, pulse not palpable and evidenced by absence of respiratory movements. Although there is a breakthrough in the management of cardiac arrest, this event involves high mortality, because even with a cardiopulmonary resuscitation (CPR) of success, the person affected may still present neurological sequelae and risk of death.<sup>1</sup>

It estimated that in Brazil occur annually, cardiac arrest 200,000 as one-half of the cases in hospitals, and the other half in Extramural environment. Survival rates related to client with return to spontaneous circulation not yet known despite advances related to prevention and treatment. This is justified by the absence of statistical studies proving the effectiveness of application of post-cardiac arrest care. However, it can be said that there is a breakthrough with regard to the legislation on public access to defibrillation, the mandatory provision of automatic external defibrillator (AED), as well as training in cardiopulmonary resuscitation (CPR) promoted by the Brazilian society of Cardiology, guided by the Guideline of the 2010 American Heart Association<sup>2</sup>.

Published studies show three fundamental factors and associated with the outcome of the cardiac arrest. First, the quality of chest compressions is still in need of improvement, although the implementation of the guidelines of the American Heart Association (AHA) of 2005 for cardiopulmonary resuscitation (CPR) and Emergency Cardiovascular Care (ECC) has been associated with a better quality in the resuscitation and greater survival. Another factor is that there is a considerable variation in survival to extramural cardiac arrest between the urgency/emergency medical services. Finally, most victims of sudden extramural cardiac arrest receives no CPR of people present on the place. To attempt to resolve such issues the AHA updated, in 2010, the guidelines on this issue and in order to increase the quality of life and success in the management of care post-cardiac arrest included in the chain of survival the emphasis to this care as fifth link.<sup>3</sup>

Initially, you might want to mention that according to the AHA, 2010, the initial goals of post-cardiac arrest care are: optimize the cardiopulmonary function and perfusion of vital organs. If the cardiac arrest occur outside the hospital environment, move the client to a hospital with comprehensive care system that includes acute coronary interventions, neurological care, critical care guided by goals and consider hypothermia. If the cardiac arrest occur within hospital, transfer the customer to a critical care unit capable of providing comprehensive post-cardiac arrest care, seek to identify and treat the precipitating causes of stop and prevent recurring events.<sup>4</sup>

In addition to these, are still considered the following objectives of the post-cardiac arrest care: control the body temperature to optimize the chances of survival and neurological recovery; identify and treat acute coronary syndromes; optimizing mechanical

ventilation to minimize lung damage; reduce the risk of multiple organ failure and support the functioning of the organs; evaluate, objectively, the prognosis for recovery and assist the survivors with rehabilitation services.<sup>4</sup>

Since the nurse actively participates in this process and the evolution of nursing started with numerous theories, transposed to the classifications of diagnoses, interventions and outcomes, the systematization of nursing care focused on post-cardiac arrest care is necessary to ensure that the actions are guided and conducted successfully. Within this context stands out nursing interventions described in the Nursing Interventions Classification (NIC)<sup>5</sup> for bringing systematic and objective actions, facilitating its implementation in healthcare practice.

Considering that there is a gap in knowledge about the specific nursing care in each step of the algorithm was defined as problem: what are the specific nursing interventions, according to NIC<sup>5</sup> for each step of the algorithm of post-cardiac arrest care<sup>3</sup> of the AHA, both of 2010?

To answer this problem, traced the following objective: to correlate the algorithm of post-cardiac arrest care of AHA classification system proposed by the NIC<sup>5</sup> and its consequent nursing interventions.

Thereby, this study aims to contribute to the scientific community, for education and for nursing care through the proposed suggestions for nursing interventions for each step of the algorithm of post-cardiac arrest care of the AHA, 2010, seeking to display data that improve the care provided.

## METHODOLOGY

Thus, the present study is the kind of narrative literature review aimed to correlate the post-cardiac arrest care algorithm published in last guideline of the American Heart Association (AHA) to Nursing Interventions Classification (NIC)<sup>5</sup>, both published in 2010.

The Nursing Interventions Classification (NIC)<sup>5</sup> is a textbook that describes the actions to be performed by nurses in order to meet the identified diagnoses. Each intervention has a definition and a set of activities related to attend its purpose.

The period of data collection occurred in July 2012 and the variables collected were phases of customer algorithm post-cardiac arrest care and their respective nursing interventions.

To organize the data were raised phases of customer service post-cardiac arrest algorithm, in the 2010 version of the AHA, and the respective nursing interventions, in the 2010 version of NIC<sup>5</sup>. For data, analysis built a table in order to allow the confrontation between phases of the algorithm and their classifications and nursing interventions identified.

To support data collection and subsequently the discussion, sought to understand, from the AHA, initial and subsequent objectives to individual suffering a cardiopulmonary



arrest. Thus, it became possible to the suggestion of more appropriate activities for each stage of the algorithm in order to meet the recommended by the AHA: optimization of the assistance.

## RESULTS AND DISCUSSION

General literature points out that although the best hospital care for customers with return of spontaneous circulation post-cardiac arrest are not completely known, there is a growing interest in identifying and optimizing practices that seek to improve the results.<sup>4</sup>

To this end, a comprehensive care program, structured and multidisciplinary should be applied consistently for the treatment of post-cardiac arrest clients. Must include as part of structured interventions: therapeutic hypothermia; optimization of hemodynamics and gas exchange; immediate coronary reperfusion when indicated to restore coronary blood flow with percutaneous coronary intervention; Glycemic Control and diagnosis, management and neurological prognosis.<sup>3</sup>

In view of the importance of optimization of care in the early 12:00 am return of spontaneous circulation and to facilitate the achievement of the objective of this study correlated if, initially, the steps of the algorithm of post-cardiac arrest care with nursing interventions classification (NIC)<sup>5</sup> more appropriate.

Thus, the first phase of the algorithm that corresponds to the return to spontaneous movement presents the following classification more appropriate nursing: cardiac care.

The second phase of the algorithm that corresponds to optimization of oxygenation and ventilation offers the following classification more appropriate nursing: respiratory monitoring.

The third phase of the algorithm that corresponds to the treatment of hypotension presents the following classifications most appropriate nursing: hemodynamic adjustment and control of hypovolemia.

The fourth phase of the algorithm that corresponds to the induced hypothermia, presents the following classification more appropriate nursing: induction of hypothermia.

The fifth phase of the algorithm that corresponds to the diagnostic confirmation of acute myocardial infarction without ST segment above or high suspicion of acute myocardial infarction presents the following classification more appropriate nursing: cardiac care - acute phase.

The sixth phase of the algorithm, which corresponds to coronary reperfusion, presents the following classification more appropriate nursing: cardiac care: acute phase.

The seventh phase of the algorithm that matches the advanced critical care offers the following classification more appropriate nursing: critical care.

From the previous correlation and using the NIC<sup>5</sup> version 2010, nursing interventions suggested for each classification of nursing lifted. In this way, a list of about 10 to 30

activities per intervention were selected in line with the who recommends or directs the algorithm of post-cardiac arrest care, respecting the possibility suggested by NIC<sup>5</sup> to add new activities, if so desired. Any modification or addition of activities sought consistency with the definition of the intervention.<sup>4</sup>

Thus, referring to the first phase of the algorithm, the suggested activities are conduct a comprehensive evaluation of peripheral circulation; documenting arrhythmias; Monitor vital signs frequently, observe signs and symptoms of cardiac output decreased; monitor cardiac arrhythmias, including riots in the formation and conducting of rhythm; monitor the abdomen in search of reduced perfusion indicators; monitor appropriate laboratory data.

In the second phase of the algorithm, the suggested activities are: monitoring the frequency, the pace, depth and effort of breaths; monitor respiratory noises, such as wheezing and snoring; auscultating breath sounds, noting areas of decreased ventilation/absent, and presence of adventitious noises; determine the need for aspiration through auscultation of crackles and snoring in the Airways; observe changes in venous oxygen saturation, saturation of arterial oxyhemoglobin, carbon dioxide expired and changes in arterial blood gas values.

In the third phase of the algorithm, the activities would be: to monitor, document and recognize changes in hemodynamic State, including central venous pressure, mean arterial pressure, pulmonary artery/capillary pressure; monitor the intake/elimination, the urine output and the customer, as well as weight loss insensitive liquids (e.g., diaphoresis and respiratory infection); monitor electrolyte levels and levels of hemoglobin and hematocrit; put in Trendelenburg position; crystalloid and colloid solutions combine for intravascular volume replacement, when prescribed; monitor and evaluate customer response to fluid replacement.

In the fourth phase of the algorithm, the activities would be: Monitor vital signs; monitor the temperature of the client using continuous monitoring device of core temperature as appropriate; maintain client in cardiac monitor; include external and active cooling measures, for example: ice packs, blanket, water cooling compresses with circulation of water; monitor the color and temperature of the skin; monitor the occurrence of tremors and, if it occurs, administer prescribed medications for avoid or control tremors; monitor the emergence of arrhythmias and treat them as appropriate; monitor the occurrence of water-electrolyte imbalance; acid-base imbalance monitor; monitor respiratory condition; monitor the coagulation time, partial thromboplastin time, or platelet count, and still closely monitor the client for signs and symptoms of bleeding persisted; Monitor the count of white blood cells; monitor hemodynamic condition.

On the fifth and sixth stages of the algorithm, the activities would be: monitor hemodynamic parameters; get 12-lead ECG and monitor cardiac rhythm and frequency; monitor the neurological State; monitor food intake/elimination, the urine output and the daily weight; Collect serum cardiac enzymes, as appropriate; monitor electrolytes that can increase the risk of arrhythmias (e.g., serum potassium and magnesium); monitor renal function; monitor the oxygen distribution determinants (e.g., levels of PaO<sub>2</sub>, hemoglobin and cardiac output); administer medicines to prevent episodes of Valsalva maneuver; administer medications to relieve/prevent pain and ischemia.

The seventh phase of the algorithm includes several nursing interventions and sought to include the main: determining the need for airway aspiration; observe changes in venous and arterial oxygen saturation, carbon dioxide expired and changes in arterial blood gas values; recognize, monitor and document changes in hemodynamic State; monitor electrolyte levels and levels of hemoglobin and hematocrit; monitor and evaluate customer response to intravenous therapy; administer medications to relieve/prevent pain and ischemia; monitor the temperature of the client using continuous monitoring device of core temperature as appropriate; include external and active cooling measures; monitor the emergence of arrhythmias and treat them as appropriate; monitor the occurrence of water-electrolyte imbalance; acid-base imbalance monitor; monitor the coagulation time; monitor the neurological State; monitor food intake/elimination, the urine output and the daily weight; and monitor renal function.

In view of the COFEN resolution 358/2009 which provides for on the systematization of nursing care and the implementation of the nursing process in environments that occur the nursing professional care, whether public or private, correlated the AHA care algorithm to NIC.<sup>5</sup> Choose the NIC because she brings nursing interventions based on clinical judgment and knowledge held by a nurse to improve the health outcomes of the client.<sup>7</sup>

In addition, it is worth emphasizing that when the standardized language used to document the practice, it is possible to compare and evaluate the effectiveness of the assistance provided in multiple settings and by different health care providers. Therefore, observed that the use of standardized language does not inhibit the healthcare practice, but transmits the essence of nursing care and let's make it through research.<sup>7</sup>

To comply with the law/7498 1986 that deals with private actions of the nurse and, among these, those of greater technical complexity that require science-based knowledge and ability to make immediate decisions, it is recommended that the nurse is the professional responsible for acting with customers with return to spontaneous circulation.<sup>6</sup>

In this context is the control of body temperature, which answers the initial objectives and subsequent post-cardiac arrest care to optimize the neurological recovery<sup>4</sup> about this goal was, located a nursing intervention classification called "induction of hypothermia" where the mentioned activities include all phases necessary to consider a therapeutic hypothermia. In this way, the intervention in question considered in the study one of the most complete classifications.

From what has been stated above, it is concluded that the suggested activities do not saturate the range of care that a client in need post-cardiac arrest. Still, the activities mentioned were proposals focusing on the first 12:0 am that are crucial to the restoration of vital functions of the client with return to spontaneous circulation.

## CONCLUSION

Systematization of nursing care is a private task of nurses and guides the activities of the entire nursing staff. In this way, the systematization organizes the execution of the

nursing process and facilitates the decision-making process of the nurse. In view of the importance of customer assistance with return to spontaneous movement in early 12:0 am, becomes relevant to implementation of systematization of nursing care also in this case.

Is known that for selecting the NIC should describe NANDA (North American Nursing Diagnosis Association) and NOC (Nursing Outcomes Classification), however, this study did not present to describe the whole process of nursing, but rather to suggest the possible interventions and nursing activities for each stage of the algorithm.

As a suggestion for future studies it is recommended the construction of a new survey which broaden the discussion on nursing interventions that stand out on stage "advanced critical care" in order to emphasize the actions taken by the nurses in units that receives customers with return to spontaneous circulation.

Once it was possible to correlate the phases of post-cardiac arrest care algorithm with their respective ratings and nursing activities, believed that the aim of the study achieved. Suggested for future work the application of this study in units that receives critical clients, including one after return of spontaneous circulation, in order to confirm or not the effectiveness of the assistance. That way it will be possible to the proposition of protocols and the re-evaluation of nursing interventions suggested as the reality of each institution.



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Received on: 27/11/2012  
Required for review: 23/05/2013  
Approved on: 03/10/2013  
Published on: 01/01/2014

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