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NOTE PREVIEW ARTICLE

ANALYSIS OF VOLUME OF SOLUTION FOR THE TOTALLY IMPLANTABLE CENTRAL VENOUS CATHETER MAINTENANCE

ANÁLISE DO VOLUME DE SOLUÇÃO PARA MANUTENÇÃO DO CATETER VENOSO CENTRAL TOTALMENTE IMPLANTADO

ANÁLISIS DEL VOLUMEN DE SOLUCIÓN PARA MANTENIMIENTO DEL CATETER VENOSO CENTRAL TOTALMENTE IMPLANTADO

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ABSTRACT

Objective: to develop a procedure handbook for the maintenance of the Totally Implantable Central Venous Catheter (TI-CVC), considering the specificities of the catheter, the user's biotype and the final length after insertion. **Methodology:** it is a quantitative study through which a documentary research in stuffs of manufacturers of catheters will be conducted, in addition to interviews with eight surgeons responsible for implanting TI-CVC in the Surgical Center from Unit I at the National Cancer Institute, after accepting to participate in the survey and have signed the Free and Informed Consent Form (FICF). The research project was approved by the Research Ethics in Research, CAAE nº 08151212.8.0000.5274 and Opinion nº 154.005. **Expected results:** we hope that the drawn handbook from this study is guiding of the procedures for the TI-CVC maintenance, checking the quantity of solution used for the TI-CVC maintenance, through the table of volume for maintenance, considering the specificities of these objects and of users. **Descriptors:** Indwelling Catheters; Maintenance; Nursing Assessment.

RESUMO

Objetivo: elaborar manual de procedimentos para manutenção do Cateter Venoso Central Totalmente Implantado (CVC-TI), considerando as especificidades do cateter, o biotipo do usuário e o comprimento final após a inserção. **Metodologia:** estudo quantitativo onde será realizada uma pesquisa documental nos materiais dos fabricantes dos cateteres, além de entrevistas com os oito cirurgiões responsáveis pelo implante do CVC-TI no Centro Cirúrgico da Unidade I do Instituto Nacional de Câncer, após aceitarem participar do estudo e terem assinado o Termo de Consentimento Livre e Esclarecido (TCLE). O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, CAAE nº 08151212.8.0000.5274, parecer nº 154.005. **Resultados esperados:** espera-se que o manual elaborado a partir deste estudo seja norteador dos procedimentos para manutenção do CVC-TI, verificando da quantidade de solução utilizada para manutenção do CVC-TI, por meio da tabela de volume para manutenção, considerando as suas especificidades e as dos usuários. **Descritores:** Cateteres de Demora; Manutenção; Avaliação em Enfermagem.

RESUMEN

Objetivo: elaborar manual de procedimientos para mantenimiento del Catéter Venoso Central Totalmente Implantado/CVCTI considerando las especificidades del catéter, del biotipo de usuario y la largura final después de la inserción. **Metodología:** estudio cuantitativo donde será realizada investigación documental en los materiales de los fabricantes de los catéteres y entrevista con los ocho cirujanos responsables por el implante del CVCTI del Centro Quirúrgico de la Unidad I del Instituto Nacional de Câncer, después de aceptar participar y tener firmado el Término de Consentimiento Libre y Aclarado. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación, CAAE nº 08151212.8.0000.5274, parecer nº 154.005. **Resultados esperados:** que el manual elaborado a partir de este estudio sea el norte de los procedimientos para mantenimiento del CVCTI, verificando la cantidad de solución utilizada para mantenimiento del CVCTI, por medio de la tabla de volumen para mantenimiento, considerando las especificidades de los mismos y de los usuarios. **Descriptor:** Catéteres de Demora; Mantenimiento; Evaluación en Enfermería.

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INTRODUCTION

The cancer incidence grows in Brazil and across the world at a pace similar to the population aging arising from increased life expectancy. In 2004, Brazil registered 141.000 deaths from cancer. In males, the most common cancer cases were in lung, prostate and stomach; while in females, breast, lung and bowel were predominant.¹

In Brazil, the estimates for the year 2012, which are also valid for the year 2013, indicate the occurrence of approximately 518.510 new cancer cases, including cases of non-melanoma skin, enhancing the magnitude of the cancer-related problem in the country. Without counting the non-melanoma skin cancers, it is estimated a total of 385.000 new cases. The most incident cancer types will be non-melanoma skin, prostate, lung, colon, rectum and stomach for males; and non-melanoma skin, breast, cervix, colon, rectum and thyroid gland cancers for females.²

In parallel to the increasing cancer incidence in our country, the oncology has achieved a great progress, both in diagnostic and in therapeutic techniques, which has enabled an improvement on the survival and life quality of patients with this disease. It is task of the Nursing to monitor the development of this specialty by means of scientific researches, which are the main resources for updating the knowledge so that one can provide an increasingly better care to oncologic patients in professional and scientific senses.

Most drug therapies for the various types of neoplastic diseases are intravenously performed. Because of the time of treatment, endothelial irritabilities caused by many of these drugs, in addition to the risk of tissue necrosis can also take place in case of leakage of some of them to the subcutaneous region. Thus, generally, the insertion of central venous catheters is indicated. Besides the administration of chemotherapeutic drugs, this device might have other indications, such as: administration, blood products, antibiotics, parenteral nutrition, analgesics and frequent need of blood sample collection.³

Such devices might be inserted in peripheral veins, such as the Peripherally Inserted Central Catheter (PICC), or inserted in deep veins, such as the Semi-Implantable Central Venous Catheter (SI-CVC), and Totally Implantable Central Venous Catheter (TI-CVC). It should be remembered that the PICC might be inserted by the nursing professional, whether it is trained, because, in Brazil, the assignment of technical and legal competence

of nurses to exercise the practice of manipulating the PICC was defined in the Resolution nº 258/2001, of the Brazilian Federal Nursing Council (known as COFEN).⁴

These catheters remain in the patient for a period ranging from days to years and/or until the end of treatment. Accordingly, such catheters need to remain pervious with anticoagulant solution, during the period in which they are not being used for some kind of infusion, i.e., disabled. In general, we should use 0.9% saline with heparin (heparin solution) to disable thereof.

It should be observed that the daily practice of specialized institutions in cancer treatment has a discrepancy regarding the volume of fluids to be introduced into the totally implantable or semi-implantable catheters. Hence, the object of this research is the identification of the approximate volume of solution to be inserted into the Totally Implantable Central Venous Catheter (TI-CVC) for its maintenance.

Some recommendations, such as the American⁵ standards and the guidelines for the practice of intravenous therapy in Brazil⁶, indicate that the volume should be at least twice the prime of the used catheter. Nonetheless, other countries, such as New Zealand⁷, advise that, for the calculation of this volume, the catheter type and size, as well as patient's age, should be regarded. This recommendation considers not only the characteristics of the stuff to be used, but also the patient. Thus, it is observed a concern with the safety of the patient, in which the catheter will be implanted, with solution waste, with the characteristics of the stuff, in short, with an individualized practice to maintain the permeability of the catheter.

The hospital itself, which is reference in oncology, has its form of Nursing Procedure for handling Central Venous Catheters and recommends the administration of 2ml of heparin solution for its maintenance, but without making differentiation between adult and child, for example.⁸ Some authors recommend the heparinization of central venous catheters with 3ml of heparin solution for adults and 1 ml of the same solution in the cases of children.⁹

It should be considered that, when an institution has its pre-established protocols, which are incorporated by the professionals, the procedures are usually performed by them without the presence of a professional to establish prescriptions. In the case of volume for TI-CVC maintenance, when the institution has a pre-established quantity for it, there is usually not a prescription, both from the

doctor or from the nurse, and what is determined by the protocol, handbooks, standard operational procedure and other similar guidance is followed.

These catheters, if there is no infection, obstruction or any other complication, tend to stay until the end of treatment. Catheterization is a means of safe and permanent vascular access for years, when operated by trained professionals.¹⁰ Thus, this research project aims at developing a guidance handbook with the approximate volume for TI-CVC maintenance, from the specificity of the catheter, the biotype and the despised piece at the time of implantation, aiming to assist nurses.

This study might be considered as relevant, given the patient safety, the quality of the nursing care, because, through it, we hope to more reliably control the introduction of the solution for maintaining the TI-CVC.

By thinking of patient safety, we have found in the literature some publications of cases of allergies to substances and/or drugs that are eventually used in these catheters, such as the streptokinase, which acts as a thrombolytic in case of obstruction of catheters, for example; a case of angioedema related to the use of this substance and there are also publications with description of a patient with an allergy to heparin. Thus, it should be highlighted the importance of developing a guidance handbook for the maintenance of totally implantable catheter, taking into account the specificity and the despised piece of this catheter, as well as the patient's biotype.

OBJECTIVES

- To develop a procedure handbook for the maintenance of the Totally Implantable Central Venous Catheter (TI-CVC), considering the specificities of the catheter, the user's biotype and the final length after insertion.
- To identify the TI-CVC catheter types and their more used specificities in the Unit I at the National Cancer Institute.
- To describe the selection criteria from the surgeon by means of the catheter to be implanted.
- To check the quantity of solution used for the TI-CVC maintenance in this institution.
- To propose a table of volume for the TI-CVC maintenance, considering the specificities of these objects and of users.
- To check the quantity of volume that a unit of TI-CVC holds.

- To analyze patients by age group (adult/child) in an accurate way.

METHOD

It is a quantitative study through which a documentary research in stuffs released by the manufacturers of catheters will be conducted, with non-participant observation of the time of catheter insertion and a questionnaire for surgeons with the purpose of knowing the criteria for electing the catheters to be implanted and the section to be conducted. The subjects (surgeons) will be separately approached, because the catheters insertions are held by different professionals, respecting the age group previously defined by the institution.

• Study Type

This research will use a quantitative approach. The subjects (surgeons) will be separately approached, because the catheters insertions are held by different professionals, respecting the age group previously defined by the institution.

We will request a prior opinion to the Research Ethics Committee (REC) from the National Cancer Institute (INCA), thus respecting the determinations of the Resolution 196, of October 10th, 1996¹³, from the Brazilian National Health Council, which establishes the regulatory standards for researches involving human beings. After approval, we will start the research.

Before the beginning of the investigation, we will send a document to request authorization for the General Board of INCA and for the Nursing Board for allowing the accomplishment of the research within the Surgical Center.

By having as the main objective to assess if there are significant differences in the prime volume (in milliliters) between two age groups: adults and children, we have considered the following assumptions for the calculation of the sample size:

- I) Significance level of 5% (α);
- II) Power of the statistical test of 80% (1-B);
- III) A relatively "large" expected difference between the age groups, which is known as effect size: it is obtained by prior knowledge of literature of similar study.⁹

The researcher will monitor the catheters insertion in the Surgical Center at the unit at stake, both done in adults and in pediatric patients and, after the observation, the questionnaire will be applied to surgeons with questions aimed at answering the criteria that these professionals have elected for the catheter insertion.

• Scenario and Research Participants

The scenario for the development of this research will be the Surgical Center from the Unit at the National Cancer Institute.

The surgeons who implant catheters in adults and children in the Unit will be the participants, totaling about eight subjects. The subjects will be presented to the research objectives. After having accepted to participate and have signed the Free and Informed Consent Form (FICF), the research will be conducted.

• Data Analysis

The descriptive analysis will be presented in the form of tables, the observed data will be expressed by the frequency (n) and percentage (%) for categorical data and average; standard deviation, median, minimum and maximum for numerical data.

The comparison between age groups (children and adults) will be assessed by means of the χ^2 test or Fisher's exact test for categorical data; or through the Mann-Whitney's test for numerical data without normal distribution (Gaussian), according to the Kolmogorov-Smirnov's test.

The adopted criterion for determining significance will be the level of 5%. The statistical analysis will be processed by the statistical package SPSS, version 17.0.

• Expected Results

We hope to achieve the preparation of a procedure handbook for the TI-CVC maintenance, considering the specificities of the catheter, the user's biotype and the final length after insertion. We aim at identifying the TI-CVC catheter types and their more used specificities in the Unit I at the National Cancer Institute. We have the purpose of describing the selection criteria from the surgeon by means of the catheter to be implanted, as well as checking the quantity of solution used for the TI-CVC maintenance in this institution. We intend to develop a table of volume for the TI-CVC maintenance, considering the specificities of these objects and of users. We have the expectancy of checking the quantity of volume that a unit of TI-CVC holds. Finally, we hope to conduct an accurate analysis of patients by age group (adult/child).

• Ethical Aspects of the Research

It is a dissertation project of the Professional Masters Degree Program in Assistential Nursing (MPEA) from the School of Nursing Aurora Afonso Costa, Fluminense Federal University, forwarded to the Research Ethics Committee (REC) from the involved

institution, in accordance with the Resolution nº 196/96, of the Brazilian National Health Council (CNS)⁶, which establishes standards and guidelines for the conduct of researches involving human beings, through the Brazil Platform, submitted on December 10th, 2012, under CAAE nº 08151212.8.0000.5274 and Opinion nº 154.005.

Each research participant will receive the Free and Informed Consent Form, authorizing the use of its data in the research, which will be developed in line with the standards of the institution.

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