

## NURSING IN THE PREVENTION OF INFECTION IN TOTALLY IMPLANTED CATHETERS OF ONCOLOGICAL PATIENTS

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**ABSTRACT:** The aim of this free communication is to highlight scientific evidence related to nursing contributions in preventing infection in totally implanted catheters of oncological patients, based on reference literature on the subject. The studies were selected between November 2015 and January 2016, in the Cochrane Library, Latin American and Caribbean Center on Health Sciences Information, and Medical Literature Analysis and Retrieval System Online databases via PubMed and Web of Science, using the descriptors indwelling catheter, nursing care, and patient safety. The evidence was organized into three categories: safe puncture of the totally implanted catheter, safety in the change and maintenance of the totally implanted catheter dressing, and safe administration of medication and maintenance of the closed system. Nursing care for totally implanted catheter patients is surrounded by risks that can result in infection of the catheter, however, the existence of preventive measures can reduce these risks.

**DESCRIPTORS:** Catheter related infections; Nursing care; Patient safety.

### ENFERMAGEM NA PREVENÇÃO DE INFECÇÃO EM CATETER TOTALMENTE IMPLANTADO NO PACIENTE ONCOLÓGICO

**RESUMO:** O objetivo dessa comunicação livre é apontar evidências científicas acerca de contribuições da Enfermagem na prevenção de infecção em cateter totalmente implantado de pacientes oncológicos, com base em literatura de referência acerca do assunto. Os estudos foram selecionados entre novembro de 2015 e janeiro de 2016, nas bases de dados *Cochrane Library*, Literatura Latino-Americana e do Caribe em Ciências da Saúde, *Medical Literature Analysis and Retrieval System Online* via PubMed e *Web of Science*, por meio dos descritores cateter de permanência, cuidados de enfermagem, segurança do paciente. As evidências foram organizadas em três categorias: punção segura do cateter totalmente implantado, segurança na troca e manutenção do curativo do cateter totalmente implantado, e administração segura de medicamentos e manutenção do sistema fechado. A assistência de enfermagem ao paciente portador de cateter totalmente implantado é cercada de riscos que podem resultar na infecção do cateter, porém, a existência de ações preventivas é capaz de reduzir esses riscos.

**DESCRIPTORES:** Infecções relacionadas a cateter; Cuidados de enfermagem; Segurança do paciente.

### ENFERMERÍA EN LA PREVENCIÓN DE INFECCIÓN EN CATÉTER TOTALMENTE IMPLANTADO EN PACIENTE ONCOLÓGICO

**RESUMEN:** Fue objetivo de esta comunicación libre apuntar evidencias científicas acerca de contribuciones de la Enfermería en la prevención de infección en catéter totalmente implantado de pacientes oncológicos, basándose en literatura de referencia respecto al asunto. Los estudios fueron seleccionados entre noviembre de 2015 y enero de 2016, en las bases de datos *Cochrane Library*, Literatura Latinoamericana y del Caribe en Ciencias de la Salud, *Medical Literature Analysis and Retrieval System Online* por PubMed y *Web of Science*, utilizándose los descriptores catéter de permanencia, cuidados de enfermería, seguridad del paciente. Las evidencias fueron organizadas en tres categorías: punción segura del catéter totalmente implantado, seguridad en el cambio y en la mantención de las vendajes del catéter totalmente implantado, y administración segura de medicamentos y mantención del sistema cerrado. La asistencia de enfermería al paciente portador de catéter totalmente implantado presenta riesgos que pueden resultar en infección del catéter, pero la existencia de acciones preventivas es capaz de reducir esos riesgos.

**DESCRIPTORES:** Infecciones asociadas a catéter; Cuidados de enfermería; Seguridad del paciente.

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## ● INTRODUCTION

Patient safety comes from the need to provide support for safe and quality care in the health services. Patient safety (PS) is understood as actions to reduce to an acceptable minimum, the risk of unnecessary harm associated with healthcare<sup>(1)</sup>. In recent years, the World Health Organization (WHO) has encouraged the adoption of safe practices in healthcare. One strategy was the implementation of International Patient Safety Targets, highlighting that which aimed to prevent healthcare associated infections (HAIs). The HAIs are responsible for harm to patients, prolonged hospitalization and high costs to the health systems<sup>(2)</sup>. In this situation, the harm to the patient in most cases is irreversible and inevitable. The risks involved in the provision of healthcare have particularities depending on the clinical profile of the patient; among them, there are cancer patients, who are surrounded by risks throughout the treatment. These risks involve the underlying disease itself (cancer), the treatment and the care.

Cancer, defined as the disordered proliferation of certain cell types, has the potential to cause local or systemic damage. The therapeutic options are chemotherapy, surgery and/or radiation therapy. Chemotherapy is one of the most promising options, as its systemic action is capable of inducing the death of cancer cells in all organs and tissues affected by the disease<sup>(3-4)</sup>. The healthcare related risks are the most worrisome, since they can be avoided. When the therapy used is chemotherapy, patients need a safe route of administration for the drugs, since administration in peripheral veins leads to the failure of the venous network<sup>(2)</sup>.

The totally implanted catheter (TI-CVC) is a long-term catheter that allows the infusion of chemotherapeutic agents, solutions, blood transfusions, nutrition and the collection of test samples in a safe way<sup>(5)</sup>. The safety of cancer patients is the basic premise for care quality, since the disease, treatment and complications arising from this make the patients fragile and expose them to constant risk.

Nursing care for a cancer patient with a TI-CVC is aimed at the adoption of measures preventing the occurrence of infection in the catheter. To reduce the risk of infections associated with healthcare is an international patient safety target<sup>(6)</sup>. These goals were determined by the WHO in order to reduce healthcare related errors, thus ensuring a safe stay in the hospital for the patient.

It should be noted that the use of intravenous devices, such as the TI-CVC, has the potential to cause injuries to patients and is associated with morbidity and mortality, especially during hospitalization<sup>(7)</sup>. Among these injuries, there is infection of the TI-CVC, which is a complication responsible for discontinuation of treatment and antimicrobial resistance of immunosuppressed patients at high risk for developing sepsis<sup>(7)</sup>. Infection of the TI-CVC is considered a delayed complication, since it occurs after the use, that is, from the colonization of the skin, use of contaminated equipment and contamination of the catheter connections<sup>(8)</sup>.

Considering the relevance of the theme, this paper aims to highlight scientific evidence related to nursing contributions in the prevention of infection in the TI-CVC of oncological patients. The data were obtained by searching the databases: Cochrane Library, Latin American and Caribbean Center on Health Sciences Information (LILACS), and Medical Literature Analysis and Retrieval System Online (MEDLINE) via PubMed and Web of Science using the descriptors indwelling catheter, nursing care, patient safety. Only articles published between 2011 and 2015 were included. Data collection occurred from November 2015 to January 2016. The evidence was synthesized into three categories, as presented below: puncture of the totally implanted catheter, medication administration and maintenance of the closed system, and changing the dressing.

## ● SAFE PUNCTURE OF THE TOTALLY IMPLANTED CATHETER

The puncture of the TI-CVC is the responsibility of the nurse. It requires theoretical knowledge and skill in sterile techniques. Access to the TI-CVC is by means of a Hubber non-coring needle, which increases the half-life of the catheter<sup>(2)</sup>. The antisepsis of the skin with chlorhexidine is the most effective way to prepare the skin for puncture, as its microbicidal action maintains a residual effect on

the skin longer than alcohol and alcoholic polvidine and thus reduces the risk of infection related to the puncture of the TI-CVC<sup>(3,9-10)</sup>.

In addition to the antiseptics of the skin to be punctured, the correct preparation of the materials to be used (simple surgical mask, cap, sterile gauze and gloves, Hubber type needle) are important measures in preventing infection of the TI-CVC<sup>(10)</sup>. Sterile techniques are the first safety barrier for the patient with a TI-CVC, as they prevent microorganisms from invading the ostium or tunnel of the catheter resulting in infection and sepsis. It is necessary for nurses, when performing the TI-CVC puncture, to be aware that their function during the procedure is not only to ensure the infusion of medications through that route, but also to ensure that the applied technique is safe.

## ● SAFETY IN THE CHANGE AND MAINTENANCE OF THE TI-CVC DRESSING

The change of the TI-CVC dressing requires correct choice of cover, evaluation of the catheter ostium, early identification of signs of inflammation and compliance with the frequency of dressing change. The dressing serves as protection for the needle insertion site. Alcoholic chlorhexidine is the most suitable solution for antiseptics of the region due to its residual effect. Regarding the interval between dressing change, it is considered that when the cover used is sterile gauze, the change must be performed every 48 hours, and when transparent film is the choice, the change must be performed every 7 days<sup>(9)</sup>.

It should be noted that the moment of dressing change is the unique circumstance for evaluation for the presence of inflammatory signs. Furthermore, the daily review of the catheter prevents unnecessary delays in the withdrawal of lines not being used, as the risk of infection is proportional to the length of time that the catheter remains. The transparent film cover is recommended, as it allows easy visualization of the signs of inflammation<sup>(10)</sup>.

## ● SAFE ADMINISTRATION OF MEDICATIONS AND MAINTENANCE OF THE CLOSED SYSTEM

The connections linked to the TI-CVC must be carefully handled to avoid direct or indirect contamination of the patient by microorganisms<sup>(7)</sup>. The administration of medications, among which the chemotherapeutic agents are those administered more frequently, require hand hygiene immediately before contact and antiseptics of the connections with 70% alcohol<sup>(3)</sup>. Some microorganisms responsible for infections originating from the use of TI-CVC come from the hands of the professionals manipulating this device<sup>(11)</sup>.

To allow the catheter connections to remain unprotected favors the colonization of the ostium and the lumen by bacteria of the flora of the patient or the hands of the professional, as well as bacteria from the external environment, such as multidrug resistant strains present in hospitals<sup>(11)</sup>. The change of the infusion set should be performed at least every 96 hours<sup>(10)</sup>. Nursing actions relating to this step of the work process are simple and do not require the full team, materials and supplies, only the recognition of the team that the washing and antiseptics of the hands and disinfection of the side nozzles and connections are actions that can save lives.

## ● IMPLICATION OF THE NURSING ACTIONS FOR THE SAFETY OF PATIENTS WITH TI-CVC

The nursing actions described in this informative text are directly implicated in the care to reduce to an acceptable minimum the risk of patients with TI-CVC having infections arising from the healthcare. These actions, though simple, require the nursing team to adopt measures aimed at preventing microorganisms related to the handling of the catheter or the microflora of the patient making the catheter unusable due to infection, as well as interrupting or delaying the treatment or leading to sepsis and death.

## ● FINAL CONSIDERATIONS

The evidence of the nursing contributions identified in this article show that the safe puncture, the maintenance and change of the dressing and maintenance of the closed system are essential care actions for the prevention of infection of the totally implanted catheter. These actions aim to make the care safe for cancer patients, already weakened by the disease and treatment. It is hoped that this text demonstrates to nursing professionals that the actions identified are simple and can prevent harm to the patient. In addition, it is suggested that further studies on the theme are developed with different methodological approaches.

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