

## NURSING AND INTERNATIONAL SAFETY GOALS: HEMODIALYSIS ASSESSMENT

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**ABSTRACT:** The objective of this study was to describe the nursing care offered at a hemodialysis hospital service based on international patient safety goals. A descriptive study was conducted at the hemodialysis service of a Brazilian public hospital, reference in care for acute and chronic kidney patients, between August and October, 2013. Twenty-five nursing professionals participated in the study. Data were collected through interviews, observation and a checklist based on the safety goals of the Joint Commission International. The goals found to be in conformity were: improving effective communication; reducing the risk of healthcare-associated infections; and reducing the risk of patient harm resulting from falls. The remaining goals, namely: identifying patients correctly; improving the safety of high-alert medications; and ensuring safe surgery, deserve attention from the researched team and the assessed institution. The research found a need for the implementation of protocols in the service aimed at patient and team safety.

**DESCRIPTORS:** Nursing; Patient Safety, Nephrology Nursing; Hospital Hemodialysis Units.

### ENFERMAGEM E METAS INTERNACIONAIS DE SEGURANÇA: AVALIAÇÃO EM HEMODIÁLISE

**RESUMO:** Objetivou-se descrever o cuidado de enfermagem prestado em serviço hospitalar de hemodiálise com base em metas internacionais de segurança do paciente. Estudo descritivo realizado no serviço de hemodiálise de hospital público brasileiro, referência no atendimento de pacientes renais agudos e crônicos, entre agosto e outubro de 2013. Participaram 25 profissionais de enfermagem. Os dados foram coletados com entrevista, observação e *checklist* baseados nas metas de segurança da *Joint Commission International*. Observou-se que as metas em conformidade foram: comunicação efetiva; redução do risco de infecções associadas aos cuidados de saúde; e redução do risco de lesões decorrentes de quedas. As demais metas, que são: identificação correta do paciente; segurança no manuseio de medicamentos de alta vigilância; e assegurar procedimento em local correto, merecem atenção por parte da equipe estudada e pela instituição avaliada. Constatou-se a necessidade de implementação de protocolos no serviço para a segurança do paciente e da equipe.

**DESCRIÇÕES:** Enfermagem; Segurança do paciente, Enfermagem em nefrologia; Unidades hospitalares de hemodiálise.

### ENFERMERÍA Y METAS INTERNACIONALES DE SEGURIDAD: EVALUACIÓN EN HEMODIÁLISIS

**RESUMEN:** Se objetivó describir la atención de enfermería brindada en servicio hospitalario de hemodiálisis en base a metas internacionales de seguridad del paciente. Estudio descriptivo realizado en servicio de hemodiálisis de hospital público brasileño, referencia en atención de pacientes renales agudos y crónicos, entre agosto y octubre de 2013. Participaron 25 profesionales de enfermería. Datos recolectados mediante entrevista, observación y *checklist* basados en metas de seguridad de la *Joint Commission International*. Las metas en conformidad fueron: comunicación efectiva; reducción del riesgo de infecciones asociadas a cuidados de salud; y reducción del riesgo de lesiones provocadas por caídas. Las demás metas, identificación correcta del paciente; seguridad en manipulación de medicamentos de alta vigilancia; y asegurar procedimientos en ubicación correcta, merecen atención del equipo estudiado y de la institución evaluada. Se constató necesidad de implementación de protocolos en el servicio para seguridad del paciente y del equipo.

**DESCRIPTORES:** Enfermería; Seguridad del Paciente; Enfermería en Nefrología; Unidades de Hemodiálisis en Hospital.

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## ● INTRODUCTION

Despite advancements in the field of patient safety, human error, understood as problems in the execution of action plans, is a factor that stands out at hospital institutions. Errors can cause, for the involved professionals, feelings of shame, guilt and fear, given the strong punitive culture still prevailing at institutions, which contributes for the omission of occurrences<sup>(1)</sup>.

This reality has been calling the attention of researchers and the society in general, considering the increasing publicity of adverse hospital events. Thus, patient safety became part of health policies throughout the world<sup>(2)</sup>.

Dialysis treatment has been increasing in the last decades in the care for chronic kidney patients. According to the Brazilian Society of Nephrology, the number of dialysis patients went from 42,695 in 2000 to 112,682 in 2015<sup>(3)</sup>. Thus, there is more attention for adverse events in this field, since these patients are more vulnerable to incidents<sup>(4-6)</sup>.

In order to promote safety and protection for patients during hemodialysis (HD) sessions, nurses and nursing teams must employ aseptic techniques and prevent infections when caring for these patients; constantly assess the individual results of patients; monitor vital signs; observe bodily manifestations such as: pain, empathy, smile, affection, attention; assess ultrafiltration and pay attention to signs of intradialytic intercurrents<sup>(7)</sup>.

The introduction of patient safety goals to hemodialysis hospital services is a way to minimize issues that do not comply with national and international standards. For that end, tools for hospital accreditation can be employed<sup>(8)</sup>.

The World Health Organization (WHO) created a work group to disseminate the patient safety culture among health services in 2004, titled World Alliance for Patient Safety<sup>(9)</sup>. In Brazil, in 2013, the Ministry ruling 529/2013 established the National Program for Patient Safety (*Programa Nacional de Segurança do Paciente*), which contributes to qualify health care in all health institutions in the country<sup>(10)</sup>.

Three institutions in Brazil work as accreditation agencies: the National Accreditation Organization; the Joint Commission International (JCI), represented by the Brazilian Accreditation Consortium; and the Canadian Council on Health Services Accreditation (CCHSA), represented by the Qualisa Management Institute<sup>(11)</sup>.

The Joint Commission International (JCI), using the International Patient Safety Goals, aims to decrease errors resulting from healthcare at care environments<sup>(12)</sup>. Its goals are: 1 - Identifying patients correctly; 2 - Improving effective communication; 3 - Improving the safety of high-alert medications; 4 - Ensuring safe surgery; 5 - Reducing the risk of healthcare-associated infections; 6 - Reducing the risk of patient harm resulting from falls<sup>(12)</sup>.

The objective of this study was to describe nursing care offered at a hemodialysis hospital service based on the JCI International Patient Safety Goals.

## ● METHOD

Descriptive research was conducted at a reference hemodialysis unit of a public hospital in Fortaleza, state of Ceará, Brazil, from August to October, 2013.

The service offers 19 hemodialysis machines and 20 electric chairs. In all, there are 12 machines working 24 hours and serving patients at intensive care and kidney transplant units and recovery, stabilization and emergency rooms in the hospital. The interdisciplinary team in the unit comprises 76 professionals.

The nursing team in this unit comprises 57 nursing workers, with 15 nurses and 42 technicians. Twenty-five nursing workers participated in the research, along with 18 nursing technicians, who worked in the unit during the day for at least one year. Those on vacation or on medical leave were

excluded.

Data were collected through semi-structured interviews and a checklist for systematic observation created by the researchers, based on the patient safety goals of the JCI<sup>(12)</sup>. The interview script addressed: the service dynamics; the hemodialysis treatment and its risks; the perception of adverse events; and care conducted with patients, while focusing on safety.

The checklist was created based on a study<sup>(6)</sup> that describes adverse events reported by nursing professionals of a hemodialysis unit. It presented information on frequency and observers' records related to: Shift change and its characteristics; Care planning; Records; Clinical complications and incidents with patients; and Measures for patient protection/good practices. A field diary was used to record aspects not included in the other collection instruments.

Interview data were transcribed, read and treated using thematic content analysis<sup>(13)</sup>. Data confidentiality was guaranteed along with the professionals' anonymity. They were identified by the letter "N" when they were nurses and "NT" when nursing technicians, followed by Arabic numbers according to the interview order.

Results were presented according to the description of data collected from the various instruments and the analysis of their conformity to the JCI International Patient Safety Goals. Thus, inter-relationships between the hemodialysis process and patient safety observed and recorded by the researchers were sought.<sup>(12)</sup>

The research was approved in August, 2013, but a human research ethics committee (ruling no. 376.199/13). Guidelines and ethical criteria for human research were observed during data collection according to Resolution No. 466 of December 12th, 2012, from the National Health Council (CNS)<sup>(14)</sup>.

## ● RESULTS

The sample comprised women, with a mean age of 41 years ( $\pm 7.9$ ), a mean of nine years of nursing training ( $\pm 6.0$ ), and a mean length of practice at the hemodialysis service of four years ( $\pm 4.9$ ). 40% worked over 40 hours per week; all nurses were nephrology experts.

Among the JCI International Patient Safety Goals, goals 2, 5 and 6 had the best performance in the service. In contrast, there were errors in the other goals, presented as follows:

Regarding goal 1, only patient names and, sometimes, their prescriptions were checked before the procedure. However, there was a printed sheet next to each machine identifying the patient to undergo hemodialysis and their respective blood pressure and weight measurements. In addition, they wore ID bracelets.

Some interviewees worried about the correct identification of patients to undergo hemodialysis:

*[...] you have to observe if it is the patient, if it is the correct patient being hooked up, if it is the correct sector, according to their bed [...]. (N3)*

*Before I put the patient in the machine, I check if it is the correct patient, if the prescription in my hands has the same name as they do, that is basically it. (NT12)*

On goal 2, the communication process had some important gaps, such as: lack of participation of nephrologist nurses and physicians in visitations for patients undergoing dialysis in external areas and lack of standardization when transmitting information by telephone regarding the general state and the clinical condition of patients to undergo the procedure.

The nurse in charge of the external dialyses received information and communicated by telephone with the nurses at the sector where patients were hospitalized. However, in the following speech, a nurse made it clear that this exchange only happens when there is a complication.

*[...] we call the sector to ask for information on the hemodynamic conditions of patients, [...] so we employ a nursing technique to conduct dialyses. In case of complications, we get in touch with the sector's nurse, but only if there is an event impeding the dialysis from flowing normally. If that is not the*

case, we do not get in touch “during” the dialysis [...]. (N5)

As observed, receivers did not repeat messages received by phone, which could cause communication errors and risks for patient safety.

In the internal dialysis area, the communication process was more effective, focusing on confirming results of laboratory exams and in reading medical records. The nurses who practiced directly in this unit discussed the patients' cases with physicians and collected relevant information that could compromise patients' dialysis, according to the following speech:

*[...] The nurse in the room receives the patients and then assesses their dialysis for that period with the physicians and takes care of any complications that happen [...] they conduct the whole nursing systematization part [...] they check the material along with the warehouse worker [...]. (N2)*

As for goal 3, there were complications during hemodialysis related to high-alert or potentially dangerous medications, which presented increased risk of causing significant harm to patients because of errors in the administration process.

An occurrence observed was bleeding related to use of heparin in the hemodialysis system, as well as coagulation in the system.

*[...] post-surgery, they [the patients] present bleeding, then you have to assess the bleeding issue so there is no anticoagulant in the dialysis, you have also to check the exams along with the physicians to find out if those patients may need transfusion [...]. (N2)*

*[...] The most common complication is coagulation in the system, in the lines, the capillaries, the catheter sometimes does not have a good flow [...]. (NT9)*

Another common complication with high-alert medications regards hemodynamic instability due to frequent use of vasoactive drugs, especially for hospitalized patients undergoing hemodialysis procedures:

*[...] Sometimes there is also hypotension, hypertension, hypoglycemia. Some patients even have to stop using, [if it is the case] vasoactive drugs in order to increase pressure [...]. (NT10)*

All medications were stored in identified drawers at the nursing station. However, there was no access control for these drawers; medications were not labeled at that unit, and neither were their containers, high-alert medications were stored with no identification.

Medication concentration was not standardized, and neither was the complete list of medications with similar names. A list of high-alert medications was found in the nursing station. However, that list did not include risks related to the administration of each medication.

Regarding goal 4, it was possible to observe it more clearly in the work process of the nurse who was in charge of external dialysis when she communicated with the nurse in the sector from which the patient came in order to find out if they were able to undergo dialysis.

The nursing technician who was in charge of preparing the machines programmed the solutions for each patient according to their medical prescription, session length and losses of patients. The nursing technicians received the machines already programmed and took them to the patients' units, which could lead to the wrong patient receiving the procedure, if the communication between sectors was not correctly conducted. This error was reported by a nurse:

*Before hooking up the patient [to the hemodialysis machine], you have to check if it is the correct patient, if it's the correct sector regarding the bed, because there have been cases of wrong patients being hooked up [...]. (N3)*

In contrast, there was emphasis on checking patients, procedures and prescriptions:

*[...] we take the machine ready from here, there is testing, the complete dialysis program is ran through, we take the machine all set up to the bed [...] when we get there, we do the same again [...]. (NT2)*

The procedure or the intervention to be initiated was double-checked when the nursing technicians

of the hemodialysis unit went to the units of the patients to undergo dialysis. They checked the prescriptions, complete names of the patients and the machine parameters, whether they fit the medical prescription.

Goal 5 must be part of the procedures conducted by the team before hooking patients to the hemodialysis machines, as well as of all procedures involving direct contact with patients.

Bandages were applied by nurses with an aseptic technique. Hand hygiene was constantly maintained by professionals, however, there was no protocol in place for these procedures and the use of antimicrobials was not monitored.

Another procedure conducted by the team and observed by the researchers concerned the manipulation of venous access:

*[...] you have to assess the access of the patients, if there really is an access to be used, if the access is pervious, you have to make the connection aseptically in order to avoid infections [...]. (N3)*

Nursing procedures in disinfecting the machine between dialysis sessions were emphasized in the speech of N7, as a way to prevent hematologic diseases.

*[...] We do not know external patients' serology, which are patients who come in acute conditions and we have to provide dialysis, so for all patients, the machine has to be chemically disinfected before and after dialysis. (N7)*

Regarding goal 6, seeing how the unit's clients are critical patients, their condition may lead to falls.

*[...] they frequently have headaches, resulting from urea removal, and they generally come in hypertensive, then they turn hypotensive [...] they feel ill, sudden dizziness [...]. (N2)*

Researchers did not find professionals preoccupied with the risk of falls for patients. However, the hospital offered a clean environment, with air flow, well lighted, and wheelchairs for patients unable to walk. Bedridden patients received dialysis on their own beds, with the protective guards raised. But the goal did not meet the standards from the Joint Commission International, because there was not a standardized protocol for fall prevention in the unit.

## ● DISCUSSION

The profiles of the interviewees are similar to those of other studies in the area: female population, working over 30 hours per week, with a large part presenting work overload<sup>(15)</sup>.

When studying the applicability of the goals for patient safety at the dialysis unit, the main factors contributing for incidents were found to be goals 1, 3 and 4.

International studies show that the main problems related to the safety of patients in dialysis involve falls, medication errors, events related to venous access, errors in the dialysis machine and prolonged bleeding<sup>(16)</sup>.

Regarding goal 1, the guidelines state that patients should be identified by two different methods, and they should not display the room number or the patients' location<sup>(12)</sup>. Moreover, adequate identification must occur before the application of medications, blood or blood components; before taking blood and other samples for exams; and before conducting procedures and treatments.

In relation to goal 2, the need for the interdisciplinary team to monitor patients is emphasized, since the dialytic treatment demands integration and communication among all professionals in order to prioritize quality and safety<sup>(17)</sup>.

Another study also identified communication problems between caregivers and patients at hospital dialysis and clinic services. Interviewees claimed communication was not effective and were worried about negative effects on patient care and placing them at risk of adverse events<sup>(6)</sup>; they were also able to mention barriers to good communication and expressed desire for standardization of the communication process at discharge, but they could not list specific improvements<sup>(6)</sup>.

One of the problems that came up was the exchange of relevant patient information over the phone between nurses, such as clinical conditions and general state. Guidelines state that, in order to reduce communication errors, whenever orders are given verbally or by telephone, one must ensure that the information was understood and correctly recorded by the receiver.

On goal 3, interviewees demonstrated satisfactory knowledge of the risks of anticoagulant therapy; however, the service was not safe regarding storage and control of high-alert medications, which shared many characteristics, such as a narrow therapeutic index and a significant risk of harm. These adverse events may lead to incapacity, need for hospitalization or death. Nurses intercept 50% to 86% of medication errors before they reach patients<sup>(18)</sup>.

Therefore, it is crucial to involve multidisciplinary teams; conduct independent double-checks; limit interruptions and distractions during the administration of medications; control workload and allocation of personnel; and reduce confusion around medications with similar names and name sounds<sup>(18)</sup>.

High-alert medications must be identified with red labels and sent to units inside red plastic bags. These substances must be kept in nursing stations, in drawers with keys and must only be handled at the pharmacy<sup>(12)</sup>.

In case of emergencies, medications must be identified by red tags and separated from the others. Before administration, the nursing team must check: patients' complete name; date of birth/patient records; name of medication; prescribed dose; route and time of administration<sup>(12)</sup>. There should be records of adverse events with patients and they should be reported<sup>(19)</sup>.

Regarding goal 4, double-checks guarantee that the procedure is properly conducted. A study with 1506 patients under dialysis who underwent general non-emergency surgical procedures found that they are more prone to developing pneumonia, unplanned intubation, relying on ventilation and needing re-operation than patients who did not undergo dialysis. Submission to dialysis treatment is considered an important risk for these patients, in addition to causing higher risk for vascular complications and death<sup>(20)</sup>.

Although dialysis machines are rarely important causes of death, human factors on the machine interface and ineffective communication among professionals are common sources of errors. The main causes of potentially reversible adverse results are medication errors, infections, hyperkalemia, errors related to the patient access and falls<sup>(21)</sup>.

Human factor engineering and simulation exercises have a strong potential to define the goals of the clinical team and improve care processes. Patient observations and participation in the reduction of errors increase the efficacy of patient safety efforts<sup>(21)</sup>.

There is a need to increase vigilance of professionals regarding adherence to safety goals, with special attention to invasive procedures and surgeries on these clients through time out, a short pause taken by the team before the skin incision, in order to check items essential to client safety<sup>(22)</sup>.

Before puncturing the fistula, nursing professionals must assess and choose the best and correct place for it; this demonstrates safety cautions for patients<sup>(23)</sup>. It is recommended that the unit adopts safe practices, such as identification of patients through ID bracelets containing complete names in legible letters, asking patients for their complete names, the identification of the bed and avoidance of placing patients with similar names close together<sup>(24)</sup>.

As for goal 5, it is important to highlight that, for patients with kidney disease undergoing dialysis, infections related to vascular access may cause bacteremia or loss of access, in addition to a high risk of developing bloodstream infections<sup>(25)</sup>.

This goal addresses the adoption of guidelines, strategies for training and education for hand hygiene; measures for the prevention of central venous catheter-related bloodstream infections; and monitoring of multi-resistant microorganisms/rational use of antimicrobials<sup>(26)</sup>.

Finally, regarding goal 6, a startling fact was the lack of risk assessment of patient falls related to a metabolic disorder resulting from kidney disease, which can compromise the musculoskeletal system

starting in stage 3 of the chronic kidney disease<sup>(27)</sup>.

The authors recommend the development of continuous educational programs for the nursing team, in order to promote discussions on identifying and correcting errors in dialysis services.

This study was limited by not monitoring dialysis conducted outside the dialysis unit, because it was not possible to apply systematic observation and observe the work processes of every nursing professional.

## ● CONCLUSION

It is relevant to observe the International Patient Safety Goals, since the population expects health services to provide health promotion, disease prevention, healing and rehabilitation, avoiding harm resulting from the received care, such as acquiring infections through negligent practices.

The researched dialysis unit had issues to be addressed, which involve the development of strategies to reduce risks for patient safety in relation to identification, high-alert medications and invasive procedures, implementing protocols and enabling the whole team to follow safe practices and what is determined by the institution, while observing international safety guidelines and standards.

Some goals, such as improving effective communication and reducing the risk of patient harm resulting from falls, presented evidence in practice, in other words, actions that were recommended by the Joint Commission International were applied. However, these practices must be implemented in full and patients should receive quality and safe care from the nursing team.

The present research contributed to improve the work process of the nursing team, as well as the hemodialysis service, since it evidenced the need to implement protocols and standardizations for patient and team safety. Results may encourage and serve as milestones for other similar services.

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