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# New Practices in the Management of Medications in Critical Units Using the Safety 2.0 Strategy

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## ABSTRACT

**Aim:** Patient safety since the 1999 IOM report, is conceived as the absence or minimization of adverse events, errors or accidents that can cause permanent or temporary damage to patients.

**Objective:** to know the existence of practices that could improve the use of medicines and that are not officially recommended.

**Method:** Study of structured user interviews with open responses.

**Results:** 34 professionals were interviewed, from two hospitals. Age range: 25-49, mean age: 36.5, SD: 9.5. The questionnaire collected 291 recommendations: Duplicates and those mentioned in the reviewed sources were excluded; leaving 209 (71.82%). Then those with a score of less than 7 in patient safety, 0 in reproducibility and 0 in costs were excluded; remaining 8 recommendations. Most of them correspond to administration and prescription16 consistent with studies published so far, which are the two nodes of the process where errors that lead to adverse events occur most often.

**Conclusion:** The recommendations suggested by the interviewees do not imply investment, they are reproducible and provide a volume of immediate and available improvement opportunities. 8 recommendations can be highlighted as recommendations not known "as such" in the sources of good practices and that come from the process operators with the study selection criteria.

## INTRODUCTION

Patient safety since the 1999 IOM report, is conceived as the absence or minimization of adverse events, errors or accidents that can cause permanent or temporary damage to patients. This has led to the formulation of a set of practices that act as barriers to avoid these events [1]. A good group of them are mentioned in the International Goals for Patient Safety (IPSG), prepared by the WHO to guard critical processes that are frequent causes of errors [2]. Among them, Goal 3 indicates the guidelines for the safe handling of high-risk drugs.

Various international organizations such as the Institute for Safe Medication Practices (ISMP) [3] have formulated a series of concrete

recommendations to avoid medication errors. These errors are one of the leading causes of avoidable injury and damage in health care systems: the cost associated with these errors worldwide is estimated to be US $ 42 billion annually [4].

The so-called Security 2.0 can be defined as "the presence of skills that allows things to go well in situations of variability" [5]. It is based on the principle that process operators find it necessary to make adjustments in the execution of their tasks due to the constant situations of variability that occur when executing them. It is a complementary vision, which has begun to slowly enter the health field and focuses on learning from what is done well, in order to improve performance [6]. Variability is a constitutive element of medicine and comes not only from the clinical characteristics of patients, but also from the environment where they are cared for and from the practice styles of health professionals. Adjustments or adaptations should not be interpreted negatively, as "deviations from the norms" or "non-compliance". On the contrary, it is a "new knowledge" that can be generalized and improve the performance of the systems. Professionals who carry out additional practices or who introduce modifications to adapt them to different situations can become a source of relevant knowledge that is often little considered by those who improve processes and make decisions about them [7].

The therapeutic chain of the drug, which includes all the steps from the prescription by the doctor, the validation / transcription by the pharmacist or suitable, the preparation or dispensing by pharmacy technicians and the administration by nurses, constitutes a critical section of the Drug Use Management System on which the application of the Safety 2.0 methodology offers the potential to provide new learning [8].

## OBJECTIVE

To know the existence of practices that could improve the use of medicines and that are not officially recommended.

## METHOD

Study of structured user interviews with open responses. In a first phase, the problem, the objective, the variables to be studied and the instruments to be used were defined. Two experts, pharmacists, designed a first 5-question interview that was reviewed in three instances by a third expert with the appropriate modifications. Then, the 5 questions were corrected by 3 external experts, who made 7 CORRECTIONS: 1 on question 1), 1 on question 2), 2 on question 3), and 3 on question 5). The questions were formulated on the premises of the patient safety 2.0 perspective: -the clinical work of health personnel is susceptible to being adjusted, the decision and opinion of the user counts, deviations from the procedures should not always be interpreted as non-conformities but as necessary variability. The 5 questions were 1) What practices do you use on a daily basis and are they not in the official procedure? 2) What recommendations did your superiors suggest that would improve the safety of the process?;3) Do you use practices that are not in the procedure but that you adopted because you observed them in your peers ?; 4) Do you suggest practices that would improve your work? 5) Do you suggest practices that would improve steps before or after your intervention in the process?

The interviews were carried out by the two pharmacists, first a pilot test was carried out, then the interview was launched to all participants. The study was carried out on personnel who handle medicines, exclusively from critical areas, with at least two years of experience in the position and accredited training in the medicine process. Critical areas were selected due to the habitual use of high-risk medications, frequent management of administration devices, and high presence of polypharmacy.

The study was carried out in two acute hospitals (A and B) with similar endowments (283 and 200 beds respectively), both with more than 4000 patient days per month, average general mortality 30-32 per thousand discharges, mean stay: 4.8 and 4.5 days respectively), from Argentina. Both institutions have a drug management and use program, contemplates the implementation of the international goal of patient safety "safety in the management of high-risk drugs", presence of a pharmacist in the room, and annual training in medication processes according to each staff function.

All responses were classified with a scale of: 0-10 points, the higher the score, the greater the strength of the proposal, the scale was designed on three topics:

a) Topic Impact on patient safety. To determine its degree, the following aspects were taken into account: that the practice was related to: high-risk patients according to the standard of the Joint Commission International Edition 6, (2014) [9]: 1 point, management of high-risk drugs of the recommended list and LASA list (look alike, sound alike) written by ISMP [10]: 1 point, and elements or circumstances present in the international bibliography about fatal medication errors.

To do this, a review was made of all the articles published in pubmed with the following keywords: "all cause mortality" and "medication error" from the years 2000-2019, from that review 38 articles were found from which 11 elements were extracted causal or general contributing factors, of all of them only [5] applicable to this study were included and these were: a) medications that are prescribed with irregular administration patterns, b) that are administered in emergency situations or with verbal orders, c) absence of a complete and unique medical history, d) inadequate transfer or communication between professionals h) lack of reconciliation of medication, e) absence of clinical pharmacists. If these elements were present they added 1 point for each one (5 points). Within this sub-classification of impact on safety, a scale of 0-8 points remained, the scores were sub-classified as follows: 0 - 2:

Null or low impact; 3 - 6: medium impact; 7- 8: high impact.

b) Topical reproducibility had two sections: a) applicable to all types of patients or replicable to all population of both adult and pediatric patients, with various pathologies. b) The

The second section was to consider reproducible those practices for which there were no barriers to their implementation in another organization / s that handle drugs, nor did they have specific requirements (electronic medical record for example), nor did they imply relevant changes in the process. It was considered a relevant change to re-design of the process, interventions related to the structure. This topic was dichotomous. It considered the two sections in one, if it had to comply with both: YES-NO (1 point "YES", 0 points "NO").

c) Topic Cost: dichotomous: YES-NO. "YES" was defined when it required economic investment or cost increase (0 points), and "NO" when it did not require it (1 point). An investment or cost increase was considered to: -incorporation of technology for its implementation whatever.

In this way, a full scale of 10 points was left among the three topics, the final recommendations that were selected were those that met the three topics as follows: high impact: 7-8 points, 1 point for the reproducibility topic, and 1 point for the topic costs.

The scores obtained for the recommendations finally included were: those greater than 8 points, that is, 9 and 10 points. Duplicates were eliminated, those that SKJJUA did not meet two or three of the defined criteria ("NO" in reproducibility, "NO" in costs, and / or "Nil" in patient safety) and those that were already recommended in the mentioned sources.

The topics were specified by the two pharmacists mentioned, on all the responses, and they did so separately. Concordance between them was assessed with Cohen's Kappa test, finding values for the topic - patient safety of: 0.69 (95% CI 0.65-0.74) population in which it impacts: 0.89 (95% CI 0.86-0.93) and for costs: 0.92 (95% CI 0.89-0.95).

All the practices found, after assigning the score, were contrasted by consulting the following organizations that issue recommendations to check whether or not they already existed: Institute for Safe Medication Practices (ISMP), National Council Coordinating for Medication Error Reporting and Prevention (NCCMERP ) [11], Uptodate [12], National Health Service-UK (NHS) [13], World Health Organization (WHO) [14], Joint Commission on Accreditation of Healthcare Organization (JCAHO) [15] visited all of them in the month of April 2019, collected in a summary table of which the reviewers served.

## RESULTS

34 professionals were interviewed, 16 from hospital A and 18 from hospital B. 8 were nurses (23.5%), 9 doctors (26.5%), 9 pharmacists (26.5%) and 8 pharmacy technicians (23.5%). Age range: 25-49, mean age: 36.5, SD: 9.5. Distribution by sex: 19 women (55.9%) and 15 men (44.1%). The questionnaire collected 291 recommendations: 126 from hospital A, and 165 from hospital B. Duplicates and those mentioned in the reviewed sources were excluded; leaving 209 (71.82%). Then those with a score of less than 7 in patient safety, 0 in reproducibility and 0 in costs were excluded; remaining 8 recommendations. They were:

1) Manage the patient's own medication together with the patient, at the time of discharge, review it with the patient and check that the epicrisis and the prescription were not discrepant.

2) Involve pertinent inter-consultant physicians in ward passes.

3) Carry out electrolyte corrections in conjunction with the pharmacist.

4) Review the Nursing Office daily in order to assess adherence to the Storage Policies.

5) Avoid verbal orders; and if there are, restrict them, consign them in a written proforma of "Read back: write, repeat and confirm" and then write them on a shared board with all the data.

6) Daily review of the drug consumption registration system in stock by a pharmacist in order to verify whether or not there was a medical prescription associated with its use. The information that is collected during these tours is used to incidentally educate the nursing staff and the doctors in the ward.

7) Verify information through "data triangulation"; that is, the data provided by the patient must coincide with the data on the bracelet and in turn with the data on the label of the medicine that we are going to administer.

8) Record the patient's allergies on the identification bracelet, on the door of the room, in the medication drawer, at the head of the bed, on the wall of the room and in the nursing office.

The data must be explicit:

Penicillin allergy patient: do not administer:

Methicillin, Nafcillin, Oxacillin, and all the Penicillin's.

Proceed in the same way with allergies to sulfa, food, etc.

Among the other questions that yielded other data, it was quantified that 17.6% (n = 6) of the people interviewed received recommendations from peers, which are applicable and in fact apply them in their daily practice. Two of the people interviewed 5.9% (n = 2) mentioned that they receive recommendations from their superiors, which are not feasible, vs 6 that they are recommendations that they apply in their daily work and come from peers (p = 0.05).

In relation to how to make their work better and easier, the answers were grouped in various aspects, namely:

1. Further standardize processes: 26.31% 95% CI 24.32-27.43 (n = 20).

2. Generate more instances of face-to-face training: 18.42% 95% CI 16.23-19.44 (n = 14)

As we can see, the two topics include issues that are achieved with work in the short-medium term.

The responses were grouped into the following topics.

1. Improve communication between professionals who handle medication (avoid verbal indications, avoid ambiguous indications, communicate changes to all actors in the process): 15.79% 95% CI 15.01-16.89 (n = 12).

2. Have smart technology: 15.80% CI 95% 14.67-16.12 (n = 12).

3. Improve monitoring of things that go wrong to be corrected and encourage team meetings to resolve them: 10.52% 95% CI 9.16-10.98 (n = 8).

4. Have more human resources: 7.90% 95% CI 7.10-8.76 (n = 6).

5. Re-design the processes: 5.26% CI95% 4.34-6.10 (n = 4).

Of the five groups, three are achievable in the medium-short term (1,3 and 5) and two in the long term (2 and 4).

## DISCUSION

The recommendations suggested by the interviewees do not imply investment, they are reproducible and provide a volume of immediate and available improvement opportunities. 8 recommendations can be highlighted as recommendations not known "as such" in the sources of good practices and that come from the process operators with the study selection criteria. Most of them correspond to administration and prescription [16] consistent with studies published so far, which are the two nodes of the process where errors that lead to adverse events occur most often.

A percentage of the interventions -17% (95% CI 15.8-18.3), come from suggestions from peers and not from superiors, when verifying that the former add value to the process. The opportunity is to create instances of formalization of these or other practices to be made official.

The WHO strategy, "Medication without harm" (2017) [17], whose purpose is to reduce by 50% the serious avoidable harm related to the use of medicines in five years worldwide, is a good challenge to create and replicate solutions simple that do not require large investments. This study aims to be a contribution in that sense, since most of the recommendations issued by those who operate the processes can be reproduced without additional costs.

Three fundamental aspects highlighted by the interviewees were a greater standardization of processes, providing more and better training instances and improving communication between professionals, issues that are already mentioned by various studies [18], but which are worth reiterating. This means that trained personnel can provide simple practices that continue to improve safety.

Other solutions mentioned by the interviewees, but not among the first categories, merit investment to reduce medication errors, as is also mentioned by multiple studies. However, we believe it is important to note that isolated technological solutions do not improve patient outcomes [19]

One study [20] mentions that improvement opportunities include best practices, as well as the development of learning cultures and the reinforcement of the double verification process, issues that are similar to the results of our study

The main weakness of this study lies in the failure to implement these practices and to test their effectiveness.

## CONCLUSIONS

After prioritizing using high potential impact criteria in the process improvements, 8 recommendations were found that could be useful to make the barriers that stop errors and avoid adverse events more effective. Most of them correspond to administration and prescription. Acting professionals often develop additional interventions that can add value to the process in pursuit of patient safety and we believe it is appropriate to recognize them and monitor their usefulness to add them to the processes. The therapeutic chain of drugs in intensive care patients offers opportunities for improvement to intensify the standardization of the process. Having user feedback was helpful in finding new ways to add potential security to the process. In our study, the use of the Safety 2.0 strategy to gather information on improvements that usually go unnoticed and was key to discovering where to make improvements and the questionnaire designed for the interviews allowed them to be made explicit.

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