

SAFETY MEDICAL CABINET FOR CARDIAC ARREST TROLLEYS IN PRIMARY HEALTH CARE

Topic: Patient safety and medication use in PHC

Authors:

José Manuel López Garrido*.

José Sánchez Blanco*.

***Servicio Andaluz de Salud. Centro de Salud Olivar de Quinto. Área de gestión Sanitaria Sur de Sevilla (AGSSS).**

Abstract

The administration of any drug is inevitably subject to the possibility that a human error could cause an adverse event, including critical incidents. Misuse or failure in medication administration from cardiac arrest trolleys (also known as crash trolleys) can generate risk scenarios, both because of the characteristics of the medications themselves, as well as the care situation itself that is addressing that risk scenario. A neat, ergonomic layout and use of codes during storage of the medication can help prevent or reduce the incidence of errors while improving efficiency of care. The time needed for training newly hired professional is minimal. The time needed to identify the correct medication is reduced by a factor between 4 and 10 with respect to the time required when using regular medical cabinets and repositories.

Description of the problem

The administration of any medication is inevitably subject to the possibility that a human error induce the production of an adverse event, including critical incidents. Numerous studies have confirmed the occurrence of these errors with, in some cases, irreparable consequences. Of all the medication that we use in the context of Primary Health Care (PHC), there is a especially dangerous group either because of their appearance, presentation or pharmacodynamic and chemical characteristics, or because they are used at a particularly complex moment during patient care: we are referring to the medication of the crash trolley.

Incorrect identification of the medication, mixing it up with another of similar appearance, an exceeded expiration date, a poor replacement after usage, an incorrect dosage or the use of an improper administration route are, among others, some of the causes that may generate adverse events related to medication administration from crash trolleys in PHC.

Analysis

It basically consisted of the review of the medication content for crash trolleys advised by various institutions and expert groups in the context of PHC, including the ERC, and having made a local adaptation of such content.

Subsequently, and using the experience on critical care that some of the professionals participating in this safety proposal have, we have questioned,

through informal interviews and open inquiries, many professionals in our environment, both in the field of PHC and the field of Critical Care, about what were their concerns or difficulties in identifying, dosing, dispensing, inspecting and accounting the medication contained in the crash trolleys of their centers or mobile units. At the same time, we have observed and photographed, in some cases, the medication content of crash trolleys in various centers of our immediate environment, to assess these concerns and difficulties.

The opinions of newly hired personnel and fellows with temporary contracts have been particularly useful in the assessment of the possibility of error in the administration of a medication, mainly because the lack of a unified methodology around the elements that should define the medicinal contents of the crash trolley, make the trolley itself a difficult to recognize field to untrained staff or recent incorporations to the team.

Proposal for improvement

After the analysis we have carried out, we propose a safety medical cabinet for crash trolleys in PHC. In this analysis, we have found all these areas for improvement identified by professionals, which, in our view, improve safety in the use and administration of medication crash trolleys in PHC.

This proposal for improving patient safety is a set of easy to incorporate and implement measures to reduce the incidence of the errors in handling the medications of the crash trolley. Upon a basis of a basic proposal about the medication content in the crash trolleys in Primary Attention Teams, the trolley should contain the following medications:

• On one side (red zone):

- Adrenaline.
- Atropine.
- Adenosine.
- Amiodarone.
- Digoxin.
- Furosemide.
- Lidocaine.
- Solinitrine.

• On the other side (white zone):

- Vecuronium bromide.
- Clorazepate dipotassium.
- Parenteral diazepam.
- Rectal diazepam.
- Flumazenil.
- Midazolam.
- Naloxone.
- Prednisolone.

This proposal reconciles the recommendations of the literature consulted with professionals at the Critical Care Health Device from the Health Management Area to which we belong.

The proposal developed by the Group for Healthcare Improvement and Patient Safety of our unit is primarily focused not so much on the content of the crash trolley, but to the spatial arrangement or layout of the medication in the trolley. Consequently, the need for combining the best practices around the content has been identified, as this would result in a homogenization around the recommendations of the various clinical practice guidelines, and a more logical and proper disposal of stored medications, for their use in the emergency situation for which they are required, has been added.

To that goal, we have kept in mind the 5S methodology and the Reason model, while taking into account the recommendations of the OSP (“Observatorio para la Seguridad del Paciente”) with respect to high-risk medication and medications with similar names or appearance, not to mention the “Estrategia de Seguridad del Paciente” (Patient Safety Strategy) of the “Consejería de Igualdad, Salud y Políticas Sociales” (Council for Gender, Health and Social Policies) and “Recomendaciones para la Seguridad del Paciente en Centros Sanitarios” (Recommendations for Patient Safety in Health Facilities).

In this way, we have developed a consistent strategy for coordinating a series of very simple and intuitive codes, which, if known by professionals who potentially would use them, would result in better control over the safe administration of the medications contained in the crash trolley. The presentation and division into two groups as discussed above is part of the proposal as detailed below. Each of the aforementioned medications is exposed in two containers that are interchangeable, so the professionals are who decide the organization and classification of a medication with respect the rest of the medications, but always within the same color group.

Code 1



The medical cabinet is previously divided into two areas characterized by two colors, which in turn define the content:

- The RED color zone contains the medications whose effect or response is expected to occur at the cardiovascular level, through several levels such as the inotropic, vasodilator, antiarrhythmic, diuretic, etc.
- The WHITE color zone contains the rest of the medication. Here we can find those medications with a sedative purpose: muscle relaxants, anti-inflammatory corticoids, antagonist of benzodiazepines and opioids, etc.

Code 2

This code is defined by the presence of a color marker in the upper-outer corner of each container. This marker shows the expiry state of the medication in question and should be confirmed with periodic reviews scheduled on the medication of the crash trolley. The staff responsible for this review should ensure that all samples of the same medication have the same expiration date, or take as a reference for the signaling the most immediate expiration. In this case, the colors that are used are that vehicle traffic establishes to give way or stop through traffic lights. In this way:

- A GREEN pin indicates that the drug has a shelf life longer than three months.



- A YELLOW pin indicates that the drug has an shelf life shorter than three months.



- A RED pin indicates that the medication will expire within the current month.



Code 3

This code is characterized by the use of two icons with the following respective meanings:

- A SYRINGE icon means that the medication can be used with a direct IV line without any added risk beyond that of a local complication.



- An SEROTHERAPY icon refers to the use of the drug by dilution only, to dispense it as a continuous infusion. If the SYRINGE icon appears also in the same container, it would indicate that the administration of the medication may be subject to a double route of administration, depending on the care needs of the patient and the procedure chosen by the professional.



Code 4

This code has a double meaning for safety. On one hand, each ampoule is assigned a slot in each of the containers with a diameter adjusted to the size of each of the ampoules and vials. In addition, the intense yellow colored inside the locus for each of the ampoules or vials should be understood as a warning to the user of the medical cabinet, so that, if viewed, it means that the medicine has been used in the context of the patient care, or, that, if the care process has been finalized, the sample of the medication must be replaced.

Results

We believe that this tool will reduce or eliminate the possibility of errors occurring during clinical practice because:

1. We propose a model with a universalizing character for configuring crash trolleys.
2. We standardize high-risk medications that the PHC crash trolley must have in two distinct blocks. Medication identification is simplified.
3. This instrument limits the stock of medications the crash trolley must contain. The medications are used according to protocols. Monitoring systems are implemented.
4. An international color system is used. This system improves access to information.
5. This tool allows local adaptation of recommended practice guidelines procedures.

6. An intuitive and easy-to-recognize coding system is used to control expiration dates. This system improves access to information.
7. A system for self-checking / inspection of the medication that needs to be replaced after usage, to prepare for an eventual emergency, is implemented. This also improves access to information.
8. The tool increase the safe use of medications that have similar use or appearance.
9. The tool facilitates the identification of medication quickly / effectively, improving the identification times. This characteristic improves effectiveness.
10. The tool improving learning by professionals and students untrained in emergency procedures, which turns our solution into a teaching tool.
11. Our tool allows modifications according to the needs of each center. That is, it takes into account the client.

We believe, therefore, that the IMPLEMENTATION of the ampoule holder in our emergency crash trolleys is an UTILITY MODEL, which we consider as ORGANIZATIONAL INNOVATION, and that we translate to the "SSPA" ("Servicio Sanitario Público Andaluz", Public Health Service of Andalucía) as a PRACTICE SAFE / GOOD PRACTICE, being formalized and made explicit prior to the submission of this communication.

This good practice was implanted in our unit in May 2014.

Images:

