

Case Report

Report Gap Analysis about a Thoracic Multifunctional Crash Cart

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Abstract

This research project started to be conducted in the Thoracic Surgery Ward of the Bari Policlinic in the late 2021. The idea of creating a multifunctional crash cart specific for thoracic surgery activities was born in the context of the realization of a thesis for a master’s degree in Nursing. Considering the problems which arose for the medical world and patients, especially in the last few years and furthermore after the COVID Pandemic, it was more than necessary to apply a fundamental change management to such an important garrison like the crash cart, giving to it a new shape, imagining its use shifted in a high specialty workplace. Even the literature research, with studies mostly conducted through India, Pakistan, USA and Brazil, have shown the lack of European literature on the topic in question, although from the few available studies emerged a greater satisfaction perceived by the nursing staff for the use of a trolley tailored to the specificity of the reality in which they operate, obviously accompanied by a specific information booklet that illustrates its correct management.

Therefore, the research project mentioned early was substantially thought to be structured into several phases, which can be summarized as following:

- **PHASE 1** (in the span of 6 months): it started with the presentation of the pilot checklist for a multifunctional crash cart to the staff and ended with the administration of a questionnaire to the nursing staff employed in the department at that time in order to successively conduct a gap analysis, according to the Lean Method.
- **PHASE 2** (present time): it began with the analysis of the results coming from the gap analysis to make the necessary corrective interventions to the above checklist, using a critical analysis approach according to the FMECA Method and, therefore, oriented towards Risk Management.
- **PHASE 3** (still to be done): The next phase of this research project will be oriented towards the training and information of healthcare staff (especially neophyte ones), which finds its theoretical bases on the Patricia Benner’s Model and which, through the Professional Focal Modules Method (PFM), will try to plan a management governance of urgencies/emergencies in Thoracic Surgery, in order to seek the optimization of processes and their continuous updating over time, both through shared knowledge of a new unit and through the drafting of a knowledge booklet in which can present to newly hired staff and nursing students the main procedures that take place in a thoracic surgery specialized unit.

In this case report we’re going to present the results of the gap analysis conducted at the end of the abovementioned Phase 1.

Short Summary

At the end of the six-month trial planned for the pilot project of a multifunction trolley for specialist urgencies at the University Thoracic Surgery Operative Unit of the Bari Polyclinic, the analyser in addition to preparing a monthly activity report, also drew up a questionnaire consisting of 11 questions and exhibited it to the nursing staff hired at that moment in the ward [1].

It has been given to the same staff, in a period of approximately 3 months (December 2022 - February 2023), the possibility to give more than one answer if the observations regarding the garrison would have changed in base of the experience of use and, until the last nurse had given his feedback, only two nurses on the totality of the sector nurses chose to submit more than one response.

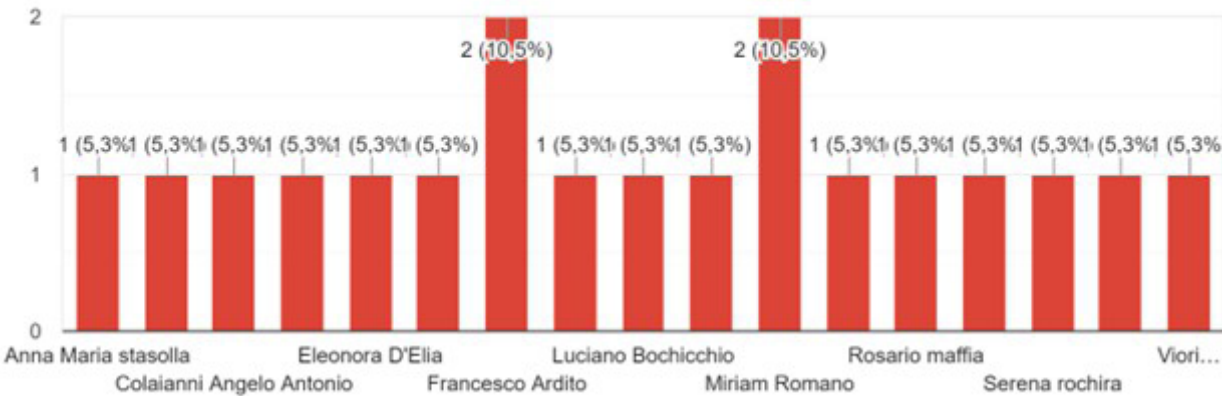
Therefore, a total of 19 responses were collected.

In case of more than one response, only the most recent feedback was considered for statistical constructions.

Questions 1-2

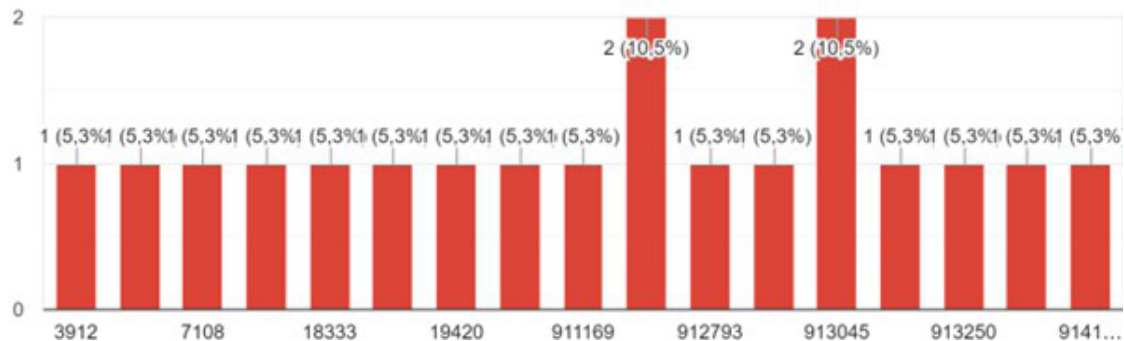
The first two questions show the personal details and the matriculation of the personnel who filled out the questionnaire.

1) NOME E COGNOME  
19 risposte



## 2) MATRICOLA

19 risposte



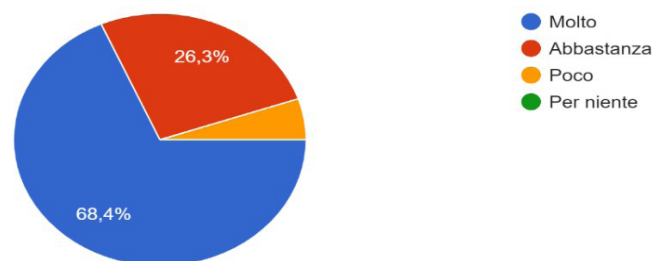
**Please Note:** It was not considered unethical not to make the responses to the questionnaire anonymous because this choice was made only with the intention of monitoring that all the staff expressed at least one feedback and, in any case, the statistical data were then subsequently processed as relative percentage value, also and above all for the purpose of making any decisions on the continuation of the research project (for example: see question 8) and always, without any qualitative indication or judgmental interpretation, adopting appropriate Likert scales for transmutation of opinions, to avoid any analytical bias [2-5].

## Question 3

The third question involved assessing the validity of the idea of using a multi-function trolley as an emergency trolley, in a specialised operating unit. The staff expressed itself as following: 68,4 % of the staff STRONGLY AGREE with the idea, 26,3 % AGREE, while only 5,3 % DISAGREE (1 answer).

3) Quanto ritiene valida l'idea di utilizzare una checklist operativa multifunzione per un carrello urgenze in un'unità operativa ad approccio specialistico?

19 risposte

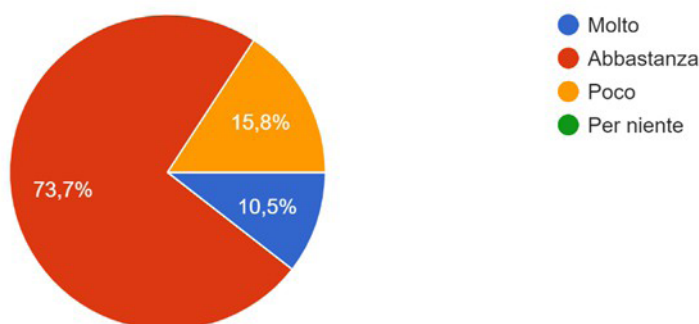


## Question 4

The fourth question asked the nursing staff to carry out a self-assessment of their level of training in the use of the device at the end of the six-month trial period. The staff expressed itself in this direction: only 10.5% of nurses considered themselves VERY prepared to use the device; the majority of the staff (73.7%) self-assessed itself as ENOUGH trained; finally, 15.8% of nurses considered themselves UNDERTRAINED.

4) Quanto ritiene di essere adeguatamente formato sull'utilizzo del presidio (in virtù anche degli outcomes previsti al momento della realizzazione del...riodo di prova di sei mesi di uso della checklist?

19 risposte

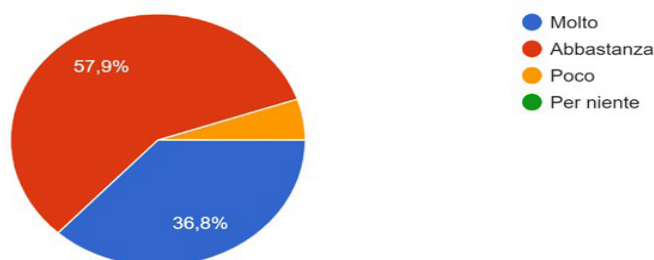


## Question 5

The fifth question asked the staff feedback on the adequacy of the external and internal contents of the device, both to carry out the specialist procedures typical of thoracic surgery and to treat any emergency linked or not to these procedures which require a specific clinical and/or surgical expertise. According to the staff, 36.8 % of nurses considered these contents VERY adequate, 57.9 % QUITE adequate and the remaining 5.3 % NOT MUCH adequate (1 answer) [6-7].

5) Quanto ritiene che i contenuti interni ed esterni del carrello siano adeguati a gestire le procedure specialistiche e le urgenze che possono verificarsi in un reparto di chirurgia toracica?

19 risposte



## Question 6

The sixth question asked the staff to identify and list the main critical issues related to the being analysed device. What emerges from the nurses' answers is that, in fact, the main problems would be related to the ergonomic design of the device: one of the staff nurses considered it not adequate to perform multifunctionality, having regard to the reduced capacity of the drawers and the qualitative-quantitative abundance of the materials within them. Moreover, many nurses have expressed themselves on the excessive quantity of materials inside it; therefore, it has been tried in the subsequent reworkings of the checklist to reduce these quantities to the bare minimum. From a qualitative point of view, however, some nurses considered part of the material (for example, that for the positioning of PICC, CICC and/or FICC central lines) to be little essential and/or superfluous, despite the rational of the need of a multifunction monitor for their insertion. Another problem that emerged was that relating to the seal of the garrison: since the same is equipped with a closing band that allows to seal only the first drawer (containing life-saving drugs) leaving the others open anyway, it was difficult for the staff to ensure the integrity of the other non-lockable drawers, despite the daily compilation of the checklist, either because the staff considered prohibitive in some shifts to compile the above referenced checklist, both because the procurement of various materials from drawers that remained open was also improperly done for reasons of non-urgency or without using the cart in any specialized procedure. Therefore, considering the small number of procedures/emergencies actually managed by using the multifunction trolley during the first six months of its testing, it was decided to lock laterally the entire garrison and to place the key in the closing seal affixed to the first drawer, in such a way that those who must use it were forced to break the seal in full to access even the other drawers apart from

the first one, clearly with all the medical and legal implications of the case. Hence, the preference to switch to a weekly control of the full checklist, rather than a daily check. Finally, the new nursing coordinator, although she did not fill in the questionnaire for the survey of opinions on the new garrison since she had recently taken office, still considered it appropriate to move the portable oxygen cylinder in the adjacent business premises, for the alleged explosive risk due to the presence of cables and wires of the monitors on the trolley, although this recommendation had not emerged from the results of the systematic review conducted for the development of the original thesis product [8].

### Question 7

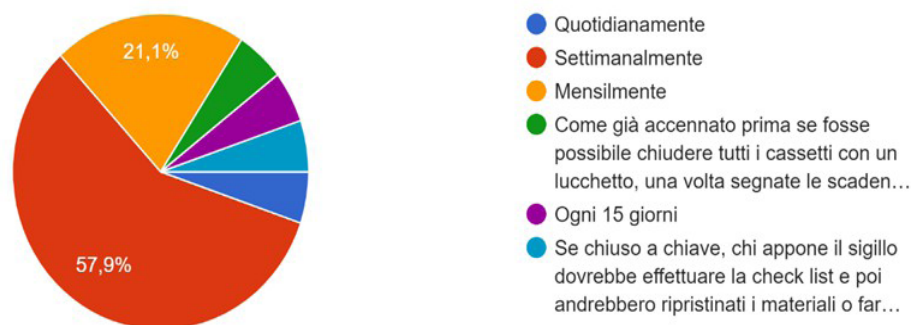
The seventh question asked the nursing staff for suggestions both for a better allocation of materials and for a better management of the garrison in full. In line with the findings of the criticality analysis, the main suggestions of the nursing staff were aimed at the reduction in the amount of materials collocated within the drawers and to the request to those in charge in the Corporate Health Management of another garrison with a different design, better and more capacious, in order to contain all the materials provided by the referenced checklist and avoid, in co-time, “makeshift” allocations (as in the case of the rcp table, which originally did not have a “dedicated” space but it was basically obtained in the context of the ergonomics of the cart). Alternatively, another solution proposed by the staff was to eliminate materials which, at present time, have a rare incidence of use in the management

of emergencies, even if doing so would lead to lose markedly that multifunctionality characteristic that is an intrinsic and founding part of the project, according properly to the mission for which the garrison was born. Another main suggestion was that all drawers should be closed simultaneously with the first one, despite the absence of a definitive and simultaneous lateral closing band of all drawers. To respond to all these criticisms/suggestions, corrective actions have been taken and are still on running, as already mentioned in the body of the previous question and in the abstract of this document. Finally, another valuable piece of advice that emerged from the staff responses to the questionnaire was to seek greater involvement from the staff itself. This means that only a focal professional module constructed ad hoc for thoracic surgery could actually play the role of driving force and that - as we already said - it is enthusiastically proposed to constitute as the next phase of this research project.

### Question 8

The eighth question asked the nursing staff to give its opinion on the frequency considered optimal for the compilation of the checklist in the reference operative unit, reiterating a priori the fundamental need to carry out the daily functional test in order to constantly ensure the proper functioning of the defibrillator in case of practice of CPR manoeuvres and, moreover, reaffirming the absolute need to restore the cart after each use, without leaving it out of stock until the next check. These are the results.

8) Quale ritiene sia la frequenza ottimale per il controllo della checklist operativa nel reparto di chirurgia toracica universitaria del Policlinico di B...edura/urgenza in cui lo stesso sia stato adoperato).  
19 risposte



Therefore: the majority of the reference nursing population who expressed an opinion (57.9%) considered carrying out the weekly checklist sufficient; 21.1% believed it was sufficient to do it once a month. The remaining 21%, representing the minority, was divided quite evenly between the daily and bi-weekly execution of the operational checklist, expressing personal opinions however in line with the majority's point of view and with what was stated above.

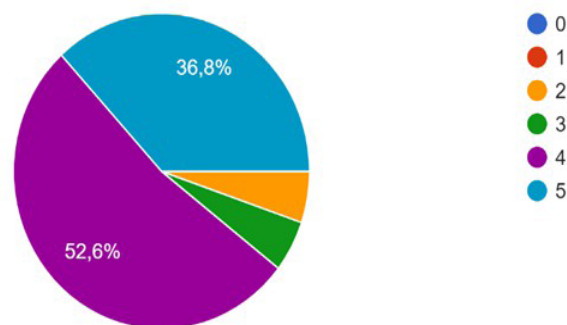
Therefore, from March 2023, the compilation of the checklist was planned on a weekly basis and, for reasons of internal organization of the operational unit's work, Sunday was identified as the reference day, as a prerogative of the night shift.

### Question 9

Question No. 9, by means of a special Likert transduction scale, required the healthcare personnel to define quantitatively and on a point scale from 0 to 5, its level of professional satisfaction in relation to the innovations carried by this new instrument introduced and brought into the reality of the reference operating unit . Most of the staff declared itself to be FAIRLY SATISFIED with the implementations made by the checklist (52.6%), while 36.8% expressed itself with the highest marks, as VERY SATISFIED.

9) Quanto si ritiene professionalmente soddisfatto in una scala da 0 a 5 (dove 0 corrisponde a "per niente" e 5 a "molto soddisfatto") dalle implementaz...i apportate dalla checklist operativa di cui sopra?

19 risposte



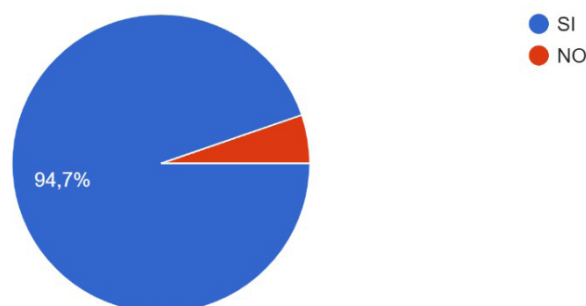
Finally, the remaining 10.6% expressed itself simply as SATISFIED (1 operator) and LOW SATISFIED (1 operator).

### Question 10

The penultimate question required nursing staff to evaluate the usefulness of building a specific “ad hoc” checklist modelled on the needs of a highly specialised working unit. The response was almost unanimous: 94.7 % of nurses considered the idea of a multifunctional emergency trolley to be valid and exportable. Only one operator (5.3%) voted negatively.

10) Ritiene che l'elaborazione di una checklist operativa dedicata ad hoc potrebbe essere vantaggiosa se adottata anche in altre realtà operative ad alta specialità?

19 risposte



This, obviously, gives us hope to propose in the future, also in other multi-specialized operating units, the idea of a multi-functional trolley, standardized indeed, but also built on specific procedural needs, with the possibility of extending this pilot project to other working realities that share the same characteristics and vision within the company, increasingly promoting the personalization of the assistance that is so much talked about today, but that in addition to standardization as a safety tool should also offer additional safety through the specificity of the treatments to be provided, which must be performed with mastery, foreseeing all possible complications and proactively pushing to have all the necessary materials immediately available for their management and correction nearby; in other words, it is no longer possible to ignore the highly specific typology of patients who are currently treated in our work environments.



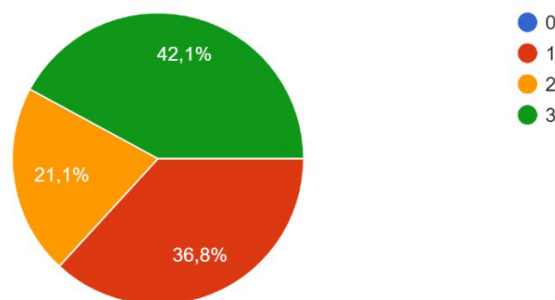
All this with a view to the rationalization of resources that makes the assistance increasingly cost-effective and time-effective for the patients.

### Question 11

The last question, again by means of a special Likert Transduction Scale, required healthcare personnel to define quantitatively and in a numerical scale from 0 to 3, their motivation to be part of an inter- company working group (for example, the type of a vocational focal module) in order to promote the training of neophyte and student personnel through the sharing knowledge of various training tools, including and together with others, also the operative checklist for a multifunctional emergency trolley, making for this purpose the latter, in all respects, a real training tool, as well as a specialist health management tool.

11) In una scala da 0 a 3 (dove 0 corrisponde a "per niente" e 3 a "moltissimo") quanto sareste interessati a far parte di un progetto di formazione...senti uno degli strumenti formativi a disposizione?

19 risposte



The majority of the staff declared itself VERY enthusiastic to take part in such an initiative (42.1%); on the other hand, it is impossible not to notice the concomitant and, unfortunately, almost overlapping slice of nurses who declared to be SCARCELY inclined to devote their time and invest their energies in projects destined to increase training of other target operators in this case, but at the end of the day, also of their own personal training (36.8%). This data should represent a very important starting point, to be used as a tool for reflection to draw conclusions from which start to propose a positive operational change, therefore to understand how to involve the staff more in training and investigate what are the deepest motivations of the lack of interest/ little energy of the nursing staff in updating and to take part in innovative initiatives directed to the growth of the own cultural background. 21.1% of the responses, finally, indicated a REASONABLE interest in being part of the future training projects which are going to be structured in the Thoracic Surgery Operative Unit of the Bari' Polyclinic.

### Conclusions

Following the administration to the nursing staff of the C.O.U. of University Thoracic Surgery of the Bari' Polyclinic of the evaluation questionnaire to conduct the Gap Analysis about the garrison of our interest, it seems to appear as a real dynamic tool of specialist assistance in Thoracic Nursing and, therefore, seems clear that it will need continuous revisions, which with

them will bring new potential changes and/or implementations to its use. This should give healthcare professionals the courage and the opportunity to explore new perspectives, especially with the hope that if the project proves to be successful in the long term, it could be possible to "export" this idea, at the moment a little visionary not to mention revolutionary, in other high specialty clinical realities, with the supreme mission of standardizing by customizing. Therefore, the nursing commitment in this case will have to be voted on several fronts, in order to make known as much as possible this new garrison and the vision that it underlies, starting from the daily practical use up to the continuous training of the actors involved in the decision-making process. Only in this way can trained nurses also become themselves trainers and medium of transmission and amplification of knowledge also based on experience, as well as of knowledge itself, the theoretical one.

### References

1. Kaushik A, Mancheri N (2019) "A Comparative Study to Assess the Knowledge and Expressed Practice of Staff Nurses and Student Nurses regarding Crash Cart in a Selected Hospital of New Delhi." - Inter J Nur Mid Res 6: 3-6.
2. Siddiqui DS (2020) "Minimizing Medication Errors by Triangle Check of Look-Alike Sound- Alike Medications from Crash Cart of Gynecology and Obstetrics in Emergency" - INNOVATIONS in pharmacy 11: 18.

3. Jacquet GA, Hamade B, Diab KA, Sawaya R, Dagher GA, et al. (2018) "The Emergency Department Crash Cart: A systematic review and suggested contents" - World J Emerg Med 9: 2018.
4. Gaikwad S, Suresh J, Swapnil B, (2021) Effectiveness Of Information Booklet On Knowledge Regarding Crash Cart Among Staff Nurses Serving In Tertiary Care Hospital Of Maharashtra State. Euro J Mol Clin Med 8.
5. Fuente J, Tachibana D, Leemon K, Liu C, Twomey C, et al. (2015) "Measuring the Effect of Affordances on a Crash Cart Medicine Packaging" - 27th IAPRI Symposium on Packaging 2015.
6. Makkar N, Madaan N (2016) "Study of compliance of crash carts to standards in the emergency of a tertiary care teaching hospital". Int J Res Med Sci 4: 3968-3976.
7. Naeema Akber, M. Afzal, M. Hussain, M. Sabir, "Nurses Knowledge and Practices Regarding Crash Cart in a Government Hospital Lahore", Saudi J Nurs Health Care.
8. Silva VF, Lazzari DD, Reisdorfer N, Michaelsen SC, Kuhnen AE (2021) "Analyzing the operational conditions of crash carts in clinical and surgical hospitalization units". Rev Esc Enferm USP. 55: e03693.