DOUBLE CHECKING MANIPULATIONS FOR COMPLEX AND/OR HIGH RISK PREPARATIONS

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Background

On a daily basis, hospital pharmacists are confronted with multiple tasks that may compromise, for safety reasons, a positive outcome for the patient. Traditionally, those tasks are focused at the following areas: sterile and non-sterile products preparation and mainly, due to its potential to cause harm, cytotoxic drug preparations.
The implementation of a double verification at the critical points of any preparation process is a national standard. However, most of the times this collides with our reality, due to the scarcity of human resources.

Objective

The main objective of this project is the development of an informatics tool that enables the double verification process and simultaneously eliminates the need for a second element inside the cleanroom, improving quality control and patient's safety .


Methods

Process

An ocular device with a high-definition camera was used to capture images on a preparation environment (Pict.1)

The operators are able to mark predefined critical points through the visualization of a QR * code (Pict.2).

Before liberation to the ward, the pharmacist check the critical points marked by the operator through a specific software designed by vision lab and, in case of any doubts, he can visualize a part or the entire shooting (Pict.3).

If all critical points are according to the prescription, the treatments are sent to the oncology day unit.

*Quick response



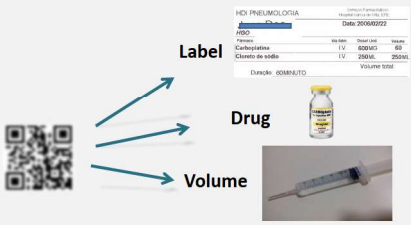
Pict.1

Pict.2


Pict.3

Critical Points

Managing critical points was a big issue and all the onco team (technicians and pharmacists) gave theirs suggestions.
Together they determine that is mandatory to check the labels, drugs and volumes, and get the registry of the operator as well as pharmacist validation of prescriptions and preparations.



Results

Phase 1

Phase one major goal was to test the image capture during the daily environment of manipulation and work on a visualization software that allow drugs identification, constituting solutions and their respective volumes, as well as the preparation labels registry.

After the validation of 3 hours of film (table 1), it was established that, when the validation occurs through the ocular device, it represented a time reduction of 76%, of the time regarding the second element presence.

Total Validation Time				Average Time Reduction	Number of Preparations
Presential		Device			
3 hours	12 min	44 min	19 sec	76 %	44

Table 1. Results from double validation, without marking the critical events.

Phase 2

The goal of the second phase was to implement the marking of the critical points. As referred in the methods this was accomplished through the visualization of the QR code. Our goal was to get a better reduction. Table 2 represents real work data of one day of manipulation (6h) and table 3 shows the direct costs reduction.

Total Validation Time				Average Time Reduction	Number of Preparations
Presential		Device			
6 hours	12 min	25 min	30 sec	92,9 %	75

Table 2. Results from double validation, marking the critical events.

Daily Cost Analysis Materials/Staff	Presential 2 persons	Costs	Device 1 person	Costs
Sterile Gloves	20	6.60 €	8	2.64 €
Gowns	4	14.76 €	2	7.38 €
Boots	8	0.64 €	4	0.32 €
Protection masks	8	5.36 €	4	2.68 €
Caps	8	0.32 €	4	0.16 €
Gloves	8	1.28 €	4	0.64 €
Technicians	2	151.44€	1	75.72 €
	Total	180.40 €		89.54 €

Table 3. Direct daily costs on preparation team.

Conclusion

Since this project represents the implementation of a new routine, it is expected to be a gradual adaptation process. Furthermore, the results here presented in the second phase are extremely positive since they show a potential of a striking reduction.

The implementation of this project will generate a significant reduction in the time cargo associated with this task, the equipment required to enter into the cleanroom and the occupational exposure to carcinogenic substances, allowing operating in accordance with the national good practice.

Additionally this process improves the traceability of the manipulation and validation of every treatment. This gives confidence to all health professionals in the quality and safety of the treatments administrated to our patients and we are fully committed to continue to develop the system and prove is applicability in other areas like sterile and non sterile preparations and to students training or professionals retraining.



References

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