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Comparison between manual and automated processes in elaboration of intravenous mixtures

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OBJECTIVE

Automated systems have shown increase efficiency and safety in elaboration process and quality control of intravenous mixtures (IVMs).
To evaluate differences, in terms of efficiency and safety, between manual and automated processes in elaboration and quality control of IVMs.

METHODS

Comparative descriptive study of manual versus automated (IV Station™ robotic system) IVMs preparation:

MANUAL PROCESS

MANUAL WORKFLOW AND AUTOMATED SYSTEM WORKING PROTOCOL

QUALITY CONTROL PROCEDURES OVER THE FINAL PRODUCT

AUTOMATED PROCESS

RESULTS

STAGE	MANUAL PROCESS Five Stages	AUTOMATED PROCESS Five Stages
1ST	•Preparing relevant material (e.g. drugs, solvents, consumables, packaging material).	• Preparing the materials specified in a software generated list.
2ND	• Checking the material gathered.	• Loading and automatic material checking by optical recognition and barcode control.
3RD	• IVMs elaboration (following standard operating procedure).	• IVMs elaboration and gravimetric control of intermediate components (e.g. vials) and final product through a robot integrated precision balance.
4TH	• Packaging and labelling final product.	• Automatic labelling and unloading of final product.
5TH	• Quality control over final product by a different member of staff: drug and solvent (name, volume), label (patient, drug and dosage, solvents, volume, infusion rate, storage conditions, batch, expiry date, visual inspection, packaging).	• Label check and visual inspection of final product by nursing staff.

CONCLUSIONS

Although preliminary results show the same number of steps for both processes, the robotic system achieved the automatisation of the 60% of quality control. From it, optical and barcode recognition, gravimetric control and automated labelling represent the main advantages respect to the manual preparation, and also the best guarantees for IVMs elaboration process. Robotic systems are an added value to elaboration in terms of efficiency and safety.

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