

# IMPACT OF FULLY AUTOMATISED CENTRAL INTRAVENOUS ADDITIVE SERVICE (CIVAS) ON DAILY NURSING PRACTICE

F Mura<sup>1</sup>, S Leoni<sup>1</sup>, F Vagnoni<sup>1</sup>, M Federici<sup>2</sup>, A Marinozzi<sup>1</sup>, S Guglielmi<sup>1</sup>, C Capone<sup>1</sup>, S Felicetti<sup>1</sup>, M Badaloni<sup>1</sup>, A Pompilio<sup>1</sup>

<sup>1</sup> AOU Ospedali Riuniti Di Ancona, Pharmacy, Ancona, Italy

<sup>2</sup> Loccioni, Angeli Di Rosora, Italy

## BACKGROUND AND OBJECTIVES

The introduction of the pharmacy-based Central Intravenous Additive Service (CIVAS) enabled the batches production of ready-to-administer, non-hazardous IV drugs by using the robotic system APOTECAunit. The clinical benefits brought in terms of higher quality aseptic process, reduced medication errors, and increased quality control testing have been demonstrated.

This study aimed at evaluating the impact of the fully automatized CIVAS on the working efficiency of the wards by measuring the time saved in the daily nursing practice.

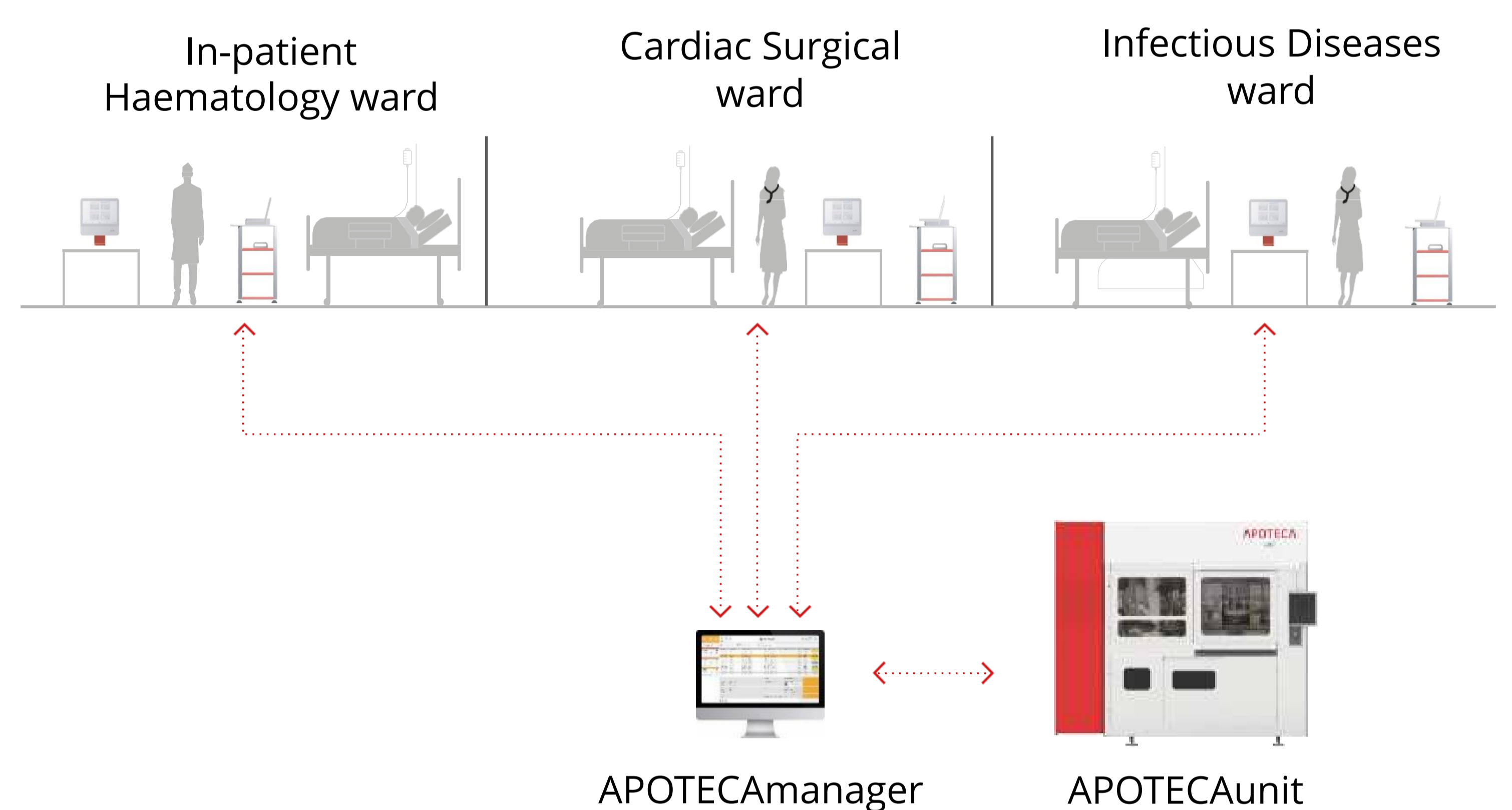
## MATERIAL AND METHOD

The study was conducted over three months with data collected before and after introducing the CIVAS. Overall, three wards were analyzed: In-patient Haematology (IH), Cardiac Surgical (CS), and Infectious Diseases (ID). The nursing staff was daily observed over four weeks. Different tasks associated with the selected IV drugs were evaluated and recorded. In the study, six IV drugs supplied by CIVAS were analyzed (ondansetron, palonosetron, cefazoline, piperacillin-tazobactam, ceftriaxone, dexamethasone).

The average working time spent on managing IV drugs was calculate per Full Time Equivalent (FTE) including direct activities (IV drugs preparation) and indirect activities (drugs and medical devices procurement, drugs inventory management, drugs ordering). 1.0 FTE was equivalent to a nurse working 8.0 hours per day, 5 days per week.

## RESULTS

- The overall time spent on managing IV drugs decreased from 1.6 to 0.7 hour/day/FTE for IH, from 0.75 to 0.15 hour/day/FTE for CS, and from 2.1 to 0.43 hour/day/FTE for ID (Table 1).
- Before implementing the CIVAS, on average 1.0 FTE spent 0.5 hour/day on preparing IV drugs, whereas the IV drugs preparation time was afterwards reduced to zero in each of the three wards.
- The time spent on procurement decreased by 60% for IH, by 80% for CS, and by 75% for ID.
- The nursing staff shortened the time required for the drugs inventory management by 33% in HI and by 50% in CS and ID.
- In all wards, time associated to "drugs ordering" was reduced by at least 50%.



Tasks	In-patient Haematology (IH)			Cardiac Surgical (CS)			Infectious Diseases (ID)		
	Before CIVAS (h/day/FTE)	After CIVAS (h/day/FTE)	Time reduction (%)	Before CIVAS (h/day/FTE)	After CIVAS (h/day/FTE)	Time reduction (%)	Before CIVAS (h/day/FTE)	After CIVAS (h/day/FTE)	Time reduction (%)
Procurement of drugs and disposables	0.3	0.1	60%	0.25	0,05	80%	0.4	0.1	75%
Aseptic preparation	0.2	0.00	100%	0.25	0	100%	1.0	0	100%
Drugs inventory management	0.3	0.2	33%	0.17	0.08	50%	0.33	0.17	50%
Drugs ordering	0.8	0.4	50%	0.08	0.02	80%	0.33	0.17	50%
<b>Total</b>	<b>1.6</b>	<b>0.7</b>	<b>55%</b>	<b>0.75</b>	<b>0.15</b>	<b>80%</b>	<b>2.1</b>	<b>0.43</b>	<b>80%</b>

Table 1 Comparative evaluation on three wards before and after CIVAS

## CONCLUSIONS

The study showed that the centralized, automated preparation of IV drugs optimized the working efficiency of the wards, thereby allowing the nursing staff to dedicate more time to perform tasks directly involved.

