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Background

5-FU infusor production is a **high-volume, repetitive and MSD-generating activity** in our compounding unit (dedicated day-hospital scheduling).

Since automation was introduced in our centre (2023): **11492 infusors** have been prepared on two **APOTECACHemo®** systems and the **overall rate** of automated preparation has reached **60%**.

Objective: to compare the **productivity** and **cost** of three preparation modes: **manual**, **cobotised via APOTECACHemo®** (Loccioni, Italy), and **semi-automated via a MIBMIX® C24** (2-channel) (Hemedis GmbH, Germany) to consider implementing a semi-automated system.

Materials and methods

Standard-dose campaigns of 5-FU infusors, 3 production modes

Preparation time per infusor (min): Drugcam® export (manual), Apoteca Manager® export (cobot), stopwatch timing (MibMix®)

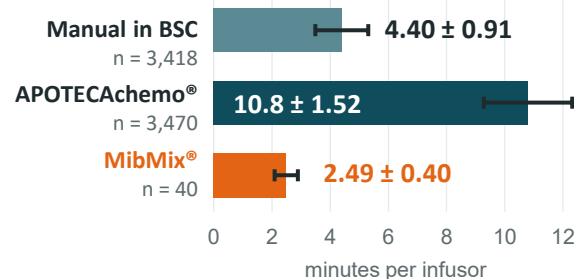
Consumable costs: equipment-specific consumables, € (excl. VAT)

Labour cost: qualified technician, CCN CLCC scale RMAG1, 5 years' seniority: €24.15/h with employers contribution

Technicians assigned: 2 (manual), 1 (cobot), 1 or 2 (MibMix®, with and without an assisting operator)

Results: preparation times

Time per infusor (min), mean ± SD



× 1.8

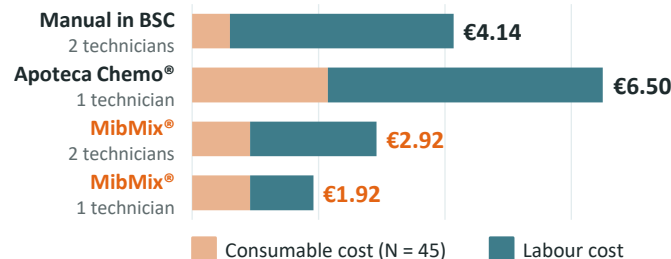
MibMix® faster than manual

× 4.3

MibMix® faster than the cobot

Full cost: consumables + labour

Per infusor for a campaign of 45; labour = time × number of technicians × €24.15/h

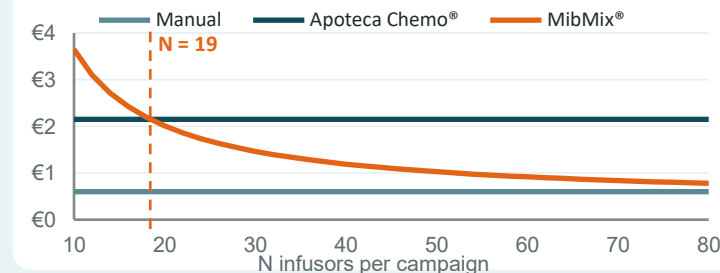


MibMix® cheaper (full cost) from N ≥ 9 (2 techs) or N ≥ 7 (1 tech) vs the cobot, and from N ≥ 19 (2 techs) or N ≥ 12 (1 tech) vs manual

Results: consumable costs

MibMix®: 3 consumables shared per campaign, €0.37 + 32.80 / N per infusor
Campaign N = number of 5-FU infusors prepared in series

Consumable cost per infusor (excl. VAT), by campaign size N



If N ≥ 19

infusors per campaign: MibMix® cheaper (consumable cost) than the cobot

Projected productivity gain from transferring infusor preparation to the MibMix®

Typical campaign of 45 infusors: the freed cobot time is reallocated



APOTECACHemo®
cobot

Activity transfer:
45 infusors prepared in 8.1 h of cobot time

→ equivalent to **103 preparations*** in the same time

Productivity gain of **+31%** on the cobot, while reducing manual work in the BSC



MibMix®
semi-automated

* Bevacizumab, carboplatin, gemcitabine, irinotecan, oxaliplatin (4.7 min/bag on average on the cobot).

Conclusion

Implementing a MibMix® semi-automated system appears relevant and complementary to the automation already in place in our centre. This set-up strengthens productivity and also process safety: through ultrasonic flow measurement (Fluicheck® system), the MibMix® calculates the volume of active substance actually delivered and issues a traceability report for each preparation.

Implementation in the workflow remains conditional on operational interfacing with the existing software (CHIMIO®), the cost of which is currently a major barrier.