OPTIMIZING DRUG AND MEDICAL DEVICES LOGISTICS WHILE ENSURING PATIENT SAFETY AND HEALTHCARE STAFF WELL-BEING: AUTOMATION AND TRACEABILITY

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Our aim is to develop innovative solutions to improve the efficiency of drugs and medical devices logistics in hospitals and remote settings (such as patients' home). We envisioned an ecosystem of tools capable of tracing drugs and monitor their intake to ensure the correct and efficient delivery of patients care with improved personnel and cost efficiency.

In collaboration with Ospedale San Raffaele, we developed a solution to improve medication management and traceability from the central pharmacy to the patient's bedside in order to avoid shortages, improve staff well-being and patient safety by ensuring the five rights of drug administration (patient, drug, dose, time, route).

The proposed system incorporates next-generation automated carts and cabinets controlled by a central traceability and stock management software. Before each shift, the total medication requirement is calculated, and the drugs/medical devices are automatically loaded into the carts without any human intervention. During the round, the patient is identified, the automated cart retrieves the specific medication(s) to be administered and places them directly on the cart countertop. The system keeps track of all the operations: which medication was administered, at what time, and by whom. The platform enables end-to-end traceability, providing pharmacists and hospital staff with a comprehensive and seamless visibility of drug flows from the central pharmacy on to the patient's bedside. Therefore, the system can provide numerous benefits such as: logistics optimization and inventory accuracy, avoidance of waste and prevention of shortages, while ensuring timely and accurate recalls on top of real-time monitoring of the entire hospital stocks.

The study benchmarked the new AUTOMATED solution against the TRADITIONAL one by measuring various metrics and KPIs. A cohort of nurses with different profiles (age, experience, and familiarity with IT applications) was selected to conduct the test.

Each nurse was asked to perform some rounds of therapy administration and give ratings, on a scale of 1 to 5, on parameters concerning:
- Effectiveness in tracking the operations and recording all results to the patient EHR
- Patient Safety
- Ergonomics of use for the nurses
- Overall Efficiency of the process

The results showed that the automated system is superior in all metrics considered, with a significant advantage in terms of safety and efficiency as a result of reducing non-value-added activities, such as manually replenishing drug stocks inside cabinets and carts, allowing nurses to focus their attention on what really matters: patient care. In conclusion, this solution provides healthcare systems with novel and disruptive automation tools that make the work easier, more efficient, and less stressful for healthcare professionals. The level of automation introduced is unprecedented and is expected to set a new benchmark in efficiency, safety, and ergonomics of these practices.

The next step is to bring this solution to more hospitals and extend the perimeter of the platform towards outpatient management. The goal is to bring the excellence of this technology to patients' home for guaranteeing their safety, through real time drugs traceability and intake monitoring, thus enabling widespread and effective patient care.