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Hospital Inventory Management— New Trends in Healthcare

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The increase in cost of supplies and services is outpacing the increase in revenues at many hospitals. In response to this cost increase hospitals are seeking more efficient ways to store and manage inventories of medical supplies. Modern inventory point-of-use technology is changing the way hospitals are distributing and controlling medical supplies. Traditional hospital inventory practices have been characterized by low inventory visibility and prevalence of par-level systems. The use of new technology is enabling the adoption of novel inventory management practices that can result in lower inventory costs while at the same time improve availability of critical medical supplies. Nevertheless, even when new technology is available it is not always clear to hospital management how to take advantage of this new technology. We study two prevalent options for inventory management and distribution at the point-of-use, automated dispensing machines (ADM) and RFID-enabled two bin systems. ADM machines are computer controlled cabinets used for storing and dispensing drugs and medical supplies. ADM software tracks product inventory continuously and can use this information to place replenishment orders for supplies. In contrast, two bin systems denote an inventory control method similar to a Kanban system in which an item's inventory is divided and stored in two bins. Under a two bin inventory system only empty bins are tracked in lieu of unit-level item consumption. ADM cabinets are typically used for high-value items while two bin systems can be used for high volume low cost items. We study different inventory replenishment policies that take advantage of increased demand information provided by these different technologies. We use different methodologies such as semi-Markov decision models and simulation-based optimization engines to provide insights on how to best manage hospital supplies inventory at the point of use.

Claudia R. Rosales is an assistant professor of supply chain management in the Eli Broad College of Business at Michigan State University. She has a BS in chemical and industrial engineering, an MS in quantitative analysis, and a PhD in operations management. Current healthcare research includes optimization of medical supplies inventory at the point-of-use, analyzing the impact of new technologies in the healthcare supply chain, consignment inventory and management of physician preferred items, waste reduction in the OR room, and forecasting of hospital spending among others. In her research she uses methodologies such as stochastic modeling, optimization, simulation-optimization techniques, and development of optimal and heuristic solution methodologies among others.

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