Goldmine On the Shelves –

The Unrecognized Mounting Inventory of Drugs in Health Systems

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In recent years, health systems have experienced a steady increase in the amount of drug inventory on their balance sheets. What might seem like harmless stockpiled medication sitting on shelves is actually a multi-million dollar asset—a unintentional "goldmine" that is consuming cash. For large US health systems, the inventory value of drugs can reach tens of millions of dollars and, unlike other supply items, drug inventory carries high financial risk due to rapid price fluctuations, expiration risk, shortages, and regulatory requirements. As drug costs escalate and health systems expand services, the value and implications of drug inventory is growing, tying up more and more working capital and exposing the health system to significant carrying costs. Managing this growing inventory efficiently is a complex challenge, but can unlock substantial financial and operational benefits.

2. Why Are **Inventory Values Rising?**

The causes of higher drug inventory can be varied and complex, but generally are driven by individual costs of new, specialty medications; frequency of supply chain disruptions and need for greater buffer or safety stock; regulatory and contractual constraints; geographical expansion, and lack of effective inventory management systems.

Drug Costs

Drug costs are relentlessly climbing. According to the Office of Health Policy at the US Department of Human Services[1]:

- The average price of drugs increased by 15.2% from January 2022 to January 2023, which is an average increase of $590 per drug. This was more than three times the increase of $172 from the previous year.
- The median annual price for new drugs in 2023 was $300,000, which was a 35% increase from the previous year.

Many new drugs are categorized as 'specialty drugs', which puts new demands on providers in order to properly purchase, prescribe, distribute and administer these high-priced medications. The additional processes and labor for specialty drugs only compound the cost burden.

Shortages

The rise in drug shortages in the US is concerning, reaching a new high of 323 active drugs in 2024. Shortages create fear of stockouts, and can drive hoarding. When a primary drug cannot be adequately sources, substitute drugs may be purchased and stocked to mitigate risk. Nearly 75% of health systems cite shortages as a major contributor to exceeding their budgets.[2]

Managing shortages is labor-intensive and adds carrying costs to inventory purchases, stretching limited resources and tightening financial margins further. Hospitals nationwide collectively dedicated an estimated 20 million hours annually to managing these shortages, incurring a staggering cost of nearly $900 million in labor—more than double the impact reported in 2019. [2]

Regulatory & Contractual Requirements

The regulatory and contractual landscape is growing more complex, with significant implications for medication management. There are federal laws, such as the Drug Supply Chain Security Act (DSCSA), and national standard setting bodies, like USP, which drive policies, procedures and data for inventory. There are contractual obligations, such as with Group Purchasing Organizations (GPOs), that require purchases from specific suppliers, and complex programs like 340B and PBM/payer contracts. Add in any applicable state regulations and the complexity and cost grow further.

Health System Expansion

The last few decades have seen healthcare decentralize to provide more care outside of the traditional hospital setting. Recent estimates show that an average health system has 13-17 ambulatory or outpatient centers per hospital, with plans to grow that ratio to 20:1 by the end of the decade.[3] As the health system geographic footprint expands with additional settings, new inventory locations are created that must be stocked and maintained.

Lack of Inventory Management Solutions

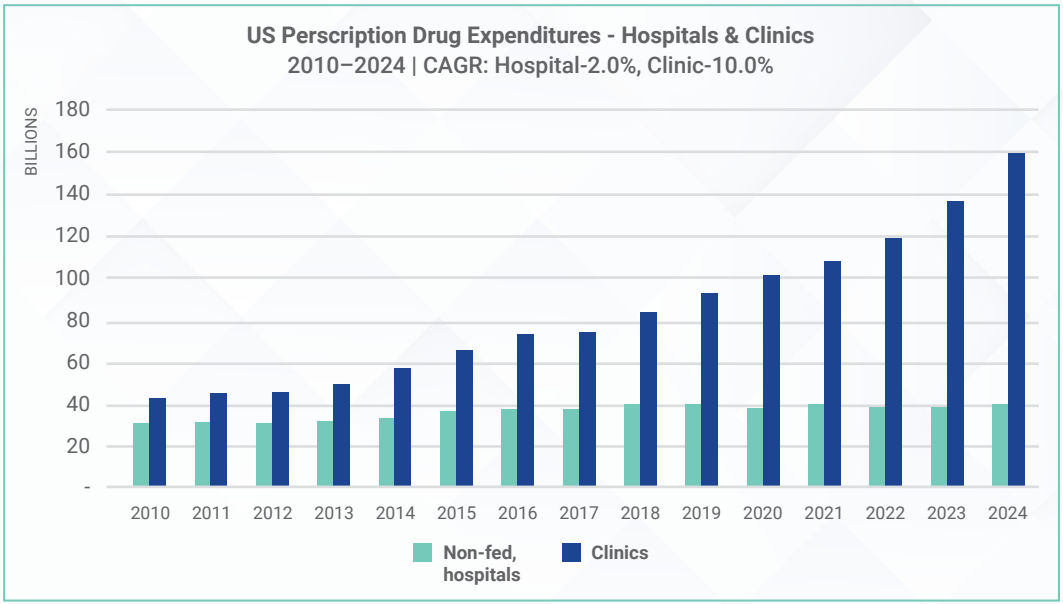
While drug inventory management solutions have been available for decades, their effectiveness may be waning. Health systems adopted automated dispensing cabinets (ADC's), medication carousels, and dispensing robots 20+ years ago.

> **Yet, recent research has shown that 65% of drug inventory lacks digital visibility, and only 1% of drug inventory is fully digitally visible.[4]**

While existing solutions have all evolved, growing more capable and integrated, they have also grown more expensive and complex. Acquisition and operating costs have exploded. The complexities and costs of these systems make them ill-fitted for the modern health system with numerous smaller settings, creating additional challenges to properly manage drug inventory.

3 The Clinic **is the Challenge**

The challenge is most acute and deepening in ambulatory, outpatient, and clinic settings for two primary reasons. First, drug costs are rapidly rising in the clinic. In the American Journal of Health System Pharmacy (AJHP), the most recent analysis shows clinic drug expenditures rising five times faster than hospital drug expenditures, with forecasts for the trend to continue.[5]



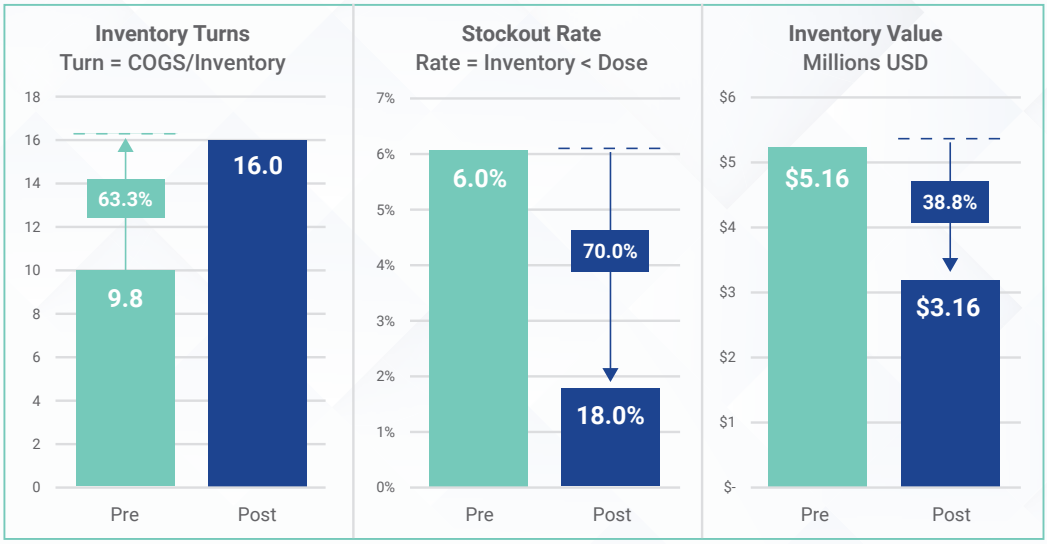
Second, there are few inventory management solutions that scale down to the clinic environment. Current inventory management solutions are not only costly, but burdensome in workflows and support.

> **While their effectiveness for inpatient care in acute care settings may be warranted, legacy solutions cannot deploy or scale into settings where there is little pharmacy or IT help, where patient volume and turns are high, and where the clinical workflows are shorter, more rapid, and with less risk.**

Virtual solutions have been explored, but require more manual steps and discipline. For these software tools, compliance falls off with time. Larger health systems are now considering or implementing central distribution centers, which consolidates inventory for the enterprise, but still cannot optimize for the clinic.

4 The **Potential Benefit**

Regardless of the challenge, the opportunity and benefit from greater inventory control in the clinic is apparent. Another study in the AJHP demonstrated the potential benefit of improved inventory management – showing dramatic results: 63% increase in inventory turns, 70% decrease in stockouts, and 43% reduction in inventory value.[6]



This clinic standardized the formulary and applied inventory management principles, which isn't rocket science. With dozens to hundreds of clinics in major health systems, if this benefit were extrapolated and generalized to other clinic inventory locations, the impact to a health system could easily reach savings of tens of millions in working capital and millions in annual carrying costs. Yet, to extrapolate and apply across a health system, the principles and tools used must be easy to replicate and scale.

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How to **Tap the Drug Inventory 'Goldmine'**

While numerous industry practices and supply chain barriers contribute to the problem, the first challenge in inventory management is digital visibility.[4,7] The goldmine of drug inventory is growing and unrecognized first and foremost because it is not clearly visible to health system leaders.

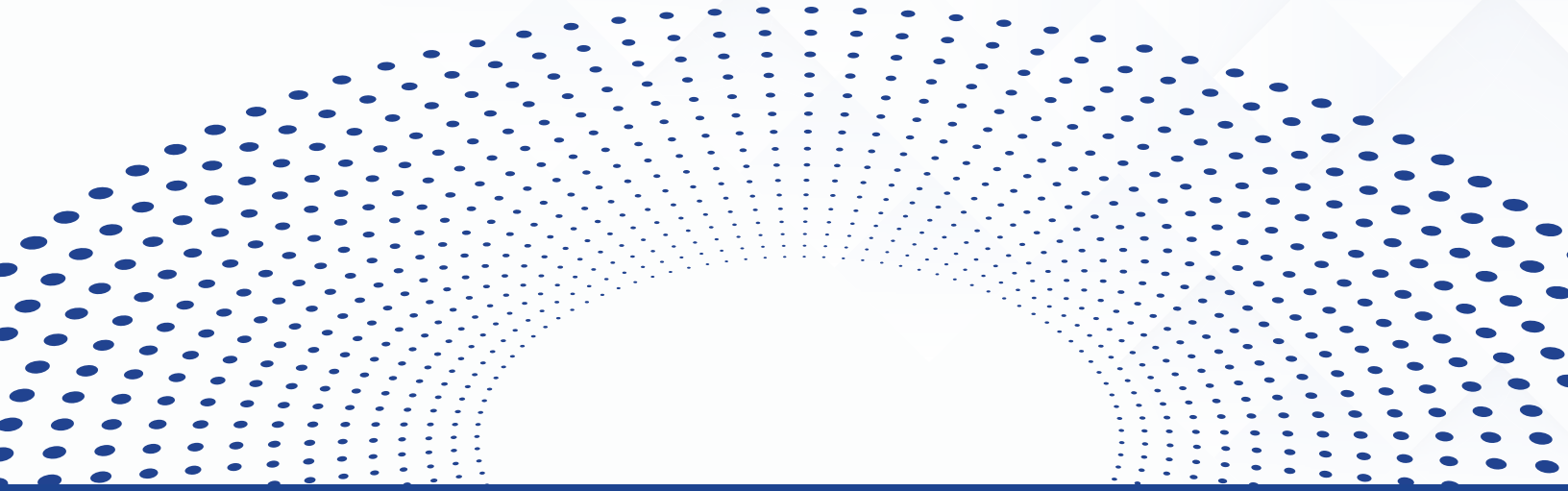
> **The lack of visibility creates bloated, unmanaged stock levels and a dependence on manual ordering processes. It limits the ability to apply automation and intelligence.**

In every case study or example where supply chain optimization has generated meaningful results, visibility into inventory was necessary and established first. This doesn't just apply to healthcare, it is a foundational principle for any supply chain.

Unfortunately, digital visibility cannot be established and maintained with manual processes. It's simply impractical and unreliable to have staff cycle count every day, or load data into spreadsheets or forms, or barcode scan every inventory transaction. Even if data could be manually gathered, it has to be communicated, aggregated, and sorted. Given the complexity of modern healthcare, the growing costs and thin operating margins of most health systems, and the lack of available labor, automation and technology will be necessary.

> **Fortunately, new technology is on the horizon. While software and cloud based inventory management systems have long been available, new sensing technology is capable of detecting every inventory transaction, communicating transaction events in real time, and aggregating system wide inventory events into a 'blockchain-style' record.[8] All of this now possible, without tagging and without the need to connect to internal health system IT networks.**

As drug costs escalate, shortages rise, regulatory and contractual burdens increase, and care migrates to the clinic, digital visibility will become the foundation for effective inventory management. With increased visibility, new automation and tools can be applied to recognize and control the growing 'goldmine on the shelves'. New technology is coming with broad application to current gaps in visibility, and presents new opportunities to streamline operations and lean out the supply chain. In doing so, health systems can realize significant financial and operational benefits that will position them well for the future of healthcare.



[1] Bosworth, A, Sheingold, S, Finegold, K, Sayed, B.A., De Lew, N, Sommers, B.D. (Issue Brief No. HP-2023-25). Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. October 2023.
[2] https://www.ajmc.com/view/report-reveals-mounting-burdens-of-drug-shortages-on-us-health-system, accessed 8/6/25.
[3] https://www.beckershospitalreview.com/finance/big-systems-looking-outside-of-the-four-walls-of-the-hospital/, accessed 8/7/25.
[4] Ashemore, A.W.., et. al., "Understanding the problem of digital medication inventory visibility in health-systems", AJHP, June 2023, https://doi.org/10.1093/ajhp/zxad130
[5] Tishy, EM, et. al., "National trends in prescription drug expenditures and projections for 2025", AM J HEALT H-SYST PHARM, 15 Jul 2025, https://doi.org/10.1093/ajhp/zxaf092
[6] Amerine, L.B., et. al., "Implementation of an integrated pharmacy supply management strategy", AM J HEALT H-SYST PHARM, 15 Dec 2017, https://doi.org/10.2146/ajhp160316
[7] https://www.linkedin.com/pulse/digital-visibility-foundation-autonomy-intelligence-douglas-descalzi-nhixe, accessed 8/13/25
[8] https://www.thiopoly.com, accessed 8/13/25