

Deadly Medication Shortages: Time for a Fix

The United States is currently grappling with a critical issue that threatens the health and well-being of its citizens: a shortage of essential medications. This crisis has been escalating over the past few years and has severe implications for patient care, with treatment delays and compromised health outcomes becoming increasingly common.

The Current State of Medication Shortages

The American Society of Health-System Pharmacists (ASHP) maintains a list of current drug shortages, which includes a wide range of medications, from antibiotics and anesthetics to cardiovascular and oncology drugs.

The impact of medication shortages on patient care is profound. Treatment delays due to the unavailability of essential drugs can lead to disease progression, complications, and even death. Moreover, substituting medications can result in reduced efficacy, increased side effects, and higher healthcare costs.

Several medications are experiencing extreme shortages. For instance, Vincristine, a vital chemotherapy drug used to treat various types of cancer, including acute lymphoblastic leukemia (ALL) in children, has been in short supply. This shortage has led to treatment delays for pediatric patients, potentially impacting their prognosis.

Additional medications currently facing shortages include:

Bacillus Calmette-Guérin (BCG) Live: This vaccine, primarily used against tuberculosis, is also used in treating bladder cancer. Its unavailability can lead to a rise in tuberculosis cases and affect bladder cancer treatment.

Epinephrine: Commonly used for severe allergic reactions and cardiac arrest, a shortage of this drug could lead to fatal consequences in emergencies.



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Dr. Chaiken has over 25 years' experience in healthcare information technology, clinical transformation, and business intelligence. He provides thought leadership and strategic and analytics assessments in healthcare information technology, quality of care, clinical change management, and business development.

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Navigating the Code

The healthcare industry, unlike many others, runs on time-tested ways to practice excellence in medicine. But does that mean adherence to practices and processes that are fifty, seventy, even a hundred years old?

Dr. Barry P. Chaiken thinks not. His 25+ years of experience as a physician and an informaticist, he believes information technology is healthcare's greatest problem-solving tool for resolving the greatest medical and business problems of the 21st century.

[Navigating the Code: How Revolutionary Transforms the Patient-Physician Journey](#)—Available on Amazon (Kindle and Audible) and at navigatingthecode.com

Morphine: A potent opioid medication used for severe pain management, its shortage can significantly impact patients needing palliative care or post-surgical pain management.

Causes of Shortages

The reasons for these shortages are multifaceted. Manufacturing issues, quality control problems, and business decisions by pharmaceutical companies play significant roles. Natural disasters, global supply chain disruptions, and regulatory hurdles also contribute to the crisis.

Shortages most impact generic medications due to their lower profit margins, and manufacturers may choose to produce higher-profit drugs over generics, leading to a supply-demand imbalance.

Pharmaceutical intermediaries, or Pharmacy Benefit Managers (PBMs), play a significant role in the medication shortage crisis. PBMs negotiate prices with drug manufacturers and insurers, often prioritizing high-profit drugs over less profitable but essential ones. This approach can lead to a shortage of generic medications, which are typically less expensive but equally effective as their brand-name counterparts.

Lower medication costs deliver smaller profit margins, driving manufacturers to stop making these less profitable drugs. As manufacturing becomes more concentrated in a small number of companies, the slightest disruption in one company can lead to significant drug shortages.

Steps to Fix the Problem

Alleviating the medication shortage requires a coordinated response from manufacturers, governmental health agencies, clinicians, health systems, and manufacturers.

As manufacturers play a significant role in alleviating shortages, here are some steps they can take:

1. **Improve Production Planning:** Using predictive analytics to forecast demand and adjust production can improve production planning schedules and help to prevent shortages caused by unexpected spikes in demand.
2. **Increase Capacity:** Expanding existing facilities, building

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- new ones, or investing in more efficient production technologies increases production capacity.
3. **Diversify Supply Chains**: Diversifying supply chains reduces the risk of shortages caused by disruptions in a single location or supplier. The solutions involve sourcing raw materials from multiple suppliers or countries or setting up production facilities in different places.
 4. **Stockpiling**: Creating strategic stockpiles of essential medications provides a buffer in case of sudden increases in demand or disruptions in production.
 5. **Collaboration**: Collaboration among manufacturers, governments, and healthcare providers to manage shortages could involve sharing information about potential needs, coordinating production schedules, or jointly investing in new production facilities.
 6. **Regulatory Measures**: Manufacturers can work with regulatory bodies to expedite the approval of new production facilities or suppliers. They can also advocate for policies that support the stability of the pharmaceutical supply chain, such as incentives for domestic production or penalties for causing avoidable shortages.
 7. **Quality Control**: Additional investment in quality control measures reduces the risk of shortages caused by production issues. This action could involve implementing more rigorous testing procedures, investing in better equipment, or training staff to identify and resolve quality issues.
 8. **Transparency**: Increased transparency by manufacturers about their production processes and supply chains can help healthcare providers and regulators to anticipate potential shortages and take action to mitigate them.
 9. **Research and Development**: Increased investment in research and development can help create new medications that can serve as alternatives to those frequently in short supply.

Other stakeholders also have actions they can take:

Federal Government: The government can implement policies to incentivize drug manufacturers to produce less profitable but essential drugs. They can also work on improving the

What is Hallucination in AI?

Hallucination in AI refers to the generation of outputs that may sound plausible but are either factually incorrect or unrelated to the given context. These outputs often emerge from the AI model's inherent biases, lack of real-world understanding, or training data limitations. In other words, the AI system "hallucinates" information that it has not been explicitly trained on, leading to unreliable or misleading responses.

Source: <https://bernardmarr.com/chatgpt-what-are-hallucinations-and-why-are-they-a-problem-for-ai-systems/>

transparency of the drug supply chain to identify potential shortages early. The government can also invest in domestic manufacturing capabilities to reduce reliance on foreign drug manufacturers.

Healthcare Insurers: Insurers can adjust their formularies to include alternative medications when a shortage occurs. They can also negotiate with pharmaceutical companies to ensure a steady supply of essential drugs.

Clinicians and Health Systems: These stakeholders can implement strategies to manage their drug inventories more effectively, such as using alternative therapies and reducing waste. They can also work together to share information about shortages and potential solutions.

Patients: Patients can help by being open to alternative medications suggested by their healthcare providers during a shortage. They can also advocate for policies that address drug shortages at the government level.

Role of Technology

Healthcare Information Technology (HIT) tools can help alleviate medication shortages by enhancing transparency and efficiency in the supply chain. Real-time tracking of drug inventory, predictive analytics for demand forecasting, and electronic health records integrated with pharmacy systems can help manage drug supplies more effectively.

Artificial Intelligence (AI) can also be pivotal in addressing this crisis. AI can predict potential shortages by analyzing patterns in supply chain data, enabling proactive measures. Additionally, AI can aid in drug discovery and development, potentially leading to alternatives for drugs in shortage.

The medication shortage in the United States is a complex issue with multiple contributing factors and severe consequences, including delays in medical procedures, rationing of drugs, increased costs for healthcare providers and patients, and delivery of poor clinical outcomes. Solutions require a coordinated effort from all stakeholders, including manufacturers, healthcare providers, regulators, patients, and policymakers. While some of these approaches may not immediately alleviate current shortages, they will position our healthcare system

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to avoid these shortages in the future.

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Hallucinations

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Author Note: I wrote this article using ChatGPT (4.0). By requesting several "regenerations" of the responses, I constructed a more informative article from pieces of each version. This is the finished document.