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Review on Strategy of Pharmaceuticals Waste Management

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Abstract: *The management of pharmaceutical waste is an increasingly critical aspect of environmental protection and public health safety, given the proliferation of pharmaceuticals and their potential adverse impacts Pharmaceuticals Waste Management improperly disposed of. Pharmaceutical waste encompasses expired, unused, contaminated, or discarded medications, along with associated materials such as bottles, gloves, and syringes. Improper disposal methods, such as landfilling, flushing into water systems, or incineration without appropriate controls, can lead to environmental pollution, bioaccumulation of hazardous chemicals, and the development of drug-resistant microorganisms. These issues pose significant risks not only to ecosystems but also to human populations through contaminated water sources and soil. Proper pharmaceutical waste management involves a systematic process that includes waste segregation, secure storage, transportation, and disposal tailored to the specific type of waste—hazardousor not dangerous. To ensure that toxic or infectious waste is handled differently from general waste, segregation is usually accomplished through color-coded containers. Establishing efficient waste management procedures requires maintaining compliance with local, national, and international laws, such as the Resource Conservation and Recovery Act (RCRA), WHO guidelines, and EU directives. In order to stop drug abuse and unintentional exposure to leftover medications, public awareness campaigns like drug take-back programs have also received a lot of attention. Technological advancements in waste treatment, such as plasma gasification and high-temperature incineration, help reduce their negative effects on the environment. Additionally, the creation and application of bio-based and biodegradable plastics present viable ways to lessen the plastic pollution linked to pharmaceutical packaging. Overall, the success of pharmaceutical waste management relies on integrated efforts across healthcare facilities, regulatory bodies, and communities to mitigate pollution, safeguard public health, and promote sustainable practices through technological advancement and effective policy enforcement.*

Keywords: Pharmaceutical waste, Healthcare waste management, Hospital waste disposal, Drug contamination, Wastewater treatment, Emerging contaminants

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