

Managing Unused Pharmaceuticals in a Hospice Setting: A Pilot Study

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Abstract

With the escalating use of pharmaceuticals in health care, there has been increasing anxiety over the potential health risks associated with pharmaceutical waste accumulating in the environment. This research provided nurses in a hospice care facility in Concord, California, with education and training to offer patients a medication disposal service through the use of mail-back envelopes. Over the 6-month study period, 160 of the 400 distributed mailers were returned for disposal. The total weight of pharmaceuticals diverted for incineration was 107 pounds, with an average weight of 0.66 pounds per mailer. This study suggests that the mailer system and proper education of medical staff have the potential to improve medical waste management, but alternative approaches may be necessary to increase the rate of envelop return.

Keywords

hospice, waste, disposal, pharmaceuticals, pollution, education, nurses

Introduction

The American health care system is responsible for prescribing large quantities of medications for a broad spectrum of ailments. In 2005, roughly 70% of medical visits resulted in the provision of drug therapy, with a total of 1.9 billion prescriptions ordered or provided.¹ Over the last decade, there has been increasing anxiety over the potential health risks associated with the increase of pharmaceuticals entering the environment.² In 2002, the US Geological Survey (USGS) and the San Francisco Estuary Institute revealed that active pharmacological ingredients (APIs), such as acetaminophen, diltiazem—a blood pressure medication, codeine, and various antibiotics, were found in 80% of the waterways sampled nationwide.³

The risks posed to human health associated with the long-term consumption of minute concentrations of medications in drinking water, as well as the long-term risks to the environment by continual exposure, are largely unknown. However, research on the “Effects of a Complex Mixture of Therapeutic Drugs at Environmental Levels on Human Embryonic Cells” found that a mixture of 13 common APIs found in drinking water inhibit cell growth and cause negative changes in human embryonic cells.⁴ Furthermore, the report on San Francisco Bay Area’s Safe Medicine Disposal mentions several well-documented cases of endocrine disrupting effects on fish and wildlife.⁵

Reduction of human exposure to unwanted chemicals can only be achieved by implementing proper disposal techniques at all levels in health care. Ideally, cradle-to-cradle product stewardship would be the most cost-effective; however, complex regulations currently prohibit this type of program.⁶ An ongoing pharmaceutical drug take-back program is an

essential and effective alternative. Rather than placing the burden on the waste management system alone, ultimate solutions will distribute educational and behavioral action throughout the entire life cycle of the drug (manufacturing, distribution, consumption, and disposal) by including all parties as part of the solution.

Until recently, little emphasis has been placed on pharmaceutical waste reduction in hospice care. Home hospice nurses have the unique position to directly inform patients and their families about the proper methods of disposal for waste pharmaceuticals. Currently, it is most common for hospice nurses to use the White House Office of Drug Control Policy’s recommendations for disposal of unused pharmaceuticals.⁷ The recommendations include flushing controlled substances directly down the toilet or mixing prescription drugs with kitty litter and placing them in the garbage. Furthermore, hospice nurses do not handle unused medications once distributed to the patients. At the time of death, instructions may be given directly to the family or caregivers of the deceased.

Given the continual growth of pharmaceutical interventions, proper disposal of unused and unwanted pharmaceuticals should be a necessary consideration for patients, nurses, and health care facilities. This study provided one home hospice care facility in Concord, California, with the necessary

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education and training to offer patients an easy-to-use medication disposal method through the usage of mail-back envelopes. This study suggests that the mailer system and proper education of medical staff have the potential to improve medical waste management. However, for the program to be cost-effective, further study is needed to determine how to increase the rate of return. In addition, there may be alternative approaches that are better suited for pharmaceutical waste management in the hospice environment.

Methods

Five hundred 8 × 11 inch prepaid mailers from RxTakeAway, sponsored by Sharps Compliance, Inc, Carthage, Texas, were distributed to the nursing staff at the Sutter VNA facility in Concord, California. All mailers contained specific instructions on how to return unused medications, as well as information regarding limitations of the mail-back system for the disposal of controlled substances.

Nurses attended an on-site 45-minute presentation conducted by Dr Joel Kreisberg, educating them about the nature of pharmaceutical waste in the environment and the current regulations for handling consumer pharmaceutical waste. Nurses were also provided with brochures to be given directly to patients, which further explained the nature of handling pharmaceutical waste and current guidelines for proper disposal.

Twenty mailers were given to each of the 25 nurses who participated in the study. The nurses were instructed to offer mailers to patients on the first home visit and to the family of the deceased at the time of the final visit. Nurses did not directly handle unused medications during the pilot, but encouraged patients to use the mailers to return all medications, with the exception of controlled substances. Patients and patients' families were instructed to remove pills from packaging and place them inside a plastic bag inside the mailer. Liquids and ointments were to be wrapped in plastic before placing inside the mailer. Nurses provided extra mailers to patients at no charge.

Nurses noted the serial numbers of mailers they were given and the date each mailer was distributed to patients. All mailers were sent through the US Postal Service directly to the incinerator facility of Sharps Compliance, Inc, in Carthage, Texas. Sharps Compliance, Inc, recorded when each mailer was received and the date each mailer was disposed of in the incinerator.

Results

The study began on October 1, 2009, and results were completed on March 31, 2010. Of the 500 mailers given to the nurses, 400 had been distributed, while 100 were still held by the nurses. During that time, Sutter VNA cared for 285 new patients. According to the data maintained by Sharps Compliance, Inc, 160 mailers were returned during this 6-month period, which represents a 40% return rate based on the number of mailers distributed. (To date, 184 mailers have been returned with fewer than 40 mailers still undistributed, again a

40% return rate.) The total rate of return is 32% because of the total 500 prepaid mailers, only 160 were returned.

A total of 119 pounds of waste pharmaceuticals were collected by the mail-back program, with an average weight of 0.66 pounds per mailer. The range of weight of pharmaceuticals per mailer was 0.1 pounds to 2.7 pounds, with a median weight per mailer of 0.5 pounds.

At the current market rate, prepaid mailers cost an average of \$4.00 per piece. Therefore, the retail cost of the 500 prepaid mailers is \$2000, so the cost of the 400 distributed mailers would be \$1600. But because the mailers were prepaid, the 40% return rate of the distributed mailers resulted in a cost of \$10.00 per mailer and a cost of disposal of \$13.45 per pound of pharmaceuticals. Examining the total rate of return at 32%, the cost per mailer is increased to \$12.50 and the cost of disposal to \$16.81 per pound of pharmaceuticals.

In terms of the nurses' compliance and feedback, 13 of the 25 nurses who participated in this study had distributed all 20 mailers. These nurses stated that they felt a compelling need to promote the safe drug disposal policy. Out of the remaining 12 nurses, 7 had not been in a position to distribute the mailers to patients and their families because of administrative assignments. The 5 remaining nurses had not put conscientious effort into promoting the program. No data were collected as to how often patients asked for information about unused pharmaceuticals.

Discussion

The pharmaceutical waste mail-back program facilitated education for hospice nurses to provide patients and their families a means to properly dispose unused medications. As a key medical provider, hospice nurses have direct access to patients who are at risk of improper medication disposal. Thus, the education of hospice nurses regarding issues of pharmaceutical wastes in the environment is an essential focal point for creating a zero-waste system.

The study showed that the mail-back program successfully diverted 119 pounds of pharmaceutical waste from the environment. Despite the pounds diverted, results show that the mail-back program was not utilized to its fullest capacity by nurses and patients. Of the 500 prepaid mailers, only 400 were given to the patients by the nurses, resulting in an 80% rate of distribution. Of the 400 mailers that were distributed, only 160 were mailed back by the patients for incineration, resulting in a 40% rate of return. Because 160 of the 500 total mailers were used, there is a 32% total rate of return for the pilot study.

The use rate may be a result of nurses' inconsistency in commitment to educating patients as to the need for properly disposing medications. Some nurses were able to use all of their mailers in a rather timely manner, while others are still carrying some of the mailers around with them. Hospice nurses have many issues to deal with during the end-of-life care. The average hospice patient at Sutter VNA lives 16 days. Only some of the nurses are quick to adopt a new policy added into the mix of information that is delivered in a difficult circumstance.

The study showed that hospice patients and families on the whole only partially utilized the mailer system in a timely manner. However, the return of mailers is to be expected continue beyond the time frame set by this study, due to the fact that they do not expire. Assessment in 6 months would allow a more accurate measurement of the overall return rate.

Because this is the first pilot research used to study the effectiveness of the mail-back system among hospice nurses and patients, the 40% rate of return for the distributed mailers and the 32% rate of return for the total mailers are a helpful comparison for future studies. The research suggests that providing mailers for the return of waste medications offer an effective option for patients and consumers who are unable to make the trip to a take-back system or have no access to a local take-back program. In fact, part of the Sutter VNA program region covers Solano California, which has no ongoing pharmaceutical take-back programs in operation. In addition, providing consumers with a mail-back option provides broader opportunities in regions that have little or no access to traditional take-back collection systems. Based on the current data available for disposal of household pharmaceutical waste, the mail-back system is significantly more expensive than take-back programs that require consumers to bring unwanted medications directly to take-back sites, which cost an average of \$2.00 to \$6.00 per pound.⁸

Potential Improvements

The cost of pharmaceutical waste disposal could be reduced if there was a higher rate of mailer return. For example, an 80% return would put the costs of the program \$5.00 per piece. Costs per pound would be \$7.57 per pound. Another way to reduce the cost of disposal is to increase the sizes of the prepaid mailers to accommodate more waste. Nurses could have access to larger types of mailers such as a shipping box, which would allow for return of larger quantities for a smaller shipping cost. A third way to help cushion the cost of disposal is to utilize a pay-as-you-go system that only charges the provider for envelopes used.

Although controlled substances were allowed to be returned through the mailer system at one point in the last few years, current regulations prohibit their return through the system. If Drug Enforcement Agency regulations returned to allowing for controlled substances, this program would be ideal for returning controlled substances. The mailer program would allow the controlled substances to be returned and destroyed anonymously, without being handled by additional stakeholders, ensuring patient confidentiality and safety.

The design of the mailer program could also be adjusted to improve user compliance of both nurses and patients. To ensure all patients are educated about proper pharmaceutical disposal, the mailers could be included in the hospice welcome packet given to patients upon arrival. Instead of giving each nurse 20 mailers to be distributed, the mailers could be placed in a

centralized location in the hospice. This system would give the nurses better access to the mailers and allow the nurses to distribute the mailers according to patient demand.

Hospices interested in the mailer system could implement these suggested changes to increase the overall success of the waste pharmaceutical disposal program.

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