

Medication wastage in residential care facilities

A recent study of medications discarded unnecessarily at residential care facilities in the Interior Health region points to three main contributing factors and reveals that policy changes could reduce wastage and lead to significant cost savings.

ABSTRACT: Medication wastage is a significant concern at residential care facilities in British Columbia. In 2016 the residential care quality improvement team for the South Okanagan Similkameen Division of Family Practice undertook a study that identified three factors contributing to medication wastage: multi-dose packaging, all physician medication orders in residential care facilities are considered STAT by default, and restrictions on re-using medications. The team consulted with pharmacists, physicians, nurses, facility directors of care, and health authorities before quantifying medications returned to a pharmacy at 10 facilities over a 4-week period.

Tracking showed that, each month, 13% of residents had their medication strips returned to the pharmacy, most commonly because of a change in prescription. These returns included 818 medications and an estimated 6229 pills. Extrapolating from these findings suggests that in BC each year 50 000 mid-week multi-dose medication strips are returned and 2.5 million pills are incinerated. The hard cost of these discarded medications is estimated to be \$570 000 per year. Soft costs were not evaluated. We recommend that a provincial working group of pharmacy leads be formed and that policy changes to reduce medication wastage be tested and implemented.

The residential care initiative (RCI) of the General Practice Services Committee (GPSC) aims to improve care for patients in facilities through five best practice recommendations,¹ one of which is the implementation of meaningful medication reviews. The RCI also aims to achieve system-level outcomes that include reduced cost per patient with higher quality of care and improved patient-provider experience.¹ While working to implement meaningful medication reviews and achieve RCI system-level outcomes, the residential care quality improvement team of the South Okanagan Similkameen (SOS) Division of Family Practice discovered significant medication wastage and set out to study this in more detail.

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Factors contributing to wastage

Three main factors contributing to medication wastage were identified early on and then quantified at 10 residential care facilities over a 4-week period in 2016:

Multi-dose packaging. Medications at most residential care facilities in BC are delivered in multi-dose packages, with several pills sealed together in one pouch. Often a resident is allocated several pouches per day, which are delivered in weekly strips. Multi-dose packages are used by private pharmacies because they save time on the ward and are less prone to error. It is understood that Interior Health is moving to the use of multi-dose packaging for these same reasons.

STAT medication orders. All physician medication orders in residential care facilities are considered STAT by default. A STAT medication order must be changed immediately, whereas a Next Pouch Day medication order change can wait until the next regular scheduled delivery of medications.

Restrictions on reusing returned medications. The standards of practice for the College of Pharmacists of BC do not allow pharmacies serving residential care facilities to reuse returned medications unless the medication is in a single-drug, sealed dosage unit or container as originally dispensed.² The use of returned medications poses several safety risks, including the possibility of cross-contamination and the possibility of errors occurring when previously dispensed medications are reintroduced to the pharmacy system.

The combined effect of these three factors on current practice in residential care facilities is significant. When

a medication is discontinued or the dosage is changed, a resident's entire strip of weekly medications is immediately returned to the pharmacy for controlled disposal. In one instance we discovered that a simple reduction in the dosage of acetaminophen, a drug costing pennies, led to the disposal of medication worth approximately \$100.

Wastage of this kind shows how an improvement in one area of health care can have unintended consequences in another area. In this case, the efforts of provincial residential care to improve patient care by increasing the frequency of proactive physician visits, meaningful medication reviews, and physician attendance at care conferences¹ have increased physician participation in all of these aspects of care and resulted in a corresponding increase in returned medications.

Project overview and design

After the South Okanagan Similkameen Division of Family Practice reported on systemic medication wastage to the project director of the General Practices Services Committee, the GPSC provided a small grant for the division to partner with a pharmacy and determine the costs associated with medication wastage.

Early on in preparing for the study we discussed medication wastage with the provincial pharmacy leads of Remedy'sRx, London Drugs, Save-On-Foods, and Sobeys/Safeway, the providers of pharmacy services for a majority of the 30 000 residential care beds in the province. All were aware of medication wastage from returns, and several had tried to remedy this. During our initial discussions we also discovered soft costs to wastage, which include time spent by both pharmacy and health care staff dealing with medication returns,

transportation costs, and possible environmental costs resulting from the incineration of pills. We did not measure these soft costs in our study. We also did not address the risk of medication errors resulting from midweek medication change. We did discuss the potential for medication errors, and hired a nursing consultant to delineate the problem by developing a sample nursing flow process for changes to medication orders, but we concluded that this complex subject was beyond the scope of our study. In future, this concern might be considered in more detail along with the soft costs mentioned above and other factors contributing to wastage not yet identified.

Pharmacy partner

Remedy'sRx was a natural partner for this project because this pharmacy has a contract for 7000 beds in the province, and their Kelowna facility receives all medication returns for 10 residential care facilities within the Interior Health region. In addition, the SOS Division of Family Practice has already worked with Remedy'sRx and two of their clinical pharmacists on a polypharmacy risk reduction project.³ Remedy'sRx had also previously investigated medication wastage and developed a new order form that allowed physicians to indicate if an order was STAT or Next Pouch Day, and found the form had limited success in reducing wastage.

Other stakeholders

We discussed medication wastage and its potential magnitude with Interior Health. The health authority was quick to recognize the significance of the issue and wanted to be kept apprised of findings.

Of the 10 residential care facilities that return medications to the Remedy'sRx facility, two are located within the SOS Division of Family

Practice. The remainder are located within four other divisions: Central Interior Rural, Central Okanagan, Shuswap North Okanagan, and Thompson region. The SOS Division of Family Practice medical lead discussed the project with the residential care medical leads from these four regions, outlining the purpose of the project and soliciting their support. They were reassured that the study would not interfere with the operation of their facilities. Prior to these discussions, some of the divisions were aware of the medication wastage issue but not of its potential magnitude;

others were not aware of the issue. All divisions involved were supportive of this project and interested in the outcome of the study.

Development of a tracking process

The creation of a tracking process was a collaborative effort undertaken by SOS Division of Family Practice staff and Remedy'sRx staff, who quantified the number of medications returned during a 4-week period. Remedy'sRx did not identify individual facilities or patients and reported on the aggregate returns. Funding

from the GPSC supported hiring a pharmacy research assistant to facilitate the tracking process.

A visit to the Kelowna facility of Remedy'sRx helped project members understand the process of medication returns, and the process for packaging medications (**Figure 1**). The project team then developed a standardized tracking sheet to capture relevant information (**Figure 2**). Facilities were identified by letters and residents by randomly assigned numbers to anonymize the data.

During the 4-week study period, medication changes came in over the

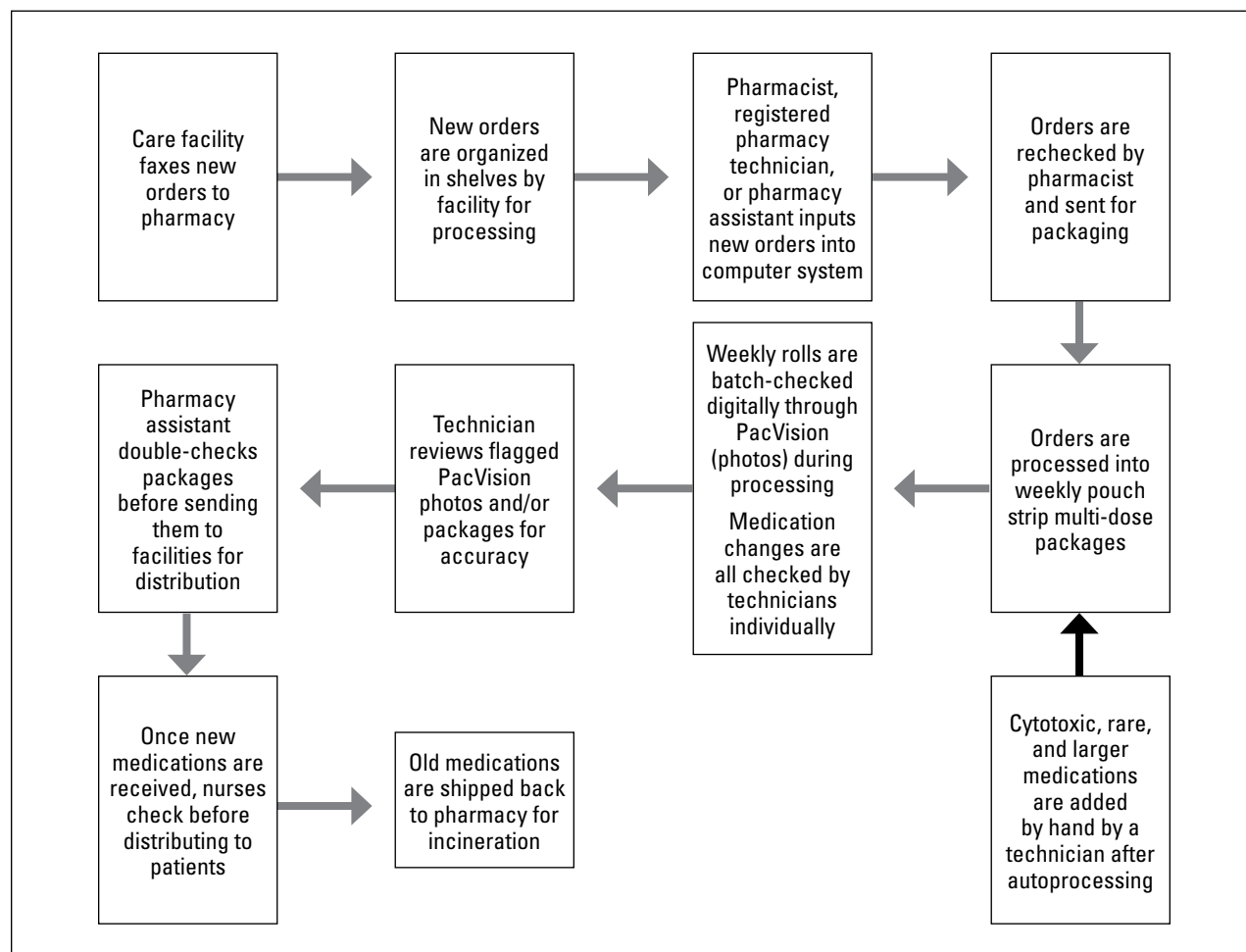


Figure 1. Pharmacy process flow for medication changes.

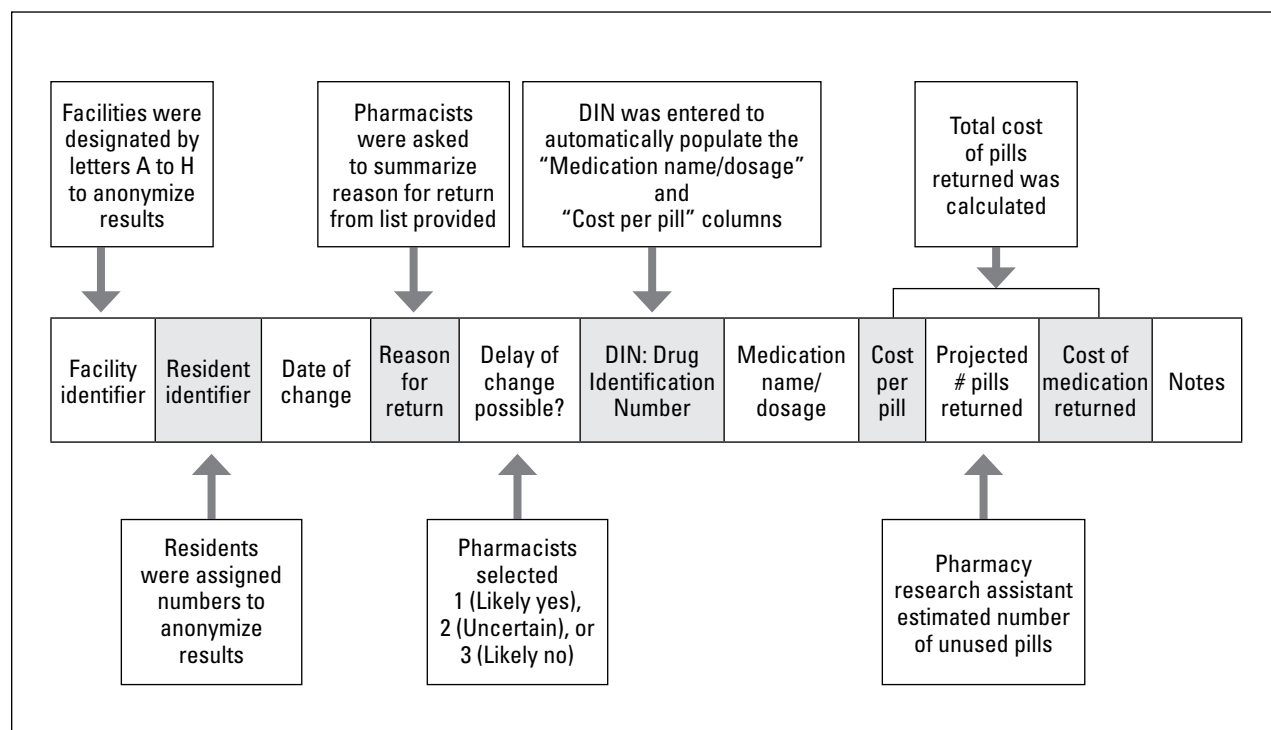


Figure 2. Tracking sheet used for medications returned to pharmacy during study.

course of the day and were collected and processed by the facility. These changes were tracked, and a pharmacist reviewed the change and added the appropriate additional notation to a copy of the requisition, which was then collected and batch-entered by the pharmacy research assistant. Once the study period ended, all data were entered by the assistant and double-checked by a pharmacist. The data set was then reviewed by Remedy’sRx and shared with the project team.

Results of tracking

Data were analyzed for 948 beds in 10 different facilities, ranging in size from 46 to 152 beds per facility. During the 4-week study period, 125 residents (13%) had medication strips returned. These returns included 818 medications and 6229 pills (an approximation since not all doses were whole) worth a total of \$1382.61

Table. Total values for medication returns at 10 Interior Health residential care facilities during 4-week study period.

Number of beds	Weekly strips returned	Medications returned	Pills returned	Cost	Cost per bed per year
948	125	818	6229	\$1382.61	\$18.96

(Table). Most of the medication returns (85%) were due to prescription changes, with the remainder being due to either resident transfer or death.

Extrapolating from these findings, we estimated that each year in BC:

- 50 000 medication strips are returned.
- 2.5 million pills are returned.
- \$570 000 is spent on wasted medication.

Pharmacists estimated that the cost of the packaging for discarded medications could be as high as \$70 000 per year. Pharmacists also estimated that approximately two-thirds of returns

were for prescription changes that could have been delayed until delivery of the next weekly medical strip.

Given the significant total cost for returned medications, we were surprised by the low cost of individual pills—less than 10 cents per pill for 50% of returns, and more than 50 cents per pill for only 9% (Figure 3).

Approximately 40% of all returned medications were simple analgesics, bowel medications, thyroid replacements, or dietary supplements (vitamins, iron, etc.). If these were excluded, most residents were taking only four medications per day.

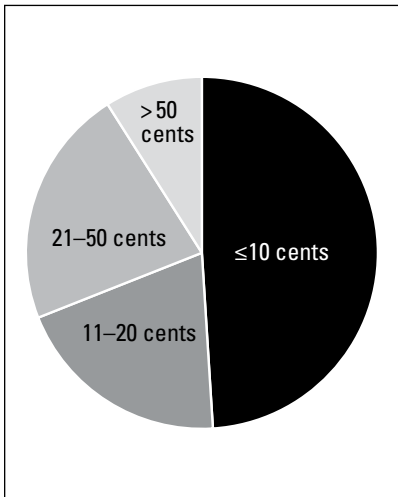


Figure 3. Average costs of returned medications (individual pills).

Results of care provider discussions

The practice standards of many professional groups and governing bodies influence how care is provided and medication is dispensed in residential care facilities, making the issue of medication wastage complex (Figure 4). We spoke to a broad range

of physicians, Interior Health pharmacists, private pharmacists, nurses, and directors of care to better understand how current practices affect medication wastage. Each of these groups endorsed this project and felt that a reduction in wastage would improve efficiency and the quality of patient care.

Pharmacists

Private pharmacies are currently the major provider of medications to residential care facilities. They use multi-dose packaging and typically deliver weekly. Interior Health pharmacies, which currently use single-dose packaging, deliver several times a week. Interior Health anticipates using private pharmacies for more of their facilities in future and moving to multi-dose packaging.

Except in rare circumstances, pharmacies are not able to reuse returned medications because there is a risk of:

- Cross-contaminating medications during return or repackaging.

- Making errors when reintroducing returned medications to the pharmacy system.
- Mixing medications with different expiry dates.
- Being unable to track medications in the event of a medication recall.
- Initiating chemical changes to medications with repeated heat-sealing.

All four provincial lead pharmacists consulted during this project recognize that the return process is inefficient and leads to discarding medications unnecessarily. They believe improvement is possible and that reducing wastage would allow pharmacists to spend more of their valuable time on high-level tasks.

Facilities

There is no standardized medication order sheet used in residential care facilities in BC. Local health authorities determine actual professional practice standards for nurses, which may or may not conform to the full scope of practice set by the College of Registered Nurses of BC. For example,

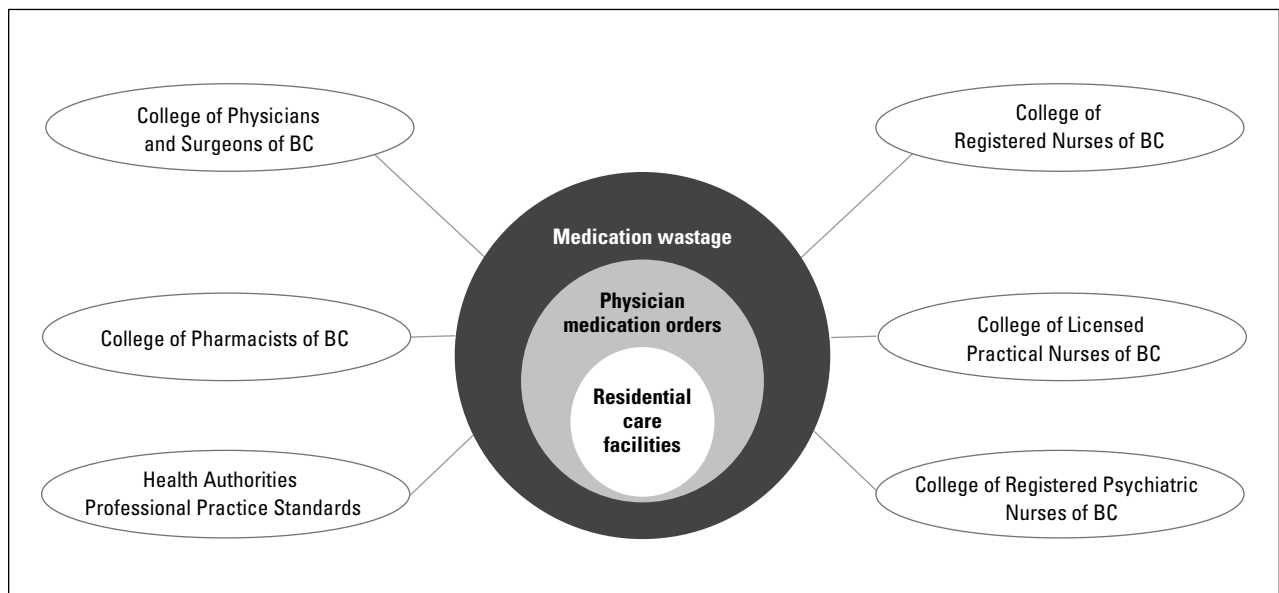


Figure 4. Governing bodies and practice standards for residential care.

Interior Health nursing practice presently mandates that medication orders be dealt with immediately by fax or a phone call to a pharmacy. At present, if a pharmacy delays filling an order, a nurse must record the delay as a medication error.

Physicians

Discussion with medical leads and with a local physician focus group indicated that a majority of residential care medication orders could have been delayed until the Next Pouch Day. Most physicians interviewed were not aware that their orders are automatically treated as STAT and many spontaneously volunteered to make immediate changes to avoid wastage.

Recommendations

We recommend that policy changes to reduce medication wastage be considered. This would involve having committed stakeholders collaborate to study both hard and soft costs and to develop a solution for testing and implementation. Policy changes could include changing the default for medication orders from STAT to Next Pouch Day, unless overridden by a physician order. In addition, we recommend forming a provincial working group of pharmacy leads from the major companies supplying residential care facilities, a suggestion already endorsed by the leads of Remedy'sRx, London Drugs, Save-On-Foods, and Sobeys/Safeway. This working group could assist with standardizing medication order sheets, ensuring that successful practices from individual health authorities become generalized, developing standardized licensing practices, and identifying other sources of wastage. For example, currently a container of topical cream must be discarded and replaced when there is an order change for fre-

quency of application. A less wasteful approach would involve providing a new label for the container of cream.

Summary

Three factors contributing to medication wastage were identified in a study quantifying pharmacy returns from 10 Interior Health residential care facilities over a 4-week period in 2016: multi-dose packaging, all physician medication orders in residential care facilities are considered STAT by default, and restrictions on reusing medications. Extrapolating from study findings suggests that 2.5 million pills are incinerated in BC each year at an estimated cost of \$570 000. Although the issue of medication wastage is complex because of the different professional bodies and practice standards governing residential care facilities, stakeholders consulted during this study support reducing medication wastage as a way to improve efficiency and quality of patient care. Future studies might attempt to identify other factors contributing to medication wastage and address soft costs and concerns such as the amount of time spent by both pharmacy and health care staff dealing with medication returns, transportation costs, possible environmental costs from the incineration of pills, and the risk of medication errors re-

At present, if a pharmacy delays filling an order, a nurse must record the delay as a medication error.

sulting from midweek medication change. [BCMJ](#)

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Competing interests

None declared.

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