

Identification and quantification of medication returned to Otago pharmacies

Rhiannon Braund, Yi Ching Yuen and Jane Jung

Correspondence to: rhiannon.braund@stonebow.otago.ac.nz

Rhiannon Braund is a PhD candidate and Clinical Pharmacy Practice Lecturer at the School of Pharmacy, University of Otago.

Yi-Ching Yuen and Jane Jung are undergraduate students at the School of Pharmacy, University of Otago.

ABSTRACT

Aim

To identify and quantify medicines returned to Otago pharmacies, specifically to identify what types of medications were being returned and whether these items were 'stat' dispensed (i.e. a three-month supply given at the time of dispensing).

Methods

A random sample (159kg, 12%) of the 1294kg of medications returned for destruction over a nine-month period from the Otago region were identified and quantified based on generic name, trade name, strength, form, quantity, subsidy amount, cost per unit, stat or non-stat, and therapeutic classification.

Results

Of the top 20 most returned tablets all were 'stat' dispensed. Of the top 20 most returned capsules, 10 were 'stat' dispensed. The most commonly wasted medication was paracetamol (6059 x 500mg tablets in our sample). The calculated value of the entire sample was \$20,475.

Conclusion

A degree of medication wastage is unavoidable in certain situations, but the volume may be affected by 'stat' dispensing. The significant proportion of wastage due to 'stat' medications in the analysed sample indicates that prescribers need to be aware of the volumes of medications that are dispensed and the potential impact on wastage volume.

Key words

Medication, wastage

Introduction

According to Pharmac's 2005 report,¹ the number of subsidised prescriptions being written is rapidly increasing. This year alone there were just over 27 million, which was a sharp increase of 10.7% from the previous year. This increase in the number of subsidised prescriptions is reflected in the increased amount of money spent on pharmaceuticals provided to the community. A number of studies have revealed that a large proportion of prescription medications are being wasted, compounding the problem of increased cost. Several District Health Boards (DHBs) in New Zealand, including Canterbury, MidCentral and now Otago, have been concerned about this situation and have supported studies to identify and quantify the wastage of prescription medications. In April 2005, the Otago District Health Board (ODHB) introduced a programme to collect and dispose of unused prescription medications from Otago community pharmacies. These medications were defined as prescription medications that have been dispensed and are no longer needed by the patient. The programme offered to collect all unused medications from the pharmacies, with the ODHB meeting the cost of both the collection and the destruction of the unused medica-

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tions. Currently there is no published research on the volume of this wastage and the types of medications that are returned to pharmacies in New Zealand. There is, however, data on returned medications from some other countries.

A study conducted in Alberta, Canada in 1996,² quantified medication returns over a two month period and found that people making returns brought back an average of 60% of the drugs from the original prescription, and that the reasons for returns included death of the patient (26.6%), expired medication (25%), the person felt better (11%), the doctor changed the medication (11%), allergic reactions (8%), and simply not wanting to take the drug (7%). The dollar value of these medicines when extrapolated to include the whole province was over \$(US)700,000 over two months. A similar study from Houston, Texas in the USA over a six month period in 2002³ estimated wastage for the country at \$(US)53 million for oral pills alone. Work conducted in the UK and published in 2004 puts their estimate of medication wastage at between £30 and £90 million per annum.⁴

In New Zealand 'stat' or all-at-once prescribing and dispensing was reintroduced on the 1st of October 2003. With stat dispensing three months' supply may be given to a patient rather than just a single month. Pharmac intended that up to 50% of all subsidised medications dispensed be available under the stat dispensing proposal. Pharmac predicted that there would be an increase of medicines collected via stat dispensing since not all patients collected all three repeats in the past, but that this might only lead to a 6% increase in dispensed medications that may be wasted. Assuming an expenditure of \$565 million for medications in 2005,¹ this 6% equates to \$34 million dollars potentially wasted in New Zealand. This additional cost was believed to be more than outweighed by the re-

duction in dispensing fees paid to pharmacists and would actually lead to overall savings. A full report on the implementation and accuracy of predicted savings of 'stat' dispensing was undertaken by the Controller and Auditor-General in May 2005.⁵ One recommendation from the Auditor-General's report was that local DHBs need to quantify the actual wastage and put strategies in place to minimise wastage.

The aim of this work was to identify and quantify medicines returned to Otago pharmacies to identify the types and quantity of returned medications.

Methods

Medication collection

Currently patients are invited to return any unwanted medications to a community pharmacy. These medications are boxed at the pharmacy and collected by MediSmart Ltd, the contracted medical waste disposal company, at the request of the individual pharmacy. Medications returned unsolicited to pharmacies over a nine month period, from 1st April to 31st December 2005, were eligible for consideration. The pharmacies were unaware that the boxes were to be analysed before destruction. As part of Medismart Ltd's destruction process, each box was weighed and recorded before disposal and one or two boxes per collection run were put aside for the researchers to collect. During the collection period there were a total of 174 boxes picked up by Medismart Ltd from Dunedin, Mosgiel, Oamaru, Roxburgh, Queenstown, Alexandra and Balclutha with a total weight of 1294kg. Of these boxes, 25 were collected by the researchers for analysis. Each box was weighed by the researchers before opening and this weight was recorded, the total weight was 158.5kg. Non-prescription medications were removed and disposed of and prescription medications were identified and quantified.

Medication quantification and analysis

A database was generated cataloguing the medications based on generic name, trade name, strength, form, quantity, subsidy amount, cost per unit, stat or non-stat, and therapeutic classification. The subsidy amount and cost per unit were taken from the New Zealand Pharmaceutical Schedule April 2005. This schedule dictates the amount that pharmacies are reimbursed for the medications dispensed based upon the brand dispensed and the strength. This allowed the cost of each medication returned to be calculated.

Results

Medication quantification

Over the collection period MediSmart Ltd collected 1294kg of returned medicines. The analysed sample was 158.5kg (12%). The calculated value of the entire sample was \$20,475 (cost of prescription medicines only with no dispensing fees, etc.), and when extrapolated to include the entire amount collected over the nine months, and assuming no seasonal variation over the three month period not sampled, gave a value of over \$230,000 per year. There were 65 907 tablets returned (55.5% of returned medication cost). There were 7599 capsules returned (12.4% of returned medication cost). The remainder of costs consisted of injections (9%), inhalers (7%), eye drops (3%) and many others including creams, gels, ointment, test strips, liquids, suppositories (all less than 2% each). Tables 1 and 2 show the top 20 tablets and capsules returned (respectively).

One box contained medicines entirely from one patient including 1557 paracetamol/codeine tablets, 1198 paracetamol 500mg tablets, 469 doxepin 25mg capsules, seven 100g tubes of hydrocortisone-17-butyrate cream, 362 warfarin tablets and other items with a total value of \$347.

Table 3 shows the top 20 generic items returned based on the total cost

Table 1. Most returned tablets

Generic Name	Trade Name	Strength	Number	% of tablets	
Paracetamol	Pacimol/Panadol/Pamol	500 mg	4039/1114/906	9.2	S
Docusate sodium, sennosides	Laxsol	50 mg / 8 mg	3651	5.5	S
Paracetamol, codeine phosphate	Panadeine/Codalgin	500 mg / 8 mg	1910/678	3.9	S
Frusemide	Diurin 40	50 mg	1940	2.9	S
Metoclopramide HCl	Metamide	10 mg	1587	2.4	S
Gliclazide	Apo-Gliclazide	80 mg	1506	2.3	S
Sodium valporate	Epilim EC 200	200 mg	1385	2.1	S
Sodium valproate	Epilim EC 500	500 mg	1325	2.0	S
Metformin HCl	Metomin	500 mg	1233	1.9	S
Glipizide	Minidiab	5 mg	1132	1.7	S
Multivitamins	Healtheries	BPC	1075	1.6	S
Potassium Chloride	Span K	600 mg	975	1.5	S
Warfarin	Marevan	1 mg	889	1.3	S
Calcium Carbonate	Osteo-500	1.25 mg	865	1.3	S
Ibuprofen	I-profen	200 mg	768	1.2	S
Prochlorperazine	Antinaus	5 mg	598	0.9	S
Aspirin	Solprin	300 mg	594	0.9	S
Dexamethasone	Dexamethasone	4 mg	574	0.9	S
Simvastatin	Lipex	20 mg	560	0.8	S
Spironolactone	Spirotone	25 mg	558	0.8	S

S=stat item

of wastage. In this table all dollar values were calculated based upon strength, but combined total data is shown for simplicity.

Discussion

The calculated value of the sample analysed in this study was \$20,475. When extrapolated to include the entire amount returned, this accounts for over \$230,000 a year for the Otago area alone. The most commonly returned tablet was paracetamol accounting for 9% of all tablets returned. The most commonly returned capsule was omeprazole 20mg, accounting for 8% of capsules, additionally omeprazole 40mg accounted for a further 5% of all capsules. It is not unexpected to see such a large volume of paracetamol returned as

patients are regularly issued 720 tablets for a three month period (up to two 500mg tablets to be taken four times a day), and most patients will stop taking analgesics when the pain is less noticeable.

All of the tablets and most of the capsules in the respective top 20 are 'stat' although caution should be exercised about the interpretation, as Pharmac's intention was to increase access to the more commonly prescribed medications.

Paracetamol, simvastatin and omeprazole are the top three prescribed medications based on prescriptions collected, according to Pharmac's Annual Review 2005¹ and so it is not surprising to see that these feature in the most returned tablets/capsules. Omeprazole was the returned

item in a similar campaign run by Central Pharmacy Ltd in Palmerston North (unpublished data).*

One entire box of returned medications was from one individual. The medications in many instances had not been touched and it appeared that repeats were always collected even if not used. This is not surprising as many people think of repeats as an entitlement and something that they have paid for (in terms of tax and also the original dispensing fee) and so many repeats are collected even when the medication is not being used. There are many anecdotes of this kind of wastage, and such an incident was reported previously in the Pharmaceutical Journal,⁶ where four waste sacks full of unused medications were returned to a UK pharmacy

* Susan Judd. The safe and efficient disposal of unused medicines. Interim Report, Nov 2004.

Table 2. Most returned capsules

Generic Name	Trade Name	Strength	Number	% of capsules	
Omeprazole	Losec 20	20 mg	602	7.9	S
Phenytoin sodium	Dilantin	100 mg	565	7.4	S
Doxepin HCl	Anten	25 mg	557	7.3	
Fluoxetine HCl	Fluox	20 mg	480	6.3	S
Gemfibrozil	Gemizol	300 mg	401	5.3	
Omeprazole	Losec 40	40 mg	358	4.7	S
Ketoprofen	Oruvail	200 mg	336	4.4	S
Loperamide	Imodium	2 mg	312	4.1	S
Acipimox	Olbetam	250 mg	275	3.6	S
Mexiletine HCl	Mexitil	200 mg	271	3.6	
Dipyridamole	Persantin	150 mg	222	2.9	
Celecoxib	Celebrex	100 mg	217	2.9	
Doxepin HCl	Anten 10	10 mg	207	2.7	
Tramadol	Tramal	50 mg	200	2.6	
Flucloxacillin sodium	Staphlex	500 mg	186	2.4	
Diltiazem HCl	Cardizem CD	180 mg	144	1.9	S
Loperamide	Dicap	2 mg	130	1.7	S
Phenytoin sodium	Dilantin	30 mg	123	1.6	S
Cefaclor	Ceclor	250 mg	122	1.6	
Cyclosporin	Neoral	25 mg	122	1.6	

S=stat item

after an individual's death. These included 73 x 10mL eye drops, 532 temazepam, 34 tubes of dermivate ointment, 4600 glyceryl trinitrate sublingual tablets and many other items. The calculated cost of this medicine excluding dispensing fees was over £800.

There are some limitations to this study. The medications collected in this period are most likely an underestimate as the returns were unsolicited and many wasted medications are simply flushed down the toilet or disposed of with household rubbish.

The entire box returned from one patient skews our data in terms of doxepin appearing on the most returned capsule list (Table 2). There were 557 doxepin 25mg capsules returned and 469 of them were from one individual.

It would be useful to know why these medications were not used and a further study is being conducted

by these researchers in an attempt to address this issue and to correlate the types of medications returned with the reasons that they were not used. Another aspect is to investigate the other factors that influence prescription writing which may include the prescribers' beliefs that patients require active intervention, and also the expectation of a prescription as an outcome of a medical consultation by some patients and prescribers.⁷ A study into the reasons for medication returns in the UK found prescriber changes made up 48%.⁸ The most likely time for changes in prescribed medications for a patient's condition is in the early phases of the treatment,⁸ and so it may be prudent not to dispense an entire three months' medications when treatment is being initiated.

This is the first published study in New Zealand that has attempted to identify and quantify the medica-

tions that are returned to pharmacies. This is important because there is a high rate of nondispensing of medicines prescribed in general practice⁹ but even when prescriptions are dispensed there is a number of patients who do not continue to take their medications. One study conducted in Auckland showed that after only four days, just 79% of patients were taking their prescription medication.¹⁰ What has not been quantified is the amount of medication that is dispensed and subsequently returned to pharmacies unused, often without prescribers being aware that their patients never take these medications.

Pharmac predicted a close control rate (monthly dispensing of a 'stat' medication at the prescriber or patient's request) of 5% for stat dispensed medications, although reports show that this rate is actually closer to 20%,⁵ indicating that prescribers are still choosing monthly dispens-

Table 3. 20 most returned generic medications by cost

Generic Name	Form	Number	Total Cost (\$)	Cost (%)	
Quetiapine	Tablet	674	1684	8.2	
Omeprazole	Capsule	1079	1100	5.4	S
Sodium valproate	Tablet	2796	1084	5.3	S
Simvastatin	Tablet	1205	672	3.3	S
Salbutamol, ipratropium Br	Inh/neb	18/555	510	2.5	
Heparin sodium 5000i.u./ml	Injection	147	408	2.0	
Risperidone	Tablet	224	401	2.0	
Dexamethasone	Tablet	824	395	1.9	S
Fluticasone propionate	Inhaler	14	358	1.7	
Candesartan	Tablet	295	317	1.5	S
Hydrocortisone	Topical		307	1.5	
Olanzapine	Tablet	43	262	1.3	
Beclomethasone dipropionate	Inhaler	18	258	1.3	
Interferon Alfa-2a	Injection	8	251	1.2	
Itraconazole	Capsule	99	245	1.2	
Paracetamol	Tablet	5153	236	1.2	S
Methyl prednisolone	Injection	28	233	1.1	S
Mesalazine	Oral/rectal	60/32	229	1.1	
Lignocaine HCl	Injection	255	214	1.0	
Metoprolol succinate	Tablet	1058	213	1.0	S

S=stat item

ing for some of their patients. Patients may also find that not all of the medications on their prescriptions are 'stat' and will have to return to the pharmacy monthly for repeats. While 'stat' dispensing of a three month supply may be beneficial for patients on stable long-term medication regimes, prescribers should consider whether it is appropriate for every patient, given the amount of medication wast-

age, the risk of accidental ingestion with large amounts of medications stored in households and consider monthly or 'trial' dispensing when initiating a new therapy.

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Competing interests

None declared.

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