

Limiting the wastage of aseptically prepared medicines on paediatric wards is a priority

Avoiding any medicines wastage is essential when drugs budgets are stretched. Deanna Gilman has assessed the scale of the problem of wastage of aseptically prepared intravenous medicines noted in St. James' University Hospital through an audit for her pre-registration project. She presents her findings and describes the reasons for the medicines wastage.

Introduction

The paediatric pharmacists at St James' University Hospital (SJUH) have reported a considerable amount of waste of aseptically prepared intravenous (iv) medications. Medicines waste is a problem that may be related to a number of factors, including excess supply and over-ordering. When considering ways to reduce a departmental drug budget spend, limiting drug waste may be seen as one of the priorities. The aim of this audit, which was conducted as a pre-registration project, was to identify the following:

- the scale of waste of aseptically prepared products on paediatric wards
- the reasons for this waste.

Method

A protocol was produced detailing the method for data collection on the paediatric wards in SJUH. A data collection form for the audit was designed. Paediatric pharmacists and aseptic staff were informed about the aims and details of the audit. Ward nursing staff were recruited to collect data. An instruction sheet was prepared for all nursing staff informing them how and when to fill in the data collection forms. This was to be done every time an aseptically made iv product was wasted.

The audit was piloted on ward 12, the cystic fibrosis and general paediatric ward,

for a one-week period. No problems were identified from the pilot. Forms were then distributed to all paediatric wards in SJUH for staff to enter data as appropriate.

Data forms were then analysed to determine the number of syringes or bags of iv medicines wasted. The batch number of the product used was recorded on the forms and was used to find the original worksheet from aseptics. This was then used to find the number of doses required originally and the day of the week that the product was made on. Using this information the data collection form was completed to determine the number of vials wasted and the associated cost.

From the total quantity of product that was requested originally it was possible to determine whether the number of appar-

ently wasted syringes or bags was actually waste. By determining the day of the week on which the product was made it was possible to see whether there was a pattern linking the day the product was made and the associated waste.

Because of time restrictions for our study we decided to focus on a sample of wards. These were wards 10 (paediatric oncology), 12 (cystic fibrosis and some general paediatrics) and 5 (general paediatrics). To determine how much of a problem the drug waste was it was necessary to see how much money was actually spent on centralised intravenous additives (CIVA) in the six-week period on these wards. To do this the CIVA log sheets for the six-week period were collected and the cost of each product ordered from wards 10, 12 and 5 was calculated.

Table 1: Common reasons for waste of aseptically made products on wards

Reason for waste	Number wasted	Percentage of total
Stopped	65	39%
Unplanned discharge <24hr	33	20%
Expired	25	15%
Planned discharge >24hr	15	9%
Oral swap	12	7%
Swapped to different IV medication (ward 10 only)	7	4%
No IV access	5	3%
Not on ward	4	2%
Dose Change	2	1%

Table 2. The number of wasted aseptically made products and the day of the week that the product was made

Day of the week product made	Number wasted	Percentage of total
Thursday	35	28%
Friday	35	28%
Tuesday	20	16%
Wednesday	20	16%
Monday	15	12%
Saturday	0	0%
Sunday	0	0%

Results

The reasons for aseptically prepared items being wasted on the three wards during the six-week study period are shown in Table 1. The relationship between the wasted iv products on the ward and the day of the week the product was made in aseptics is shown in Table 2. There was no waste of iv products made on Saturdays and Sundays.

The value of waste estimated for the three wards during the 6-week study period is shown in Table 3. If these data were to be extrapolated to include all nine paediatric wards the mean total cost of waste per annum would amount to £40,000 out of a total of £850,00-worth of products prepared by the aseptic unit.

Discussion

Medicines waste on paediatric wards may be as much as £40,000 per annum (5% of items prepared by aseptics for paediatric wards). The amount of aseptically made drugs that we found to be wasted in our study was relatively small in comparison to the amount of iv medication used on our paediatric wards. When considering the cost of preparing all the iv drugs on the wards using single vials and the potential risks this involves, the small amount of waste appears to be justified. However, it is difficult to assess the cost-effectiveness of

the aseptic service, because in addition to the drug costs, there are many extra costs. These include the cost of disposable materials — such as, gloves, syringes, needles and cleaning materials — staff wages and the costs of running the unit, including energy and equipment.



The preparation of iv drugs on the wards could have the potential to reduce the level of waste. There are positive aspects of drug preparation at ward level. It is

Medicines waste is a problem that may be related to a number of factors, including excess supply and over-ordering. When considering ways to reduce a departmental drug budget spend, limiting drug waste may be seen as one of the priorities.

useful when rapid preparation and administration are required, and it reduces pharmacy labour costs. However, it has disadvantages. A study performed in four hospitals across the UK observed nurses prepare 824 doses, and found that during the preparation of 299 doses the preparation area was never cleaned, hands were not washed, gloves were not worn and vials were rarely swabbed.¹ There is no protection of products from particles and contaminants in the air and there can be dangers to staff, for example if product is cytotoxic. The aseptic service is essential to ensure product sterility and staff safety.

Stopped medication

The main reason for drug wastage on our paediatric wards was through patients' medication being stopped without passing this information to the aseptic staff (Table 1). There appeared to be a lack of communication between the doctors who stopped patients' iv medications on the wards and aseptic staff who prepared the aseptic products. Informing the aseptic staff in advance of stopping these would have prevented the patients' daily doses from being made. This may be further helped by a change in our daily routine. Although the early preparation of iv drugs is essential to ensure everything gets done during the day, it may prove cost-effective to wait for the go-ahead from a pharmacist after the ward round, particularly for those patients who are likely to be stopping or switching to oral medicines, or for the more expensive drugs.

It is important for pharmacists to be alert to the average length of time that patients with specific infections tend to need to take the various iv medication so

Table 3. Money spent and wasted on wards in a six-week period

Ward	Amount spent in 6 weeks	Amount wasted in 6 weeks	Average spent per week	Average waste per week	Percentage waste
10	£17012	£476	£2835	£79	3%
12	£9958	£734	£1660	£122	7%
5	£5763	£351	£960	£59	6%

Original research

We should not aim to decrease costs by reducing the number of products made aseptically, but instead, to reduce the wastage of drugs so that more patients may be treated.

they can inform aseptics of potential or planned stop dates.

Unplanned discharge

Unplanned discharge (with less than 24 hours notice) appears to be another popular reason for wastage of aseptic drugs. In practice patient discharge may occur relatively fast, by which time the daily doses of aseptic products could have already been made. It is important for doctors to inform ward pharmacists or aseptic staff if they



© Alcasamb-Tanzenko / iStockphoto

suspect or plan the discharge of a patient who has been receiving aseptically made iv drugs while in hospital.

Planned discharge

Waste due to planned discharge is more of a concern and should not be happening. For the purpose of this audit, a planned discharge was seen as anyone who was discharged with more than 24 hours notice. It should therefore enable enough time for aseptic staff to be informed and not make the iv medication.

Expired medicines

Table 2 shows that the majority of waste on paediatric wards was derived from products made on Thursday and Friday. This is when products are made in advance for the weekend. Doses for Friday use are made on Thursdays, and those for use on Saturdays and Sundays are made on Fridays. All doses are sent to the wards. If the doses are given in the wrong order, for example a Sunday dose is used before a Friday dose, then it is likely that the Friday dose will expire.

It is clear that this advance preparation is producing waste, which may also be caused by drugs being stopped on a Friday or by unplanned discharges over the weekend. However, this advance preparation service does have many advantages. It saves a great deal of time and it prevents the need for extra weekend work. It also saves money because multiple doses may be drawn up from a vial.

Swapping intravenous medication

It is common practice on the paediatric oncology ward that, if after 48 hours of receiving a medication the patient fails to respond, they are switched to a different medication. Swapping to a different iv medication was a common cause of waste.

Audit limitations

Because of time constraints only three of the nine paediatric wards could be audited and it was not possible to collect data for longer than six weeks. The results are therefore not indicative of spending and waste over a long period of time being based upon data from only 30% of our paediatric wards.

It is likely that there were inaccuracies

with the completion of the data collection forms. This is because we had to rely on nurses being truthful about waste and filling in the forms every time something was thrown away. It is possible that nurses may have been cautious about filling in the forms because they feared the consequences of re-using or wasting iv medication. Poor compliance with filling in the data collection forms would have resulted in inaccurate data, but this was not measured.

Conclusion

In our study we found the proportion of waste to be small considering the amount of iv medications that are made aseptically, which we feel points to an efficient aseptic service. We should not aim to decrease costs by reducing the number of products made aseptically, but instead, to reduce the wastage of drugs so that more patients may be treated. ✚

Deanna Gilman, pre-registration pharmacist, Leeds Teaching Hospital

Reference

1. Mackridge A, Marriott J. When medicines are wasted so much is lost: to society as well as patients. *The Pharmaceut J* 2004; **272**, jan 2004.

Further reading

1. Hotchkies L, Grima DT, Hedayati S. The total process cost of parenteral antibiotic therapy: beyond drug acquisition cost. *Clin Ther* 1996; **18**(4): 716-25.
2. Smith I. Cost considerations in the use of anaesthetic drugs. *Pharmacoeconom* 2001; **19**: 469-81.
3. Department of Health. Policy and guidance available at http://www.dh.gov.uk/PolicyAndGuidance/OrganisationPolicy/FinanceAndPlanning/FinanceArticle/fs/en?CONTENT_ID=4134484&chk=l6AI85
4. Allwood M, Stanley A, Wright P. *The cytotoxic handbook*. 4th Ed, 2002, p35.
5. *LTH Injectable Medicines code*. 1st edition. March 2006

Original research submissions

Students are encouraged to submit their pre-registration project findings for publication in *Pharmacy in Practice*.

Please, in the first instance, however, send a 250 word abstract outlining the main aims of your project and your main findings to the editor at pip@medicomgroup.com.

All submissions will be peer-reviewed before publication, but we are happy to help you with writing your paper if you wish.