Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

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Cost savings from batch production of IV anti-neoplastic treatments

INTRODUCTION

Current practice at Midland Regional Hospital at Tullamore (MRHT):

Anti-neoplastic agents are manufactured after a 'go-ahead' has been given from the ward. This 'go-ahead' is given based on individual patient assessment.

A tray is set up in advance for each anti-neoplastic agent to be compounded. The necessary drug quantity to compound the product is in the tray, i.e. to compound a dose of Oxaliplatin 210mg, 1x200mg vial and 1x50mg vial will be placed in the tray and charged to the patient. This will result in 40mg of drug not being used. For expensive medications (e.g. bevacizumab, cetuximab), the part vials are recycled if deemed safe to do so by the pharmacist in charge of compounding on the day.

The compounding unit can operate most efficiently by manufacturing items continuously, without any lag-time between go-aheads.

Currently at MRHT only azacitidine and bortezomib are batch produced (vials shared between patients). These are only manufactured after a 'go-ahead' has been received. The contents of the vials are shared between patients.

For the purpose of this study *batch production* means manufacturing all doses of the same drug at the same time.

AIM

Hypothesis: Batch production of certain frequently used drugs at MRHT (without waiting for a go-ahead) would improve compounding times and reduce patient waiting times. Would batch production be cost-effective if ROHP had a longer shelf life for products?

METHOD

Seven of the most commonly compounded drugs were chosen for this prospective analysis during three weeks in April/May 2010.

- All patients (except patients known to be unwell) scheduled to receive treatment with a particular drug each working day excluding Tuesdays were identified. Tuesdays were omitted as they are a quieter compounding day.
- Costs of producing the drug using current procedure were calculated.
- Costs of producing the drug using batch production procedure were calculated. Drug volume overages in vials were included in this calculation.
- The cost difference between current practice and batch production was calculated.
- All cancellations on the treatment date were identified. It was assessed if the product could be reused for another patient within its shelf-life. If not the cost of the cancelled product was calculated and the figure subtracted from the cost difference.
- Note;
    a. Products can only be reused for another patient if the dose is the same or higher.
    b. Currently the maximum shelf-life assigned to products is 24hours. The maximum shelf-life used in this study was the physicochemical stability of the product or maximum one week, whichever is shorter.

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RESULTS

Table 1: Savings from batch product of commonly used drugs over a 3 week period.

Drug	Savings with batch production	Cost of cancelled products*	Net difference
Irinotecan	€ 233,00	€ 0	€ 233,00
Oxaliplatin	€ 57,51	€ 0	€ 57,51
Carboplatin	€ 40,20	€ 38,68	€ 1,52
Paclitaxel	€ 160,91	€ 0	€ 160,91
Gemcitabine	€ 133,54	€ 85,58	€ 47,96
Bevacizumab	€ 7390,32	€ 8959,37	€ -1569,05
Cetuximab	€ 3881,89	€ 4153,21	€ -271,32

*Currently drugs compounded in ROHP have a 24 hour shelf life. In this study the maximum shelf life was used.

CONCLUSION

- In the period of the study five of the medicines were more cost-effective by batch production if the shelf life of the product was extended to maximum physicochemical shelf life or seven days (whichever is shorter).

- When excluding patients known to be unwell, using the maximum shelf life and taking into account the extra volumes of drug vials batch production should be considered for the five medicines.

RECOMMENDATIONS

- The ROHP should take steps to increase microbiological shelf life to maximum 7 days.
- Irinotecan, oxaliplatin, carboplatin, paclitaxel, gemcitabine, should be manufactured as batches.
- A study should be undertaken to see how/if batch production would improve compounding times and patient waiting times.

References

1. Shield K. Capacity planning for chemotherapy. Pharm J 2004; 272: 61-64