

# Using an interactive chemotherapy training package to improve patient safety

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**All health-care professionals involved in the use of cytotoxic chemotherapy, if they are to avoid serious harm to patients, can benefit from an interactive training package in the safe use of these drugs. This article discusses a pilot study of a training CD-ROM which was undertaken in a cancer unit.**

### INTRODUCTION

The introduction of clinical governance has made health-care professionals focus on the need for clinical staff to take an active part in reviewing the quality of the service they provide. It also helps to plan ways of improving services. The cultural shift needed to make patient-centred care accountable, safe and of a high quality, and for that care to be delivered in an open and questioning environment, is a challenge to all who work in the NHS.

In recent years there has been a number of deaths in cancer care as a result of the incorrect administration of chemotherapy drugs. Chemotherapy for cancer can be a dangerous treatment in that there is a wide variety of adverse effects, from simple extravasation of drugs to potentially fatal side effects. In addition these drugs have traditionally been given in a variety of settings, from specialist units to general wards or even general outpatients departments. A wide variety of staff demonstrating various levels of competence has been administering them. Guidelines published in the *Manual of Cancer Standards* (Department of Health, 2000) require that such treatments be provided in 'dedicated and suitably equipped areas' by 'appropriately trained staff' using 'guidelines for the prevention and treatment of side effects and implications of chemotherapy'.

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The death of a patient at Queen's Medical Centre, Nottingham in February 2001 (Department of Health, 2001a), following the administration of intrathecal vincristine, has resulted in an internal and an external enquiry. The findings of these enquiries have been circulated nationally to cancer teams in the hope that the recommendation will be implemented widely. One of the suggestions of these enquiries is that only staff trained and deemed competent in the administration of chemotherapy drugs should be allowed to do so.

### CLINICAL SERVICE

The cancer unit at Galen House opened in 2001 following the local implementation of the Calman-Hine report (Department of Health, 1995). One of the Unit's objectives is to centralize local administration of chemotherapy. Before this, patients received chemotherapy in a variety of settings within the Trust.

Within the authors' own practice a problem with medication errors had been highlighted through the clinical incident reporting system. This showed that there were errors both in prescribing of drugs and their administration. The errors tended to cluster at times of high risk for the hospital when new junior doctors arrive and start to practice.

In addition there have been two clinical incidents related to the extravasation of a chemotherapeutic agent given for cancer therapy by untrained members of staff. One (in 1998) was a serious incident leading to the need for plastic surgery, and the other (in 2000) was less serious.

### A POTENTIAL SOLUTION

Having identified a potential risk in the administration of chemotherapy, when the authors were approached to consider piloting an interactive training package for chemotherapy, they realized that it would meet the Unit's identified needs. The package *Safety in the Clinical Use of Cytotoxics* (Buckley and Barrett, 2001) would also complement existing training policies, and would help to meet cancer accreditation standards for training and education of staff. Consequently the cancer team at Princess Alexandra Hospital NHS Trust agreed to pilot a CD-ROM for all staff involved in the administration of chemotherapy. This includes junior doctors, nurses, pharmacists and pharmacy technicians.

### THE INTERACTIVE TRAINING PACKAGE

The North Thames Deanery commissioned this package in 1999 from the Unit for Health Services Development, University of Bath, following an incident at Great Ormond Street Hospital when vincristine was administered incorrectly. An educational grant was obtained from Faulding Pharmaceutical Ltd. The initial writing was undertaken by a team including four pharmacists in the North Thames Region, and subsequently completed and edited by Christopher Barrett, recently Chief Pharmacist at the Royal London Hospitals NHS Trust. The CD-ROM was created by the Commercial and Academic Services Ltd, University of Bath. It is designed to be easy to use, allowing staff to access it whenever they wish. This package is meant to complement the local policies and procedures.

The package is in two parts. The first is an interactive training programme which takes the student through ten activities:

1. Guide to the package
2. Foreword and introduction
3. Principles of chemotherapy
4. Primary anticancer drugs and their use
5. Methods of administration of cytotoxic drugs
6. Hydration guidelines
7. Safe handling and disposal of cytotoxic drugs
8. Problem-solving
9. Extravasation
10. Prescribing chemotherapy and dose calculation.

The second part is a separate formal assessment. In the pilot trial of the package the assessment was carried out locally on the student's computer and the responses sent off for marking on a floppy disc. In the final version, the assessment takes place on a dedicated secure website where the student answers 30 multiple choice questions selected from a database. Various codes and safeguards are in place to ensure the assessment is attributed to the right candidate. The responses are marked automatically and the results of the assessment are sent by e-mail to the candidate. The procedure for processing a candidate's performance can be determined locally, for example it may be a requirement that the candidate copies the e-mail containing the results to the local clinical tutor or other responsible individual.

### LOCAL IMPLEMENTATION

The package was introduced to the unit by the nurse consultant in oncology and the oncology pharmacist at a training day for all staff involved in the dispensing and administration of chemotherapy. This included junior and senior doctors, nurses, pharmacists and pharmacy technicians. The Trust's policies on chemotherapy administration including intrathecal administration, and on extravasation were outlined and staff responsibilities explained. A series of case scenarios were worked through. The training package was introduced to the staff (Figure 1).

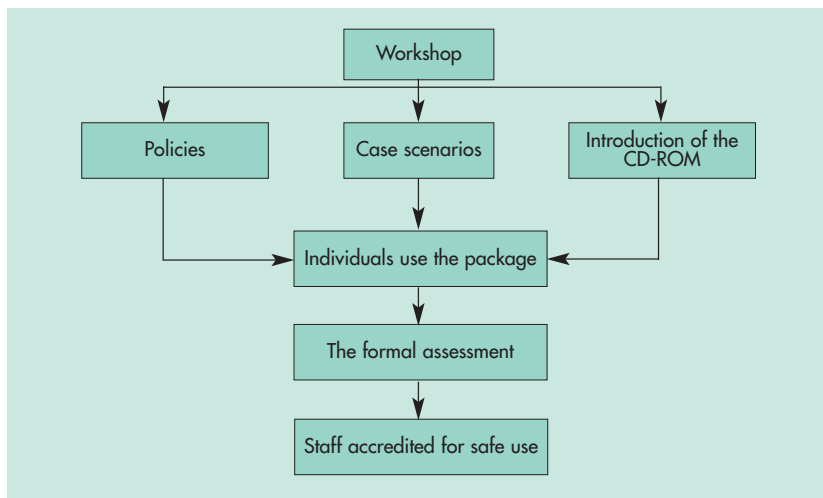


Figure 1. Implementation process.

Subsequently copies of the training package were made available on every PC in the Unit. It is also available in the Unit's Education Centre where it can be accessed by any health-care workers in training.

Each staff member was then asked to undertake the formal assessment. At the time of writing, around 50% had undertaken their formal assessment. All staff were given protected study time to complete the package and the assessment. Any student whose assessment indicates they would have made a serious or fatal error in administration is excluded from real-life administration until they have been retrained and have a satisfactory assessment.

### EVALUATION

All staff involved in the training package were asked to evaluate its use by completing a questionnaire (Table 1). In addition the users were asked to

score the content of the package by section, including the formal assessment. For each section of the package they were asked to score the following five aspects of use:

1. Ease of first access to the package
2. Were the graphics helpful?
3. Was the content easy or difficult to follow?
4. If you left the package halfway through was it easy to re-access?
5. Did you find the revision questions useful?

They were also asked for any general comments about the package. The scoring system was 1 (poor), 2 (adequate), 3 (good), 4 (very good).

### RESULTS

Of those trained 70% (10 out of 15) responded to the questionnaire. Respondents came from the medical,

TABLE 1.  
Evaluation questionnaire

What problems did you have loading the CD-ROM?
Did you find the instructions for the assessment clear and easy to follow?
Would you go back to this package as a reference source for your revision?
How long have you worked in chemotherapy with cancer patients?
Have you had any previous experience of working with cytotoxics?
Were the references and bibliography useful?
Did you require explanations that were not available in the package?
Having gone through the package did you feel adequately prepared to take the assessment?
Would you recommend this training package to colleagues?

'It was a clear and concise package, relevant for junior medical staff embarking on an oncology career'

'Once a clinician has completed this package they would be a safer practitioner'

'It could be used as an excellent teaching resource'

'The graphics on extravasation were particularly compelling'

'I go back to the package again and again to keep myself up-to-date'

Figure 2. Comments from users of the package.

nursing and pharmacy professions. There was a range of experience in cancer care from 1 month to 20 years.

Scoring of the content of the package demonstrated that all found the package good or very good in all sections. One user, however, found the guide to using the package difficult to follow, but this user was very unfamiliar with using PCs.

Among the general comments (Figure 2) from users the following points emerged:

- There needed to be more advice on choosing the correct intravenous access device for safe administration
- Some of the revision questions were found to be repetitive
- In some cases a single answer was expected when in fact more than one response was correct
- The package did not make explicit the checking mechanisms needed before intrathecal administration.

As a result of this pilot, the manufacturer has received detailed feedback of these areas of relative weakness in the package. The manufacturer has agreed to make these modifications before the package is placed on the open market.

### NEXT STEPS

The authors intend to use the package for the induction and education of all new staff in the unit, and for the updating of trained staff in chemotherapy administration. The package is also a

useful teaching resource and members of the unit intend to use it to raise awareness of issues of prescribing, dispensing and drug administration for a wide variety of health-care workers.

### CONCLUSION

The authors' experience of this training package has been very positive. It complemented existing policies in the area of medicines management. Staff described it as a fun experience. Introduction of the package to the unit was good for team building in the unit. The authors consider that such a package makes an excellent complement to practice, but would warn potential users not to think that the training package is a solution to their problems in its own right. The quality of the training experience is dependent on how the package is used in practice. One area of concern in the light of recent adverse events with intrathecal cytotoxics (Department of Health, 2001b) is the lack of teaching about checking procedures in the package. Once this is rectified and the other recommended modifications made by the

manufacturer the authors would highly commend the use of this package in any unit engaged in the administration of cytotoxic agents.

### FOOTNOTE

Since the production of the version used in the trial of the package referred to in this paper, the *National Guidelines on the Safe Administration of Intrathecal Chemotherapy* have been published (Department of Health, 2001b), and to ensure compatibility with the guidelines a number of minor modifications have been made to the package. Changes have also been made as a result of the feedback from the trial and it is expected that the database of questions will gradually be refined as more candidates take the formal assessment. Further information on the development of the training package can be found on the website (<http://www.coacs.com/cyto>). **HM**

Conflict of interest: none.

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### KEY POINTS

- Recent adverse experience in the NHS shows the need for structured training for all staff involved in the administration of chemotherapy.
- Structured training can be a positive experience especially in the team-building.
- This interactive package can enhance local education and training programmes.

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