

THE DEVELOPMENT OF A CAPACITY PLANNING MODEL FOR PHARMACEUTICAL SERVICES TO CANCER PATIENTS

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This article details the steps involved in the development of the capacity planning model for pharmaceutical services to cancer patients used by the Association of Scottish Trust Chief Pharmacists

The Scottish Executive and NHS Scotland have proposed to invest in excess of £50m between 2001 and 2004 to improve cancer services to patients in Scotland. Patient numbers are increasing and it is predicted that there will be a doubling of chemotherapy administration over the next 10 years.¹ This will result in a need to review capacity for all professions to enable them to provide quality cancer services.

“Cancer in Scotland: action for change” sets out areas of change and investment in cancer prevention, rapid diagnosis, treatment and palliative care, staffing, technology and research and development.² There will be capacity implications for both technical and clinical pharmacy services. Business plans and bids to the regional cancer advisory groups (RCAGs) will be required to secure the necessary resources to expand the capacity and to allow the safe, effective delivery of chemotherapy.

In Scotland, there are five cancer centres (Aberdeen, Dundee, Edinburgh, Glasgow and Inverness) and 25 cancer units where certain patient services are being decentralised from the cancer centres to allow patient to be treated closer to their homes. The Association of Scottish Trust Chief Pharmacists (ASTCP) commissioned a subgroup to produce a capacity planning model to assist in planning for present and future workload resulting from any future increase in chemotherapy delivery.

CAPACITY PLANNING

Capacity planning has been used in pharmaceutical services to assess the volumes and types of workload which need to be undertaken within the given timeframes and the resources (staff, facilities, equipment) necessary to meet these workloads.

A need to address the clinical and technical workload associated with the care of

cancer patients was identified to ensure the safe, effective prescribing, preparation and administration of chemotherapy in line with national standards and guidelines.^{3,4}

Capacity planning is required to ensure that clinical risk is minimised and quality patient care is maintained throughout the entire patient journey. For example:

- Response times remain within agreed limits
- Safety standards are not compromised
- Working time directives are complied with
- Excessive pressure is not placed on staff
- Error or defective product rates do not increase

Clinical pharmacy services are essential to minimise risks to the patient. The role of the clinical pharmacist includes prescription verification, patient assessment and preparation of individual pharmaceutical care plans and ensuring appropriate policies, procedures and training are in place.

A working group was set up consisting of pharmacist practitioners from Scottish cancer centres and cancer units as well as practitioners from aseptic services and quality assurance. The group was chaired by a trust chief pharmacist and included pharmacists from the three Scottish cancer regions (North, South West and South East Scotland). The subgroup was asked to develop a tool that would assist in identifying current gaps in cancer pharmacy staff resources both locally and nationally, and ensure that future staffing levels meet the needs of increasing chemotherapy as predicted over the next 10 years. The group discussed current working practices in relation to capacity and also reviewed an existing published capacity planning model,⁵ identified following a literature search.

In order to develop a capacity planning model, current resource and activity levels were identified. These included the skill mix and number of staff available for particular defined tasks as well as an indication of the current workload in terms of patient numbers, prescription items and the pharmacy services provided.

Since there had been no previous work published on clinical pharmacy staffing levels for cancer, the figures to be proposed in the model were discussed by a pharmacy practitioner focus group. Two separate

resource needs were identified. First, there was a requirement for a lead pharmacist position in each trust, unrelated to patient numbers, to take forward service development, guideline and protocol implementation, facilitation of pharmacy cancer networks and education, training and research. It was proposed this would be one whole time equivalent in trusts with a cancer centre and 0.4 WTE in trusts with smaller cancer units. Secondly, the resource needed for direct patient care for inpatients and outpatients was proposed at one WTE per 30 inpatients per day and one WTE per 20 outpatients per day. These figures were discussed by members of the practitioner focus group, who reached consensus based on shared experience of current working practice.

The figures detailed by Purkiss⁵ in his model were discussed and compared with the Scottish capacity planning model for aseptic dispensing (unpublished). There was strong agreement between the two models, therefore the figures in the Purkiss paper were adopted for aseptic dispensing. The figures for dispensary items were revised to take into account the increased complexity associated with dispensing oral cytotoxics.

The proposed figures were developed into a model, which consisted of not only the number of WTEs per activity but also the number of WTEs required if the patient number increased by 100 patients. (The calculations used are available from the authors on request.)

This model was circulated to all trust chief pharmacists in Scotland, who were asked to review and comment upon it.

Each trust submitted its current activity data and staffing levels and these were used by the group to validate the model. The model was modified according to comments received and a spreadsheet was devised to enter the current activity data of all trusts. The spreadsheet calculated the ideal staffing complement according to the model (this included an additional 20 per cent to take into account undercapacity). This was in line with the previously published capacity planning model.⁵ In other words, if full staffing will only reach 80 per cent of maximum capacity due to annual leave, sickness etc, then an additional 20 per cent has to be added to calculate staffing at maximum capacity. The variance between ideal and actual staffing levels was then calculated.

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The revised document was reviewed and approved by the working group and sent to members of the ASTCP along with the calculated staffing requirement. Members were asked to consider if the calculated figures were a true representation of their local situation and to feedback at a scheduled meeting. Since many trusts were already suspected to be working over capacity, the trust chief pharmacists were asked to consider if the calculated deficit was an accurate indication of the staffing required to provide the service at their current activity levels.

The meeting took the form of a presentation, discussion and peer review. Modifications agreed were incorporated into the final document, which was sent to ASTCP members along with the tables of current staffing requirement. The Panel shows the final capacity planning model.

Assumptions made When applying the model it should be noted that the following assumptions were made:

- All chemotherapy items take the same time to prepare — this is known not to be the case but since most aseptic units prepare a variety of regimens of differing complexity, the model is based on an average preparation time (see “Further work” below)
- All inpatients require the same degree of pharmaceutical input (see “Further work” below)
- All patients receive an average of three items per cycle for a total of six cycles for both oral and parenteral prescriptions — this assumption was only used when trying to predict the staffing required for dispensing for an additional 100 patients, not for the current staffing requirement; the clinical pharmacist requirement is based on patient numbers
- All clinical pharmacists provide the same services
- The workload is constant throughout a five-day week

Limitations The model does not differentiate between different grades of staff, patient groups or complexity of preparation of chemotherapy. Local working practice, skill mix, patient population and clinical trial work may require local interpretation of the model, particularly in cancer centres. The model does, however, represent a consensus from the shared experience of cancer centres and units in Scotland and as such can be used generally to calculate capacity requirements.

Further work This model has been used to support bids to increase pharmacy staffing, or reductions in workload, for example, using dose banding to reduce aseptic unit workload. It will also aid in the redesign and planning of future services. Further work to refine the model has been identified by the working group. This will include weighting patient groups and complexity of preparation of regimens according to the pharmaceutical input required and evaluating to establish if this allows a more accurate representation of workload. Most trusts could not supply spe-

Capacity planning model for pharmaceutical services to cancer patients

CLINICAL PHARMACISTS

Cancer centres	Pharmacist lead	1 WTE grade E/F per trust
Cancer units	Pharmacist lead	0.4 WTE grade D/E per trust
	1 WTE/daily activity	WTE required
Inpatients	30 patient episodes/day	1 WTE (per 30 beds)
Outpatients	20 patient episodes/day	0.15 WTE (per 100 additional patients receiving chemotherapy)

ASEPTIC DISPENSING — CYTOTOXIC

	1 WTE/workload (items/year)	WTE required per 100 additional patients
Pharmacists	8,000	0.28
Technicians	5,000	0.43
ATOs	25,000	0.08

DISPENSING — NON-STERILE

	1 WTE/Workload (items/year)	WTE required per 100 additional patients
Pharmacists	30,000	0.07
Technicians	12,000	0.18
ATO	20,000	0.1

PALLIATIVE CARE

	WTE required
Health board area	0.25 WTE grade E lead pharmacist 0.25 WTE grade E pharmacist to lead community pharmacy palliative care network Palliative care network to be established in community
Tertiary care	1 WTE grade D/E pharmacist per 30 inpatient beds 0.5 WTE MTO2 technician per 30 inpatient beds
Cancer centres	1 WTE grade D pharmacist
Cancer units	0.25 WTE grade C/D pharmacist

QUALITY ASSURANCE

	WTE required per aseptic dispensing facility
Pharmacists	0.5 WTE
Technicians	0.5 WTE

cific information as to the oral chemotherapy workload as a percentage of total oral drugs dispensed, thus data will have to be collected to assess the impact of the move to more chemotherapy being given orally.

The palliative care model will be refined in light of the palliative care needs assessments that are being carried out by the unified boards across Scotland, and the Scottish Neonatal and Paediatrics Group will be asked to review and amend the model to ensure that it is applicable to paediatrics. Consideration should be made to reviewing the skill mix and duties of staff involved in oncology to ensure uniformity of roles and grades between trusts.

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