

# Quality improvement report

## Improving the quality of palliative care for ambulatory patients with lung cancer

Christian von Plessen, Aslak Aslaksen

### Abstract

**Problem** Most patients with advanced lung cancer currently receive much of their health care, including chemotherapy, as outpatients. Patients have to deal with the complex and time consuming logistics of ambulatory cancer care. At the same time, members of staff often waste considerable time and energy in organisational aspects of care that could be better used in direct interaction with patients.

**Design** Quality improvement study using direct observation and run and flow charts, and focus group meetings with patients and families regarding perceptions of the clinic and with staff regarding satisfaction with working conditions.

**Setting** Thoracic oncology outpatient clinic at a Norwegian university hospital where patients receive chemotherapy and complementary palliative care.

**Key measures for improvement** Waiting time and time wasted during consultations; calmer working situation at the clinic; satisfaction among patients.

**Strategies for change** Rescheduled patients' appointments, automated retrieval of blood test results, systematic reporting in patients' files, design of an information leaflet, and refurbishing of the waiting area at the clinic.

**Effects of change** Interventions resulted in increased satisfaction for patients and staff, reduced waiting time, and reduced variability of waiting time.

**Lessons learnt** Direct observation, focus groups, questionnaires on patients' satisfaction, and measurement of process time were useful in systematically improving care in this outpatient clinic. The description of this experience can serve as an example for the improvement of a microsystem, particularly in other settings with similar problems.

### Context

Improving the quality of ambulatory care for patients with lung cancer is challenging. Oncologists, who generally have little time available,<sup>1</sup> need to help patients find the right balance between chemotherapy and radiotherapy and supportive care<sup>2</sup> in ambulatory clinics, where the infrastructure and organisation is not adequate to deal with increasingly sick patients who traditionally have been admitted as inpatients.<sup>3</sup> Under such circumstances, effective and timely services are essential to allow for informed patient centred

decisions.<sup>4</sup> Furthermore, the evaluation of system and process changes in this setting is difficult because of interdisciplinary care, complex treatments, and the inevitable deterioration in most patients' medical condition.<sup>5</sup>

In Bergen the outpatient clinic for patients with lung cancer is at the department of thoracic medicine. Each year in this clinic<sup>6</sup> about 150 patients with advanced lung cancer receive chemotherapy and about 300 patients attend for their regular follow up visits at the unit. Chest radiographs are taken at the unit. Blood samples are also taken and analysed at a central laboratory. Results are available through a password protected computer system. Two consultants and three nurses work in the clinic four days a week.

### Outline of the problem

The unit was started in 1995 to reduce costs of ambulatory chemotherapy. Because of their weekly visits for chemotherapy and their need for ancillary hospital facilities and oncological expertise, however, patients became attached to the unit, which became a primary provider of care.

At baseline, neither the infrastructure nor the organisation of our clinic was well designed to meet the task of providing chemotherapy and supportive care. Signals that alerted us of problems included complaints from team members about constant time pressure. Paradoxically, while members of the oncology team constantly felt a lack of time, patients were spending many hours each visit waiting for their chemotherapy. The fact that most of the patients only had a few months to live aggravated the problem of waiting time.

Because of these problems we embarked on a project with the long term goal of improving the palliative care for lung cancer patients at the clinic.

### Key measures of improvement

We defined the following aims for the project:

- Reducing waiting time by at least 30 minutes
- Reducing the waste of time during consultations
- Calming the work situation at the clinic.

### Process of gathering information

Eight patients and six spouses participated in a focus group. All patients had received at least one cycle of

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BMJ 2005;330:1309-13

**Box 1: Methods and key findings during process of gathering information**

Method	Findings
Patient focus group	Waiting time is too long Explanations for waiting time should be given Doctors need to be updated on the patient; otherwise patients feels insecure Information given by different staff members and should not be contradictory Staff availability and time spent with staff are appreciated Furniture in waiting area is uncomfortable Information should be individualised Information should be actively offered Alternative medicine and psychological and nutritional problems should be discussed Direct observation
Direct observation	Nurse has fragmented work situation due to retrieval of laboratory results
"Walking the system"	Waste of time during consultations Difficult to gain overview in electronic patient file Coordination between process at the clinic and the pharmacy causes delays
Flow chart	Process sequence causes delays

chemotherapy at the clinic. The overall question for the group was, "What is your impression of the outpatient clinic?"

To stimulate the discussion we also asked: "What is your best impression?" "What is your worst impression?" "What do you think about the quality of information and communication at the clinic?" "Do team members respond to non-medical problems?" and "Is there anything that has not been mentioned yet?" An external nurse facilitated the group and another nurse documented the conversation.

We designed a questionnaire to measure patients' views sequentially. The questions were based on topics that had been brought up in focus groups. Patients rated their answers on a scale, with 7 being best and 1 worst. For each question we calculated the mean of the maximum achievable improvement—that is, the best obtainable score (7) minus the actual score after the interventions. Then we calculated the actual differences between the mean scores for each question before and after the interventions. Finally, the achieved difference in percentage of the maximum achievable difference was plotted to show achievements of the project and potential for future improvements. Considering the short survival time for patients with advanced lung cancer, we accepted the need to sample different groups of patients before and after interventions.

Discussion, analysis, and planning took place at team meetings held twice a month during the project. Meetings followed a structured agenda; roles of leader, timekeeper, and recorder were designated. Conclusions were recorded in writing, distributed to all team members by email, and made available on the local bulletin board as the "latest news." Staff satisfaction was documented in a focus group that was facilitated by an external nurse.

We created a flow chart after walking through the relevant hospital units, observing colleagues at work and following the patients' progress through the system. CvP observed the processes, and the observations were discussed in the team meetings. The nurse at the clinic registered waiting time, which was defined as time from registering at the front desk until chemotherapy was started.

**Analysis and interpretation**

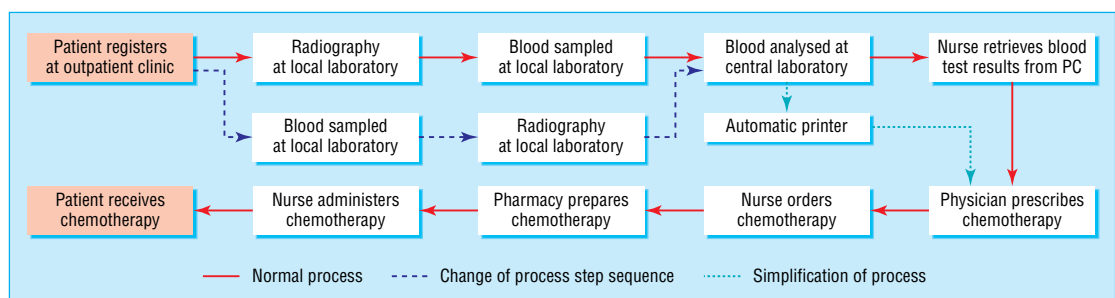
Waiting time was a concern for patients and their families, and many patients often felt physically uncomfortable in the waiting area, particularly those with pain from bone metastases. Team discussions and direct observations showed that nurses often had to interrupt other tasks to check the computer for results of blood tests. These repeated checks added up to considerable amounts of time and fragmented work, particularly as nurses had to log on to the computer each time. On a busy day the nurse might need to look up results as many as 10 times during one hour.

Considerable time was used during consultations to get an overview of the patient's status and earlier treatment in the electronic file. In the focus group, patients mentioned that they felt insecure in these situations (box 1). Furthermore, uncertainty about the number of chemotherapy cycles had resulted in near errors and occasionally manifest errors.

**Strategy of change**

Box 2 shows an overview of the changes implemented. The flow chart (fig 1) suggested that patients could have their x ray pictures done while they waited for laboratory results. We also found that by installing a network printer in the doctor's office the results of blood tests could be printed automatically as soon as they were available in the laboratory, thus reducing the number of steps in the process and freeing up nurses' time.

We also found that the time required to prepare chemotherapy drugs for administration (pharmacy time) varied considerably depending on the time of



**Fig 1** Movement through outpatient clinic for patient with lung cancer

<p><b>Before</b>                  Scheduled appointment for non-small cell lung cancer. A computed tomogram done in December 2001 showed progression of the tumour in the lung and metastasis to mediastinal and axillary lymph nodes. Thus the disease is considered stage IV and he started chemotherapy with carboplatin-vinorelbine for the first time in February.                  He is feeling generally well but still has pain in the chest, mainly during the night, nearly every day. The pain is alleviated by two tablets of paracetamol. Furthermore, he has pain paravertebrally in the back. Acupuncture had alleviated the pain. Furthermore, he has experienced increasing dysphagia during the past two months; during the past two weeks he has had pain when swallowing meat. His body weight has been stable.                  The patient is in a good general condition; the paravertebral muscles are painful on palpation. No palpable tumour in the armpits.                  Blood tests today: creatinine 90, leucocytes 6.7, haemoglobin 9.7, platelets 293. Normal liver function tests.                  Assessment/next steps: order extended work up with x ray oesophagus, bronchoscopy, eventually gastroscopy. Today he receives his second course of first line chemotherapy following schedule (carboplatin, 850 mg, vinorelbine, 55 mg), next appointment in a week.</p>										
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Clinical study	1st line chemotherapy	2nd line chemotherapy	Performance status	Weight (kg)	Hb	Platelets	Leucocytes	Creatinine	Drug	Dose (mg)
No	2nd course	-	1	82	9.7	293	6.7	90	Carboplatin	850
									Vinorelbine	55

Fig 2 Before and after example of a patient's notes showing use of standardised table to simplify presentation

day. A visit to the hospital pharmacy showed that chemotherapy orders arriving before 10 am could be completed within less than an hour, while later orders had to be postponed. To avoid unnecessary delays for drug preparation, we therefore scheduled patients for chemotherapy earlier than previously and ordered drugs early in the consultations, postponing talks and questions until later in the day.

To increase clarity of the patient's file and save consultation time, the number of cycles of chemotherapy, haematological parameters, weight, World Health Organization performance status, and dose were reformatted in the electronic record in tabular form (fig 2). Physicians dictated their notes by following the structure of this table.

To improve patients' understanding of their progress through the hospital, we wrote an information leaflet that explained the organisation of the clinic and reasons for possible delays. The leaflet also lists team members with contact information. It was produced locally and can easily be updated.

Initially, the clinic had a consultation room, a chemotherapy room, and a hallway. We opened a separate and more convenient room for talks with patients and families. Comfortable sofas that would allow patients to lie down were put in the waiting area.

The head of the department was kept informed. From the beginning the laboratory and the information technology department were involved in planning changes. CvP dedicated one day a week for three months to the project.

### Effects of change

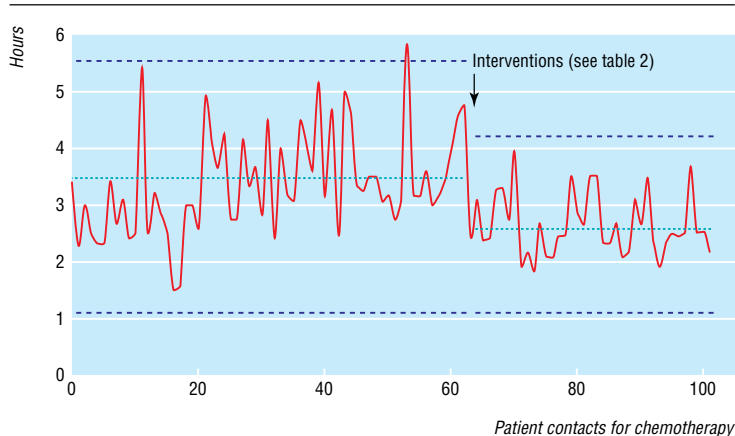
Measurements before and four months after interventions showed that absolute waiting time was reduced by nearly an hour and variation in waiting time had also decreased (from a mean of 3 hours 23 minutes (range 2 hours 19 minutes to 5 hours 42 minutes) to 2

hours 38 minutes (1 hour 32 minutes to 4 hours 10 minutes)) (fig 3). The reduction in waiting time seemed to be due to a combination of rescheduling appointments and simplifying the care process by installing a network printer.

Twenty six patients completed the questionnaire the first time and 28 at the follow-up six months later, and five participated in both surveys. The mean score of patients' general satisfaction with the clinic before and after the interventions was 6.0 and 6.2, respectively. Figure 4 shows the patients' perceptions of the improvement of different aspects of the service as measured with the questionnaire: facilities at the clinic (51%), clarity of medical information (44%), organisation of the clinic (38%), opportunities to talk about non-medical problems (35%), orientation about the organisation of the clinic (12%), and the amount of information (10%). The least change was

### Box 2: Overview of problems, improvement principles, and interventions

Problem	Improvement principle	Intervention
Waiting time too long	Rearrange steps of process	X ray pictures taken during laboratory analysis time
	Reduce number of process steps	Network printer installed at physicians office
	Coordinate with other units of system	Rescheduling of patient appointments
Patient not aware of reason for waiting time	Explain processes of care	Local information leaflet
Fragmented work situation	Reduce number of process steps	Network printer installed at physicians office
Waste of time because of difficulty in gaining up to date information during consultations	Simplify presentation of information, use potential of information technology	Tabulate crucial patient information in electronic file



**Fig 3** Time from registration at the outpatient clinic to start of chemotherapy. Time measurements were plotted as a run chart. Control limits (dotted blue lines) were calculated as: upper/lower control limit=mean waiting time±(2.66×average point to point variation—that is, moving range). Dotted green lines represent average waiting times

**Key learning points**

Actively seeking feedback from patients in focus groups created ideas and momentum for improvement of this clinical microsystem

Observation, analysis, and illustration of the processes of care revealed interventions for improvement

Waiting time was reduced significantly and reliably by simple changes of scheduling and rearrangement of process steps

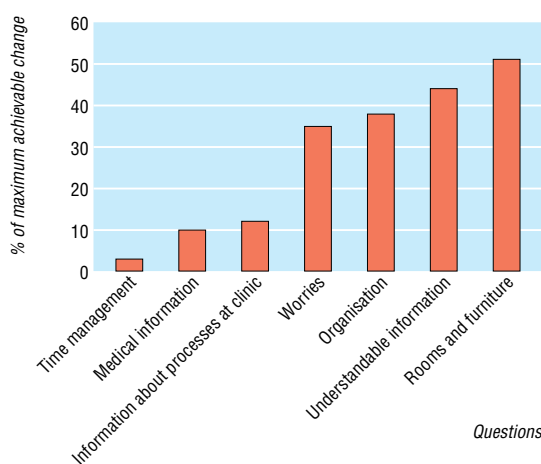
Clarity of medical information was improved by tabulation within existing electronic patient file

found in patients' perception of time management by members of staff (3%). Time management also scored lowest in questions before interventions with a mean score of 5.1, while all other questions scored above 5.4.

A focus group meeting with team members at the end of the project showed that the working situation was more relaxed, allowing for better communication with patients; work had become more interesting because of the broader approach to treatment; and patients' records were easier to interpret. Physicians, however, found that routine procedures were still too time consuming.

**Next steps**

So far we have improved time management, work flow, the physical space at the clinic, and the documentation in patients' files. Having achieved this degree of improvement, we will incorporate more complex measurement dimensions into routine clinical practice.<sup>7</sup> Beyond patients' satisfaction and assessment of process, we will also incorporate medical (symptom



**Fig 4** Improvement in patients' views expressed as percentage of maximum possible change in score

control, mortality) and functional (time spent at home) outcomes and an assessment of cost. For this purpose, we have begun to use the Edmonton symptom assessment system.<sup>8</sup> Such a balanced combination of measurement dimensions has been called clinical value compass.<sup>9</sup>

Reductions in waiting time seemed to be due to a combination of rescheduling patients' appointments and simplifying the care process by installing a network printer. Unfortunately, it was difficult to disentangle the influence of these two factors as they were introduced at the same time. Moreover, increased motivation of team members in the early phases of the project and enhanced awareness of process probably also contributed to the improvements. Increased motivation may, of course, wane with time, although precise knowledge about effective interventions may help to maintain enthusiasm and the gains. We plan to improve future measurements of change by restricting interventions to a single factor while performing repeated measurements.

While the changes were successful within the clinic, shortcomings of linkages to other units and the need for coordinating support from leadership in the hospital became obvious during the course of the study.<sup>10</sup> Next steps in the improvement of the service will cover handovers between the outpatient clinic and other units and between different levels of care in the community.<sup>11</sup>

In the course of the project, we recognised that we often did not know when our patients had died and that we lacked opportunities to cope with our feelings of loss. Thus we established a monthly team meeting to talk about patients who had died and to reflect about their time at the clinic.

In summary, we addressed generally relevant aspects of outpatient oncology care for outpatients, such as waiting time, flow of patients, design of waiting areas, and documentation of chemotherapy. Feedback from patients and measurement of their views and the performance of process drove the changes. The novelty of the quality improvement approach was welcomed by patients and staff as a way to change the system.

We thank Frank Davidoff for his constructive reviewing of the manuscript, Gene Nelson for contributing ideas, Kerstin von



Plessen for detailed comments, and Alf Andreassen for supporting the project in the department of thoracic medicine.

Contributors: CvP developed the project, wrote the paper, and is guarantor. AA guided the design of the project and reviewed the manuscript.

Funding: The project was supported by the Quality Improvement Fund of the Norwegian Medical Association. The Norwegian Heart and Lung Foundation sponsored new furniture for the waiting area at the clinic.

Competing interests: Astra-Zeneca, GlaxoSmithKline, and Boehringer have supported CvP to attend conferences on thoracic medicine. He is currently investigator in clinical studies initiated by AstraZeneca and Ely Lilly. AA has received funding from the Norwegian Cancer Society and Medirad.

Ethical approval: The protocol was presented to the local ethical research committee and a formal review was not deemed necessary.

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(Accepted 2 March 2005)

## A memorable patient

### The giggly girl

To prepare for the short cases of the MRCP examination, candidates often seek the help of their successful predecessors, usually registrars or senior registrars, who select patients agreeable to being examined. That was how I met the "giggly girl."

"You'll find Susan in the day room," the registrar said to me. "She's a friendly sort and will let you examine her. Look at her optic fundi and tell me what you think."

I walked down the ward and introduced myself to Susan, a cheerful young woman in her 20s. "May I examine your eyes?" I asked.

"Of course, doctor," she replied, and gave a little laugh. Although I had been asked to examine only the fundi, I thought a quick review of the cranial nerves, including visual acuity and fields, might help. I detected no abnormality, and, adjusting my ophthalmoscope, I bent down to look into her eyes.

That was when I felt her shoulders quiver and heard a sound. I stepped back sharply, thinking that she had started to cry; but no, she was giggling. I was embarrassed and wondered if there was something in my appearance or demeanor that had amused her. "I'm sorry, doctor," she said, "please go ahead." As I tried again, I heard the sound once more, but this time more of a guffaw. I stood up, slightly irritated, not quite knowing what to do.

"I'm so sorry, doctor," she said again, "I sometimes can't help myself. I'll really try to keep quiet." This time she did remain still, and I saw that she had pearly white optic discs in both fundi. I thanked her, and, as I was leaving, I again heard her giggle. I also thought that there was something a little odd about her speech, but I could not tell what it was.

I returned to find the registrar putting away a chart. "Well," he said, "what did you find?"

"The patient has optic atrophy," I responded, being careful to avoid any mention of primary or secondary.

"Good," he said, "and what are the causes of primary optic atrophy?" As I listed the causes, carefully memorised, I knew what his next question would be.

"What do you think is wrong with Susan?" I hesitated, and he went on: "What if I reminded you

that she is a young female?" That's when things suddenly fell into place.

"She could have disseminated sclerosis," I said.

"Yes," he replied, "that's what we think she has. I know you didn't spend long with her, but if you had, you would have observed the abnormality that is described as scanning speech." So that's what it was. "If you are examined on a patient with optic atrophy," he continued, "try not to get drawn into a discussion about differentiating between a primary and a secondary optic atrophy. It's very difficult. You did just fine."

I thanked him for his time, and he remarked "Did you notice anything curious about her affect?"

"Well," I said, "she giggled quite a bit, and had difficulty in staying still. In fact—though I would never admit this to a real examiner—I was slightly irritated with her."

"I'm not surprised. She manifests the euphoria that is characteristic in some patients with disseminated sclerosis. Poor girl, I don't think she appreciates the seriousness of her illness, and perhaps it is just as well."

A few years later, on my first day as staff physician in a general medicine unit, I was introduced to a middle aged patient in a wheelchair. He welcomed me enthusiastically and expressed the hope that I would enjoy working at the hospital. I thanked him, and when we were out of earshot, I asked his nurse what was wrong with him. "Why," she replied, "He has advanced multiple sclerosis. But he's always so happy."

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