Evaluation of Hospital Care in a Radiotherapy Department in North-eastern Italy

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Assessment of the quality of care and patients' satisfaction has become an increasingly needed area of research. The present study investigated various qualitative and quantitative aspects of provision of care and interaction between cancer outpatients and medical and nursing staff within a radiotherapy department in Pordenone, north-eastern Italy. A total of 368 outpatients were contacted: 258 completed the questionnaire (response rate 70%). No difference emerged between respondents and non-respondents as concerning age, sex, marital status, clinical stage, cancer type and reason for referral. Significant differences were found for education and type of work, white collar and better educated patients being more frequent among respondents. Most of the patients reported good or very good levels of satisfaction with major aspects of care provision and relationship with medical and nursing staff. Length of time spent in various administrative procedures, cost of the therapy and change of attending physician in different examinations were the issues commented upon relatively less favourably. Reported waiting time for each medical examination exceeded 1 hour in approximately half of the patients. Improvement in hospital services constituted the priority, according to male patients. Public transportation concerned most women's and elderly patients' attention. Among elderly patients, the need for better provision of care at home was also deeply felt.
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INTRODUCTION

THE ASSESSMENT of the quality of care and patients' satisfaction has become an increasingly needed area of research [1]. Special attention has been paid to whether variations in patient outcome can be explained by differences in various aspects of care, and to the development of simple and reliable tools for the systematic monitoring of patients' perception of medical assistance [2–5]. Generally, the aim is the improvement of health services and supplies, not only as concerns the medical standards of hospital care [6, 7], but also in the quality of interaction between physicians and patients.

The need for careful assessment in the field of cancer is especially strong, either by hospital staff and community physicians [1], on account of the especially heavy burden that cancer and its related treatments cause, from a human and financial viewpoint, to patients, their families and society as a whole [8–10]. A few studies have already addressed the issue of quality of care and satisfaction among cancer patients, reaching different conclusions [11–16].

The present study has been undertaken in order to evaluate various qualitative and quantitative aspects of provision of care and interaction between cancer outpatients and medical and nursing staff within a radiotherapy department in Pordenone, North-eastern Italy.

SUBJECTS AND METHODS

From January to August 1987, 368 consecutive cancer outpatients, who were referred for last cycle of radiation treatment

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or follow-up to the radiotherapy department of Pordenone General Hospital, were contacted by one of three nurses at the end of the medical visit. Instructions on how to fill the questionnaire and use the visual analogue scale when back home were given to all patients, and a prepaid reply envelope was provided. The importance of their participation and the strictly confidential management of their answers were stressed. The three nurses were pilot-trained, in order to avoid internurse variability in the instructions, particularly as concerns the understanding of the visual analogue scale.

The questionnaire included 30 items. The setting-up of the questionnaire preliminarily required identification of aspects of health care most relevant to cancer patients, and a test in a small sample of patients of the understandability of questions and visual analogue scale. Visual analogue scale consisted of a single horizontal line (100 mm in length) with polar-opposite statements (i.e. never or not at all as 0, to very much or very frequently as 100). Visual analogue scales were chosen because, besides being reportedly efficient in discriminating patients' level of satisfaction, they do not contain numbers or word descriptors, and therefore, ambiguities should be avoided [13, 17–19].

All patients were asked to indicate their opinion by placing a vertical mark on the visual analogue scale and scores were derived by measuring, in millimetres, the distance between the mark and the 0 point of the scale (range 1–100). Sociodemographic and clinical information including age, sex, type of diagnosis, clinical stage, performance status and past or current treatments were separately derived from the patients' clinical chart.

The present investigation offered also the opportunity to assess the new *Guidebook for Cancer Patients*, which was meant to provide information on the type of treatment offered in the radiotherapy department and its related side-effects, together with some advices on how to cope with them.

All questionnaire replies were also analysed separately according to patients, sex, age ($\leq$ 54; 55–64; $\geq$ 65 years) and reason for referral (therapy/follow-up). Standard χ^2 tests for linear trend [20] were used to evaluate differences between proportions. On account of the particular distribution of questionnaire replies, we performed the statistical analysis using both Student's t test and a non-parametric test to compare mean values [21]. Since the two tests achieved very similar results, the t test was chosen for presentation.

RESULTS

368 cancer outpatients were contacted and, among them, 258 completed the questionnaire, yielding a response rate of 70%. No differences emerged between respondents and non-respondents (Table 1) as concerns age (mean age 57.6 and 58.2, respectively), sex, marital status, clinical stage, cancer type, months elapsed since first diagnosis and reason for referral (therapy or follow-up). Significant differences, however, were found as concerns years of education (mean 6 and 5, respectively, for respondents and non-respondents), and type of work, white collar work being more frequent among respondents. Among men, most frequent cancer sites were lung (42%), genitourinary tract (18%), head and neck, and gastrointestinal tract (12%). Among women, they were breast (56%), genitourinary tract (21%) and lymphatic system (8%).

Table 2 shows patients' replies to questions relative to their interaction with physicians and nurses outside the hospital. About 96% of the patients reported that their general practitioner was aware of cancer diagnosis and treatment, and the vast majority (90%) stated that they considered the interaction between specialists and general practitioner very important. Only 3% of respondents habitually needed nurse assistance at home, at their own expense. Significant differences according to age and reason for referral to hospital were noticed as concerns behaviour in case of emergencies. Two thirds of younger patients (i.e. $\leq$ 54 years) would have been referred to the radiotherapy department staff, compared to 35% of those aged 55–64 and 33% of those 65 or more. As expected, a higher proportion (54%) of those still under therapy would have been referred to the radiotherapy department staff as compared to patients in follow-up (38%) (Table 2).

Table 3 shows the average length of time reportedly spent in the waiting room in relation to selected characteristics. Significant differences were found between patients still receiving therapy and on follow-up. 60% of patients on follow-up vs. 22% of patients still under therapy reported to wait, on the average, more than an hour and a half. Conversely, no difference in waiting time emerged in respect to performance status (Table 3).

Sex and age turned out to affect significantly the chief concerns addressed by patients to the health organisation (Table 4). The highest proportion of males (50%) considered improvement of hospital services the most important issue, while among females, the majority considered better transportation to and from the hospital the issue with highest priority. Among elderly patients (i.e. those 65 years or more) improvement of home care services was also often indicated as the most important problem (27%).

Figure 1 shows levels of patients' satisfaction according to selected hospital facilities. The mean score of satisfaction was particularly elevated (mean score 60) as concerns compatibility of medical time schedules with personal and family engagements, waiting-room comfort, help by physicians and nurses in the use of hospital facilities and help given by the *Guidebook for Cancer Patients*. Intermediate scores (mean score below 50) were

Table 1. Sociodemographic and clinical characteristics according to response to the questionnaire in 368 cancer outpatients

Characteristic	Respondents ($n=258$)	Non-respondents ($n=110$)
Area of residence		
Pordenone province	108 (42)	39 (35)
Other provinces	150 (58)	71 (65)
Sex		
Male	111 (43)	53 (48)
Female	147 (57)	57 (52)
Age (yr)		
$\leq$54	92 (35)	46 (42)
55–64	90 (35)	37 (33)
$\geq$65	76 (30)	27 (25)
Marital status		
Single	27 (10)	7 (7)
Married	198 (77)	84 (76)
Widowed, separated	33 (13)	19 (17)
Occupation		
Clerical–professional	59 (23)	10 (9)
Manual worker	126 (49)	65 (62)
Housewife	71 (28)	30 (29)*
Education (yr)		
$\leq$4	55 (28)	23 (29)
5–7	86 (44)	45 (57)
$\geq$8	54 (28)	11 (14)*
Cancer type		
Head and neck	18 (7)	10 (9)
Gastrointestinal	20 (8)	17 (15)
Lung	51 (20)	19 (17)
Breast	88 (34)	35 (32)
Genitourinary	51 (20)	14 (13)
Lymphomas	20 (8)	12 (11)
Other	10 (3)	3 (3)
Performance status (Karnofsky)		
90–100	183 (72)	81 (74)
$\leq$ 80	72 (28)	29 (26)
Stage		
I–II	130 (51)	54 (50)
III–IV	124 (49)	52 (50)
Months elapsed since diagnosis		
$\leq$ 5	83 (32)	37 (33)
6–11	78 (30)	29 (27)
$\geq$12	97 (38)	44 (40)
Reason for referral		
Therapy	99 (38)	41 (37)
Follow-up	159 (62)	69 (63)

No. (%).
Some figures do not add up to the total because of missing values.
*As compared to the respondents' group, the difference was significant ($\chi^2_2 \geq 6.45; P < 0.05$).

obtained as concerns time wasted in various hospital admission procedures and costs of the therapy. Difficulties in finding the laboratory services in the hospital were very seldom a matter of concern (mean score 10). Significant differences emerged when considering analogue scales according to sex, age and reason for referral. Elderly patients reported to have more difficulties in finding laboratory services as compared to younger ones (Fig. 1). Women reported more difficulties than men as concerns hospital admission procedures. Patients receiving therapy found the *Guidebook* more useful than those attending for follow-up.

Interaction between medical and nursing staff and cancer patients are shown in Fig. 2. In general, the performance of

Table 2. Interaction with general practitioner and nurses at home

Question	Sex		Age (yr)			Reason for referral	
	Male	Female	≤ 54	55–64	≥ 65	Therapy	Follow-up
GP knowledge on health status							
No	3 (3)	6 (4)	2 (2)	4 (4)	3 (4)	4 (4)	5 (3)
Yes	105 (97)	141 (96)	89 (98)	86 (96)	70 (96)	93 (96)	153 (97)
Importance of GP–hospital staff communication							
No	8 (7)	14 (10)	10 (11)	8 (9)	4 (6)	9 (9)	13 (8)
Yes	100 (93)	132 (90)	81 (89)	81 (91)	69 (94)	87 (91)	145 (92)
Nurse help at home							
No	104 (97)	142 (97)	88 (98)	88 (98)	69 (95)	92 (96)	154 (97)
Yes	3 (3)	5 (3)	2 (2)	2 (2)	4 (5)	4 (4)	4 (3)
Place of referral in case of emergencies							
First aid	18 (17)	8 (5)	6 (7)	12 (14)	8 (11)	10 (10)	16 (10)
GP	47 (44)	69 (48)	30 (33)	44 (51)	41 (56)	34 (36)	82 (52)
Radiotherapy staff	42 (39)	68 (47)	55 (60)	31 (35)*	24 (33)*	51 (54)	59 (38)*

No. (%).
Some figures do not add up to the total because of missing values.
* As compared to first column, the difference was significant ($\chi_2^2 \geq 7.00$; $P < 0.05$).
GP = general practitioner.

medical visits was not considered too frequent. Elevated levels of satisfaction (mean score above 70) were reported in respect to information on health status, help from nurses and technicians, particularly as concerns younger patients and patients still undergoing therapy. Lower levels of satifaction (mean score 50), emerged in respect to the habit of changing the attending physician from one clinical examination to another.

DISCUSSION

The present study shows that the majority of cancer patients in Italy is willing to express opinions about various aspects of the assistance experienced in the hospital during treatment and follow-up. Although a few objective measurements may suggest otherwise (i.e. waiting time greater than 1 hour in 48.5% of cases), they generally report good or very good levels of satisfaction with major aspects of care provision and relationship with medical and nursing staff. Issues on which patients' opinions are relatively less favourable include the length of time spent in

Table 3. Average waiting time according to performance status and reason for referral

Characteristic	Waiting time (min)					
	≤ 29	30–59	60–89	90–119	≥ 120	Total
Performance status						
90–100	15 (9)	20 (12)	58 (35)	24 (14)	49 (30)	166
≤80	3 (5)	10 (16)	16 (26)	12 (19)	21 (34)	62
Reason for referral						
Therapy	15 (17)	23 (26)	31 (35)	7 (8)	13 (14)	89
Follow-up	4 (3)	7 (5)	45 (32)	29 (20)	57 (40)*	142

No. (%).
Some figures do not add up to the total because of missing values.
* As compared to first row the difference was significant (χ_1^2 for trend = 6.56, $P = 0.01$).

various administrative procedures, the cost personally sustained for treatment and the frequent change of the attending physician in different examinations.

As concerns different levels of satisfaction according to patients' characteristics, some complaints about time losses were especially reported by males, whereas help from medical and non-medical staff was relatively more often acknowledged by patients still undergoing radiotherapy as compared to those in follow-up. Other differences worth noting concern the improve-

Table 4. Chief request according to selected characteristics

Characteristic	Chief requested improvement			
	Home care	Transport	Hospital services	Total
Sex				
Male	11 (11)	38 (39)	49 (50)	98
Female	28 (20)	67 (47)	47 (33)*	142
Age (yr)				
≤54	9 (11)	40 (47)	36 (42)	85
55–64	11 (13)	35 (42)	38 (45)	84
≥65	19 (27)	30 (43)	21 (30)*	70
Performance status				
90–100	26 (15)	78 (46)	66 (39)	170
≤80	11 (16)	27 (40)	29 (44)	67
Stage				
I–II	18 (15)	55 (45)	49 (40)	122
III–IV	21 (18)	48 (42)	45 (39)	114
Reason for referral				
Therapy	16 (17)	44 (47)	33 (36)	93
Follow-up	23 (16)	61 (41)	63 (43)	147

No. (%).
Some figures do not add up to the total because of missing values.
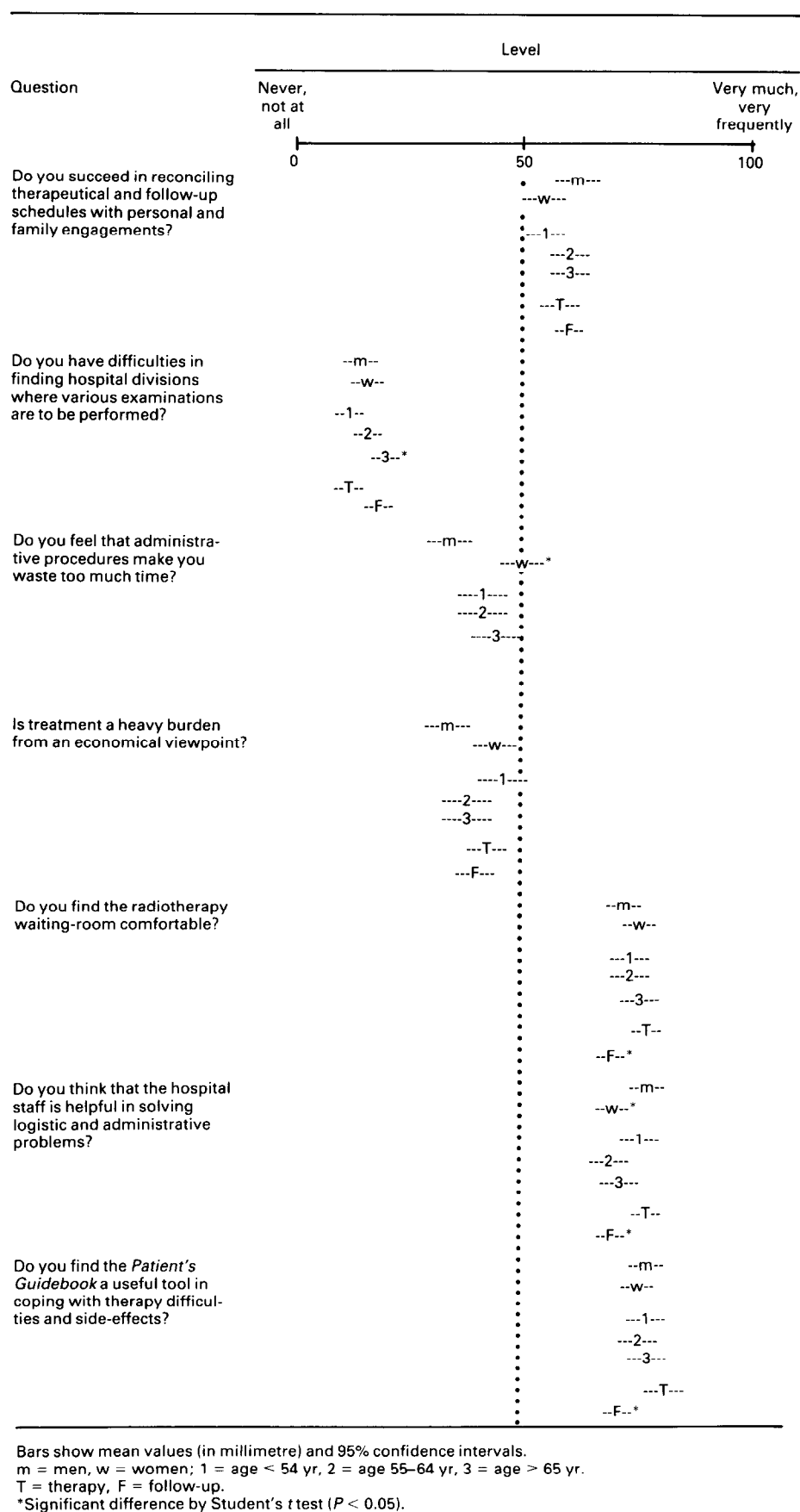* As compared to first row the difference was significant ($\chi_2^2 \geq 7.56$, $P < 0.05$)

Level

Question	Never, not at all		Very much, very frequently

0   50   100

Do you succeed in reconciling
therapeutical and follow-up
schedules with personal and
family engagements?

    ---m---
---w---
---1---
  ---2---
  ---3---
 ---T---
  --F--

Do you have difficulties in
finding hospital divisions
where various examinations
are to be performed?

--m--
--w--
--1--
--2--
  --3--*
--T--
 --F--

Do you feel that administra-
tive procedures make you
waste too much time?

---m---
---w---*
----1----
----2----
----3----

Is treatment a heavy burden
from an economical viewpoint?

---m---
---w--
----1----
----2----
----3----
---T---
---F---

Do you find the radiotherapy
waiting-room comfortable?

--m--
--w--
---1---
---2---
---3---
--T--
--F--*

Do you think that the hospital
staff is helpful in solving
logistic and administrative
problems?

--m--
--w--*
---1---
---2---
---3---
--T--
--F--*

Do you find the *Patient's
Guidebook* a useful tool in
coping with therapy difficul-
ties and side-effects?

--m--
--w--
---1---
---2---
---3---
---T---
--F--*

Bars show mean values (in millimetre) and 95% confidence intervals.
m = men, w = women; 1 = age < 54 yr, 2 = age 55–64 yr, 3 = age > 65 yr.
T = therapy, F = follow-up.
*Significant difference by Student's *t* test ($P < 0.05$).

Fig. 1. Level of satisfaction as concerns various aspects of care provision.
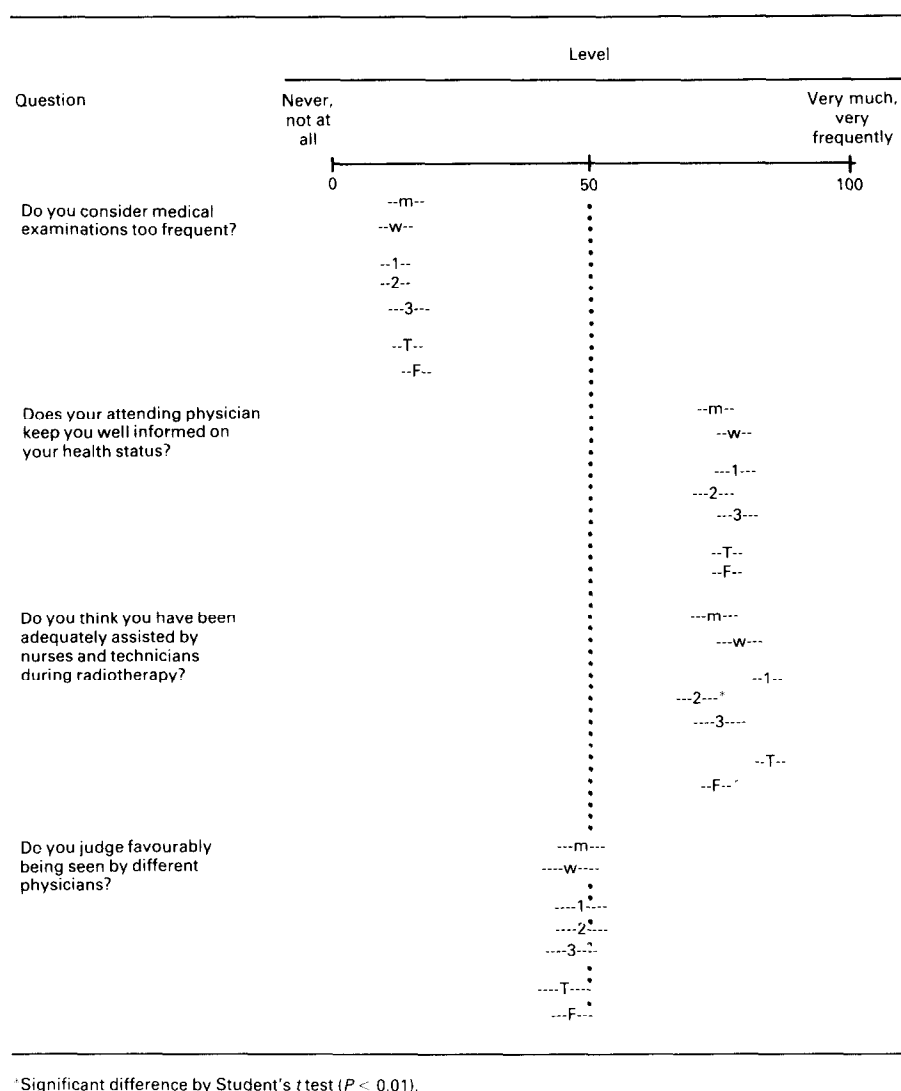
Fig. 2. Levels of interaction with hospital staff.

*Significant difference by Student's t test (P < 0.01).

ment most needed in the patients' opinion: whereas improvement of hospital services constitutes the priority among males, public transportation most concentrate women's and elderly patients' attention. Among the elderly, the need for better provision of care at home is also deeply felt.

Not many studies have assessed systematically cancer patients satisfaction [11–15]. One study [12] showed evenly moderate levels of satisfaction from different items of quality of care, while in others [11, 13] higher levels of patient satisfaction for provision of care and lower levels for information concerning illness and treatment were reported. Some differences in results may well derive, however, from sociocultural differences between study populations and non comparability of chosen measurements.

Several weaknesses of the present investigation are worth mentioning. Non-respondents (30% of patients initially contacted) may have evaluated care less favourably than those who did respond to the questionnaire [22]. Another common cause of overestimation of patients' satisfaction is an excess of positively worded items in the questionnaire (acquiescence response bias) [22]. Since, however, in the present study good opinions emerged for both positively worded and negatively

worded items, we suspect that the determinants of high levels of satisfaction may be of a different nature. Dissonance between positive judgements relative to interpersonal relationship with providers of care and less positive ones as concerns organisational aspects of care (herein queuing, time loss and financial cost) have already been shown in other investigations [23–25] and, particularly, in one carried out in Italy [14]. The apparent contrast has been interpreted in terms of predominance of interpersonal relationship over technical attributes as key determinants of satisfaction. We think, however, that at least the very prolonged waiting time (mean 83 minutes), even among patients in relatively poor condition, and the complaints about cost of treatment in the context of a theoretically free National Health System such as Italy's, deserve to be investigated and possibly, urgently ameliorated.

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Chemosensitivity Testing with Highly Purified Fresh Human Tumour Cells with the MTT Colorimetric Assay

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A major problem associated with the succinate dehydrogenase inhibition (SDI) test using tetrazolium dye (MTT) as a cancer chemosensitivity testing is the contamination of non-malignant cells in the tumour tissues. Highly purified fresh human tumour cells from 44 solid tumours and 24 malignant ascites were used for the MTT assay. The purity of tumour cells was greater than 90% after separation on Ficoll–Hypaque and Percoll discontinuous gradients. The OD_{570} obtained from tumour cells alone was higher than that from non-malignant cells. The chemosensitivity of tumour cells was distinct from that of non-malignant cells. Moreover, the chemosensitivity of highly purified tumour cells was also distinct from that of non-purified cells just separated from tumour tissues. 31 of the 68 patients had evaluable lesions, and received cancer chemotherapy according to the results of MTT assay using highly purified tumour cells. A clinical response was obtained in 10 of the 31 patients (response rate = 32.3%, 5 complete responses, 5 partial responses).
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INTRODUCTION

A RAPID COLORIMETRIC assay was described by Mosmann [1]. This assay determined the ability of viable cells to convert a soluble tetrazolium salt, 3-(4,5-di-methylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT), into an insoluble formazan precipitate. There have been numerous reports on the MTT assay where tumour cell lines [2, 3], as well as fresh human tumour cells were used as target cells, but without purification of these cells prior to testing [4, 5]. The MTT assay used for chemosensitivity testing of tumour samples, however, should be performed using highly purified fresh tumour cells, since contamination by non-malignant cells affects results and therefore the sensitivity of the test.

This study presents a technique for purification of tumour