

Invited reviews

Best practice with limited resources

B. J. Cummings

The concept of best practice with limited resources is addressed within a framework of actions to promote the quality of treatment at the level of the cancer centre and individual oncologist. The principal measures of the merits of any treatment are its clinical and cost-effectiveness. The public, government, patients and physicians should accept collective responsibility for the ethical distribution of resources, but decisions are usually left, by default, to physicians and bureaucrats. Several specific measures to promote best practice are discussed.

Najlepsze wyniki leczenia w zakresie ograniczonych środków

Idea dążenia do osiągnięcia najlepszych wyników (best practice) w danym zakresie ograniczonych środków jest wpisana w szersze ramy działań, obliczonych na promowanie jakości leczenia na poziomie tak ośrodka onkologicznego, jak i pojedynczego lekarza onkologa. Podstawowe zalety jakiegokolwiek terapii to skuteczność kliniczna i efektywność ekonomiczna. Odpowiedzialność za etyczne aspekty dystrybucji kosztów powinna spoczywać na całym społeczeństwie, rządzie, pacjentach i lekarzach, lecz w istocie decyzje zazwyczaj pozostawia się tylko lekarzom i biurokratom. W pracy omówiono kilka konkretnych sposobów na promowanie dążenia do najlepszych wyników leczenia.

Key words: resource allocation, quality of care, best practice

Słowa kluczowe: leczenie – koszty, leczenie – wyniki

No society has sufficient resources to meet the unbridled expectations regarding health care of its every member. Given that resources are limited, how may they be used to best effect? The answers are many, and depend on the perspective of the person or group asking the question. That perspective is subject to personal, political, cultural, ethical and religious influences. Ideally, the policies and management guidelines of a national cancer control programme will be implemented to provide fair and equitable care to every person in that country [1]. Particularly where there are major limitations in resources and where universally endorsed policies are lacking, there is usually a strong element of pragmatism at the level of delivery. In this essay, the greatest emphasis will be placed on actions to promote the quality of treatment at the level of the cancer centre and individual oncologists, for it is there that most operational decisions are taken and implemented. This is not to diminish the value of prevention, screening and non-clinical research, which are each important elements of a comprehensive national cancer control programme, but is intended only to focus discussion.

Determining “best practice”

Declaring a practice to be the “best” implies that it is better than all others. Rather than assume each patient has a right to “the best care as available anywhere in the world”, it is more appropriate to consider the right to “the best care available within the constraints, fiscal or otherwise, determined by the society within which a patient lives” [2]. This is but one example of potential conflict between collective and individual rights (it assumes that health care, as well as good health itself, is a right), and reflects the reality of variations in the availability of resources. Accepting that constraints are necessary, it is desirable to consider the standards against which practice should be measured.

The most appropriate measure of the overall effectiveness of a cancer control programme is the national survival rate. Viewed solely by this criterion, Poland has fared badly in comparisons with other European countries, although improvements have been noted over time [3]. When cancer survival rates are considered together with the relative strength of the economies of the countries compared, disparities are more understandable, even if no more desirable. The challenge is to ensure that the results achieved represent the best value from the resources available. These points may be illustrated with data from the EURO CARE

Table I. Trends in Survival for Breast Cancer by Region and Economic Indicators

Region ^a	5y Relative Survival Rate (%) ^a		Countries in Region ^a	Total Expenditure on Health as % of GNI (1998) ^b	Per Capita Total Expenditure on Health in International Dollars (1998) ^b
	1978-80	1987-89			
Northern Europe	75	81	Finland	6.9	1570
			Sweden	7.9	1731
			Iceland	8.4	2277
Denmark and United Kingdom	63	68	Denmark	8.3	2138
			England and Scotland	6.8	1512
Western Europe	68	77	France	9.3	2074
			Netherlands	8.7	2056
			Germany	10.3	2382
			Italy	7.7	1712
			Switzerland	10.6	2861
Eastern Europe	31	56	Estonia	6.0	516
			Poland	6.4	535
Europe (Weighted average)	65	74			
United States	75 ^c	81 ^c	USA	12.9	4055

^a Regions and Countries, Survival Rates for Europe from Sant et al [3]

^b Economic data from World Health Organization [8]

^c United States data for 1977-79 and 1983-90 from SEER [4]

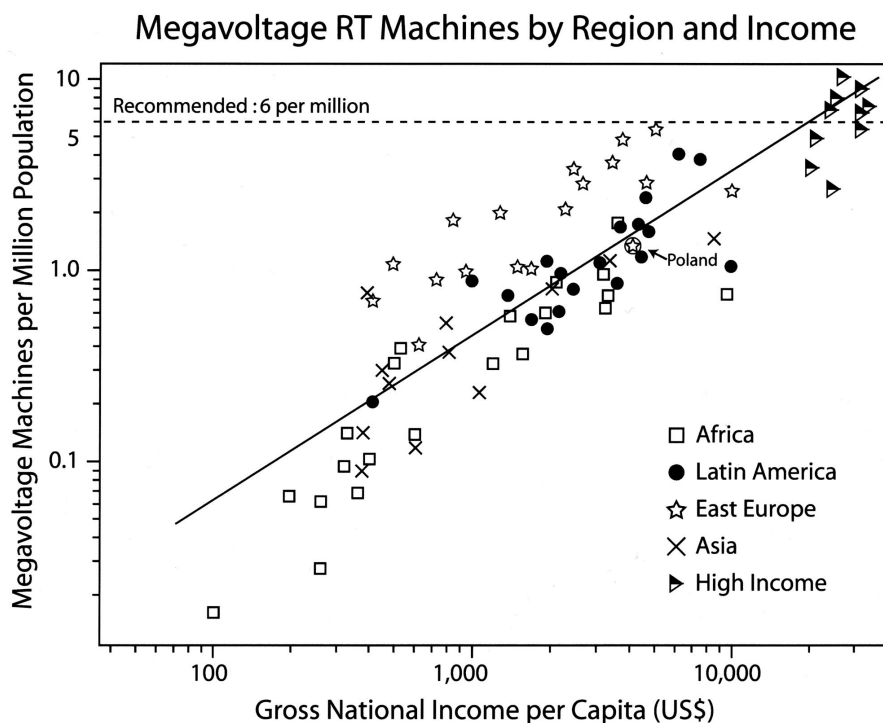
Study, the World Bank and the World Health Organization (WHO).

In the EUROCORE-II Study of adult cancer patients, it was found that the 5-year relative survival rates in Poland for all cancers were lower than the average in Europe [3]. As an example, the survival rates for breast cancer in various regions in Europe, the European average, and the comparable rate in the USA [4], are shown in Table I. While there are several possible causes for the differences reported, those leading the EUROCORE project highlighted quality of care, in its widest sense, as the major determinant for the variation in the rates. They also noted the potential for cancer survival rates to interact with the general level of life expectancy and with socio-economic conditions in each country. Life expectancy at birth in Poland rose from about 71 years in 1978 to about 73 years in 2000, but remained consistently 3 to 5 years less than in other countries which participated in EUROCORE-II. In 2001, the World Bank ranked Poland 74th of 205 countries in its list of Gross National Income (GNI) per capita, the lowest of the EUROCORE-II participants [5]. The dangers of "ranking-tables" are well-known, and these observations alone do not establish whether the care received by cancer patients in Poland was the best possible with the resources available at the time of the EUROCORE reviews. However, commentators in Poland have remarked on delays in diagnosis and other factors as major contributors to poor cancer survival rates [6, 7]. The improvement in the survival rates for breast cancer seen over the two periods shown in Table 1 presumably resulted at least in part from successful efforts to promote both earlier

diagnosis and the broader application of effective treatments.

One indicator often used to compare national expenditures on health care is the percentage of GNI committed to this purpose. In Europe, this percentage is usually in the range of 6% to 10%, with Poland lying at the lower end of that range (1998 figures) [8]. More revealing is a comparison of the international dollar value of annual per capita expenditures for health care (Table 1). The range then is seen to be much greater, with most European countries expending between \$1500 and \$2400 per capita, but with Eastern European countries considerably less, between about \$500 to \$900 (some countries in WHO list are not shown in table). All European countries lie substantially below the \$4000 per capita expended on health care in the USA. Yet it is common for countries to expect to match the health care outcomes achieved in the USA with its much greater resources. A more realistic short-term target for Eastern Europe would seem to be to apply their more limited resources to match, through the adoption of best practices, the results achieved in regions of Europe able to commit only moderately greater financial resources to health care.

Shortage of physical resources contributes to difficulties in making effective treatments readily available to all who might benefit from them. While it may not be easy to estimate the extent of shortages of multipurpose resources, such as surgical facilities, single purpose resources, such as radiation treatment equipment and staff, are easier to assess [9, 10]. Figure 1 shows data from the International Atomic Energy Agency (IAEA) for the



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Figure 1. The number of megavoltage radiation treatment machines by global region related to Gross National Income per capita (US\$). Log-Log plot. Adapted from Levin et al [10].

number of megavoltage radiation treatment machines per million population, and relates this to per capita GNI [10]. At the time of the survey, Poland had 54 such machines, less than 2 machines per million, and well below the 6 per million estimated to be appropriate to fully realize the contribution this modality can make to cancer control [11]. It can be seen that relatively few countries have reached the recommended level. It was estimated that around 1990, no more than about 12% of cancer patients in Poland received radiation treatment [7], compared with the planning target of 45% to 55% adopted, but not always achieved, in many other countries [12]. The proportion of patients treated by radiation in Poland now is estimated to be about 30% (B. Maciejewski, personal communication 2002). As in many countries, the shortage of physical resources has been partially overcome by operating equipment for extended hours each day.

Additional funds are generally needed if a limited resource pool is to be enlarged, although some redistribution of existing funding may be possible. Redistribution of funding within healthcare systems is often constrained, particularly when funds are limited, and interest groups defend existing allocations fiercely [13]. However, relatively small (percentage-wise) reallocations of funding may offer potentially significant improvements in cancer treatment. The proportion of health care expenditures allocated to cancer treatment ranges from about 6% to 15%, with Poland and Eastern Europe in the lower bracket and the USA at the upper limit [14]. Analyses in Sweden over the past decade

showed that the direct costs of radiation treatment were only about 5% of the national expenditures for cancer treatment (at a time when it was estimated that about 30% of those who could benefit from such treatment actually received radiation), and the cost of cytotoxic drugs was also about 5% (the costs of administering this form of treatment were not included, as they were for radiation therapy, and many expensive drugs which have recently come on the market were not in use at the time of this survey) [15, 16]. About 40% of the costs of cancer treatment in Sweden were consumed by inpatient surgical care, and 10% by drugs other than cytotoxic agents. It may be assumed that much of the remaining expenditure was for palliative and terminal care [17]. It is not possible here to expand on the possibilities for reallocation of funding for cancer care since this would require detailed knowledge of national and local planning priorities.

Issues in resource allocation

Consideration of the ethics and practice of resource allocation in health care commonly takes place informally at the level of individual oncologists, with policy makers seemingly reluctant to engage in debate. Limited resources force choices. If choices are not formally planned, then each cancer centre and oncologist "does his best", usually without considering the effects of their actions on society as a whole, and restrictions in utilization arise in an ad hoc fashion. However, experts in the philosophical, ethical and economic aspects of resource allocation for health

care are increasingly participating in, and informing, discussion [18-21].

The merits of any medical intervention are usually assessed in terms of clinical effectiveness [22]. To the most important, and commonly used, endpoint of survival has recently been added quality of life. This latter measure has relevance for all treatments, but may be particularly useful for treatments of advanced or metastatic cancer which may not improve survival. Surrogates for, or alternatives to, survival must be chosen carefully, as some may be misleading, especially to patients who lack the depth of understanding of the oncologist. One such alternative end-point is "response", often misinterpreted by patients and their families as correlating with cure, which is not always true. Such confusion may be compounded by the presentation of possible outcomes in relative rather than absolute terms. As an extreme example, the improvement in survival rate with a new treatment may be described as "50%", but in absolute terms represent an increase from as little as 2% to only 3%. In some societies, there is often reluctance among physicians, patients and their families to discuss the diagnosis of cancer, the treatments available, and the prognosis, especially when the patient has advanced cancer [23, 24].

Physicians have an ethical obligation to present potential benefits and disadvantages fairly and clearly to patients. Best practice requires a balance on the part of the oncologist between stark directness and unreasonable paternalism. When the results of available interventions are known to be poor, there is great pressure to explore new technologies and treatments, often heralded in both the medical and lay press as "promising" or "potential breakthroughs". Real benefits from many new treatments are often limited however [25, 26]. For example, in a 10 year review of abstracts reporting randomized trials of treatments for advanced breast cancer published by the American Society of Clinical Oncology, only 3 of 142 described an improvement in survival from experimental treatment which reached statistical significance ($p < 0.05$) [26]. Discussion of the relationships of clinical and statistical significance is beyond the scope of this presentation, but it must be noted that many patients regard even very small increases in survival as worth pursuing [22]. Assessment of quality-of-life now plays a greater role in determining the benefit of new interventions, and attempts to assay the impact of cancer and its treatment on the physical, psychological and social components of a patient's life [22]. While physicians generally understand a result presented in terms of the duration of symptom-free survival, many remain less comfortable with the methodologies of the social sciences used in some quality-of-life assessments, and are often resistant to the application of the utilities inherent in the computation of such measures as "quality adjusted life years" (QALYs) [27].

It has been suggested that to the evaluation of clinical effectiveness be added an assessment of cost effectiveness, and that this should include not only the effect on the patient who received the medical care in

question, but also that on other patients in the health care system who did not receive benefits they could have obtained had those resources not been otherwise used [28]. While this latter economic concept (called opportunity cost) is used infrequently, many clinical trials now include some form of cost analysis, if not true cost effectiveness assessment [20]. It should be remembered that, just as the apparent clinical effectiveness of an intervention may not be generalizable from the setting in which it was conducted (often a clinical trial in which patients had carefully defined characteristics, including good performance status), differences in health care systems may mean that cost analyses also cannot be generalized. In economically advantaged communities, the efficacy of an intervention usually outweighs cost effectiveness considerations, and these may be further distorted where a private payer system exists. In countries with markedly limited resources, however, rational choices may be facilitated by informed and relevant cost effectiveness analyses (although appropriately trained health economists to perform such analyses may be among the resources in short supply).

The efficient use of resources may require operation of facilities and equipment during "unfashionable" hours, and extended operation of high cost equipment is common, where there are sufficient trained personnel. It is often more efficient to purchase commercial packages incorporating tested equipment, rather than committing the time of scarce personnel to the development of new systems. Exceptions to this may occur where observation of commercial systems suggests alternative and substantially cheaper ways of achieving the same result, and considerable ingenuity is often demonstrated to circumvent resource limitations.

The development of appropriate collective responsibility for the ethical distribution of limited resources is rarely addressed. Decisions are often left by government and its bureaucracy, which seek to avoid political unpopularity, and the public, who are usually not consulted formally and may be poorly informed of the issues, to physicians, who are assumed to have the requisite knowledge to prioritize the use of resources. However, it has been argued that only a collective solution, to which the larger population subscribe, can resolve the conflict between the ethical responsibilities of physicians to offer the best available medical care to the patients for whom they have assumed responsibility, and their role as gatekeepers of the limited health care resources available for all patients collectively [29]. Wide public consultation, such as that carried out in Oregon, USA, to prioritize medical services for funding, has not been attempted elsewhere [30]. Some countries, for example, England and Wales, have introduced processes to involve patients and the public in developing and evaluating policy and practice [31]. More often however, public involvement in the determination of resource allocation is manifest through special interest groups, who usually advocate the commitment of additional resources to management or research of a specific cancer

type rather than address the needs of the community as a whole.

Best practice and the cancer centre

In the following section, several measures intended to promote best practice at the level of a cancer centre are discussed briefly. Most are applicable whether or not resources are limited.

Planning

While some form of organizational planning to meet short-term needs is common, the more important longer term strategic planning is often neglected. Failure to communicate goals and objectives contributes greatly to fragmentation of effort and the frustration of staff and patients. Planning should be realistic, and objectives should not run so far ahead of provision of the resources necessary that the planning process is discredited.

Data collection and analysis

Effective assessment of resource utilization and management is not possible without adequate up-to-date data. Even when funding is limited, it is essential that sufficient resources be committed to collecting and reviewing key indices. It is surprising how frequently, even in major cancer centres with substantial budgets, data on such basic features as the number of patients seen and treated, waiting times, cancer diagnosis and stage, and outcome are either not available or are accessible only by retrospective review. Only prospective data collection and contemporary review can allow timely response to important changes. An example of failure to perceive predictable changes in the demand for resources, and to examine in a timely way data available in a comprehensive prospective electronic register, occurred in Ontario, Canada, between about 1984 and 1992. During that period, waiting times for radiation treatment increased dramatically. Retrospective analysis of the registry data some years later showed that changes in utilization patterns could have been identified, and efforts made to obtain additional resources, much earlier than actually occurred [32]. Three major demands for increased utilization of radiation therapy were found, beyond those expected from annual increases in the incidence of cancer: the adoption of lumpectomy and postoperative radiation as the preferred treatment for early stage breast cancer; more widespread use of adjuvant radiation for rectal cancer; and the introduction of PSA testing which identified many early stage prostate cancer patients who were referred for radiation therapy. The analysis also revealed that during the same period there were reductions in the use of radiation treatment for conditions such as gynecologic, lung, and head and neck cancer and for palliation, for which no good medical reasons could be identified.

Waiting lists

One of the first manifestations of an imbalance between resources and demand is a waiting list. Waiting times should be assessed against standards which are formalized and transparent. Those standards should be set by expert assessment of available biological and clinical data. Typical standards are those adopted in the UK [33] and in Canada [34]. The radiation oncology specialty bodies in those countries recommend consultation be provided within 2 weeks of a request, and that treatment commence within 2 weeks of a decision to treat (in non-emergency cases). The standards provide a measure by which resources meet an ideal, and should not be changed (for example, in response to political pressure) to reflect the resources actually available. A "shorter" waiting list may be politically desirable, but if the number of patients on the list is reduced by adopting medically inappropriate permissible delays, such changes in the standard for waiting times will eventually contribute to poor clinical outcome.

As physicians in a community become aware that waiting times for cancer treatment are lengthening, they often apply ad hoc rationing, and may make decisions which would not be made by oncologists. Review of the Ontario data referred to earlier identified such ad hoc rationing on the basis of increasing patient age; the distance of a patient's residence from a cancer centre; the intent of treatment, with under-referral particularly for palliative or adjuvant radiation treatment; and lower patient socio-economic status [32, 35]. It is likely that additional reasons were present but not identified. It is also probable that similar patterns of ad hoc rationing occur wherever resources are limited.

When there are delays before a preferred intervention can be offered, there is great pressure for physicians "to do something". Particularly where there are delays in oncologic surgery or radiation therapy, this has led to widespread use of neo-adjuvant chemotherapy. Because this treatment is largely unproven, and is not delivered in the formalized context of a clinical trial, it is difficult to determine whether the practice is advantageous. Randomized trials of neoadjuvant therapy have produced mixed results so that generalization is not possible. Some laboratory studies indicate that any partial treatment, be it surgical, radiotherapeutic or cytotoxic drug, may stimulate the growth rate of residual cancer, and thus jeopardize the outcome of definitive treatment when it is eventually given. Unattractive though the concept is, when delays prevent timely management by established therapies, an alternative equally effective (for cure or palliation) but less desirable (for organ conservation or for side effects) definitive treatment may be best practice.

Clinical practice guidelines

Every physician generally has an approach to the treatment of each cancer patient for whom he is responsible

which he regards as “standard”. This “standard” treatment is often based only loosely on best evidence. In one study of the diversity of treatments recommended for defined clinical scenarios, oncologists offered as the basis for their recommendations local policies, logistical constraints, training and experience, and patient convenience. Fewer than 10% alluded to current or previous clinical trial results [36].

Determining whether local policies, applied by an individual or a group of physicians, are “best” clinical practice requires comparison with external standards. Efforts to identify the most scientifically sound and useful information from amongst the vast volume of published reports have led to the promotion of the evidence-based medicine and clinical practice guideline initiatives. The intent of guidelines is to promote consistency of care, and the use of the most clinically effective interventions, thus reducing the often somewhat arbitrary value judgements which are a characteristic of individual medical practice [2]. The publication of clinical practice guidelines does not ensure their adoption, but they offer physicians a standard against which to measure the care they offer [37]. The effect of guidelines on practice is often modest, although it generally increases with time. There is no agreement on what level of compliance with a guideline in a community is appropriate, and wide variations are reported.

While guidelines promote clinical effectiveness and efficiency, they often do not address cost effectiveness. Although published guidelines and evidence-based medicine reviews offer the physician short cuts through the mass of published data, it is essential that each guideline be reviewed, and if necessary modified, by those in any cancer centre in which it is proposed the guideline be implemented. Many are first written by physicians in relatively resource-rich settings, so that recommendations that depend on the ready availability of sophisticated technology, for example, may not be practical. Nor are all published guidelines and evidence-based reviews free of scientific error or of conclusions not justified by the data [38, 39]. Where relevant external guidelines are not available, consistency of care and efficient use of resources should be fostered by the development of local consensus.

Audit and quality assurance

When resources are limited, particularly when patient to physician ratios are excessive, it is all too easy to omit audit and quality assurance procedures in the search for “more time”. Yet these procedures can greatly improve the level of care and should be considered an essential element of best practice. Audit has been described as “the systematic critical analysis of the quality of medical care, including the procedures used for diagnosis and treatment, the use of resources and the resulting outcome and quality of life for the patients” [40]. This rather daunting all-encompassing definition is applicable in all settings, even when resources are limited. Audit can be

applied to small, selected segments of practice, in successive projects which can be integrated to form an overview of a whole process, and identify areas which can be improved. For example, radiation oncologists in a small regional cancer centre worked either as a full group or as subgroups to audit 3052 radiation treatment plans (about half of all plans prepared) over an 8-year period, using predetermined criteria. Changes were recommended in 4.1% due to apparent errors in radiation planning, and a further 3.6% were found to deviate from previously agreed treatment policies [41]. Where these reviews were performed before treatment started, they served to improve quality further by enabling amendment of the plans. Similarly, a two-week study in 2001 in a large cancer centre disclosed errors or omissions in 15% of 940 drug prescriptions (unpublished).

Participation in multicentre collaborative clinical trials, such as those conducted by the EORTC (European Organization for the Research and Treatment of Cancer) offer an important means of improving the quality of care. Even in a resource limited centre, the efforts expended to collect the data required for such trials are more than offset by the advantages of assessment and advice from the sponsoring organization's quality review processes. For example, in an EORTC randomized trial of radiotherapy for patients with Stage I or II breast cancer, a quality assurance program was implemented to confirm that breast irradiation was carried out in a standard fashion in all centres. A team of physicists verified the calibration of the radiation beams in the participating centres, and a programme was set up for comparing the calculated doses and the doses delivered, together with a process to identify the reasons for any discrepancy [42]. Even quite small variations in the dose of radiation delivered may have significant effects on the rates of cancer control and normal tissue toxicity [43]. The importance of repeated audits, the need for additional physicists with appropriate training in clinical radiation therapy, and for replacement of obsolete treatment machines and dosimeters were emphasized in a study by the European Radiation Oncology Programme for Assurance of Treatment Quality (EROPAQ) in which 47 (94%) of the radiotherapy centres in Poland, the Czech Republic and Hungary participated [44]. Among the 22 centres which had not participated in external audit previously, only 68% of the treatment beams checked were calibrated correctly (within $\pm 5\%$ of the intended dose delivered), compared to 84% in treatment centres which had participated in an earlier audit at least once.

New technology and drugs

Although several frameworks incorporating assessment of clinical and cost effectiveness have been proposed for the evaluation of new, and established, technology and treatments [20, 45, 46], it is not apparent that such processes are used consistently. Paradoxically, expenditures on treatments already in use, and therefore deemed

to be “approved”, whether or not they were ever formally assessed prior to their introduction, are subjected to critical review only infrequently. Expenditures on “approved” treatments may vary widely between centres, reflecting the lack of generally accepted treatment guidelines, and affecting the funding available for other requirements. For example, in three Canadian cancer centres, to each of which about 2500 patients were referred in a year for consideration of cytotoxic chemotherapy, the proportion of patients who received intravenous chemotherapy varied from 60% to 98%, and the total costs for this treatment ranged from about \$6 million to \$9 million Can (unpublished).

Introduction of new and expensive drugs and technology represents one of the most serious stresses on resources, and can be achieved fairly and rationally only where there are effective systems in place to analyze the merits and costs of all treatments, new and old, and where there is reasonable agreement on how priorities should be set and resources allocated.

Improving efficiency and effectiveness

Reappraisal of existing treatment practices, training of staff in new and superior techniques, and review of the traditional roles of staff are examples of actions which may each result in improved efficiency and effectiveness without increased resources.

The retrospective audits of the use of radiation treatment in Ontario noted earlier (32) led to prospective research which has significant resource implications. In one study, 551 patients with node-negative breast cancer who had undergone lumpectomy and axillary dissection were found to have received adjuvant breast irradiation according to 48 different radiotherapy schedules, reflecting the lack of agreed guidelines [47]. In a subsequent prospective trial, in a similar patient group, women were randomly assigned to receive whole breast irradiation by 16 treatments in 22 days or 25 treatments in 35 days [48]. With a median follow-up of 69 months, the 5-year local recurrence-free survival rates were 97.2% (short course) and 96.8% (long course). No differences were detected in disease-free or overall survival rates, and the percentages of patients with an excellent or good global cosmetic outcome at 5 years were 76.8% and 77.4%. Thus, equivalent results were achieved using only 65% of the radiation therapy capacity required by the longer treatment schedule.

There has been a substantial reduction in the risk of pelvic recurrence following resection of cancers of the rectum by adoption of techniques of wide sharp dissection, sometimes referred to as total mesorectal excision, and by special procedures for the examination of the tissues removed. In several countries, these techniques have been taught in special surgical and pathology workshops and by mentoring, and have not required the training of additional surgeons or pathologists. For example, the rate of pelvic recurrence at 5 years was reduced from 15% to 8%, and the rate of cancer-related

death also improved, following workshops conducted in Stockholm [49].

Where there are shortfalls in the numbers of staff required to support a certain function, it is helpful to determine whether activities, traditionally the responsibility of one profession, can be delegated or transferred to others. For example, throughout much of the world many of the technical aspects of radiation treatment planning have been transferred from clinical physicists to radiographers. Nurses and radiographers have also assumed responsibility for some patient assessment and follow-up activities. Detailed advice on such transfer of responsibilities has been offered by the UK Royal College of Radiologists [50].

Conserving resources

Conserving existing resources, particularly trained personnel, is an important element of “best practice”. Where there is a significant imbalance in the clinical demands on a profession, there is increased risk of burnout, further reduction in the workforce available, and difficulty in recruitment. A study in the UK of four medical specialist groups, including oncologists, identified insufficient resources among the factors associated with both burnout and psychiatric morbidity among physicians [51]. Management of this type of imbalance is difficult, but efforts should be made to ensure clinical and other types of work are distributed fairly. Additional responsibilities, such as teaching and administration, should be reviewed regularly. The introduction of new technologies and treatments may place additional loads on some staff, and clinical productivity may decrease temporarily while staff become familiar with new techniques. Active management is necessary to maintain individual workloads at tolerable levels.

It is sometimes assumed, incorrectly, that limited resources prevent research and development programmes, and that all available resources should be committed to providing proven methods of care. However, a defined portion of resources should be reserved for a coherent focussed plan of research, principally in academically linked centres. This permits the fostering of ambition and excellence and helps the retention of staff. There is no reason why a country or cancer centre with limited resources should not aspire to, and achieve or surpass, the levels of excellence of better economically endowed countries – they should not, however, attempt to match the breadth of research in those countries.

Conclusion

Pursuit of a coherent programme, which supports best practice and optimum use of limited resources, is especially difficult at a time when the world is experiencing unprecedented biomolecular and technological development. The tenets of best practice are based on the promotion of appropriate ethical and professional relationships, proper evaluation of the clinical and cost-

effectiveness of whatever treatments and technologies are available within the constraints imposed by the community, the use of evidence-based clinical practice guidelines, and efforts to fully involve the public, government, patients and physicians in seeking a common resolution to issues of resource allocation.

Professor B. J. Cummings

Department of Radiation Oncology
Princess Margaret Hospital/University of Toronto
610 University Avenue
Toronto, ON M5G 2M9
Canada
e.mail: Bernard.Cummings@rmp.uhn.on.ca

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