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Invited Papers

The scale of the challenge of cancer in Europe

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Several measures of cancer burden are available. The most basic are incidence (new cases), mortality (deaths) and prevalence (number of living cancer patients). More sophisticated indicators are useful for planning services — quality of disability adjusted life years lost, but they require unavailable data, or a variety of assumptions about quality of life post diagnosis.

In the countries of the EU in 1995. there were estimated to be 1.5 million new cancer cases, 930 000 cancer deaths, and just over 4 million living cancer patients (diagnosed within the last 5 years). The most commonly diagnosed neoplasm is breast cancer (199 000 new cases) — remarkable since it is confined to just one gender. Large bowel cancer (198 000 cases) comes second, and lung cancer (195 000) third. In terms of deaths, the most important cancers are lung cancer (181 000 deaths), large bowel (118 000), breast (76 000) and stomach (61 000).

There are quite large variations between countries, even within the EU, with respect to current patterns, and in temporal trends. This is exemplified by lung cancer in women. There is an 8-fold difference in risk between Spain and Denmark. but quite different trends in high risk countries (rates now decreasing) and those at low risk, where increases are only recently evident in the youngest generation of women.

Future projections of incidence and mortality, based on existing patterns and trends, provide useful targets, against which the success (or otherwise) of control measures (prevention or treatment) can be judged.

Targets in primary care

N. Summerton

Setting targets for improving health care is one way in which direction can be set, key tasks and resources identified, and progress monitored. They can assist in the communication of objectives and the mechanisms to achieve them including the commitment and capacity required. However, as a general practitioner, I am becoming tired of being used for target practice. Targets in primary care are increasingly popular; they are too easy to set and generate a perception that something beneficial for patients is being done even if it is not. Good general practitioners often feel insulted by many of the targets that they are subjected to whereas poor general practitioners simply ignore them. Increasingly, target subversion has become integrated into general practice vocational training!

Primary care oncology is a relatively new discipline and provides an opportunity to develop a fresh approach and introduce fewer and better targets and standards. The difficulties are often not in deciding how to specify or measure something, but in deciding what to specify and measure, and who does it. I plan to examine this issue in relation to four questions:

1. What are the false assumptions that are made by target setters?
   - Targets in primary care are always beneficial.
   - Primary care is uncomplicated; a simpler version of secondary care.

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- Targets can be set by anyone.
- There are robust links between structure/process and outcomes.
- Broad principles are more important than detail.
- Primary care clinicians do not care about what they are doing already.

2. What principles should govern target setting for clinical care?
   - Clarity in relation to the service specification — core elements and roles and responsibilities.
   - Clarity of the purpose of the target.
   - Collaborative specification of robust targets — specific, relevant, understandable, behavioural, measurable, and achievable.
   - Evidence of benefit.
   - Feasible in relation to the available resources and the commitment and capacity within primary care.
   - Flexibility of the target and clarity about the limitations of the target.
3. What should be our primary targets — now?
   - Primary care-oriented clinical research.
   - Service specification.
   - Medical education.
4. What should be our primary targets...10 years on?
   - Clinical care.
   - Primary care-oriented clinical research.
   - Medical education.

The future of cancer treatment

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There will be a dramatic increase in global cancer incidence over the next 20 years because of ageing populations. Local forms of therapy will continue to improve, achieving local destruction of cancers with greater certainly and with fewer side-effects. Minimally invasive surgery will reduce the need for routine Organ resection without compromising survival. The application of sophisticated computer systems to radiotherapy planning will allow the precise shaping of beam delivery conforming exactly to the shape of the tumour. However, the most promising advances on the horizon come from our rapidly increasing understanding of the molecular genetics of cancer.

Over the next decade, there will be a marked shift in the types of agents used in the systemic treatment of cancer. Because we know the precise molecular targets of these new agents, there will be a revolution in how we prescribe cancer therapy. Instead of defining drugs for use empirically and relatively ineffectively for different types of cancer, we will identify a series of molecular lesions in tumour biopsies. Future patients will receive drugs that target these lesions directly.

Genetic–environmental interaction patterns that lead to cancer will become apparent. This will provide key information for future cancer prevention schemes. Individual cancer risk assessment will lead to tailored prevention messages and a specific screening programme to pick up early cancer and have far-reaching public health consequences. Cancer preventive drugs will be developed to reduce the risk of further genetic deterioration. The use of gene arrays to monitor serum for fragments of DNA containing defined mutations could ultimately develop into an implanted gene chip. When a significant mutation is detected, the chip would signal the holder's home computer and set in train a series of investigations based on the most likely type and site of the primary tumour.

The funding of cancer care will become a significant problem. Increased consumerism in medicine will lead to increasingly informed and assertive patients seeking out novel therapies and bypassing traditional referral pathways. Novel financial structures constructed by consortia of the pharmaceutical, insurance and healthcare sectors will enable future patients to choose the levels of care they wish to pay for by insurance schemes or directly. By 2020, chemotherapy is likely to replace other treatment modalities for over 50% of all cancers. This transition is going to provide a major challenge as well as new ethical and moral dilemmas.

EUROCARE: major results and implications

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EUROCARE is a collaborative 'benchmarking' study of variation in time and place of survival of newly diagnosed cancer patients by population-based cancer registries in Europe, both in the European Union and other countries. It is now the world's largest study of survival [1–3]. The EUROCARE Working Group started in 1989 with about 35 registries in 11 countries and now comprises more than 60 registries in 20 countries. It was an initiative of Italian epidemiologists and biostatisticians. Three concerted actions supported by the BIOMED programme of the EU have now been carried out (the latest still ongoing) as well as a related study on prevalence, Europreval. In-depth studies have been carried out of staging and treatment on samples of patients with breast, colorectal [4] and testicular cancer. EUROCARE now covers more than one third of the European population, and almost 50% of the childhood population thanks to special registries.

The major aims of EUROCARE were to explore the variation in outcome of cancer management of unselected patients and thus spend a lot of energy on comparability. As registries remain a mirror of the healthcare system they are part of, there are limitations in the quality of the data, which also means that such collaboration is a continuous process. Increasingly, EUROCARE serves as a vehicle for benchmarking studies and cancer control policy discussions.

Major results have been, until now, an increase in the comparability of survival data and a stimulus for registries to perform active follow-up of the vital status. It has become very clear that, on a population basis, enormous differences in survival were apparent during the 1980s. Prosperous countries appeared to perform better than poor countries because of better stage distribution at diagnosis, a consequence of adequate supply and also public confidence in specialised care. If investments in training and equipment were deficient (for a long time) and insufficient concentration took place of complex specialised services, especially for younger patients with infrequent tumours, results were also suboptimal. This is also illustrated by results of a (soon to appear) comparative study of childhood cancer [5].

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4. *Gut* 2000, **47**, 533–538 (colorectal cancer diagnosed in 1991).
5. *Eur J Cancer* [special issue] 2001, **37**, in press (childhood cancer, 1978–1992).

Cancer registration in Europe: progress and challenges

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Cancer information systems and, in particular, cancer registries have developed on a regional or national basis in the countries of the European Union over the last 50 years. During this time, national associations of registries have developed, along with some regional groupings, primarily concerned with the development of research activities, including collaborative projects and scientific meetings. However, a wider focus for the coordination of activities did not exist until the establishment of the European Network of Cancer Registries (ENCR) in l989 as a project within the framework of the 'Europe against Cancer Programme' of the European Commission. Until then, obtaining valid and comparable information on cancer incidence, survival and prevalence on a Europe-wide basis was difficult.

Today, the ENCR has 166 member registries in 40 European countries. In the 15 Member States of the EU, there are 92 registries. Only some countries, however, have registries with national coverage (e.g. Denmark, Finland, The

Netherlands, Portugal, Sweden and UK). Most registries are regional (e.g. France, Italy and Spain). Altogether, they cover about 50% of the total EU population of 372 million inhabitants. We estimated that, in 1996, over 1.6 million new cancer cases were diagnosed and 925 000 people died from cancer in the EU.

The EUROCARE high resolution studies

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1. Objective

The on-going programme of EUROCARE studies [1] has played a major role in indicating deficiencies in cancer care services in a number of countries, notably the UK. The primary measures determined in the core EUROCARE analysis have been population-based relative survival outcomes. While these have been highly informative, the absence of staging information has meant that it has bean impossible to analyse the determinants of poor survival. For example, a population may have an adverse survival in comparison with other European countries either because a greater proportion of patients present with late-stage tumours or because survival is worse on a stage for stage basis, or both. The high resolution studies were designed to investigate the determinants of poor outcome for a number of specific sites of cancer.

2. Methods

Cancer registries participating in the high resolution studies provided additional information regarding stage of disease, diagnostic procedures undertaken and treatment received for several hundred cancers, selected at random, contributing to the main EUROCARE study. For EUROCARE-II, these comprised cancers of the breast, large bowel, stomach and testis and were for patients diagnosed in the 1990–1992 period.

3. Results

The high resolution results for large bowel cancer have now been published [2,3] and show that the wide survival differences within Europe depend to a large extent on differences in stage at diagnosis. This was particularly the situation for the two participating English registries (Thames and Mersey). Similar effects were seen for breast cancer and there were also important treatment differences observed, notably in the employment of axillary lymphadenectomy and in the use of chemotherapy in young node-positive patients.

4. Conclusions

Results from the high resolution studies complement the core data from EUROCARE. Not only do these data permit an analysis of the underlying reasons for poor survival, but also they provide important comparative information into variation in treatment practice and diffusion in best standards of care.

I am grateful to Drs Gatta and Sant for providing information from the EUROCARE high resolution studies.

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What next for EUROCARE?

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EUROCARE is a collaborative project between European population-based cancer registries to compare patterns of care and survival of cancer patients [1]. At present, the database includes over five million cases from 60 populations in 20 European countries. The main results showed that between-country differences are substantial, especially for tumours whose survival is largely determined by the stage of the disease at diagnosis. In general, survival trends are increasing over time but, with a few exceptions, differences between populations persisted across the time period studied so far.

Survival may be longer either because the diagnosis is made earlier or because death is postponed. A major aim of EUROCARE, therefore, is to understand whether the difference is due to better treatments, more effective treatments because of earlier diagnosis, lead-time or other bias. This aim is being pursued through several analytical strategies, including:

1. Multivariate analyses to quantify how much of the difference is confined to the first few months following diagnosis, which suggest a major role for the proportion of advanced cases at the time of diagnosis.
2. Mixed model analyses to disentangle the two major components of survival: the proportion of cured patients and the survival of the patients that are going to die of the disease.
3. Stage-specific or stage-adjusted comparisons on representative samples of cases, with further adjustment for the staging procedures actually performed.

Several of these analyses suggested that precocity of diagnosis explain more survival variation than treatment, at least within Western Europe. Further insight for the interpretation of survival differences is expected from:

4. The comparison of (trends of) incidence, survival and mortality rates.
5. The comparison of population based patterns of care of cancer patients.

The next EUROCARE results are expected by mid-2002 for patients diagnosed in 1990–1994 and followed-up to 1999, a shorter time lag than for previous monographs but still too long to be clinically relevant in an era of rapidly evolving cancer treatment and expanding screening practices. A major challenge for the EUROCARE Working Group will be to involve cancer registries, clinicians and health planners in more timely production and interpretation of survival data.

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Specialisation and survival outcome

C.R. Gillis

This paper describes how understanding the socioeconomic paradox of breast cancer incidence and mortality identified that specialisation could improve cancer care.

Breast cancer is unusual in that it is more common in the affluent. However, mortality is the same in the deprived as the affluent. The explanation of this paradox is that the affluent survive longer.

Remarkably, no differences in tumour size, nodal status nor histological grade (where available) were found between the affluent and the deprived, indicating that the distribution of stage of advancement was the same.

Using these data, a study of survival variation in breast cancer by hospital of treatment, taking case mix into account, was conducted. Statistically valid differences were found.

This prompted the question whether specialist care improved survival outcome. When case mix was taken into account, specialists improved the 5-year survival of the affluent by 9% and of the deprived by 7%. Multidisiplinary teams led by specialist surgeons were responsible for the survival improvement observed.

The differences in survival outcome between specialist and non-specialist surgeons in breast cancer have been maintained since the introduction of breast screening. A smaller improvement was observed for ovarian cancer in patients treated by gynaecological surgeons regarded by their peers as specialist.

Similar methodology demonstrated that the stage distribution in colon cancer is the same in the affluent as the deprived and that specialist care improved 5-year survival outcome. Similar findings have been observed for melanoma.

A prospective audit will determine the anatomical sites where specialisation will improve survival outcome.

The constitution, new cancer workload, and methods of operation of breast teams affects their clinical performance

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Multidisciplinary team working has been widely adopted in cancer services following the adoption in 1995 of a new policy framework [1,2]. Evidence supporting this policy came from expert opinion [3,4] and observational studies, e.g. specialisation [5]. There was support from studies in primary care [6,7]. This study took a random sample of 72 breast teams in England using a mix of quantitative and qualitative methods. It examined relationships between:

-  Team inputs, e.g. team membership, size, tasks, diversity of members' professional backgrounds;
-  Team processes, e.g. information sharing, shared influence over decision-making, conflict management, clarifying objectives;
-  Team outputs, e.g. patients seen, quality of care (self-reported effectiveness and selected clinical measures over 12 months), innovation, team member satisfaction and stress.

Disciplines' perceptions of their team's effectiveness varied: breast surgeons and nurses were significantly more positive, histopathologists and radiologists significantly more negative, than the mean. There were relationships between team processes and effectiveness, of which leadership was most important. The number of occupational groups reported as leading the team positively predicted participation, focus on quality and reflexivity, self-rated innovation and overall effectiveness. Conflict or lack of clarity about leadership negatively predicted a range of measures.

Two input variables predicted the aggregated measure of clinical performance. The proportion of breast care nurses in the team and workload (caseload per WTE team member) positively predicted clinical effectiveness ( = 0.376, $P = 0.003$ and &#6J1538; = 0.331, $P = 0.009$, respectively). Specific relationships were found between several team inputs and individual clinical measures. The prevalence of minor psychiatric morbidity among breast teams members was substantially and significantly lower than in other health teams, in the NHS workforce generally, or in studies of the UK population. (Breast Teams caseness levels using GHQ 12 was 15.7% (CI 12.7–18.7, $P = < 0.005$); other values ranged from 20.6 to 26.6%).

Team composition, workload and team processes do affect the clinical quality of care provided.

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What is the evidence that specialisation, caseload and multi-professional teamwork improve cancer outcomes? Colorectal cancer

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Increasingly, data on intersurgeon variability in outcome after curative surgical treatment of colorectal carcinoma have been accumulated. Thus, today the individual surgeon has to be considered as an independent factor influencing locoregional recurrence as well as survival rates. Especially for rectal cancer, higher local control and survival can be expected for specialised surgeons. There are no clear correlations between surgical volume and outcome. Interinstitutional variability in treatment results reflects intersurgeon variability, but analysis is generally more difficult in comparison with to colonic cancer because of greater inhomogeneity with respect to different confounding factors.

In future, clinical trials on multimodal treatment of colorectal cancer, quality assurance of surgery and pathology are necessary for consideration of the prognostic factors surgeon and surgical technique, respectively.

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Assessing quality of life (QL) in cancer clinical trials

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Quality of life (QL) assessments in cancer clinical trials require measures that are relatively comprehensive, that minimise patient burden, and that meet basic psychometric standards. In this presentation, a number of key methodological issues surrounding the development or selection of QL measures appropriate for use in cancer clinical trials will be reviewed.

A common denominator in QL assessment is that the patient is viewed as the primary source of information about his/her QL. In some cases, this may be problematic (e.g. among patients with cognitive impairment or severe symptom distress), and thus it may be necessary to ask key informants (e.g. doctors, nurses or significant others) to serve as proxy raters of patients' QL. Recent empirical studies support the viability of such proxy QL ratings.

QL is most often approached as a multidimensional construct incorporating at least the following health-related domains: **(1)** physical functioning; (2) disease- and treatment-related physical symptoms; (3) psychological functioning; and (4) social functioning. QL instruments can be organised along a continuum reflecting their intended spectrum of application: (1) generic measures designed for use across a broad range of patient populations (e.g. the SF-36, the COOP/WONCA Charts and the Spitzer Index); (2) cancer-specific instruments (e.g. the FLIC, the CARES-SF, the RSCL, the FACT-G and the EORTC QLQC30); and (3) diagnosis-specific instruments (e.g. for patients with metastatic breast cancer or advanced lung cancer). Several investigational teams (the EORTC and the FACT) endorse the use of a modular approach in which a core instrument is supplemented by disease- or treatment-specific modules.

In selecting or developing a QL instrument for use in cancer clinical trials, seven criteria should be critically evaluated: (1) the adequacy of the conceptual model; (2) reliability; (3) validity; (4) responsiveness to change; (5) interpretability; (6) respondent burden; and (7) cultural and language adaptability. Most of the extant QL instruments meet the more technical, psychometric criteria for use at the level of group comparisons. Careful attention to the specific content and phrasing of questions, preferably accompanied by pilot testing in the patient population of interest, provides a common sense, non-statistical basis for instrument selection.

Additional efforts need to be directed toward: (1) generating normative data to facilitate interpretation of questionnaire scores; (2) defining clinically meaningful changes in QL scores; (3) generating methods for comparing results across QL instruments; and (4) adapting existing QL measures or developing new measures appropriate for use at the level of the individual patient.

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Measuring quality of life (QL) in clinical practice in cancer medicine

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N. Aaronson reviewed the assessment of QL in cancer clinical trials. There has been progress although there is additional effort still to come. There is a case for the extension of this approach, with appropriate methods, for measuring QL in individual patients. Such data could be used to enhance the interaction between patients and healthcare professionals by providing additional inputs to allow them to recognise the patients' concerns and problems in all the dimensions of QL. This approach could contribute to the detection of symptoms, to the assessment of change in the severity of symptoms and to the assessment of the damaging effects of cancer and its treatment upon physical functioning, psychological functioning and social functioning.

Before QL measurement can be used routinely in clinical practice, there are a number of barriers to overcome. Instruments used in clinical trials have appropriate psychometric properties for the assessment of groups and need to be critically evaluated in the setting of individual patient practice. Our ability to interpret the meaning of changes in QL scores is still poorly developed. Normative data exists for relatively few populations. There are considerable logistical barriers to overcome in practice where the data has to be collected routinely and regularly in a wide range of clinical settings in order to be useful. Traditional methods of paper questionnaires with manual scoring and entry into databases are clumsy and expensive for this purpose. Finally, we still know very little about the impact on the process and outcome of the care that might follow from the use of QL measurement in routine practice.

My colleagues and I have shown that an approach using computer touchscreens can be reliably and validly used to collect data using a number of established questionnaires, particularly the EORTC QLQ-C30 and the Hospital Anxiety and Depression Scale. In a randomised study, data obtained using this approach were essentially the same as

that using conventional pen and paper methods. With careful attention to hardware and software, the approach is robust in an ordinary clinical practice. We have shown that this approach is capable of detecting a significant proportion of anxiety and depression in our patient population when compared to formal psychiatric interviews. Different approaches to QL measurement in different clinical settings have been evaluated. Broadly, an 'all comers' approach with routine use of the questionnaires at every visit appears to generate a more complete picture of the patients' progress and a higher level of compliance than a selective prospective cohort approach. Our approach is more sensitive than conventional clinical records to patients' concerns, problems and morbidity and the provision of these data, to a small number of healthcare professionals in the pilot study, altered their attitudes and awareness of issues.

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Best practice in primary care for breast cancer

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The 1995 SCCAR report 'Commissioning Cancer Services' recommended that primary care was to be seen as the main focus of care for the cancer patient. Primary care has a role in raising cancer awareness, maximising uptake in screening programmes, in developing referral guidelines and in the provision of psychological and emotional support to patients, their carers and their families.

Since 1995, significant progress has been made in developing improved breast services in Scotland. Fundamental to this process has been the development of closer links between primary care and specialist breast units. The speed of the referral process has increased. The transfer of information from breast units to primary care continues to improve.

From previously being involved in initial referral to the breast unit and also in the symptomatic management of late-stage disease, GPs are now becoming involved with breast cancer patients at all stages of their management.

Development of IT services will allow GPs to participate more directly in clinical decision-making with telemedicine offering the opportunity to bring the opinions of the primary care team into multidisciplinary discussions. Further IT developments will allow GPs to provide breast cancer patients with comprehensive information on their disease and its management.

Conclusion

Developments in primary care are facilitating improvements in the overall management of breast cancer.

Best practice: radiology of breast disease

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1. Population screening

Long-term follow-up results of randomised controlled trials have shown that screening by mammography reduces the mortality from breast cancer by 30% in those invited to attend and that the benefit is greatest in women aged 50 years and over [1]. The National Screening Programme in the United Kingdom was started in 1989 following pub-

lication of the Forrest Report [2] and recommended inviting women for single oblique view screening once every 3 years from 50 to 64 years. On the basis of recently published data showing a higher cancer detection rate using two views [3], all women attending for their first screen are now offered a two-view examination and this will be extended to women attending for incident screens by 2003 [4]. The age range for inviting women for screening will be extended to 70 by years by 2004 [4]. Quality assurance standards have been published for all disciplines involved in breast cancer screening. The key radiology targets [5] include cancer detection rate (prevalent: >3.6 invasive ca/1000 screened; incident: >4.0 invasive ca/1000 screened; standardised detection ratio >1.0) recall rave (prevalent screen $<7\%$; incident screen $<5\%$) and preoperative diagnosis rate of cancers (90%).

2. Screening patients with a family history of breast cancer

Women considered to have a moderately increased risk [6] may be offered surveillance mammography every 1–2 years.

All women undergoing screening mammography should he properly informed about both the benefits and risks of screening so that they are able to make an informed choice about participation [4].

3. Investigation of women with symptomatic disease

Breast imaging should he used as part of the triple assessment of women referred to a multidisciplinary specialist breast clinic [6]. Mammography is used as the first imaging investigation for women aged 35 years and over, often followed by ultrasound. Ultrasound is used as the first investigation for women aged less than 35 years, in whom mammography is rarely required.

4. Staging investigations

There is no evidence that imaging investigation for occult metastatic disease is useful in patients with operable breast cancer [6]. Appropriate radiological investigation (CXR, isotope bone scan, plain X-ray. ultrasound and MRI) should be performed when there is clinical evidence of metastatic disease.

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Best practice in medical oncology for breast cancer

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Most patients (pts) who develop breast cancer (BC) have their disease diagnosed in its early stage (0, I or II) in Western industrialised countries. The management of early BC rests on a combination of expert surgery, radiotherapy and quite often also optimal 'systemic' therapy, which consists of endocrine treatment, chemotherapy or both and is aimed at eradication of micrometastatic disease.

It is the remarkable work of the Oxford group that has provided 'level 1' evidence regarding the effectiveness of adjuvant chemotherapy up to the age of 70 years [2] and of adjuvant tamoxifen, particularly when given for *5* years, in women with oestrogen or progesterone-receptor-positive tumours, independently from their nodal status or their age [1]. Ovarian ablation has also been shown (level 1 evidence) to be associated with significant reductions in recurrence and death in women younger than 50 years [3].

Guidelines for adjuvant systemic therapy according to risk stratification, based on well studied evidence about prognostic/predictive factors and the benefits of available systemic adjuvant therapies, have been recently updated and will be presented [4,5].

Despite 'optimal' multidisciplinary management, a significant proportion of patients diagnosed with early BC (20–80%) eventually develop overt metastatic disease, which remains a largely incurable entity. The median survival from first recurrence in unselected series is approximately 2 years. For the majority of patients with metastatic breast cancer, this disease can be considered a chronic illness, with periods of reactivation and remission and a course of multiple therapeutic manoeuvres. In this setting, optimal palliation becomes paramount, combining treatment and prevention of complications with appropriate attempts to prolong survival maximally, without adversely affecting quality of life.

There are currently four important medical treatment modalities for advanced breast cancer: hormonal therapy, chemotherapy, trastuzumab and bisphosphonates. Patients with newly diagnosed metastatic disease are first assessed to determine the extent of metastatic breast cancer, whether there are life-threatening lesions and whether there are imminent castastrophic complications that urgently need to be addressed. Following this initial evaluation, a variety of clinical parameters are taken into account to classify patients as low-risk (usually hormone-responsive) or high-risk (probably hormone-non-responsive). Age, menopausal status, hormone receptor status, HER2 status, disease-free interval, location of metastatic sites and extent of metastatic disease are all factors that enter into this consideration.

A treatment selection flow pattern adopted by many oncologists for the management of advanced breast cancer, and mostly based on level 2 evidence, will be presented.

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Best practice in radiotherapy for breast cancer

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Breast cancer is a very heterogeneous disease, and radiotherapy plays a central role in the interdisciplinary curative and palliative treatment concept of patients with this disease.

1. Breast conservation treatment (BCT) for invasive breast cancer

Based on the results of several randomised prospective clinical studies and a subsequent consensus statement [1], BCT, which obligately includes whole breast irradiation, can now be offered to the majority of women with stage I and II disease. Also, most patients with larger tumours, who have an unfavourable relation between tumour size and breast size, can now benefit in their quality of life from BCT by initial treatment with chemotherapy. The delivery of a boost dose to the tumour bed further reduces the relative risk of local failure [2]. So far, all randomised trials in which radiotherapy for BCT was omitted have shown a much higher risk of local recurrence rate, even in hormone receptor-positive and node-negative patients with tumours less than 1 cm, who received tamoxifen [3].

2. Postmastectomy radiotherapy for invasive breast cancer

New evidence clearly indicates that after mastectomy all high-risk patients are candidates for postoperative radiotherapy. With the use of modern radiation techniques. survival benefits in the order of 10% can be obtained, and the associated proportional reduction in mortality is more than 20% for the best subgroups, as shown in a recent meta-analysis [4].

3. Locally advanced and inflammatory breast cancer

There is a clear role for radiotherapy in the interdisciplinary management of patients with advanced disease and with inflammatory breast cancer to obtain maximal locoregional tumour control.

4. Breast conservation treatment (BCT) for ductal carcinoma *in situ* (DCIS)

Most patients with DCIS are suitable for BCT (conservative surgery and radiotherapy), provided that the area of mammographically or clinically detected DCIS measures less than 5 cm. Three major randomised trials with sufficient follow-up have shown that there is a significant reduction in invasive and non-invasive ipsilateral breast cancer for all patients when radiotherapy was given after the local tumour excision. In one of these studies, an added benefit was obtained with the use of tamoxifen [5]. Therefore, mastectomy is no longer warranted for the majority of patients with DCIS.

5. Palliative radiotherapy (RT) for breast cancer

Indications for palliative RT include painful bone metastases (pain relief 70–90%), impending fractures, epidural metastases with spinal cord compression, consolidation RT after surgical interventions (e.g. laminectomy), skin and soft tissue lesions, airway and superior vena cava obstruction, brain metastases, orbital manifestations, etc.

Best practice in breast cancer nursing

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Breast care nurses hay become recognised as core members of the designated multidisciplinary team considered to constitute best practice in the treatment of women and men with breast cancer [1–3]. By playing a pivotal part within the team, nurses are in a unique position in that they provide the vital continuity of care for women and their families throughout the whole experience of breast cancer.

Treatment of breast cancer requires multimodal therapy and breast care nurses should have the experience, knowledge and educational preparation to provide both expert care and support for women and their families through the

diagnostic process, treatments, rehabilitation and metastatic disease [4,5]. The key aspects of the role are information giving, physical and psychological assessment, psychological support, counselling, practical advice to patients and carers and timely referral to other affiliated members of the extended team, for example liaison psychiatry, social workers and lymphoedema specialists [6,7]. Women require information related to diagnosis, treatment options, potential side-effects, self-care needs and psychosocial aspects in order that they make make informed choices about treatments and supportive care [8,9].

Breast cancer nursing often involves dealing with individuals or families with complex or demanding needs following a diagnosis of breast cancer. Breast care nurses, as advanced practitioners, have to demonstrate clinical expertise and autonomous clinical decision-making whilst acting as a resource to patients, nurses and other healthcare professionals [5]. In some settings, the spectrum of skills added to nurses roles include nurse-led diagnostic clinics, fine-needle aspiration cytology, inflation of tissue expanders and nurse-led follow-up clinics. The variation in extended roles needs some caution, however, as the public's expectations of these roles may be challenged if there is not uniformity of practice nationally. This is highlighted in other areas of cancer management in the NHS Cancer Plan [10].

As the management of breast cancer evolves, the breast care nurse must be aware of continuing development needs. The promotion of 'best practice' is seen through utilising research and audit effectively in the clinical setting, therefore providing contemporary breast cancer care.

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Implication of best practice for breast cancer in Switzerland

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Switzerland is a small country with seven million inhabitants. Twenty-six Cantons are autonomous for health budgets and number of hospitals as well as for licensing physicians. The federalistic Swiss health structures are dominated by somehow conflicting financial interests, including physicians, state owned or private hospitals, costs for pharmaceuticals and equipment, etc. The Swiss health system is considered expensive. Basic health insurance is compulsory in Switzerland.

In breast cancer, relative high rates for cure or effective palliative treatments are probably due to the high quality of medical care available for every patient in Switzerland. Preventive measures are minimal and only applied at the discretion of physicians. Most patients in our country have access to interdisciplinary oncological treatments. The basis of that approach is the high quality with which the main treatment modalities (surgery, radiotherapy and chemotherapy) are applied. For instance, chemotherapy is provided by a medical oncologist registered and approved by the Swiss Society for Medical Oncology (SGMO). SGMO is responsible for evidence-based and updated National

Guidelines [1] and was among the first of the European National Societies which used ESMO examinations for board certifying oncologists.

The satisfying results of breast cancer treatment in Switzerland are one example for an effective interdisciplinary approach available in almost all areas of the country. All university hospitals and most large regional hospitals are members of the Swiss Group for Clinical Cancer Research (SAKK) and the International Breast Cancer Study Group (1BCSG) since 1974. Primary treatment of breast cancer in these hospitals and affiliates is mostly given within protocols. Newer technologies such as breast-preserving surgery with simultaneous sentinel lymph node examination can possibly be applied in specialised centres only, thus necessitating new patterns of care.

Actually, the Swiss Institute for Applied Cancer Research (SIAK) established the Network for Outcome Research in order to improve interdisciplinary collaboration and to open research activities on costs and quality of life. Cost effectiveness, quality of life issues and prevention are topics for studies which will then allow a more rational approach to these questions.

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Best practice for imaging colorectal cancer

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Imaging techniques can be used for both symptomatic patients and those undergoing screening for colorectal cancer (CRC). Until recently, screening has been confined to high-risk groups and is usually done endoscopically so, therefore, imaging techniques are more relevant to screening programmes directed at the general population.

Traditionally, the double contrast barium enema (DCBE) is used to detect CRC. It is very safe and will visualise the whole colon in more than 95% of cases. It will detect significant colonic abnormalities in over 90% of cases. It is intermediate in cost between sigmoidoscopy and full colonoscopy. The dose of radiation amounts to the equivalent of up to 5 years of the natural background. Screening older patients at 5 to 10 year intervals should not result in excessive dosage. In the UK, manpower shortages in radiology are an issue especially if 'double reporting' is being considered. Increasingly, the examination is conducted by radiographers and interpreted by radiologists. While endoscopy allows the removal of tissue for diagnostic and therapeutic purposes, this is not a prerequisite of a screening test. Colonoscopy has a morbidity, mortality and expense that would be very significant in a screening population. Some form of examination is necessary for patients in whom colonoscopy has failed and it is likely that the DCBE will be around for some time to come.

Staging of CRC is best done using a helical CT scan with oral and intravenous contrast enhancement. Chest CT is not routine but anal and low rectal lesions may exhibit systemic metastases before spreading to the liver. When it is available, MR may add some value in rectal carcinoma.

CT colonography is an unproven technique using new multislice technology. Early studies suggest that it offers full visualisation of the colon and sensitivities superior to DCBE and even colonoscopy. It will also show incidental pathology. It is claimed that exposure to ionising radiation is similar to screening mammography. In the USA, a large study has just commenced comparing DCBE, colonoscopy and CT colonography. In the meantime, the debate continues with diametrically opposed views being expressed in the literature.

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Medical treatment of colorectal cancer current practice and investigational treatment

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As a consequence of different studies. conducted mainly in the US but also in Europe. the evidence that systemic adjuvant 5-fluorouracil (5-FU)-based treatment can delay or reduce recurrence after resection of high-risk (Dukes' C or TNM stage III) colon cancer is now generally accepted.

It can be argued that bolus 5-FU + leucovorin (LV) either in a weekly schedule ('Roswell' regimen) or in a monthly ('Mayo') regimen for 6 months is currently the most widely accepted 'standard' adjuvant treatment.

Treatment regimens under investigation include infusional 5-FU/LV. bolus or infusional 5-FU ± CPT-11 or ± oxaliplatin. UFT (uracil + tegafur) + LV (Orzel™), capecitabine, the monoclonal antibody 17-1A (Panorex™) and active specific immunotherapy (ASI) (Oncovax™). A large trial assessing Panorex versus 5-FU/LV versus the combination has recently been completed. Although official results are unknown so far, the company decided to withdraw the drug from the German market where it had been approved already.

In stage II colon cancer, adjuvant treatment is controversial and not generally accepted.

In advanced disease, the same bolus 5-FU/LV schedules (weekly or monthly) are still widely applied. Infusional 5-FU is gaining more acceptance, mainly in Europe, because of higher response rates and a superior toxicity profile. The need for venous access devices, however, is a relative drawback. 5-FU/LV + CPT-1 has been approved by the FDA as well as in Europe, while 5-FU/LV + oxaliplatin is approved in Europe. Some now consider 5-FU/LV + OPT-11 as current standard treatment. The question is: should all patients receive this combination upfront or does a sequential approach (5-FU/LV first and, upon failure in suitable patients, the addition of CPT-11 or oxaliplatin) result in an equal benefit?

Some oral 5-FU prodrugs have been approved for first-line treatment and might possibly partly replace intravenous 5-FU/LV.

Lastly, an important challenge is to determine the means by which physicians can individually tailor new therapies, i.e. select new agents. either as monotherapy or in combination, as best treatment on the basis of individual patients' biological markers.

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The evidence base for radiotherapy in treatment of rectal adenocarcinoma

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Surgery with sharp dissection and total circumferencial mesorectal excision (TME) is the standard treatment of advanced rectal cancer [1]. Radiotherapy alone with high dose to small volume can give long-term control of TI and selected T2–3 rectal tumours [2].

If local control and survival are key end points, sphincter saving and quality of life are becoming major issues [3].

Early rectal cancer (T1 N0 small T2 N0) can be treated by local endoanal excision (±radiotherapy) or by endocavitary irradiation (±external beam radiotherapy±chemotherapy [2].

Advanced T2–3–4 rectal cancer are treated by TME surgery.

- Postoperative chemoradiation can increase local control and survival. Protracted fluorouracil infusion is recommended. Toxicity can be a limiting factor [4].
- Preoperative irradiation appears to give better local control and less toxicity than postoperative RXT [5] and can increase both local control and survival [6]. Even with TME, preoperative RXT improves local control [1].
- Preoperative RXT and long interval before surgery increase downstaging, do not increase surgical morbidity or local relapse and may increase sphincter saving surgery in low rectal cancer [3].

Ongoing clinical trials will define the best preoperative regimen of radiotherapy (±chemotherapy). Tumour biology may help to select patient for neoadjuvant or adjuvant chemoradiation.

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Optimal standards of care for colorectal cancer: the nurses perspective

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Colorectal cancer is one of the most common cancers in the Western world, second only to lung cancer in men and breast cancer in women. It has an annual incidence of 35 male and 25 female cases per 100 000 in Europe, and at least half of these patients will develop metastatic disease. Colorectal cancer killed 557 000 people worldwide in 1998 (WHO Annual Report, 1999).

This group of patients with metastatic disease requires supportive nursing interventions during their treatment and illness. 'The Nursing in Colorectal Cancer Initiative' is a European Oncology Nursing Society (EONS) project (funded by an educational grant from AstraZeneca) which was established with the aim of improving the nursing care of patients with colorectal cancer. The project has looked at the educational needs of nurses and has evaluated the structures and processes that are necessary for optimal nursing practice.

Although a multidisciplinary team approach is essential to provide best cancer care, nursing and nursing innovations are increasingly being recognised to have a positive impact on patient outcomes. The elements of professional nursing need to be in place to meet the hallmarks, or standards, of care defined and agreed by the expert colorectal cancer nurses from the 10 countries involved in the NICCE project.

An educational package provides the evidence-based rationale for the definition of the following three hallmarks of clinical practice for colorectal cancer nursing.

- Hallmark I — Nurses are integral members of the team responsible for care management.
- Hallmark II — Nurses have core knowledge, skills and professional attitudes to care effectively for patients with colorectal cancer.
- Hallmark III — Nurses facilitate patient involvement in care decisions, respecting individual patient preferences.

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Policy for best practice in colorectal cancer diagnosis and treatment

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1. Introduction

Policy for best practice is understood as the most efficient strategy to achieve an accurate disease/stage diagnosis and receive efficient treatment. Colorectal cancer is a human tumour model in which major changes in medical management have been identified in the last decade [1,2].

2. Colon cancer

Advanced endoscopy is mandatory for accurate diagnosis of cancer, premalignant conditions and survey of high-risk individuals. Presurgical disease staging requires the coordination of at least: specialised medical visits, laboratory test and imaging modalities (seven to eight different tests). Surgery is standard for the treatment of primary tumours and selected indications of liver metastatic disease. Adjuvant chemotherapy is standard for B_2–C patients [3]. Palliative chemotherapy is cost-efficient in metastatic disease [4]. Developmental strategies are: PET scan for CEA elevation (and/or initial staging); laparoscopic surgery for primary tumours; intra-arterial chemotherapy for liver metastasis ($\pm$adjuvant).

3. Rectal cancer

Rectal cancer is a challenge to the ability of the health system to integrate specialised diagnostic and treatment modalities. Definitive cure, ano-rectal sphincter preservation and minimal (asymptomatic) late enteritis are the aims of efficient treatment. Endorectal ultrasound should be added to conventional diagnostic strategies (seven to nine tests) [5]. Early tumour stages deserve radical treatment but with high priority for sphincter preservation procedures (transanal irradiation and minimal surgery) [6,7]. Intermediate stages (B_2–C) do benefit from pelvic radiotherapy plus adjuvant chemotherapy [8,9]. Total mesorectal excision is widely incorporated in most surgical practice. Selected liver metastatic and/or pelvic recurrent patients are candidates for retreatment with local techniques. Systemic chemotherapy is efficient in metastatic patients. Developmental strategies are: pre-operative irradiation appears superior to postop RT in sphincter preservation and survival rates [10,11]. PET scan might improve disease staging [12]. New chemotherapeutic agents might simplify treatment delivery (oral, intravenal bolus, etc.) [13,14]. Specific surgical training has an impact on treatment success [15].

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Best practice in radiotherapy for prostate cancer

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Radical radiotherapy for prostate cancer has undergone substantial changes over the last decade. Technologies to allow 3D tumour and target visualisation, registration, radiotherapy treatment planning and delivery have become widely available. Randomised trials of conformal radiotherapy have demonstrated clear benefit in reduced treatment-related morbidity. Large phase II trials have suggested benefits from dose escalation in improved tumour control and these results are now being substantiated with preliminary observations from phase III studies. Internationally, a sufficiently large number of patients will be entered into these randomised trials to demonstrate whether or not improvements in biochemical and local tumour control translate into overall survival advantages.

Brachytherapy using iodine or palladium seeds alone or in combination with external beam therapy is being used widely in North America and increasingly in Europe. North American and, recently, European guidelines have been produced to guide optimal patient selection for these techniques and also to ensure adequate quality assurance programmes are in place.

Phase III studies have clearly demonstrated the advantages of both neoadjuvant and adjuvant androgen suppression in addition to radiotherapy in producing tumour control and overall survival benefits. A compilation of studies reported by the Radiotherapy and Oncology Group (RTOG) currently provides the best guide for patient selection. Further work is required to define the optimal type and duration of hormonal therapy and to determine the optimal balance of efficacy and toxicity combining hormonal treatment with modern radiotherapy techniques using escalated doses of radiation.

New technological capabilities in radiotherapy and implications for outcomes

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The last decade has provided us with a large number of technological advances in the field of diagnostic and therapeutic radiology. These technological capabilities can be summarised as:

- large scale application of reliable methods to delineate target volumes in combination with sophisticated image registration tools;
- installation of sophisticated treatment machines and 3D treatment planning systems;
- introduction of extensive quality assurance programmes.

Target volume delineation is one of the most difficult steps to perform in a successful radiotherapeutic treatment. Margins in 3D around the macroscopic target volume have to be incorporated to take into account uncertainties in microscopic extension of the tumour volume, internal organ movement and set-up error during treatment. Due to the

steep dose–effect curves encountered in radiotherapy, a high accuracy is required in the computation of the 3D-dose distribution. Physical and biological optimisation of these dose distributions have led to complicated treatment techniques. Pretreatment verification as well as checks during the actual patient irradiation are applied to introduce these new technological capabilities in a safe and reproducible way in the clinic.

Better target volume delineation has certainly led to a higher quality of radiotherapy but will be difficult to quantify in terms of survival. By reducing the amount of irradiated normal tissue, fewer complications have been observed. Furthermore, higher doses can be given to the target volume, sometimes in combination with chemotherapy, resulting in higher values of local control. To what extent these new technological capabilities will be implemented in a large number of institutions will depend on many factors, such as resources for equipment, personnel and training. In clinical practice, these tools can only be used in a reliable way if the various disciplines involved in applying these technological advances work together in an enthusiastic and professional manner.

The economics of cancer: specificities and challenges

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Over the past decade, there has been a growing interest in the economic evaluation of therapeutic advances as a policy decision input, as witnessed by the creation of a growing number of governmental and private initiatives to foster evidence-based medicine and cost-effective practices.

Cancer therapy is no exception to this trend. However, a number of features distinguish it from other clinical areas for economic evaluation:

- First is the large size of the patient population, with cancer being the second or first cause of death in developed countries.
- Second, there is a historically nearly unique focus on (disease-free) survival as a measure of efficacy by clinicians and statisticians alike, given the bleak outcome and often low survival rates for patients.
- Third, medical advances have in many cases been slow, with painstaking small increases in cure rates resulting from numerous adjustments in therapy.
- Fourth, clinical studies in cancer typically need very long follow up times, often several years, and when results finally become available, they are often superseded or challenged by more recent advances in technology or drugs.
- Fifth, cancer therapy is characterised by a wide variety of comparing practices and therapeutic approaches, reflecting in a sense the gaps in our fundamental disease process.
- Finally, cancer therapy is often of long duration and uses expensive imaging technology and compounds.

Future challenges for the economic evaluation of cancer are therefore also manifold:

- First, improvements in data collection methods and integration of data from various sources, especially in daily practice, have to be pursued and improved.
- Second, we have to recognise the multiple aspects of the disease (clinical, psychological and social) and their evolution over time and take these into account in our assessment of competing therapies.
- Third, there is a need to better recognise and describe the interdependencies between screening policies, choice of diagnostic tools, chemo-, radio- and other therapeutic procedures and supportive treatments in an integrated evaluation perspective.
- Fourth, evaluation of optimal screening policies, where health gains at the population level could be large, should receive more attention than in the past.
- Fifth, there is a need to extend the results from focused studies on treatment comparisons in selected centres into evaluations of their diffusion and implementation in daily practice in the community, taking into account the financial, equipment, medical personnel and facilities constraints.

Only then will we be able to offer as a society and as professionals the best care we can afford, given the always too scarce resources we depend on.

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Approaches to delivering cost effective cancer care: a perspective from the pharmaceutical industry

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In addition to submitting safety and efficacy data to regulatory authorities for marketing authorisation, the pharmaceutical industry is increasingly required to present information supporting applications for pricing reimbursement or formulary approval. A growing number of countries subject new therapies, including those for the treatment of cancer, to formal economic assessment [1–3].

The needs of customers for economic information can be different from those of the regulators. However, often the information is required at a similar time so that the source of the data is frequently the same: phase III randomised controlled trials. While the regulatory process is becoming streamlined, the provision of cost-effectiveness information is market-specific. This is due to real differences in treatment practices, unit costs, regulations for pricing and/or reimbursement of medicines and public health priorities.

The needs of the economic customer are having a greater influence on drug development programmes. This has led to extra work to determine customer needs, identify the major cost drivers of the disease and its treatment and to develop measures of resource use and quality of life. Wherever possible, these are then included in the clinical trial programme. However, there are limitations, such as differences between the comparator for regulatory purposes and the economics in individual markets, resource use within a trial is often influenced by study design, submission to regulatory authorities is usually based on an intermediate endpoint whereas economic customers are interested in the final outcome and, while the study is powered for the primary clinical endpoint, it may not be adequate for the economic outcome.

Economic evaluation of cancer treatment presents its own challenges. Initial development is often in patients with advanced cancer when the therapy will eventually prove of greater benefit to patients with earlier stages of disease. The optimal treatment regimen may not evolve until many years after the product has been in general use. Patients are generally not followed up intensively on disease progression whereas the major economic benefits may be realised by delaying or preventing the use of resources at this time. In these instances, the best that can be provided is clinical trial, data supplemented by economic modelling.

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The Danish National Cancer Plan

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The Danish National Cancer Plan was requested by the Danish Health minister and was presented to the public in March 2000. The plan is based on an epidemiologic status for cancer survival, documenting a higher incidence and lower survival rates for cancer patients in Denmark compared with the findings in neighbouring countries. The plan contains a number of recommendations for improving the quality of care for cancer patients. The recommendations encompass all aspects of the care: preventive measures, diagnosis, treatment, rehabilitation and palliative care. The plan suggests that local and regional co-operation is strengthened in order to improve the chain of care for individual cancer patients. Furthermore, specific recommendations are made in order to improve the conditions for securing the quality of the surgical procedures and the access to evidence-based oncological treatment (radiotherapy and chemotherapy) when such care is relevant and also, subsequently, the capacity or diagnostic work-up in relation to patients submitted. Economical resources have been allocated to implement the plan's recommendations and it is continually followed-up by the National Board of Health.

The US National Cancer Institute's Quality of Care Initiative

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That the quality of cancer care is a major concern in the United States has been underscored by recent reports from both the National Cancer Policy Board of the Institute of Medicine and the President's Cancer Panel. In response, the US National Cancer Institute has launched a Quality of Cancer Care Initiative, intended to make cancer a 'working model' for quality of care research and application. The NCI Initiative, as summarised in the Fiscal Year 2002 budget request submitted to the President, creates a four-point research programme to improve the state of the science for defining, monitoring and improving the quality of care. In parallel, it continues support for the Quality of Cancer Care Committee (QCCC), a task force comprising all federal government agencies involved in cancer care delivery, payment decisions or regulation. The purpose of the QCCC is to ensure that federal-level decision-making on cancer care is informed by the best available scientific evidence about quality measures and assessments. The four-point research programme is designed to: (l) develop core process and outcome measures for assessing the quality of cancer care; (2) strengthen the methodological and empirical foundations of quality of cancer care assessment (the centrepiece is a new 5-year, $40-million project (CanCORS) to establish a national consortium of research teams — focusing on colorectal and lung cancers — to study the impact of high-profile interventions on patient-centred outcomes); (3) enhance quality-of-care research within the restructured NCI clinical trials programme; and (4) strengthen the quality of cancer communications.

Lung cancer — best practice in primary care

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1. Introduction

Lung cancer is the most commonly encountered cancer in Scottish general practice. On average, a GP will see 2 new cases every 3 years although much will depend on the deprivation profile of the practice. Because of the relatively poor prognosis, each GP will have only a few, if any, individuals 'living' with their cancer at any one time.

There is very little research evidence available to support best practice guidelines iii lung cancer in primary care although there is ample evidence of what constitutes good general practice. Individuals presenting with symptoms suggesting lung cancer as a possible diagnosis will want quick and easy access to a GP who has adequate time and the consultation skills required to allow an appropriate assessment. These GPs do exist but may be found more often in more affluent areas where workload pressures are less, an example of the inverse care law where resources are allocated to those who need it least. Crude registration rates for lung cancer between Health Board areas in Scotland per 100 000 of the population vary from 56 in the islands of Orkney and Shetland to 129 in Greater Glasgow where males in deprived areas carry as much as 4 times the risk of lung cancer as those in more affluent areas.

2. The cancer journey

Although there is a perception that the main contribution of primary care is to refer people to secondary care, the truth is that individuals spend only short spells in hospital and GPs and their primary care teams have a part to play during all stages of the patient's journey through the healthcare system. That contribution will be outlined in relation to the cancer journey and best practice will be presented, based on evidence where possible, in primary prevention, screening, diagnosis, treatment, follow-up and palliative care. The SIGN Guideline in the management of lung cancer will be discussed and ideas for improvements in service delivery will be presented.

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The evidence base for radiotherapy in treatment of lung cancer

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Radiotherapy is an effective and important treatment for patients with lung cancer. Variation in its use have been identified and wide differences exist in the choices of radiation schedules. A number of evidence-based guidelines have been developed (SIGN, COIN, ASCO) and their implementation in Scotland is being monitored by a national QA process (CSBS).

Common symptoms, such as haemoptysis, cough, large airways obstruction, dysphagia and pain, respond in at least 60% of patients treated with moderate radiation doses and minimal side-effects [1].

In patients with localised tumour unsuitable or refusing operation, high-dose radiotherapy leads to 30–40% 5-year survival [2]. CHART has produced a 10% increase in survival compared to classical fractionation schedule [3].

Postoperative radiotherapy is not indicated in completely resected patients with $<$N2 tumours [4].

In small-cell lung cancer, thoracic radiotherapy [5] and PCI [6] lead to halving the rates of local failure and significant improvements in survival.

A number of novel technical and biological modifications promise further improvements in efficacy as well as a reduction of normal tissue toxicity, and thoracic radiotherapy together with chemotherapy has become the standard of care for patients with loco-regional non-small cell lung cancer in many parts of the world.

In the UK, the limited provision of radiotherapy facilities, lack of specialisation and long waiting times for treatment have limited the availability of modern radiotherapy for many lung cancer patients. Implementation of evidence-based practice will redress some of this imbalance and help to improve the outcomes for this large group of patients.

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Best practice in nursing for lung cancer

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Currently in the United Kingdom, there are no established guidelines for best practice in nursing patients with lung cancer. The importance of involving nurse specialists within the cancer team has been emphasised in recent national guidelines [1,2]. However, evidence evaluating the impact of nursing interventions on patients with lung cancer is limited.

Patients with lung cancer suffer a multitude of distressing problems [3]. However, evidence suggests that symptoms are often difficult to ameliorate [4] and needs often remain unmet [5]. Pessimistic and nihilistic attitudes in lung cancer care still exist and the challenge for health professionals is not only to explore ways of improving survival, but also ways in which patients' overall experience of care and quality of life can be improved [6].

Initial research has demonstrated that involvement of specialist nurses in follow-up care can lead to higher levels of satisfaction for patients with lung cancer [7]. Nurses can play a significant role in ensuring a streamlined and coherent service for patients by working with colleagues across professional and organisational boundaries [7]. By responding sensitively to the aspects of care that we know are important to patients with cancer and, in particular, addressing the known needs of patients with lung cancer, nurses may be able to reconfigure the environment of care. Areas of importance include:

1. Improving communication and information giving [7].
2. Providing continuity and personalised care [7,8].
3. Providing a competent service that patients have confidence in [8].
4. Ensuring that patients have ease of access to help and advice [7,9].
5. Ensuring adequate symptom control [3].
6. Providing psychological and social support to patients and their families [6,7].

Studies suggest that involvement of nurse specialists who focus not only on improving the physical aspects of care, but also on improving the psychosocial and spiritual experience of care, can lead to positive outcomes for patients with lung cancer [7,9,10]. The challenge for all practitioners is to work within multiprofessional teams to develop new strategies and ways of working that will improve the overall experience of care for patients and their families. A further challenge is to develop research tools capable of measuring and evaluating the impact of nursing interventions on the outcomes of patients with cancer.

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Policy implications of best practice for lung cancer

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In the county of Salzburg, we expect approximately 400 new cases of lung cancer each year. For a population of 500 000, this results from a continued prevalence of smoking of approx 30% [1]. Overall, age-adjusted cancer mortality in Austria has decreased between 1971 and 1996 by 13% in men and 19% in women, resulting mainly from changed incidence and screening [2]. However, for lung cancer, age-specific incidence showed the opposite trend.

Patients in Austria tend to become younger due to the uptake of smoking at younger age. Furthermore, overall smoking prevalence in Austria has also increased by 5% between 1986 and 1995 [3].

Based on these data, primary prevention of lung cancer on an individual as well as a community level should be the first issue. This is strongly supported by cost-effectiveness analysis, demonstrating that smoking intervention is the most effective means of saving years of life [4].

With regard to secondary prevention, a number of tools have recently become available (induced sputum, low-radiation CT and fluorescence bronchoscopy), but evidence with regard to routine implementation is still inconclusive [5,6].

The care of patients with lung cancer is responsible for 20% of all cancer care costs [7] and, when compared with end-stage COPD, cancer patients do better with regard to medical treatment and social care [8]. Given that hospitalisation remains the major cost issue, care of these patients should concentrate on a number of medical services (pulmonology, thoracic surgery, radiation therapy, oncology and nuclear medicine) [9]. These centres should serve a minimum patient volume of a few hundred patients per year and, whenever possible, recruit them into clinical studies.

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Ovarian cancer: imaging

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Most women with ovarian cancer present with advanced stage (FIGO III and IV) disease, For these women, ultrasound (US) confirms the presence of an adnexal mass, ascites and/or metastatic deposits in the peritoneum or viscera. The key clinical decision is whether to proceed to radical cytoreductive surgery. In women fit for this surgery, CT and MR imaging are superior to US for planning surgery and predicting its success in terms of residual disease [1]. For women unfit for or beyond the scope of surgery proceeding to neoadjuvant chemotherapy, CT-guided biopsy provides a simple alternative to limited surgery or laparoscopy for obtaining a confident histological diagnosis [2]. This tool is also valuable when there is concern that peritoneal carcinomatosis reflects metastasis from other organs (e.g. breast and GI tract).

Other patterns of presentation are with a symptomatic pelvic mass, discovery of an incidental mass during other investigation and as part of screening programmes for ovarian cancer. There is no case for screening of the general population for ovarian cancer although large-scale trials are planned. In these CA-125-driven trials, imaging forms part of second line investigation. US-based 'screening' proved disappointing with unacceptably high proportions of women with benign ovaries submitted to surgery [3,4].

For investigation of the pelvic mass, US remains the first-line investigation on grounds of availability, safety and patient acceptance. Morphological analysis is more reliable than Doppler US measurements in defining their nature. A variety of scoring systems are described [5,6]. However, both CT and MR imaging are superior to US in characterisation of adnexal masses [7,8], and with MR in imaging dermoid tumours or endometriomas as these can be confidently characterised.

After surgery, CT is widely used for monitoring chemotherapy but this stems more from its use in clinical trials as a reproducible modality than from any evidence base. For women in clinical and biochemical remission, there is no place for imaging. CT or US may be used for confirmation of relapse. CT provides a more complete picture of disease extent and better informs treatment selection. The value of second-look laparotomy has not been redefined in the era of high resolution CT and MR imaging.

Any centre specialising in the management of ovarian cancer should also have expertise in interventional imaging techniques in the GI and GU tract for palliative procedures.

Finally, as women with ovarian cancer live longer into the natural history of the disease (or rather that modified by therapy), new and unusual patterns of disease are being encountered with brain, lung and bone metastasis. Familiarity with these patterns will limit unnecessary investigation.

'Whither Surgical Oncology?'

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Surgery has been the cornerstone of local cancer control since time immemorial, and little is going to change that in the next 20 years. What is already evolving, however, is the increasing application of systemic therapy prior to surgery for a primary tumour. The pace has been set, as in many areas of oncology, by the paediatricians. Attempts to spare children the growth-arresting effects of radiotherapy have led to the adoption of so-called neo-adjuvant chemotherapy prior to surgery. For some paediatric malignancies like osteosarcoma, the drug treatment has been so successful that the nature of subsequent surgery has dramatically altered. Amputation of tumour-bearing limbs is now the exception, removal of residual cancer tissue and restorative operations the rule.

So with common adult cancers such as non-small cell lung and breast, early results of primary drug treatment followed by surgery are extremely encouraging.

Not that radiotherapy will become redundant. Far from it; it will become more focused, better targeted and dosed according to the biology of the individual cancer.

The cancer surgeon has an interesting time ahead, because of increased efficacy of screening and early diagnosis programmes and better understanding of genetics for instance in a 'field' such as bladder or oesophagus. Chemoprevention is rapidly maturing too and, as with adjuvant therapy in the old days, many of the big trials are being run by surgeons. A good time to specialise in the subject!

Paediatric cancer trials: lessons in translating research into clinical practice

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Since the first randomised control trial (RCT) on the use of streptomycin in tuberculosis [1] such trials have progressively become the gold standard by which the choice of treatment for patients with any particular disease and the evidence to support such choice can be judged [2]. After the first early phase, single and then multidrug studies for childhood cancer in the 1950s and 1960s (especially for acute leukaemia), paediatric oncology has been the subspeciality par excellence which has embraced RCTs and, more recently, the use of overview analyses to provide the evidence for optimal treatment [3,4].

Secular trends for treatment in specialised centres, and even more markedly, entry on trials has been associated with dramatic improvement in survival. Centre treatment for acute lymphoblastic leukaemia (ALL) rose from 77% during 1980–1984, to 89% between 1990 and 1994 with an improvement in 5-year survival from 67 to 81%. Comparison during the same time periods for those treated on trials or off showed 5-year survival figures of 70 and 64%, respectively, during 1980–1984, which rose to 84% compared with 68% during 1990–1994. This latter improvement for patients on trials equates to 50 more children per year surviving if they actually enter a treatment protocol [5].

Some of the value of trials is independent of the randomised question. For example, between 1980 and 1997, treatment-related mortality on MRC childhood ALL trials has fallen from 9 to 2% of entrants, principally due to a decrease in fatal infections [6,7]. Sharing of information and expertise, laying down of management guidelines and audit of participation, compliance and outcome are all critical. The essential nature of physician and patient compliance cannot be overemphasised. Relapse rates in UKALL VIII (1980–1984) for ALL were 42% for those who deviated in drug dosage or delivery by 10% or more during induction compared with 24% for those who fully complied. Even in the hands of experienced physicians, for the patient being on a trial protocol carries real benefit [8] and *ad hoc* therapy an extra risk.

The only unbiased way to test the value of a new treatment is to randomise it against the best previous therapy. The careful preparation of a trial, asking important and meaningful questions based on sound pilot phase 1 and 2 studies Including advice on all aspects of care, has yielded an ever-increasing improvement in disease control and survival but has also demonstrated that more is not always better (for example, in the national osteosarcoma studies). Increasingly in these rare disorders, international collaboration, not always easy to achieve, is required for further advances to be made and does increase the pool of expertise applied to the question in hand [9]. Participation in trials should be the norm with no place any longer for the 'trust me, I'm a doctor' approach from the lone cavalier!

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Implementing the results of clinical trials — challenges and solutions

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The results of hundreds of clinical trials (CTs), both randomised and non-randomised, are published every year in more and more journals; but clinical practice changes slowly and often idiosyncratically. Some new drugs and procedures are introduced quickly, despite poor supporting evidence, because of intuitive attractiveness, novelty value or strong marketing. Others, though well proven, may be slow to come into routine practice because: (1) the results are not known; (2) they are known but not believed; (3) they are believed but there are local or national constraints.

Dissemination and access are real challenges. Solutions that will improve the spread of useful new information include wider access to research databases, more good systematic reviews, further development of the Cochrane Cancer Network as well as continuing medical education.

Understanding and believing the results of CTs is a more complex problem. Poor research design and poorly written reports are reasons, which wider compliance with the 'Consort' guidelines should help. However, cultural factors and preconceptions also colour how the results are interpreted.

Changing clinical practice, even with good CT evidence is hard. The strong marketing of new drugs and technologies by industry can produce rapid change, but individual problems such as finding new resources, concerns about safety and obstacles to changing the processes of care are very real. Less often acknowledged is the drop in income in some healthcare systems if the change means doing less. Economics and culture both interact with the science in this complex process.

Healthcare is changing with a move everywhere to more 'managed' and guideline-driven care. This is good provided that the processes driving this are systematic in finding and assessing innovations and can ensure that appropriate changes happen, while still giving scope for individual inventiveness — and yet more research.

Outcome measures in palliative care

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Improvement of symptoms and quality of life is the ultimate goal in palliative care. How to assess symptoms and functions, often also called health-related quality of life (HRQOL), is still discussed in palliative care after approximately 25 years since the first comparative study was published in oncology.

There are specific challenges in conducting prospective randomised trials in palliative care related to the heterogeneous patient population, short life expectancy, multiple symptoms, polypharmacy and cognitive failure.

As far as possible, the intervention should be standardised and reproducible, the compliance needs to be satisfactory and the primary outcomes should be defined. Furthermore standardised methodology is the goal also when evaluating HRQOL in palliative care, both related to use of outcome measures, scoring methodology and presentation of data.

Internationally validated HRQOL questionnaires, such as the EORTC QLQ-C30, and pain measures, such as the Brief Pain Inventory, or simple verbal or numerical rating scales are recommended by several authors. By using similar outcomes in consecutive studies, comparisons between studies are possible and the clinicians will get an intuitive understanding of the estimates which make it possible to incorporate these outcomes into the decision-making process.