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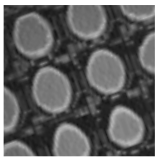

CANCER FORUM

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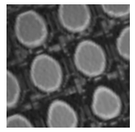

Head and neck cancer: improving outcomes

Overview

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Head and neck cancer is the sixth most common cancer worldwide representing a wide range of malignancies. This issue of Cancer Forum focuses on mucosal (non-nasopharyngeal) head and neck squamous cell carcinoma (SCC). A small section is also devoted to non-melanomatous cutaneous skin cancer.[1]

The cure of locally advanced mucosal head and neck SCC with surgery alone is commonly said to be in the order of 30%. Coutard in the 1920s demonstrated the ability of external beam radiotherapy alone to cure cancers of the pharynx and larynx. By 1957 MacComb and Fletcher recognised the benefit of a combined approach of surgery and post-operative radiotherapy in locally advanced mucosal head and neck SCC.[2,3]

By the 1980s, following a randomised trial initiated by the Radiation Therapy Oncology Group (RTOG) in the 1970s, the superiority of post-operative radiation therapy compared with pre-operative treatment was established.[4]

Since that time, efforts have been made in identifying and refining the clinico-pathological risk factors warranting post-operative radiotherapy, determining the optimal radiotherapy dose and improving outcomes with the use of treatment intensification through altered fractionation and chemo-radiotherapy.[5-8]

Peters et al on a prospective trial evaluated the optimal post-operative radiation dose for locally advanced mucosal head and neck SCC, based on clinical and pathological risk factors. The most significant high-risk feature identified was the presence of extracapsular nodal extension. This was one of the first studies to define high-risk features. The impact of these features were further validated in a subsequent study reported by KK Ang et al.[5,6]

Early attempts at organ preservation using induction chemotherapy and radiotherapy were reported by the Department of Veteran Affairs and European Organisation for Research and Treatment of Cancer Larynx preservation studies. Both demonstrated that the use of induction chemotherapy followed by radiotherapy in responders for laryngeal and hypopharyngeal tumours, respectively, could result in preservation of the larynx, without a survival disadvantage compared with immediate surgery and post-operative radiotherapy.[9,10]

Over the last two decades many centres have moved toward organ-preservation for locally advanced mucosal head and neck SCC through use of radiotherapy with or without chemotherapy. However, in the absence of high quality randomised evidence comparing surgery and post-operative radiotherapy with chemo-radiotherapy, the debate of which approach to use continues in many multidisciplinary clinics.

Altered fractionation

Disappointing outcomes with conventionally fractionated radiation therapy in locally advanced mucosal head and neck SCC led to the investigation of altered fractionated radiotherapy. Based on radiobiological principles, the use of accelerated, hyperfractionated or a combination of both schedules has been examined in randomised trials comparing outcomes with conventionally fractionated radiotherapy. Late radiation effects are partly dependent on the fraction size of the radiation dose, as discussed by Poulsen. Hyperfractionated radiotherapy aims to deliver a higher total dose, without an increase in late radiation effects, using radiation fraction sizes less than the conventional dose of 1.8-2.0Gy. Accelerated radiotherapy aims to reduce the overall treatment time by reducing the use of multiple daily fractions in an attempt to overcome the phenomenon of accelerated repopulation, which occurs around four weeks following insult to the tumour. A combination of hyperfractionation and accelerated radiotherapy can also be employed. The use of altered fractionation is often at the expense of increased acute radiation side-effects. Most randomised data has demonstrated superiority of altered fractionated radiotherapy with respect to loco-regional control, compared with conventionally fractionated radiotherapy.[11,12]

Chemotherapy

The role of chemotherapy in the definitive, post-operative and recurrent/metastatic setting in locally advanced mucosal head and neck SCC, along with novel therapeutic agents, is discussed by Guminski.

The benefit of combined chemotherapy and radiotherapy in the definitive treatment of locally advanced mucosal head and neck SCC, and post-operatively in high-risk disease, is well established. In both scenarios there is a 12% reduction in risk of cancer death and an absolute benefit of 4% in five-year survival. More recent data suggests that the absolute survival benefit is 8% five-year survival.[13,14]

The benefit of definitive concurrent chemo-radiotherapy compared with radiotherapy has been reported in many randomised clinical trials, while the role of induction chemotherapy remains uncertain.[14-17]

Endoscopic laser

The use of endoscopic laser resection of mucosal head and neck SCC has gained increased popularity over the past decade, particularly in the treatment of early laryngeal cancer. The benefit of the CO_2 laser is that it can haemostatically excise lesions with a high degree of accuracy.

The goals of treatment with early glottic SCC include curing the cancer with minimal toxicity and optimal voice quality. From a practical point of view a treatment that offers cure with one visit as opposed to six weeks of radiotherapy is appealing to both the patients and radiotherapy departments with long waiting lists. Despite the absence of randomised data it would appear that both provide similar local control. Which treatment provides superior functional outcome and is definitively more economical still remains controversial. Kleid and Iseli discuss laser surgery, techniques, advantages and risks, and functional outcome.

Functional outcomes

Regardless of whether surgery, radiotherapy, chemotherapy or a combination of these treatments is employed, each has its own short and long term effects on speech and swallowing. These effects often have a significant impact on overall quality of life (QoL). The speech pathologist is commonly the professional left to rehabilitate patients with the resulting functional deficits due to their malignancy and treatments received. Perry and Frowen have performed a comprehensive review of the speech and swallowing outcomes in patients treated with surgery and chemo-radiotherapy and conclude by providing a guide in the rehabilitation of speech and swallowing following treatment.

Nutritional management

Malnutrition is a well recognised and common problem in head and neck cancer patients. Lifestyle, along with tumour and treatment factors, all contribute to the problem.

Malnourishment often has a significant impact on complication rates, ability to complete and recover from treatment and overall QoL. When to intervene and what modalities to use, such as a nasogastric or percutaneous endoscopic gastrostomy tube (PEG), are common problems faced by clinicians and other health professionals. Careful screening and early intervention appear the key to correcting and maintaining adequate nutritional status pre and post treatment, including surgery, radiotherapy and chemotherapy. Davidson et al discuss this in greater detail.

Future directions

Positron Emission Tomography (PET)

Fluoro-deoxy-glucose PET scanning has emerged as a valuable diagnostic tool in the staging, therapeutic monitoring and restaging of head and neck cancers. It has a high positive and negative predictive value in the detection of disease and is valuable in the detection of unsuspecting metastatic disease not recognised by conventional structural imaging, such as CT. With the advent of CT-PET both structural and functional imaging can be obtained synchronously. PET scanning is also increasingly used to facilitate radiotherapy, as the images can be fused with the planning CT scans. PET can also be used in biological characterisation of tumours. The use of compounds such as fluorine-18 fluoromisonidazole can be used to detect the degree of hypoxia in tumours. Hicks and Shakher provide insight into the use of PET in head and neck cancer and its potential future roles.

Novel prognostic markers

Great research efforts are being made in trying to predict the aggressiveness of certain tumours and responsiveness to the various treatment modalities. The ultimate aim is to better tailor the treatment to suit the profile of the tumour and therefore improve outcome with the least morbidity.

There are currently no reliable tumour markers for head and neck SCC. Coman et al examine the role of gene profiling, microarray technology and the current state of tumour markers in head and neck cancer.

Advanced non-melanomatous skin cancer of the head and neck

Non-melanomatous cutaneous malignancies of the head and neck are a common problem in Australia. While the majority are early basal cell carcinomas and SCC, there is a subset of patients with high-risk disease that have a high risk of loco-regional recurrence or risk of distant metastases. These include locally advanced SCCs and merkel cell carcinoma. Veness has provided a comprehensive overview of the management of high-risk non-melanomatous cutaneous malignancies.

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Altered fractionation in locally advanced head and neck cancer – an update

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Abstract

Efforts to improve the cure rates of advanced squamous cell carcinoma of the head and neck cancer have been made by altering the dose and fractionation schedules for radiation treatment in an attempt to strike a better balance between tumour kill and normal tissue side-effects. Altered fractionation may involve acceleration, hyperfractionation or hypofractionation. Acceleration overcomes the problem of tumour cell repopulation by reducing the overall treatment time with slight reductions in the total dose and dose per fraction. Hyperfractionation aims at reducing the late effects of treatment while improving loco-regional control by reducing the dose per fraction, increasing the total dose and keeping the overall time the same. Hypofractionation applies a high dose per fraction and is useful for palliative radiation where biologically effective doses of radiation can be delivered in a short overall time without unacceptable acute effects of treatment.

A recent meta-analysis of altered fractionation schedules has been performed on more than 6500 patients in 15 trials and shows a small but significant absolute survival benefit of 3.4% at five years. This benefit was greatest for the hyperfractionation trials and was of a similar magnitude to the effect of adding chemotherapy synchronously to radiation.

In the past 20 years, many strategies have looked at improving the effectiveness of radiotherapy in advanced squamous cell carcinoma (SCC) of the head and neck. These have included incorporating the use of other treatment modalities such as surgery, chemotherapy and more recently biological modifiers such as the epidermal growth factor receptor antagonists. Small but significant improvements can also be achieved by altering the dose, fractionation and delivery of treatment to target volumes through the use of conformal radiation or intensity modulated radiotherapy (IMRT).

Radiation is delivered in multiple sessions or fractions to allow normal tissues to repair sublethal damage that has been incurred by the radiation. Normal tissues exhibit increased repair capacities compared to tumour cells and fractionation exploits this intrinsic difference. Altered fractionation schedules seek to improve the therapeutic ratio between tumour cell kill and normal tissue damage by exploiting the dissociation between acute and late radiation effects. Increased tumour control and acute toxicity are related to increasing the total dose and decreasing overall treatment time and is relatively unaffected by dose per fraction. Conversely, the late effects of radiation treatment are related to total dose and dose per fraction and are relatively unaffected by overall treatment time. If however, the acute effects become so severe that stem cells are depleted, then consequential late effects can occur.

The biological effective dose (BED) of radiation can be calculated mathematically:[1,2]

$$BED = D(1 + {}^{d}/_{a/b})$$

where D= total dose and d= dose per fraction. The a/b ratio varies from tissue to tissue with late responding tissues having an a/b ratio of 1-3 and acute responding tissues and tumours having an a/b ratio of 8-10.

This paper reviews the methods of altering fractionation in the head and neck region and the clinical studies that have investigated its use over the past 20 years. The rationale and effects of altering fractionation are summarised in Table 1.

Types of fractionation of radiotherapy

Conventional radiotherapy

Conventional radiotherapy is given with external beam radiotherapy once per day in doses of 2 Gy, five days a week. Typical conventional schedules in Australia, the US and Europe are 60-70 Gy in 30–35 fractions given over six to seven weeks. In the UK, schedules tend to be shorter by using a larger dose per fraction, such that 50 Gy is delivered in 20 fractions over four weeks.

Hyperfractionation

Hyperfractionation seeks to increase the total dose, number of fractions and reduce the dose per fraction so that the total treatment can be delivered in the same overall time as a conventional treatment. This is achieved by treating the patient with two or more fractions per day. The reduction in dose per fraction allows the total dose of treatment to be escalated. The linear quadratic equation would predict that this would produce a higher tumour effect and a reduced level of late effects.

One of the earliest prospective randomised trials to test this was the European Organization for Research and Treatment of Cancer (EORTC 22791).[3] They randomised 352 patients with T2-3 N0-1 oropharyngeal cancers (excluding tongue base) to receive either a conventional course of 70Gy in 35 fractions over seven weeks or a hyperfractionated treatment of 80.5 Gy given at 1.15 Gy twice per day, so that the total treatment was completed in seven weeks. The five year rates of local control (59% vs 40% [p=0.02]) and survival (40% vs 30% [p=0.08]) were improved in the hyperfractionated arm. Acute effects were more severe and late effects less in the hyperfractionated arm.

Hyperfractionated radiotherapy has also been compared to accelerated split course, concomitant boost and conventional radiotherapy in the four arm Radiation Therapy Oncology Group (RTOG) 9003 trial.[4] Patients treated with hyperfractionated and concomitant boost had better loco-regional control than those treated with standard fractionation. There was no difference in survival that could be demonstrated. Acute side-effects were worse in the altered fractionation arms compared to conventional radiotherapy, but there were no increased late effects.

These two trials and those of the Pinto[5,6] have been combined in a meta-analysis of hyperfractionated trials.[7] There was a survival benefit of 8% at five years which is similar in magnitude to synchronous chemo-radiotherapy. The hazard ratio of death for hyperfractionated treatment was 0.78 [0.69-0.89].

Accelerated fractionation

The rationale for accelerating radiation schedules is predicated on tumour cells undergoing accelerated repopulation during the treatment course after a lag time.[8] By shortening the overall treatment time, less of the total dose of radiation will be wasted in compensating for accelerated tumour cell repopulation during the treatment course. Approximately 40-60 cGy per day is required to correct for accelerated repopulation.

Table 1
Summary of altered fractionation

TYPES OF FRACTIONATION	CHARACTERISTICS	RATIONALE	RESULTS	APPLICATIONS
HYPERFRACTIONATION	Total dose: same Dose per fraction: reduced Number of fractions: increased Overall time: same	Reduce dose per fraction reduces late effects Higher total dose increase tumour kill	Local control: Better Acute toxicity: Higher Late toxicity: Less	Dose limiting toxicities in late responding tissues Large tumour burden Slower tumour doubling time Resource intensive
ACCELERATED FRACTIONATION	Total dose: reduced Dose per fraction: reduced/ same Number of fractions: same Overall time: reduced	Reduced time reduces tumour repopulation This comes at the expense of reduced total dose Reduce dose per fraction reduces late effects	Local control: Better Acute toxicity: Higher Late toxicity: Less	Rapid doubling time in tumour Patient wants a short treatment Efficient use of resources
HYPOFRACTIONATION	Total dose: reduced Dose per fraction: increased Number of fractions: reduced Overall time: reduced	Reduced time reduces tumour repopulation	Local control: Less Acute toxicity: Less Late toxicity: Higher	Palliation in poor performance status patients Not good for slow responding tissues such as brain Efficient use of resources Acute toxicity is low

Accelerating the treatment course will also result in an increase in normal tissue toxicity, especially mucositis. Reductions in overall treatment time are difficult for head and neck cancer patients to tolerate unless reductions in total dose are made. Strong acceleration may only partially compensate for decreasing the total dose of radiation. Accelerated protocols can be divided into those without a dose reduction and those with an overall dose reduction. Examples of each of these will be given.

The potential hazard of not reducing total dose or fraction size in accelerated radiotherapy is illustrated in the British Columbia Cancer Agency study.[9] In this trial, both arms received a dose of 66 Gy in 2 Gy fractions, but the accelerated group received two fractions per day. Acute effects were more severe in the accelerated arm and grade 4 late effects were also much higher. This led to the trial being abandoned after accruing only 82 of a target total of 226 patients.

In a trial run by the French Head and Neck Oncology Group, 268 patients with advanced head and neck were randomised to 70 Gy in seven weeks using 2 Gy daily fractions, or 63-64 Gy in three weeks using twice daily 2 Gy fractions.[10] Acute toxicity was worse in the accelerated arm. However, there was an improvement in loco-regional control and a marginal improvement in overall survival and disease free survival.

Mucosal reactions may be problematic even in accelerated regimens delivered over five weeks. A study from Poland[11] randomised 109 patients to continuous accelerated irradiation (CAIR) with daily treatment seven days a week, including Saturday and Sunday, or to conventional fractionation 5 fractions per week. The dose per fraction was initially 2 Gy, but was reduced to 1.8 Gy due to a high number of consequential late effects. The total dose in CAIR was 66-72 Gy depending on stage. Confluent mucositis was significantly more severe and lasted longer in the CAIR arm, but the relative risk of tumour relapse or death was six-fold lower.

The EORTC (split course) accelerated protocol[12] introduced a deliberate break in treatment to allow 72 Gy to be delivered in 45 fractions over a total of five weeks. This regimen produced a 13% improvement in loco-regional control over the conventional arm (70 Gy in 35 fractions over seven weeks), but both acute and late morbidities were increased substantially. It was speculated that the observed increase in late effects may have been due to insufficient intervals (four hours) between fractions. However, it is also possible that the increase in acute toxicity resulted in consequential late radiation injury.

The importance of even small amounts of acceleration was emphasised by the results from the Danish Head and Neck Cancer Study Group (DAHANCA) 6 and 7 trial.[13] A one week reduction in overall treatment time by giving six fractions per week instead of five fractions per week achieved a 10% improvement in loco-regional control with no impact on late morbidity. It did result in increased confluent mucositis (66% versus 46%), but the skin toxicity was the same.

The Continuous Hyperfractionated Accelerated Radiotherapy Trial (CHART)[14] showed that acceleration can produce equivalent results to conventional radiation even when significant reductions in overall dose occur. In this study, 54 Gy in 36 fractions over 12 days was compared with a conventional arm of 66 Gy in 33 fractions over six-and-a-half weeks. There was no improvement in loco-regional control compared to the conventional arm, with the exception of advanced laryngeal tumours. Acute morbidity was increased in CHART but the reduction in total dose and dose per fraction was associated with a reduction in later morbidities including osteochondritis, skin telangiectasia, mucosal ulceration and laryngeal oedema.

Concomitant boost achieves modest acceleration and no dose reduction by treating twice a day in the last week of treatment when tumour cells should be undergoing rapid repopulation. This limits the intense radiation to the areas of gross disease so that areas of microscopic involvement only receive standard fractionation. The RTOG 90-03 study[4] showed that concomitant boost (72 Gy in 42 fractions over six weeks) and hyperfractionation (81.6 Gy in 68 fractions over seven weeks) had better loco-regional control than conventional fractionation, but there was no difference in overall survival. The acute effects were increased, but there were no increases in the late effects.

The Trans Tasman Radiation Oncology Group (TROG) 91:01 study compared a modest acceleration protocol of 59.4 Gy in 33 fractions over 24 days with a conventional schedule of 70 Gy in 35 fractions over 49 days.[15] Differences in loco-regional control, disease free survival and overall survival could not be demonstrated. There were more acute mucosal reactions in the accelerated arm, but late effects were reduced with the exception of late mucosal reactions.

A meta-analysis of accelerated protocols has been performed.[7] There were eight randomised trials without dose reduction and five with a total dose reduction. The hazard ratio for death for the first group was 0.97 [0.89-1.05] and for the second group was 0.92 [0.86-0.97]. The absolute survival improvement at five years was 2% and 1.7% respectively and the improvements in loco-regional control at five years were 7.3% and 2.3%.

Hypofractionated radiotherapy

Hypofractionated radiotherapy utilises a small number of fractions with a larger dose per fraction. The overall time is usually shorter than an accelerated protocol. These regimes produce worse late effects than conventional fractionation when used in the curative setting.[16] The acute reactions are acceptable if treatment volumes are kept small and tolerability can be improved by introducing treatment breaks into the protocol.

This type of schedule is most suited to the patient with poor performance status in whom the aim of treatment is to palliate symptoms and cause as little as possible in the ways of side-effects. These patients have a poor prognosis with a median survival of four to eight months.[17]

There are a number of phase I and II studies that have looked at hypofractionated palliative radiotherapy for advanced SCC of the head and neck. The QUAD SHOT[18] was developed with the aim of delivering short intense

doses of radiation that were below the threshold for mucositis. The protocol consists of 14 Gy in four fractions over two days and can be repeated in responders up to a total dose of 42 Gy in 12 fractions. In patients with very advanced disease and poor performance status, objective responses were produced in 53% of cases and 44% had improvements in their quality of life. Other palliative schedules include that of Paris[19], who used 3.7 Gy twice a day for two days and repeated this monthly for three months. Although 40% did not complete the full course, responses were achieved in 77% of cases. We are evaluating a hypofractionated schedule which involves treating patients twice per week in 6 Gy fractions to a total dose of 30-36 Gy. This is well tolerated in terms of acute reactions and is equivalent to 40 Gy in 2 Gy fractions in terms of tumour and mucosal effects (Porceddu S, personal communication). Comparing these protocols with each other is difficult because of the heterogeneity of advanced SCC of the head and neck and the problems associated with measuring quality of life rather than just survival.

Conclusions

There is level one evidence indicating that altered fractionation achieves better results than conventional radiotherapy in advanced SCC of the head and neck, although the margin of improvement is modest. The greatest benefits have been achieved in hyperfractionation and acceleration without dose reductions. The margin of benefit is similar to that achieved with synchronous chemotherapy and radiotherapy which has now become the gold standard for advanced SCC of the head and neck. Accelerated and hyperfractionated radiotherapy will both increase acute side-effects of treatment, especially mucositis. The late effects are usually reduced, but there may be an increase in late effects through consequential acute effects. If the acceleration is too intense, significant dose reductions or treatment splits have to be applied to mitigate the acute side-effects and this will only be partially compensated by reducing the tumour cell repopulation. As hyperfractionation involves an increased number of radiation treatments, this may have limited application in Australia and Europe where there is a huge demand on limited radiotherapy resources.

Hyperfractionation and accelerated fractionation should be considered in advanced SCC of the head and neck where the patient is not fit for synchronous chemo-radiotherapy. By understanding the biological basis for altered fractionation, these schedules can be applied to different scenarios in advanced head and neck cancer and achieve results better than conventional fractionation.

Table 2
Summary of randomised trials of altered fractionation (modified from Bourhis J[7])

Trial	Years	Dose/fractions	Fractions/day	Number	Median FU (years)
EORTC 22791[3]	1980-1987	80.5 Gy / 7 wks 70 Gy / 7 wks	2 1	356	10.3
RIO[5]	1986-1989	70.4 Gy/ 6.5 wks 66 Gy / 6.5 wks	2 1	112	6.7
Toronto[6]	1988-1995	58 Gy / 4 wks 51 Gy / 4 wks	2 1	336	7.4
RTOG 93-03[4]	1991-1997	81.6 Gy / 7 wks 72 Gy / 6 wks 67.6 Gy / 6 wks 70 Gy / 7 wks	2 2 2 1	1113	6.0
Oro 9301[12]	1993-1998	64-67 Gy/ 6.5 wks 66-70 Gy / 7 wks	2 1	128	6.6
EORTC 22851[20]	1985-1995	72 Gy / 5 wks 70 Gy / 7 wks	3 1	512	4.8
CIC 9113[9]	1991-1995	66 Gy / 3.5 wks 66 Gy / 6 wks	2 1	82	7.8
CAIR[21]	1994-1996	64-67 Gy / 4.5-5 wks 64-74 Gy / 6.5-8 wks	1 1	100	5.7
DAHANCA[13]	1991-1999	66-68 Gy / 6 wks 66 –68 Gy / 7 wks	1 1	1485	6.8
KBN PO 79[22]	1995-1998	66 Gy / 5.5 wks 66 Gy / 6.5 wks	1 1	395	4.1
RTOG 7913[23]	1979-1983	60 Gy / 6 wks 70 Gy / 7 wks	2 1	210	9.2
CHART[14]	1990-1995	54 Gy / 1.7 wks 66 Gy / 6.5 wks	3 1	918	7.0
Vienna[24]	1990-1997	55 Gy /2.5 wks 70 Gy / 7 wks	2 1	159	5.6
GORTEC 9402[25]	1994-1998	62-64 Gy / 3 wks 70 Gy / 7 wks	2 1	268	4.8
TROG 91-01[26]	1991-1998	59.4 Gy / 3.5 wks 70 Gy / 7 wks	2 1	350	3.9

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Chemotherapy and biological agents in the clinical management of head and neck squamous cell carcinoma

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Abstract

Historically surgery and subsequently radiotherapy became established as the primary treatments for head and neck squamous cell carcinoma. The significant incidence of recurrence and metastasis in patients with advanced head and neck squamous cell carcinoma treated with surgery or radiotherapy stimulated interest in the potential role of other anti-cancer modalities including chemotherapy. Demonstration of experimental activity with newly discovered drugs in the 1970s led to clinical trials and confirmation of activity in advanced disease, albeit often tempered by significant toxicity. Interest also focused on evaluating a role for chemotherapy in combination with the primary modalities. The goals included reduction in local and systemic relapse, down-staging of the tumour prior to definitive treatment to reduce morbidity of surgery or radiotherapy, organ preservation and biological selection of responders to non-surgical treatment. Considerable effort has been expended trying to identify the optimal agents, administration and schedule of chemotherapy in these different situations. Defining the best combination of the treatment modalities of surgery, radiotherapy and chemotherapy continues to be explored and tailored to the different cancer entities collectively called head and neck squamous cell carcinoma. New agents continue to be tested and the advent of biological therapies, with the potential of molecular based individualised treatment, will impact on the clinical management of head and

Chemotherapy for metastatic/recurrent disease

By the early 1970s a number of agents were identified with single agent activity including bleomycin, methotrexate and 5-fuorouracil (5-FU). The discovery of cisplatin brought into practice an agent that has become the cornerstone of chemotherapy for head and neck squamous cell carcinoma (SCC), particularly as its toxicity was ameliorated by improvements in supportive care. Morton and colleagues in 1985 reported one of the few randomised trials comparing chemotherapy with best supportive care for patients with inoperable head and neck SCC unsuitable for radiotherapy.[1] High dose cisplatin doubled the median survival from 10 to 20 weeks in comparison to untreated controls, and no benefit was seen from adding bleomycin. Methotrexate alone was popular because of its tolerability and proven responses, however combination with cisplatin resulted in increased toxicity but no improvement in response.[2] The administration of 5-FU by four to five day continuous venous infusion appeared to be an effective radiation sensitiser[3] and also to have a good response rate used alone.[4] The combination of cisplatin with infusional 5-FU was shown to be significantly more active than with bolus 5-FU.[5] Jacobs et al in 1992 showed benefit from the combination of cisplatin with 5-FU over those drugs as single agents.[6] By this time in the early 1990s the less toxic cisplatin analogue carboplatin had become available and was being used in place of cisplatin in many tumour types. A landmark randomised trial compared the combinations of cisplatin/5-FU versus carboplatin/5-FU versus methotrexate (see table 1) in chemotherapy naïve patients with inoperable recurrent or metastatic disease.[7] Predictably greater toxicity was observed with the combinations, particularly cisplatin/5-FU. Response rates were higher with the combinations but overall survival was no different. In practice this has led clinicians to consider combination therapy in the following two patient groups: those where a response in symptomatic recurrence would be of palliative benefit; and physiologically fit patients who are prepared for the greater inconvenience, particularly of multi-day 5-FU infusion. For patients with reduced performance, weekly methotrexate retains a role. The advent of the taxanes in the 1990s and demonstration of their activity in Phase II trials has added a new class of agent to the management of cases of recurrent or metastatic head and neck SCC, however the same issues of toxicity and absolute benefit pertain. Phase II trials have reported response rates for paclitaxel over three hours of 20%[8] and of 40% for a 24-hour infusion, with a median survival time (MST) of 38 weeks.[9] For Docetaxel the reported response rate and MST are 21-42% and 27-35 weeks.[10,11]

Given the activity of taxanes, non-platinum doublets have been tested with the goal of avoiding cisplatin toxicity by combining taxane with five day infusional 5-FU. One of the largest Phase II studies used Docetaxel and infused 5-FU with a response rate of 21% but still had considerable toxicity.[12] Paclitaxel combined with cisplatin demonstrated a response rate of 35%, but was limited by severe neutropenia.[13] Paclitaxel with carboplatin showed better tolerability although neutropenia was still significant and a response rate of 27% with MST of 4.9 months.[14] A randomised trial of cisplatin/5-FU versus cisplatin/paclitaxel showed equivalence between the treatments with identical response rates (27% and 26%) and MST (8.1 and 8.7 months).[15]

The value of triplet combinations (platinum + 5-fluorouracil + taxane) has been examined in Phase II trials. A response rate of 44% has been reported for docetaxel/cisplatin/5-FU.[16] Paclitaxel has been used in combination with either cisplatin or carboplatin and ifosfamide with response rates of almost 60%, but with severe neutropenia.[17,18] The advent of light-weight ambulatory infusional devices has improved the convenience of 5-FU treatment. The 5-FU component has also been met by oral analogues including capecitabine, which can provide prolonged systemic exposure equivalent to intravenous infusion; a Phase II trial reported similar response rate and survival to the classic cisplatin/5-FU doublet.[19] It does have the potential disadvantage of requiring oral or enteral administration, which may not be feasible in locally recurrent head and neck SCC. Other agents with some reported activity include ifosfamide,[20] gemcitabine,[21] irinotecan, (reviewed in Murphy[22]) vinorelbine[23] and pemetrexed.[24] Other chemotherapy approaches have included intra-arterial administration and direct injection into local recurrences. In the palliative setting reducing toxicity and inconvenience from treatment is a relevant aim. Earlier trials focused particularly on response rates, whereas more recent studies have also paid attention to the effects of treatment on quality of life.

Table 1
A summary of important Phase III trials providing evidence for the use of systemic therapy in head and neck SCC.

Study population	Treatment arms	Outcome (RR, LRC, MST, OS)	p value	Year (ref)
Recurrent and metastatic head and neck SCC	Cisplatin 100mg/m2 D1 5-FU 1g/m2 D1-4 q3w Carboplatin 300mg/m2 D1 5-FU 1g/m2 D1-4 q4w Methotrexate 40mg/m2 weekly	RR 32%, MST 6.6m RR 21%, MST 5.0m RR 10%, MST 5.6m	P<.001 for RR	1992 (7)
Stage III&IV resectable laryngeal ca	Cisplatin 100mg/m2 D1 5-FU 1g/m2 D1-5 q3w then RT (laryngectomy if no response or recurrence) Laryngectomy then RT	5 yr overall survival (OS) 42% 64% larynx preservation 5 yr OS 46%	Not significant (NS) for OS	1991 (25)
Unresectable head and neck SCC	RT 70Gy RT 70Gy with Cisplatin 100mg/m2 D1,22,43 RT 30 Gy, Cisplatin 75mg/m2 D1, 5-FU D1-4 x2, then RT 30-40Gy, Cisplatin 75mg/m2 D1,5-FU d1-4 x1	3yr OS 23% MST 12.6m 3yr OS 37% MST 19.1m 3yr OS 27% MST 13.8m	p=.014	2003 (32)
Stage III&IV resectable laryngeal ca	Cisplatin 100mg/m2 D1 5-FU 1g/m2 D1-5 q3w then RT RT 70Gy with Cisplatin 100mg/m2 D1,22,43 RT 70Gy	2yr intact larynx 75% 2yr intact larynx 88% 2yr intact larynx 70% OS no difference	p<.005	2003 (26)
Stage III/IV oropharynx	RT 70Gy RT 70Gy with Carboplatin 70mg/m2/day, 5-FU 600mg/m2/day both D1-4 commencing D1,22,43	5yr OS 16%, LRC 25% 5yr OS 22%, LRC 48%	p=.002 for LRC, p=.05 for OS	2004 (31)
High risk resected head and neck SCC	RT 60-66Gy RT 60-66Gy with Cisplatin 100mg/m2 D1,22,43	2yr LRC 72% 2yr LRC 82% OS no difference	P=.01	2004 (33)
High risk resected head and neck SCC	RT 66Gy RT 66Gy with Cisplatin 100mg/m2 D1,22,43	5yr LRC 69% OS 40% 5yr LRC 82% OS 53%	p=.007 for LRC, .02 for OS	2004 (34)
Stage III/IV head and neck SCC	RT (various regimens) RT with cetuximab 400mg/m2 w1 then 250mg/m2/week	MST 29.3m MST 49m	P=.03	2006 (43)

Abbreviations: RR response rate, LRC loco-regional control rate, MST median survival time, OS overall survival, EGFR epidermal growth factor receptor, NS not significant.

Induction chemotherapy

Although not a curative modality the question was addressed as to whether addition of systemic chemotherapy could improve the local and distant failure rates when combined with definitive local surgery or radiotherapy.[25] Such an approach was considered

safe given the high response rates in pilot studies of treatment naïve patients. By using chemotherapy as the initial modality it was hoped local treatment could be reduced in extent, thus reducing toxicity and permitting preservation of functional aero-digestive organs. A further proposition was that tumour response to chemotherapy could help select patients with aggressive disease who could be fast-tracked to surgical salvage. An important historical study of induction chemotherapy came from its examination in laryngeal carcinoma as a component of a voice preserving approach. The landmark Veterans Affairs study in 1991 showed induction chemotherapy followed by radiotherapy could preserve the larynx in 64% of patients with a similar two-year survival rate. Surgical salvage was available to patients on the non-surgical arm who experienced local recurrence.[26] A subsequent trial randomising patients with laryngeal cancer planned to receive definitive radiotherapy to induction versus concurrent chemotherapy has provided evidence in favour of the concurrent approach.[27] Although less popular outside of North America, the use of induction chemotherapy has been re-examined using newer agents such as the taxanes with promising activity. A new generation of clinical trials have looked at combining induction therapy with concurrent radiotherapy, utilising several active chemotherapy agents with the hope of reducing the risk of both local and distant recurrences. Induction chemotherapy has been associated with reduced risk of metastases, whereas concurrent chemo-radiotherapy has been particularly associated with a reduction in loco-regional relapse, hence the rationale for combining the two approaches. Hitt et al reported an advantage for induction with cisplatin, 5-FU and paclitaxel followed by cisplatin chemo-radiotherapy over induction with cisplatin and 5-FU alone, with improved disease free survival and borderline significant overall survival benefit.[28] A recent report in abstract form has suggested adding Docetaxel to cisplatin and 5-FU induction therapy for resectable laryngeal cancer improves the laryngeal preservation rate.[29]

Concurrent chemo-radiotherapy as definitive treatment

The development of concurrent chemo-radiotherapy for advanced head and neck SCC began soon after the discovery of chemotherapy activity in head and neck SCC, with testing of the combination of chemotherapy with radiotherapy as treatment for patients considered unsuitable for surgery. A Medline search from 1975 identifies at least 40 randomised studies comparing radiotherapy with or without concurrent chemotherapy. These studies tested different schedules of radiotherapy (such as hyperfractionated, accelerated or split course) and used various chemotherapy agents, initially bleomycin, methotrexate and 5-FU, with most recent studies using platinum drugs. Two formal meta-analyses have confirmed a benefit with chemotherapy, in particular with platinum drugs.[30,31] Two large randomised trials have provided evidence for the use of either cisplatin or carboplatin with 5-fluorouracil in combination with radiotherapy as being superior to the use of radiotherapy alone. Denis et al showed improved loco-regional control and overall survival in advanced oropharyngeal SCC treated with concurrent carboplatin and 5-FU.[32] Adelstein et al in a three way study compared radiotherapy, split course chemo-radiotherapy using cisplatin and 5-FU and concurrent chemo-radiotherapy using high dose cisplatin.[33] Patients in the split course arm were able to undergo interval surgery if a sufficient response was achieved. At three years a survival advantage was shown for the group receiving concurrent treatment compared with both other arms which were not different from one another. This trial reduced ongoing interest in split course approaches.

Unresolved issues include preference for cisplatin over carboplatin, scheduling of platinum (as daily, weekly and three weekly administration have all been investigated) and preference for single agent or combinations (eg. with 5-FU or taxane). Overall however, some concurrent platinum chemotherapy appears better than no chemotherapy and major improvements are likely to come from additional novel agents rather than further manipulating platinum administration.

Post-operative concurrent chemo-radiotherapy for high risk patients

Two large multi-centre randomised trials have confirmed improved two year loco-regional control,[34] and in a study with longer follow-up improved estimated five-year survival,[35] following the addition of high dose three weekly cisplatin to patients receiving radiotherapy for high risk (node positive with extracapsular spread, microscopic positive margins or lymphvascular invasion by tumour cells) resected mucosal head and neck SCC. Details of the trials are shown in Table 1.

Novel biological agents

As in other solid malignancies interest in immune therapies led to the testing of immune modulating agents, especially interferon, in combination with chemotherapy treatment of advanced head and neck SCC, however such trials failed to show a benefit.[36] More recently, an understanding of the molecular abnormalities underlying head and neck SCC has led to development of specific biological therapies targeting those alterations. The agents of specific interest are the p53 oncolytic virus, tyrosine kinase inhibitors (TKI), anti-angiogenic agents and the anti-epidermal growth factor receptor (EGFR) antibody cetuximab. The oncolytic p53 virus, capable of infecting and destroying tumour cells but not normal cells, captivated the attention of cancer researchers and clinicians by demonstrating that a tumour specific molecular defect could be used to selectively target tumour cells and achieve an appreciable clinical anti-tumour effect.[37] A related important observation was the "bystander killing" whereby tumour cells not directly infected underwent cell death, presumably subsequent either to signalling from infected cells or due to release of material from dying cells. Ultimately this therapeutic approach has not been able to achieve sufficient systemic delivery to be a useful treatment. Anti-angiogenic agents have been tested in Phase I/II studies in combination with chemotherapy[38] and TKI.[39]

The EGFR receptor is over-expressed in up to 80% of head and neck SCC and some degree of expression can be detected by immunohistochemistry in almost all cases. The EGFR receptor belongs to a family of cell surface receptors whose members dimerise following binding of a specific ligand, leading to activation and subsequent intracellular signalling. As the receptor family members can bind in a variety of combinations the system has a range of modulated responses to stimuli. In certain cases receptors or down-stream effector molecules may acquire autonomous activation and can thus lead to an over-active pathway in the absence of over-expression. Two major intracellular pathways are activated by EGFR stimulation. The mitogen activated protein kinase pathway leads ultimately to changes in DNA transcription that promote cell growth and division. The other major pathway is downstream of the Akt protein, which leads to apoptosis resistance. Dysregulation of the EGFR signalling pathway can thus primarily lead to cells acquiring most of the important features of the malignant phenotype. Downstream EGFR activation has been targeted using the TKIs erlotinib and gefitinib, however low response rates were observed.[40,41] Understanding the molecular predictors for clinical response is an area of intense research interest.[42] The EGFR receptor can also be disrupted by the monoclonal antibody cetuximab. The value of cetuximab in combination with radiotherapy has been confirmed in a randomised Phase III trial with improved loco-regional control and overall survival in patients with locally advanced tumours. Interestingly, a post-hoc subset analysis suggested the benefit may be dependant on the radiotherapy schedule.[43] Cetuximab has also been used with cisplatin in a Phase III study in advanced disease, showing a modest improvement in response rate and a survival advantage in patients developing rash.[44] It is being tested in a variety of other settings.

Trials in progress and future directions

Achieving the best outcomes for the lowest morbidity is a major goal of clinical research in head and neck SCC. Acute side effects of chemo-radiotherapy can be severe, distressing and potentially fatal. Management of such patients requires well-resourced units with experienced medical, nursing and allied health staff. The long-term morbidity of chemo-radiotherapy approaches is becoming increasingly recognised, partly because of the benefit of these treatments in extending duration of disease control. Reduction of acute mucosal toxicity by using keratinocyte growth factor is being explored.[45] The ongoing improvements in radiotherapy techniques are also likely to further ameliorate toxicity. For relapsed or metastatic disease the important recent advances in understanding head and neck SCC tumour biology and identification of molecules to reverse these abnormalities should lead to new therapies entering clinical trial. Rather than providing magic bullets these agents are likely to be most efficacious in combination with fellow agents, conventional therapies such as radiotherapy or chemotherapy and in subgroups of patients who can be identified as harbouring specific molecular derangements driving the malignant phenotype.

In summary, the last few years have seen significant advances in the management of the heterogenous cancers collectively known as head and neck SCC. Modest but definite improvements in survival with organ sparing have been achieved, but at the cost of more severe acute and perhaps also long-term toxicities. Defining the optimum use of existing agents has been a significant step that has required collaboration between the different specialties involved in the care of primary head and neck SCC patients and the endurance of patients to participate in trials and undergo toxic therapies. The advent of new chemotherapy agents and ongoing studies to identify the best combination, sequence and timing with radiotherapy will continue to improve outcomes. Most excitingly the advent of effective biological therapies promises translation of our increasing knowledge of the molecular pathology of head and neck SCC into more cures or equally effective but less toxic treatments.

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Use of lasers in head and neck cancer

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Abstract

Trans-oral endoscopic laser excision of upper aerodigestive cancers is a relatively new and exciting therapeutic option, with the advantage of being organ-sparing and hence function-preserving. It is relatively straightforward to perform, although requires expertise and expensive equipment, and there is a "learning-curve" – it is very operator-dependant. For early laryngeal tumours, where the oncologic results are excellent, it can avoid prolonged radiotherapy and hence is less expensive. Since over 10% of head and neck squamous cell carcinoma survivors develop a second malignancy, avoiding radiotherapy is a worthwhile attribute. However, there are no good controlled studies comparing vocal function. For larger tumours of the larynx, tongue, oropharynx and even hypopharynx, neither the oncologic results, nor the functional results, are as impressive and post-operative radiotherapy is often

The focused beam of the CO_2 laser functions as a haemostatic scalpel. With a high degree of accuracy, the surgeon can deliver, through the hollow tube of an operating laryngoscope, an intensely hot beam of invisible non-ionising electromagnetic radiation (beyond the infra-red end of the spectrum), absorbed by the water in soft tissue, able to cause thermal injury. With binocular microsurgical control, incisions can be made and tumour can be differentiated from normal tissue, allowing tumours to be excised, whether benign or malignant.

With the combination of local anaesthesia (using topical cocaine) and direct laryngoscopy (autoscopy), Kirstein pioneered office endoscopic laryngeal surgery in the late 19th century.[2,3] Over the next decade Chevalier Jackson enhanced the techniques and moved them into the operating theatre.[4] Techniques were refined and enhanced, aided by developments in general anaesthesia, the surgical microscope, suspension laryngoscopy, Hopkins rod imaging and endoscopic equipment. Jako's coupling of the CO_2 laser to the surgical microscope in the 1970s[5] led to Strong and Vaughan's use of this equipment for early laryngeal cancers.[6,7,8]

Steiner was an ardent proponent of trans-oral endoscopic laser surgery for small, moderate-sized and even large laryngeal cancers (and has enhanced his technique for non-laryngeal head and neck cancers).[9]

Over the past decade, more centres around the world have been performing endoscopic laser resections of upper airway carcinomas and publishing their results. However, randomised control trials are rare and comparisons between retrospective studies are difficult to assess. A recent meta-analysis, comparing radiotherapy, open laryngeal surgery and endoscopic laryngeal surgery, concluded that "there is no good evidence available from randomised controlled trials to guide treatment choice for patients with early stage glottic cancer".[10]

Principles of technique

Using modified microlaryngeal endoscopes and surgical instruments, a CO_2 laser beam can be used to endoscopically excise a tumour, with clear margins, which can be verified histologically. Larger tumours can be managed by initially cutting through the tumour, to create several smaller but manageable specimens. "Tumour extension is clearly distinguishable under the microscope, and the lesion can be resected until healthy tissue is found and an appropriate safety margin can be maintained".[11] Although high surgical magnification does not approach the accuracy of histopathological magnification, and hence accuracy, surgical accuracy can be increased by noting the different degree of carbonisation of tumour or normal tissues, as they are cut with a laser. Intra-operative frozen section analysis is often employed to confirm clear margins.[11] Since the specimen is removed in pieces, the handling of the pathology specimens and the interpretation of the pathology report is different than in a standard open radical excision.

Advantages

Many tumours can be excised endoscopically, without skin flap elevation, dissection and preserving functionally-important structures (such as cartilage, bone, muscle and nerves), and avoiding subsequent skin graft or flap reconstruction, which in and of itself, interferes with functional results (speech and swallowing). Hence, tube feeding and tracheotomy are less often required and patient morbidity is reduced. Because wounds are not repaired or covered with a flap, a positive margin can be excised reasonably soon. Finding that margin early on, endoscopically, is more accurate; the microscope allows the surgeon more accuracy in removing the tumour and a smaller margin of normal tissue. The CO_2 laser is haemostatic, so there is less blood loss. The deep margins of the tumour can be better assessed, as it has a different reaction when lasered across, compared to lasering of normal tissue. The tumour excision can be tailored to the actual tumour size and shape, preserving as much normal tissue and functional tissue. Should excision not be adequate, re-excision (usually by the same endosopic laser approach) can usually easily be performed (depending on access).

Should it be needed, radical open surgery and/or radiotherapy can still be performed, without the laser treatment having interfered with the likelihood of success, nor of morbidity. With tiny glottic cancers, Strong et al found that 20% of cases have no tumour in the specimen after biopsy for squamous cell carcinoma (SCC) (definitive radiotherapy was not necessary). Laser excisions, although tedious and time-consuming, take less time than do open radical excisions and are far more expeditious than a course of radical radiotherapy, saving costs.

Disadvantages and risk

Exposure of the tumour can be compromised by anatomical variations (eg. trismus, stiff neck, prominent teeth and full tongue) or by the size, localisation or extent of the tumour. The anterior commissure is a well-known site of difficult exposure, as is the subglottis, deep tongue base and para-oesophageal space.

The experience of the surgeon is important, as either incomplete excision can occur, or an increased risk of complications. Special surgical and anaesthetic precautions must be taken to prevent laser fire of the endotracheal tube, a very dangerous but rare occurrence.

Intra-operative bleeding can hamper the performance of the operation, more from obscuring the surgeon's view then from dangerous blood loss. Secondary haemorrhage, particularly on the first night after surgery, or delayed 10-14 days, can be dangerous because of aspiration or exsanguination. The general anaesthetic required to control haemorrhage occurring above the laryngeal inlet is dangerous.

Other complications include post-operative airway obstruction, aspiration, hoarseness, dysphagia, infection and surgical emphysema. Delayed web formation and/or stenosis is a risk. Rarely is a tracheostomy, or a feeding tube, required.

Adjuvant treatment

When indicated, neck dissection is performed about a week after the trans-oral laser excision of the primary tumour. All of the various types and indications for lymphadenectomy exist. Depending on the author, post-operative radiotherapy is sometimes used. Steiner and Ambrosch use post-operative radiotherapy or chemo-radiotherapy to the primary site if the tumour cannot be removed completely despite further endoscopic attempts, and the only alternative would be a radical operation (eg. laryngo-pharyngectomy or glossectomy). Adjuvant cervical radiotherapy is given after neck dissection for the usual indications (two or more involved nodes, extra-capsular pread, lymphovascular invasion or a large solitary node).[11] Zeitels uses post-operative radiotherapy, almost routinely, after endoscopic laser excision of all supraglottic carcinomas. Some would argue, that since radiotherapy alone or in combination with chemotherapy, renders good results for supra-glottic carcinoma, the laser excision is nothing more than an "excisional biopsy".

Trans-oral laser microsurgery (TOLM) in laryngeal SCC

Strong and Jako first described use of the CO_2 laser to endoscopically resect laryngeal cancers.[13] Strong showed that in up to 20% of cases, no residual SCC remained after the initial diagnostic biopsy, often making radiotherapy unnecessary. Steiner and Ambrosch showed six local recurrences and only one laryngectomy in 159 patients followed for at least five years using TOLM techniques.[14] Since then, TOLM has been widely adopted as an alternative to definitive radiotherapy in the treatment of early laryngeal cancer.[15]

If local control and survival are comparable, the choice between surgery and radiotherapy for early laryngeal cancer is determined by patient preference after discussion of risks, benefits and likely functional outcomes. Steiner showed that most TOLM cases could be done as day cases with modest pain for a few days. Patients must be warned that approximately one third of patients require a second procedure often to biopsy suspicious granulation tissue. Most radiation protocols take six weeks, cause painful mucositis lasting a further two to four weeks and carry the small but real risk of causing a radiation induced tumour (estimated at 1/300).[16]

Voice outcomes following TOLM compared with radiotherapy

One of the arguments in favour of radiotherapy for early glottic cancer is the supposed better voice outcome, compared to that after laser resection. TOLM advocates have stated that their voice results are good, but why then would Remacle et al need to publish a paper titled Reconstruction of glottic defects after endoscopic cordectomy: voice outcome?[17]

Cragle and Brandenburg reported that surgical treatment of early glottic cancers may produce a vocal result that is equivalent to that following irradiation.[18] These investigators evaluated voice profiles in 11 patients treated with TOLM and 20 patients treated with irradiation. Both groups had similar voice profiles, characterised by decreased maximum phonation times and increased jitter, shimmer and signal-to-noise ratios.

Most investigators, however, contend that a better voice more reliably follows treatment with radiotherapy rather than TOLM.[19-22] Unlike surgery, radiotherapy does not require removal of adjacent healthy tissue to provide a clear margin around a cancer. However, vocal deterioration may result from radiotherapy and may be significant if loss of vocal cord bulk results from tumour necrosis or if fibrosis develops.

One of the key papers in the question of which treatment to choose came from Ton-Van and others who evaluated 356 patients with early glottic cancer. They determined that the quality of voice after treatment with radiotherapy was "indisputably superior to that after conservation surgery."[19] However, these investigators pointed out that a functional larynx was preserved in 92% of patients treated surgically compared with 81% initially treated with radiotherapy. This reflects the use of total laryngectomy for radiation salvage. As a result of these findings, Ton-Van and others advocate the use of surgery as a primary mode of therapy in patients capable of safely undergoing an anaesthetic. Exceptions include patients who are willing to accept a greater risk of total loss of the larynx in the effort to preserve the highest quality voice.

The absolute quality of their voice may not be as important a consideration for many patients in selecting treatment as is their general ability to communicate. For these patients, speech intelligibility may be more meaningful as a criterion to assess results rather than acoustic and aerodynamic measurements. Schuller and others used interviews and questionnaires to evaluate 75 patients treated with TOLM for early laryngeal cancers. They found that 88% of the respondents were content with the postoperative voice.[20]

Laryngeal preservation following TOLM versus radiation treatment

One of the key differences between TOLM and radiation is the ability to repeat TOLM in the event of local failure, whereas radiation failures are most commonly treated with total laryngectomy.[21] Consequently final laryngeal conservation is probably higher for T2 tumours using TOLM.[22] Morris and others carried out an intensive literature review and identified an overall 8.6% failure rate at the primary site for T1 glottic cancers managed surgically, compared with a 16.7% failure rate among similarly staged cancers managed with radiotherapy.[23]

Patients with T2 glottic tumours may be better treated primarily with surgery because T2 glottic cancers have an even higher local recurrence rate after irradiation. Surgical salvage with less than a total laryngectomy is unlikely to be successful.[24]

One of the advocates for radiation, Jorgenson and others described 1005 Danish patients treated at a single referral centre between 1965 and 1998. All early glottic cancers (99%) within a catchment area of 1.33 million people received primary radiotherapy and follow-up was excellent (only three patients were lost to follow-up). Three-hundred and twelve T1 glottic cancers were treated with irradiation with a five-year local control of 88%. Including surgical salvage, five-year disease-specific survival was 99%. Two hundred and thirty-three T2 glottic cancers were treated with irradiation with a five-year local control of 67.4%. Including surgical salvage, the five-year disease-specific survival was 88.4%. These investigators identify that this high recurrence rate (one out of three) for T2 glottic cancers resulted in an overall laryngeal preservation of 80%. This is substantially lower than the 95% organ preservation reported by Chevalier's group using organ preservation surgery.[25]

Jorgenson and others argued that part of the excellent results reported by Chevalier and others reflected a selection bias. Jorgensen and others additionally pointed out that the voice quality is better after irradiation than after supracricoid laryngectomy. For these reasons, they have not altered their standard approach to managing T2 glottic cancers with irradiation.

Jorgensen observed that improved radiotherapy techniques, as well as the capacity to salvage irradiation failures with supracricoid laryngectomy, will likely decrease the ultimate need for total laryngectomy. Undoubtedly the salvage rate of TOLM for local recurrences is high.[27] More recently, Steiner has shown that radiotherapy failures may also be salvaged by TOLM in many cases.[28]

Involvement of the anterior commissure by tumour

The anterior commissure of the larynx is a site of special concern. There is no perichondrium on the surface of the thyroid cartilage at this point to resist tumour invasion. Broyle's ligaments pass through the thyroid cartilage, providing a passage of low resistance to tumour spread. Early data of TOLM suggested anterior commissure involvement may increase local recurrence.[29] As TOLM has evolved surgeons have resected more cartilage and soft tissue in the region of the anterior commissure. Consequently Steiner showed a five-year local control rate of 79% in 45 patients with anterior commissure involvement for a 93% larynx preservation rate. In the 30 cases without anterior commissure involvement, the five-year local control rate was a similar 74% and the corresponding larynx preservation rate 97%.[30]

Radiation oncologists have experienced similar difficulties with tumours at the anterior commissure. Maheshwar reported increased local recurrence rates (57.1%) with anterior commissure involvement compared with similar staged tumours not involving the anterior commissure (15.8%).[31] They hypothesised that a lack of pre-treatment CT imaging may have under staged tumours and contributed to their poor results.

TOLM for other head and neck cancers

Conservation surgery has long been an alternative to primary radiotherapy for early cancers of the supraglottis and oropharynx. Many argue TOLM has merely introduced another tool that removes the need for external incisions. The frame shift from traditional oncology shown by Steiner and others has been the ability to transect the tumour. The CO_2 laser beam presumably seals adjacent lymphatics and does not carry tumour cells into deeper tissues. This allows piecemeal removal of large tumours via trans-oral endoscopes. The operative bed heals quickly by secondary intention restoring the indigenous surface and preserving adjacent neural coordination and sensation.

In his early results, Steiner reported 43 untreated patients with early supraglottic cancers.[32] He showed a 90.5% local control and all failures were salvaged via further conservation surgery. No-one lost their larynx. The five-year Kaplan-Meier overall survival was 73%. Most (84%) required a temporary nasogastric feeding tube but few (5%) a temporary tracheostomy. One patient returned to surgery for bleeding. Steiner also reported on 56 patients with higher stage supraglottic cancer. Surgery was used in 84% for neck disease and 22 (39%) had radiotherapy after surgery. Local control was obtained initially in 80.5% and the overall five-year Kaplan-Meier survival was 50%. Three (6%) patients developed laryngeal stenosis and two (4%) required a permanent tracheostomy. Five patients (10%) suffered significant aspiration, leading to total laryngectomy in three. Significant bleeding requiring a further anaesthetic occurred in 8%.

Steiner has also reported 48 patients treated with TOLM for base of tongue squamous cell carcinoma between 1986 and 1997.[33] Selective neck dissection was performed in 43 patients; 23 patients underwent postoperative radiotherapy with or without simultaneous chemotherapy. The Kaplan-Meier five-year local control rate was 85%. There was no local recurrence in T1 and T2 lesions, but there was a 20% local recurrence rate in T3 and T4 tumours. Kaplan-Meier five-year recurrence-free and overall survival rates were 73% and 52% respectively. Mean performance status scale scores were 92% for normalcy of diet and 88% for intelligibility of speech.

Most impressive is Steiner's results with hypopharyngeal primaries.[34] These tumours commonly present in advanced stages and of 103 patients mainly with piriform cancer, 63 patients had pT2 cancers and 14 had pT3. Patients with simultaneous second primaries, very advanced neck disease (N3), or distant metastases (ie. not treatable for cure) were excluded. In addition to TOLM, 75% also had neck surgery and 50% had postoperative radiotherapy. Of these 103 patients, 93

were controlled locally after a 44-month mean follow-up. The five-year Kaplan-Meier survivals were 69.2% for combined stage I and II, and 52.5% for stage III and IV.

Even in the most selective patients, Steiner's overall local control and overall survival compares favourably with published chemotherapy and radiotherapy laryngeal preservation protocols that have replaced the traditional total laryngectomy and postoperative radiotherapy for hypopharyngeal cancers.[35] The primary aim of combined chemotherapy and radiotherapy is to preserve a functioning larynx and the largest such study showed this occurs in about 39% of patients.[36] Given Steiner's preservation of over 90% of functioning larynges, albeit in a highly selective group, many surgeons argue TOLM remains a treatment option for selected hypopharyngeal cancer patients.

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Speech and swallowing function in head and neck cancer patients: what do we know?

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Abstract

In this paper, we report on common speech and swallowing dysfunction that occurs after surgery, radiotherapy or chemo-radiotherapy for head and neck cancer (oral cavity, pharynx and larynx sites). We review speech therapy interventions and discuss available evidence for the use of these techniques. Methodological quality is low in the majority of published studies that describe rehabilitation after head and neck cancer treatments and speech disability has received very little attention. Although many researchers have investigated swallowing impairment, a wide variety of measurement tools have been employed, making results across studies difficult to compare. There is an absence of good data on swallowing and/or speech outcomes after surgery, radiotherapy or chemo-radiotherapy for head and neck cancers. Further work is needed to first, undertake rigorous scientific studies of functional outcomes (speech,

Speech pathologists are traditionally the professionals who assess, diagnose and manage voice, speech and swallowing problems in people who present with head and neck cancer. The term head and neck cancer in this paper includes cancers of the oral cavity, pharynx and larynx; ICD sites COO-C14 and C32.[1]

Ideally, a pre-treatment meeting between therapist and patient occurs, when informational counselling about anticipated changes and likely management of speech and swallowing problems takes place. Patients' baseline speech and swallowing functions are documented, using objective recordings, such as audio-taping of voice and speech and video-fluoroscopic recording of swallowing function. In this way, functional changes attributable to treatment, rather than those changes due to the cancer itself, can be ascertained. Objective pre-treatment measures are also useful for planning rehabilitation.

The aim of speech and swallowing rehabilitation is to first optimise function (usually by direct therapy programs, such as exercise regimens) and second, to introduce compensatory strategies (diet changes, intra-oral or voice prostheses) or manoeuvres (such as postural changes for safer swallowing), when improvement in function cannot, or does not, occur. Impairment in speech or swallowing can negatively impact on patients' quality of life (QoL), resulting in reduction in social participation and/or in activity. These life changes can be assessed using a tool such as Australian Therapy Outcome Measures (or AusTOMs)[2] and may form goals in rehabilitation.

In this paper, we describe typical population-specific voice, speech and swallowing difficulties, as they relate to differing head and neck cancer sites and sizes, then discuss common therapeutic interventions and examine evidence for their continued use. Tracheostomy care is beyond the scope of this paper, so has not been addressed.

Oral cancer

One challenge for head and neck cancer researchers is to accrue adequate numbers of patients to enable meaningful analysis of data. This is particularly true for oral cancers, where it is difficult for any one institution to accrue many patients within a specific surgical resection/reconstruction cohort.[3] Multi-centred, collaborative research is therefore essential to address this problem of small numbers when assessing functional outcomes from different treatments.

Treatment for oral cancer usually involves surgery with, or without, radiotherapy, and this often impacts on speech and/or swallowing function. It is generally accepted that the biggest influencing factors on functional outcomes after surgery will be the extent of the resection and the type of reconstruction technique used. The more extensive the resection, the greater will be the swallowing impairment.[4] When considering the best technique of reconstruction for good speech and swallowing to result, the issues become less clear. Primary surgical closure (pulling together and suturing remaining tissue), or a laser resection, reportedly result in better speech and swallowing outcomes than does the use of free flaps.[3] Unfortunately, the surgeon does not always have the luxury of these choices.

Surgery to the tongue can impact on the oral stage of swallowing, as well as on speech. The degree of impairment is largely dependent on the extent of lingual tissue resected and it has been stated by Lazarus that, "if less than 50% of the tongue is resected and reconstruction is by primary closure, patients can regain fairly functional swallowing".[5] Patients requiring total glossectomy are, unfortunately, usually limited to a diet of thin and/or thick fluids, and use postural/compensatory techniques to swallow orally.

Speech intelligibility is largely influenced by the type of reconstruction used and this, in turn, is influenced by available sensation, bulk and mobility, if a flap is employed. Following floor of mouth resection, the oral tongue may be tethered as part of the surgical closure, thereby limiting its movement for speech and swallowing. Such surgery negatively impacts on the pharyngeal stage of swallowing, particularly if tongue base tissue or faucial arch tissue is included in the resection, as this may reduce, respectively, pharyngeal motility and triggering of the pharyngeal swallow.[5]

If a mandibulectomy occurs, limitations to lip and jaw movements will reduce speech intelligibility and the oral stage of swallowing will be slow. Resection of either the hard or soft palate can result in hypernasal speech and oral bolus residue or nasal regurgitation of food/fluids may be observed, if the surgical repair is ineffective.

When post-operative radiotherapy is required, further problems are introduced. In one published study, oral cancer patients who received post-operative radiotherapy demonstrated worse swallowing outcomes than did those who received surgery alone.[6] Xerostomia following radiotherapy results in prolonged oral transit and reduces the patient's ability to masticate solids. Post-radiation fibrosis may limit movements of the tongue, pharyngeal wall and jaw (often due to trismus). These, in turn, negatively impact on both speech and swallowing function.

Laryngeal cancer - small tumours

With an early cancer of the glottis (larynx) on one, or both vocal folds (T1 or T2), a patient's initial complaint at presentation is often that of a hoarse/husky voice. In Australia, radiotherapy is commonly the first line of treatment for early glottic cancer – although, increasingly, laser surgery is being offered as an alternative.

There are no published comparative data of voice outcomes from these two modes of treatment. In a recent prospective study of 50 patients undergoing radiotherapy treatment for early glottic cancer at Peter MacCallum Cancer Centre from 2000-2004,[7] patients' perceptions of their voice quality and their QoL significantly improved post-treatment, as did their objective and perceptual voice measures. Objectively, mean speaking fundamental frequency (or 'vocal pitch') did not significantly change, although breathiness and strain in the voice recordings were demonstrably reduced.[7]

Voice results after endolaryngeal surgery (with or without laser) for treating early laryngeal squamous cell carcinoma (SCC) are equivocal, as no comprehensive objective voice outcome data have been published. Indeed, in a recent review of radiotherapy versus open surgery versus endolaryngeal surgery (with or without laser), Dey et al stated, "There is currently insufficient evidence to guide management decisions on the most effective treatment (for early laryngeal SCC)".[8]

The value of voice therapy (identifying and addressing vocal misuse/abuse; giving advice and guidance on correct voice production and providing vocal exercises) in preventing, or reducing, dysphonia during and after treatment has not yet been ascertained; these studies remain to be done.

Laryngeal cancer – large tumours

For patients with more extensive (T3 or T4) tumours of the glottis, options for treatment include an organ preservation protocol, using chemo-radiotherapy, or having a total laryngectomy.

Chemo-radiotherapy treatment

Initially, it may seem attractive to preserve the organ (larynx), but preservation of form does not always translate into preservation of function, and patients need to have this point explained, before they consent to treatment.

In reality, we have no good scientific data on swallowing outcomes on which to base our pre-treatment advice to patients. Despite the large number of clinical trials that have been and continue to be undertaken with this population, swallowing outcomes are either not reported at all, or only crude, subjective measures are used.[9] Further, there are no well designed published studies documenting voice or speech changes after chemo-radiotherapy treatment for laryngeal cancer.

Total laryngectomy

A primary (ie. done at the time of total laryngectomy) tracheo-esophageal puncture, or TEP, is currently the world's best practice for speech rehabilitation after a total laryngectomy. Such surgical-prosthetic voice restoration may also be offered months – or even years – post-cancer surgery. Since the 1970s, when Blom and Singer advanced surgical voice restoration in the USA,[10,11] silicon voice prostheses have proliferated worldwide, becoming more user-friendly and easy for patients and clinicians to use.[12] Much research has been undertaken and improvements in surgery and prosthetics made and success rates for speech restoration after laryngectomy are now around 95%, at experienced cancer centres where swallowing and voice rehabilitation is offered.[13] Speech pathologists are the key people who ensure such results occur and many are specialised in post-laryngectomy rehabilitation. They ensure that correct sizing, fitting and type of silicon voice prosthesis occurs post-surgery, before training patients (and/or families) to be self-caring with their speech devices.

Swallowing changes after total laryngectomy are under-researched and dysphagia is likely under-reported, as patients often expect to have changes in function and an altered diet, so they do not always report the full extent of their swallowing problems after laryngectomy.[14]

Oropharyngeal cancer

Sites of oropharyngeal cancer include the soft palate, retromolar trigone, tonsils, base of tongue and superior and lateral pharynx. If the base of tongue or pharyngeal wall is affected, then speech may not necessarily be grossly impaired, but swallowing almost certainly will be. The movement of the tongue base is crucial to the efficiency of the swallow, as this area contributes, via its pressure generation against the pharyngeal wall, to the propulsion of the bolus through the pharynx.[15]

Chemo-radiotherapy is commonly used in the management of oropharyngeal cancers. While data on swallowing outcomes after such treatment remains limited, a recent systematic review identified the most commonly reported impairments in swallowing after radiotherapy.[9] These included: poor pharyngeal motility with subsequent pharyngeal residue; epiglottic immobility; reduced laryngeal excursion; poor closure of the laryngeal vestibule; and, often silent, aspiration. Fibrosis of the pharyngeal/ laryngeal muscles reportedly contributes to the above problems, further compounding the pre-treatment effects of the tumour itself.

Surgery may involve the base of tongue and/or lateral pharyngeal walls, when velo-pharyngeal closure may be compromised resulting in nasal sounding (ie. hypernasal) speech and nasal reflux (usually of fluids) during swallowing.

Ablative surgery to the oropharynx usually includes combined resection of the soft palate and tonsillar pillars.[16] This type of resection can interfere with transport of a bolus through the pharynx, because normal sensory input is interrupted by use of tissue flaps for reconstruction. Such tissue flaps may be bulky and mechanically interfere with the passage of food. Further, they act passively, not actively, resulting in the loss of normal propulsive action supplied by the pharyngeal constrictors.

Management of speech problems

There are no published assessments of speech that are cancer-specific. Speech pathologists use tests such as the Frenchay Dysarthria Assessment (FDA),[17] a motor speech assessment standardised on a UK population of adults with dysarthria of neurological origin (eg. from Parkinson's Disease, Motor Neuron Disease, etc).

This test is used to measure speech impairment only and is divided into components, such as: respiration; tongue, lip, soft palate movements; ability to sustain vowel sounds; and intelligibility of words, sentences and conversation. Comparing age and gender-matched normative data, speech features that are defective can be identified using the FDA and then addressed in therapy.

In a recent study examining the effects of head and neck cancer on speech, the FDA was found to be a practical, valid and reliable tool for use with an Australian head and neck cancer population.[17] In that pre-treatment study, people with head and neck cancer were shown to have worse speech intelligibility than the general population and the site of cancer dictated the resulting speech impairment. Research needs to be undertaken to examine how head and neck cancer treatment may further impact on speech intelligibility.

Direct therapy to maximise residual function after treatment involves range of motion (ROM) and strength (resistance) exercises for lips and/or tongue, with the aim of improving either speech or swallowing (or both). There are no definitive published data on the effectiveness of ROM exercises, but researchers have reported promising results from a preliminary study of 102 patients with surgically treated oral and oropharyngeal cancer. Those who performed ROM exercises reported significantly better function (of swallowing and, to a lesser degree, speech) when compared to patients who did not complete these exercises.[18] Research is currently underway in the US, investigating the use of ROM exercises with the head and neck cancer population, to establish more convincing evidence as to their efficacy.

Following surgery, speech and swallowing rehabilitation should ideally commence as soon as suture lines/surgical defects have healed. While there are no definitive data on the optimal time for therapy to commence, patients who receive this during the first three months post-treatment have been shown to have a better outcome than did those who had later rehabilitation.[18] This is further supported by data documenting that the level of speech and swallowing function at three months post-treatment is characteristic of patients' function at one year later.[19,20] In a study by Pauloski,[19] patients received relatively small amounts of therapy during their post-treatment phase. Further research is required into the optimal dosage/type of therapy for maximising function.

Where speech is no longer possible, a communication aid may be helpful. A range of portable speech devices are available, from those with simple written output (eg. Lightwriter®), to synthetic speech boards (with pre-set phrases that can be pressed to speak, using an electronic voice output) or an artificial larynx (eg. Servox®), where a battery-driven vibrator, hand-held against the neck, provides a substitute for sound that is normally generated by the vocal folds. Many laryngectomees use such devices.

Each patient needs to be carefully evaluated for the use of any speech aid and their daily needs and requirements, as well as an assessment of physical (especially hand) dexterity, may direct the choice of a suitable aid.

Management of swallowing problems

Swallowing impairment may be managed using compensatory strategies and/or an active therapy program. The initial post-treatment assessment usually involves an oromotor and clinical swallowing examination, and appropriate compensatory strategies may be implemented at this time. However, in many cases a bedside clinical examination may not be enough, as detailed information about swallowing physiology, including the presence of silent aspiration, cannot be detected in this way. A videofluorography swallow study (VFSS) is the most commonly used method for accurately screening for aspiration in the head and neck population, as this procedure enables the whole tract and its physiology to be visualised. The volume and timing of the bolus presentation can be controlled, ensuring an accurate diagnosis of dysphagia, not just screening for (the presence or absence of) aspiration.

Compensatory strategies do not necessarily change the swallowing physiology, but rather they redirect and/or improve the flow and direction of food and eliminate the patient's symptoms, especially aspiration.[15] Compensatory strategies include: (i) postural changes which may change the dimensions of the pharynx, so giving better airway protection without increasing the effort or work for the patient during the swallow; (ii) sensory input being increased either prior to, or during, the swallow; (iii) modifying volume and speed of food presentation; (iv) changing food viscosity or consistency and; (v) introducing intra-oral prostheses.

Such compensatory strategies are often introduced first during a VFSS, when initial diagnosis of dysphagia is being made.

Table 1 presents the postures which have current evidence for their use and their rationale.

Although there are limited published data regarding the beneficial effect of palatal augmentation prostheses and/or obturators for improving speech and swallowing, these devices are commonly used in clinical practice. Their use markedly reduces oral residue after swallowing, as the prosthesis enables the patient to re-establish intra-oral pressure and/or allows them to achieve stronger tongue-to-palate contact for more efficient oral bolus transport.[29]

Active therapy procedures are designed to change swallowing physiology (not just to compensate for the dysphagia) and require the patient to follow the directions of the clinician and (usually) practise independently and regularly. Resistance, range of motion and bolus control exercises may also be included in a repertoire of active therapy procedures.

Swallowing manoeuvres are used to teach patients to gain voluntary control of selected aspects of the pharyngeal stage of the swallow.[27] Such manoeuvres may include a supraglottic swallow, where the airway can be voluntarily closed at the level of the true vocal folds before, and during, the swallow and the super-supraglottic swallow, which is designed to close the airway entrance by the patient bearing down after breath-holding. The action of bearing down closes the false vocal folds and tilts the arytenoids anteriorly to meet the base of the epiglottis, thus giving strong closure of the entrance to the laryngeal vestibule.

The Mendelsohn manoeuvre (voluntarily increasing the extent and duration of laryngeal elevation, thereby

Table 1
Postures used for eliminating aspiration or residue, the disorders they are designed to address, and the rationale for their use.

Disorders observed on VFSSs	Posture applied	Rationale
Inefficient oral transit	Head back	Gravity clears oral cavity[21]
Delay in triggering the pharyngeal swallow	Chin down airway[22]	Widens valleculae – stops bolus entering
Reduced posterior tongue base movement	Chin down wall[22]	Pushes tongue back towards pharyngeal
Unilateral vocal fold palsy/ surgical removal of vocal fold	Head rotated to affected side	Directs bolus down stronger side; improves vocal fold closure[21,23]
Reduced closure of laryngeal entrance and vocal folds	Chin down; Head rotated to affected side	Improves protective position of epiglottis; narrows laryngeal entrance[22]
Unilateral pharyngeal palsy	Head rotated to affected side	Directs bolus toward stronger side of pharynx[23,24]
Reduced pharyngeal contraction	Lying down on one side	Eliminated gravity effect on pharyngeal residue
Unilateral oral and pharyngeal weakness (same side)	Head tilted to stronger side	Directs bolus toward stronger side by gravity[23,27]
Cricopharyngeal (c-p) dysfunction	Head rotated	Pulls cricoid cartilage away from posterior pharyngeal wall; reduces resting pressure in c-p sphincter[27]

Adapted from Logemann[15] and Sullivan[28]

increasing the duration/width of cricopharyngeal opening) or an effortful swallow (designed to increase posterior tongue base movement) may both be used to manage problems in the pharyngeal stage of swallowing.

Conclusion

Speech and swallowing rehabilitation for people with head and neck cancer is a complex and specialised area of speech pathology work.

Many treatments for head and neck cancer result in speech and/or swallowing impairments and these, in turn, may reduce a patient's activity, societal participation and QoL.

Early referral to a speech pathologist is desirable – where possible, before head and neck cancer treatment commences.

Accurate diagnosis and evidence-based therapy can improve speech and swallowing deficits, and there is good scientific evidence for the use of many manoeuvres/ compensatory strategies.

There is a need for multicentre, hypothesis-driven quality research into functional outcomes in people who are being treated for head and neck cancer.

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Nutritional management of patients with head and neck cancer: integrating research into practice

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Abstract

Malnutrition is known to be a problem in head and neck cancer throughout all phases of treatment and rehabilitation. Nutrition interventions have demonstrated beneficial intermediate outcomes. Despite this, nutrition services for this patient group are not consistent across Australia. Routine screening procedures should be implemented in multidisciplinary head and neck clinics and treatment areas to identify patients who are at nutritional risk. Close collaboration is particularly important for the speech pathologist and dietitian in order to manage dysphagia and its nutritional consequences. Guidelines for the nutritional management of these patients will assist in service provision.

The prevalence of malnutrition in patients with cancer is the highest of all hospital patient diagnostic groups[1] and it is well recognised that patients with head and neck cancer are among those at highest nutritional risk. Even before treatment commences 25–50% of patients have markedly reduced nutritional status.[2,3,4]

Malnutrition is associated with increased risk of infections, decreased response to treatment, poorer quality of life (QoL), increased healthcare costs and a shorter survival time.[5,6] Weight loss during radiation therapy to the head and neck can place at risk the safety and effectiveness of the treatment, requiring repeat CT scans in order to keep critical structures to accepted tolerance doses and emergency admissions to hospital for nutrition-related and dehydration problems are commonly reported during treatment.[7] An inability to eat and drink adequately places a significant burden on both the healthcare system and the psychosocial well-being of the patient and their carers.

Causes of nutritional depletion

Some patients are already malnourished at presentation due to eating and drinking difficulties caused by the tumour location or pre-morbid lifestyle. Nutritional status can then be further compromised due to treatment side-effects. Adapting the texture of meals is more difficult for a person if they have limited food preparation skills, cooking facilities and/or social supports. These are common features of this patient group, especially when treatment often means many weeks away from home.

The mode of treatment will affect nutritional outcomes. The effect of surgical intervention on swallowing is dependent on the degree and site of resection. Resection of the floor of mouth or base of tongue places a patient at greater risk of requiring supplemental feeding.

Radiotherapy and chemotherapy have both acute and long-term impacts on functional swallowing and nutritional status. Side-effects include mucositis, odynophagia, xerostomia, trismus, pharyngeal fibrosis and changes in taste and appetite.[8,9] These changes not only affect a person's desire to eat, but also reduce the effectiveness of chewing, bolus cohesion and pharyngeal clearance. The removal of teeth further exacerbates these difficulties.

Swallowing function deteriorates in the early post-

treatment period, then improves up to 12 months post-treatment when it subsequently stabilises commonly at a level lower than pre-treatment.[9-12] There is a trend towards organ preservation management where increased intensity radiotherapy or chemotherapy regimens are selected over surgical treatment with the expectation of improved function. Research into this area has revealed an increased early reaction which may last longer and be more severe.[13-16] Anecdotal evidence suggests these patients tend to require dietetic and speech pathology support months after completing treatment and may not ever return to managing a "normal" diet without supplementation. Little research has examined the long-term effects on swallowing and nutritional outcomes.

The loss of the ability to enjoy a meal can be distressing. Nguyen et al[17] showed that the severity of dysphagia in a group of 73 patients complaining of swallowing difficulties following a range of treatment modalities for head and neck cancer, correlated with compromised QoL, depression and anxiety.

Evidence for benefits of nutrition intervention

It is often difficult, if not impossible, to meet the high levels of evidence according to National Health and Medical Research Council guidelines. As clinical nutrition studies are difficult to complete in a blinded fashion, patients may not adhere to the nutritional recommendations and it may not be ethically possible to conduct a randomised, control trial (eg. in malnourished patients).[18] Recent randomised control trials, however, have demonstrated improved outcomes from nutrition intervention for head and neck cancer patients undergoing radiotherapy. Ravasco et al[19] randomised 75 patients receiving pre-operative chemo-radiation to one of three groups. The first received dietary counselling alone, the second received commercial oral supplements and the third group remained on an ad lib diet. Both dietary counselling and oral supplement groups achieved increased protein and energy intake during treatment compared to those on an ad lib diet. Dietary counselling produced greater benefits in the medium-term (three months post-radiotherapy) than the simple provision of supplements. This is not surprising given the individual and changing nature of nutrition impact factors.

A study of 60 patients receiving radiotherapy to the head and neck or gastrointestinal tract compared intensive, individualised nutrition counselling by a dietitian, using a standardised protocol plus oral supplements as required, to the standard practice of the centre which was general nutrition advice, nutrition handouts and referral to a dietitian if considered necessary.[4] The group receiving early and intensive nutrition intervention had less weight loss and less deterioration in nutritional status, global QoL and physical function.

These studies have demonstrated that the decline in nutritional status often reported for patients with head and neck cancer is not inevitable. Patients at risk of malnutrition ie. the majority of head and neck cancer patients, should receive regular and individualised nutrition intervention.[20]

For surgical head and neck cancer patients, pre-operative weight loss greater than 10% over six months is associated with increased complications.[6] A number of studies have examined pre/post-operative nutrition support. There is considerable evidence that immune-enhancing enteral formulae reduce the likelihood of post-operative infectious complications in patients undergoing major gastrointestinal surgery,[21,22] but evidence is less convincing for head and neck cancer.[23-26] Pre-operative nutrition assessment assists in the identification of patients who are at risk of re-feeding syndrome due to extensive nutritional depletion, extended periods with minimal intake or abuse of alcohol.

When good symptom management is unable to achieve adequate oral intake, tube feeding is highly effective. There is consistent evidence that any form of enteral feeding results in higher protein and energy intakes and weight maintenance compared with oral intake alone.[27] Low level evidence, largely from retrospective studies, suggests that for high nutritional risk groups, gastrostomy insertion prior to cancer therapy provides some beneficial intermediate outcomes. Prophylactic gastrostomy insertion results in earlier commencement of nutrition support[28] and less weight loss compared with insertion later during treatment.[29,30] Patients with prophylactic gastrostomy tubes have fewer hospital admissions for dehydration or malnutrition[7,31] and maintain QoL during treatment compared with oral intake alone.[32,33]

Both common routes of enteral feeding, nasogastric or gastrostomy, are equally effective in preserving weight,[34,35] with nasogastric tubes recommended for short-term use and gastrostomies for periods exceeding one month. Nasogastric tubes can usually be inserted in an outpatient setting, but have a higher incidence of mechanical failure and aspiration.[35] Gastrostomy tube insertion is a more invasive procedure, but one that is

Table 1
Characteristics of patients with head and neck cancer associated with greater likelihood of severe weight loss and/or need for alternative feeding methods.

Diagnosis	pharyngeal/hypopharyngeal primary[2,38] base of tongue tumours[30] nasopharyngeal tumours[30] T4 tumours [2,38,39] moderately or poorly differentiated cancer [39]
Treatment	excision of base of tongue or pharynx [39] mandibulectomy [39] reconstruction with a pectoralis major flap [39] chemo-radiation [2,30,40] post-operative radiotherapy [38,39]
Weight loss	pre-treatment weight loss > 7% body mass index [30] pre-operative weight loss > 10lbs (5kg) [38]

widely used with relatively few complications.[36,37] The ability of the patient or their carer to manage home tube feeding must be assessed prior to insertion of any feeding tube and a system for regular follow-up and support is essential.[20]

There appear to be no universal standard criteria, however, to determine which patients should receive feeding tubes. The literature (Table 1) provides some evidence to inform the development of selection criteria for prophylactic tube placement.

Secondary analysis of the largest prospective evaluation of nutrition data in patients with locally advanced head and neck cancer undergoing definitive radiotherapy concluded that although patients who received nutrition support before starting radiotherapy had less weight loss and less grade 3 or 4 mucositis (despite being more likely to have a higher tumour stage) than those who did not, they had poorer overall survival.[41] Given the methodological limits of this study, associations could not be considered causal. It does, however, highlight the importance of including mortality as an outcome in nutrition intervention studies.

Screening and assessment

As patients with head and neck cancer are at high risk of developing malnutrition, the majority should be automatically referred, where services are available, for nutrition assessment and intervention. If this is not feasible, nutrition screening is recommended to identify patients at nutritional risk.[42] The advantage of nutrition screening is that it can be applied to all patients, providing systematic identification as opposed to ad hoc referral of patients.[43] While numerous nutrition screening tools have been developed, many are time intensive and require measurements and calculations.[44]

The Malnutrition Screening Tool (MST)[45] is a quick and simple tool based on recent appetite and weight loss, demonstrated to be a valid and reliable predictor of nutritional status in oncology patients.[43,45,46] The MST can be included on admission forms and can be completed by the patient, administration, nursing staff or nutrition assistants. Patients identified as at high risk should be referred for full nutrition assessment. Patients initially screened as at low risk should be re-screened every two weeks or when next attending an outpatient appointment.[46]

Body weight is the simplest indicator of change in nutritional status and head and neck cancer patients should be weighed routinely. A more thorough nutrition assessment is required, however, to determine changes in body composition. Loss of fat-free mass is mainly responsible for the reduced functional status and increased mortality associated with malnutrition.[47] Body fat often masks loss of lean tissue and hence patients who fall within 'healthy' or overweight categories are often overlooked despite significant amounts of unintentional weight loss.[48]

Nutrition assessment provides a comprehensive and in-depth assessment of medical and nutritional histories, a physical examination and/or biochemical measurements to determine an individual's nutritional status.[42] The scored Patient Generated-Subjective Global Assessment (PG-SGA)[49,50] is a valid and reliable tool for assessing the nutritional status of patients with cancer.[51,52] The PG-SGA can be used in nutritional triage to determine the level of nutrition support required and also as an outcome measure to assess the impact of nutrition intervention. Table 2 summarises key elements in the attainment of improved nutrition outcomes.

Table 2
Key points in the nutrition care of head and neck cancer patients.

- Monitor weight regularly.
- Aim for weight maintenance during treatment.
- Implement routine nutrition screening.
- Refer high risk patients for nutrition and swallowing assessment.
- Manage nutrition-related symptoms as a

Early and intensive nutrition management

Multidisciplinary clinics provide an opportunity to identify dysphagia and nutritional risk during the pre-treatment phase. Where complex treatment regimens are planned and the patient is at high risk of malnutrition, speech pathology and dietetic intervention should commence prior to or in the first week of treatment.

Initial dietary advice for malnourished patients includes ways to increase protein and energy intake and advice on texture modification if there are chewing or swallowing difficulties. Relaxation of any previous dietary restriction is often appropriate, especially as goals of treatment change with advancing disease. Many patients will require oral nutrition supplements to reach their nutrient requirements. The dietitian can prescribe the most appropriate supplement, advising the patient on any subsidised supplies for which they may be eligible. Monitoring is an essential component to achieve positive outcomes as adherence to the original prescription can become difficult due to taste fatigue or changing side-effects of treatment.[53]

In the early post-operative phase, routine and regular review by surgeon, nursing staff, dietitian and speech pathologist is important to ensure the most efficient return to oral intake without compromising nutritional status. At this time, patients often require oral or alternative supplemental feeding while they complete swallowing rehabilitation programs.

Multidisciplinary care is also imperative during post-operative radiotherapy or chemo-radiotherapy to manage side-effects that may limit food intake. Co-locating dietetic and speech pathology reviews with weekly progress evaluations by the radiation oncologist and nursing staff improves team communication, allowing

efficient identification and resolution of symptoms.[54] Transdisciplinary intervention should continue well into the post-treatment phase until symptoms subside, patients return to oral intake and can maintain suitable weight. The use of objective assessments including fibre optic endoscopic evaluation of swallowing and modified barium swallow assessments guide clinicians in developing swallow rehabilitation programs. These patients are concurrently dealing with issues related to cancer survivorship. Supportive care should be available following the completion of treatment to promote QoL and facilitate any adaptation that may be needed due to long-term effects of treatment or disease.

Future directions

Well designed prospective studies are needed to clearly identify which head and neck cancer patients would benefit from prophylactic gastrostomy placement and to determine optimal perioperative nutrition support. Future research evaluating the impact of nutrition intervention in patients with head and neck cancer needs to include a longer follow-up, mortality data, an analysis of health service utilisation and an assessment of cost versus benefit.

Evidence-based practice guidelines for the nutritional management of cancer cachexia have been endorsed by the Dietitians Association of Australia (DAA).[18] Evidence-based practice guidelines for the nutritional management of patients receiving radiotherapy are currently being developed. Recently, local branches have merged to form the national DAA oncology interest group, which will help streamline the development of nutrition pathways. We also hope a multidisciplinary nutrition group will be formed within the Clinical Oncological Society of Australia.

Summary

Malnutrition occurs frequently in head and neck cancer and may be overlooked in patients who do not look "underweight" despite significant weight loss. Nutrition screening should be conducted on all patients and those identified as high nutritional risk referred to the dietitian and speech pathologist. The existing paradigm is that malnutrition in patients with cancer is often inevitable. Early and intensive nutrition intervention, however, has been shown to prevent or minimise nutritional deficits. Nutritional oncology is a new discipline and requires, as do other oncologic disciplines, use of standardised intervention protocols. As current improvements in the multimodality therapy of head and neck cancer continue[55] it is vital that nutritional oncology keeps pace for best patient care.

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The role of PET in the evaluation of head and neck cancer

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Abstract

Flourine-18 fluorodeoxyglucose PET, particularly when performed on a combined PET/CT scanner, provides an exciting new technique for characterising the presence, extent and biological characteristics of head and neck cancer at all phases of the diagnostic evaluation process. As a functional imaging technique, it is not constrained by structural changes either for diagnosis or exclusion of disease. PET/CT allows detailed and high fidelity fusion of anatomical and biochemical data, enabling detection of occult primary lesions, involvement of non-enlarged nodes and remote metastatic sites not detected by conventional techniques. This allows better selection and planning of therapy. Conversely, in the post-treatment setting, metabolic responses occur earlier than structural regression, allowing patients who have responded completely to treatment to be managed expectantly and salvage therapies to be instituted earlier in those who have not. New PET tracers are becoming available to further characterise tumour

PET has become an important diagnostic modality in the assessment cancer. In contrast to CT and MRI, which detail the anatomy of the body, PET provides an assessment of biochemical processes by way of uptake and retention of radiopharmaceuticals by tissues. While structural imaging can allow identification of enlarged or distorted internal structures, PET scanning provides information about whether these derangements are likely tumour, scarring from previous treatment, or other biological processes. PET aids management by answering critical questions regarding the presence and extent of disease.

In clinical practice, PET is most often performed using the glucose analogue, fluorine-18 fluorodeoxyglucose (FDG). Enhanced glucose metabolism has long been recognised to be a feature of malignant cells, but is now known to be directly driven by key genomic changes in cancer cells.[1] Because of significantly increased uptake of FDG in most cancers compared to normal tissues, FDG PET provides high diagnostic contrast. Consequently, FDG PET has superior diagnostic accuracy compared to structural imaging in a wide range of cancers and in a number of different clinical scenarios.[2] These include initial diagnosis, primary staging, therapeutic planning, response assessment, restaging at relapse and post-treatment surveillance. The evaluation of tumours by PET is not, however, limited to use of FDG since there are many other potential tracers that can be utilised to characterise other processes pertinent to tumour biology. For example, cellular proliferation can be assessed with thymidine analogues such as fluorine-18 fluoro-L-thymidine (FLT),[3] while tissue hypoxia can be imaged using nitroimidazole-like compounds such as fluorine-18 fluoromisonidazole (FMISO).[4]

Evaluation of head and neck cancer

Head and neck cancer is one of the most common cancers in the developed world and is a major cause of cancer death. In Australia, the incidence in males has been decreasing since the early 1980s, but has increased slightly in women during the same period consistent with smoking trends and emphasising the link between this type of cancer and tobacco use.

The primary treatment of head and cancer is determined by disease stage. Some early cancers, such as T1 laryngeal squamous cell carcinomas (SCC), can be cured by radiotherapy alone, or by laser surgery, maintaining the functions of speech and swallowing. However, the majority of patients currently present with loco-regionally advanced disease, requiring selection of combined modality therapies individualised to achieve the best chance of cure while minimising treatment-related toxicity. In particular, preservation of organ function and quality of life are important yardsticks of the success of therapy, in addition to the more general goal of increasing survival. With this objective in mind, radiotherapy with concurrent platinum-based chemotherapy often precedes surgery in order to minimise the volume of tissue requiring resection, or to obviate surgery in a proportion of cases.[5] In such cases, the additional morbidity of salvage surgery at the primary site and in the neck dictate that initial radiotherapy should be highly targeted to macroscopic tumour, confined to the neck in order to maximise the chance of cure, but also reduce the toxicity to adjacent normal tissues.

The likelihood of cure with any given therapeutic strategy is also related to the stage of disease. With increasing tumour and nodal stage, survival is reduced and the likelihood of relapse is increased. Overall, the five-year survival rates for patients with advanced (stage 3 and 4) head and neck cancer are low (<30%) and a high percentage will develop recurrent loco-regional disease or systemic metastasis within two years of initial treatment. These rates have remained largely unchanged over the past three decades despite improvements in loco-regional control.[6] Clearly, improvements in the selection and delivery of treatment as well as the development of more effective therapies are required. The choice of the most appropriate treatment and the delivery of that treatment are critically dependent on accurate delineation of tumour sites. There is growing evidence that PET can significantly improve on current techniques with respect to these roles.

Rationale for PET in head and neck cancer evaluation

Most SCCs, the predominant histological subtype of head and neck cancer, have increased glycolytic metabolism, leading to high FDG-avidity. Several authors have reported the use of FDG PET scanning in cancer of the head and neck, both in the setting of primary staging and evaluation of patients after primary therapy, suggesting significantly higher accuracy than conventional evaluation.[7] These studies have, however, generally focused on patients who have been first evaluated and selected by structural imaging techniques including CT and MRI.

In the primary presentation setting, there has been a tendency to use PET primarily in cases with equivocal findings after conventional evaluation. Accordingly, they have addressed its complementary role as a problem-solving tool. The need for accurate anatomical localisation of disease sites for radiotherapy and surgical planning mandates the use of CT as part of the staging process of histologically-confirmed cases, however, with development of combined PET/CT scanners,[8] there is now the possibility of obtaining this information with a single convenient and highly accurate test. Indeed, we believe that there is a strong rationale for the routine use of PET/CT for the staging, treatment selection and planning of patients with clinical evidence of locally-advanced head and neck cancer. The ability of PET to simultaneously provide a wide survey for remote nodal disease, including involvement of non-enlarged nodes, has potential implications for therapeutic selection and planning and the more reliable exclusion of remote metastatic sites is also an important diagnostic advantage. More sensitive detection of synchronous malignancies would be an added bonus.

Although the structural relations of head and neck cancer are vital for planning primary treatment, they are of less relevance in recurrent tumour. Additionally, distortion of normal anatomy renders structural imaging of limited value following aggressive local therapy. Since PET with FDG is likely to demonstrate recurrent disease with higher specificity than CT scanning, it may allow patients with negative scans to be observed. PET may be helpful in patients being considered for surgery or local radiotherapy, as the sole treatment for apparently localised disease in which detection of more widespread disease would change the treatment strategy to combined modality treatment. In patients suitable for salvage treatment of regionally-confined recurrence, determination of the local anatomy is often required. Again, combined PET/CT can potentially provide this information as a single, convenient and accurate test. By providing more accurate information about the true disease status than conventional evaluation, PET can allow more appropriate management decisions to be made. In particular, avoidance of unnecessary active treatment for patients without disease provides economic and patient benefits. Timely introduction of salvage treatment of patients with localised recurrence may also improve survival.

Finally, characterisation of the biological characteristics of head and neck cancer may be of clinical utility since these features may be important to treatment selection and to prognosis. An important example of this principle is the presence of tissue hypoxia. It is known that hypoxia is prevalent in head and neck cancer and carries an adverse prognosis with respect to the likelihood of response to radiotherapy.[9] It is now possible to non-invasively image hypoxia with PET and derive similar prognostic information.[10] This may enable selection of patients for new therapeutic approaches, including metabolically-guided radiation dose painting or use of molecular targeted chemotherapeutic agents.

Peter Mac experience of PET in head and neck cancer evaluation

Carcinoma of unknown primary

Presentation with malignant lymphadenopathy in the neck without a clinically obvious primary lesion is a well-recognised clinical problem, as detailed above. Various groups, including our own,[11] have evaluated the role of PET to detect occult primaries. Although definite primary sites were only detected in around 25%, most series have reported a substantial rate of incremental metastatic site detection consistent with the high predilection for these tumours to metastasise. Furthermore, failure to detect a primary on PET was generally associated with an ongoing failure to detect it on follow-up using other techniques. Presumably a proportion of these cases have tumours that spontaneously involute. The advent of PET/CT allows more precise determination of the anatomical site of FDG uptake and ought to improve the differentiation between physiological uptake in muscle and mucosal abnormalities suspicious for primary malignancy. FDG PET/CT is now our preferred method for evaluating malignant lymphadenopathy in the neck in the absence of tumour in the upper airways on examination (Figure 1). This should ideally be performed prior to examination under anaesthesia to allow selection of sites for biopsy.

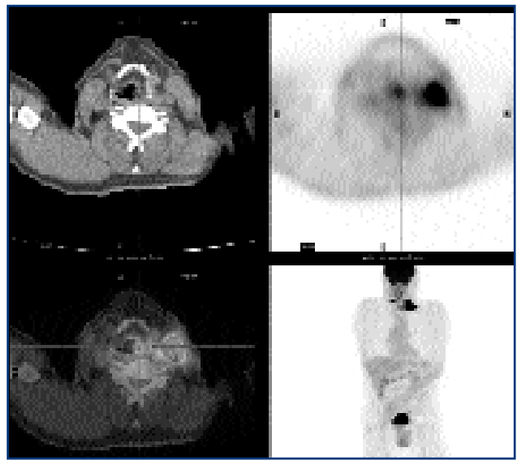

Figure 1
Detection of occult primary. This patient presented with left supraclavicular lymphadenopathy with squamous cell differentiation on biopsy. Clinical and endoscopic evaluation failed to identify a mucosal primary. CT demonstrates slight effacement of the left pyriform fossa with increased uptake of FDG suggesting a primary site. PET/CT also demonstrated several metabolically-active lung nodules consistent with metastases. These findings have both therapeutic and

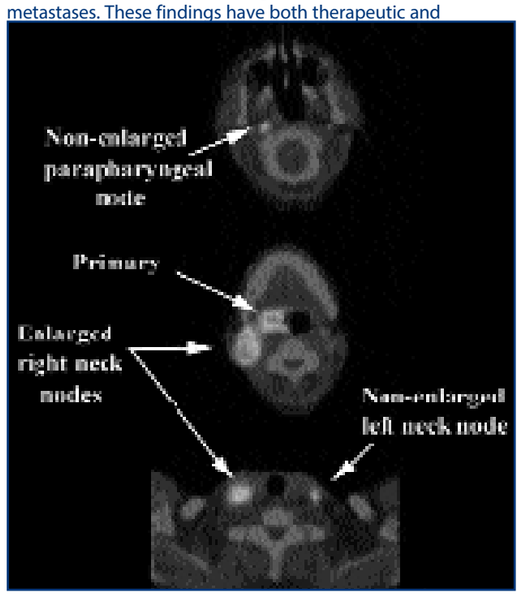

Figure 2
Radiotherapy planning. Radiotherapy planning based on CT in the patient would have been limited to treatment of the right vallecular primary and enlarged right cervical nodes. PET/CT demonstrated high FDG uptake in non-enlarged ipsilateral parapharyngeal and contralateral lower cervical nodes that would not otherwise have been included in the treatment volume.

prognostic implications.

Staging of locally-advanced head and neck cancer

Relatively little primary head and neck surgery is performed at our institution. Rather we act as a major quaternary referral site for radiotherapy services, with referrals from a number of surgical oncology groups in our region. FDG PET has been used for almost 10 years at Peter Mac for the staging of most patients with locally-advanced disease being planned for radiotherapy with curative intent. This experience has demonstrated the capability of PET to detect disease in non-enlarged nodes, unexpected distant metastatic sites and second primary malignancies. In particular, PET findings are commonly incorporated into radiation treatment volume planning (Figure 2). A significant issue in judging the accuracy of PET staging in such patients is the lack of pathological material to externally validate the imaging results.[12] Many of these patients have already deemed to be unsuitable for surgery based on the burden of disease or co-morbidity. Furthermore, where a histological diagnosis is already available and clinician confidence in the imaging result is sufficiently high to warrant empirical treatment, it is often difficult to justify further biopsy to confirm discordant results between conventional evaluation and PET. Nevertheless, where surgical, biopsy or serial imaging follow-up has been available to validate such results, PET has been shown to be correct in the vast majority of cases.

We recently reviewed our preliminary experience using combined PET/CT scan in 35 patients who were all conventionally assessed with CT or MRI, as well as clinical examination. Twelve patients (34%) had a change in staging as a result of PET/CT (95% CI 19-52%), primarily due to upstaging (unpublished results, Connell et al. 2006). One patient had a second primary lung malignancy identified on PET/CT that had been regarded as equivocal on conventional imaging. This was treated separately with radical surgery.

Staging PET/CT changed treatment modality or intent in 10% and 29% had a change in their radiotherapy plan.

Therapeutic monitoring

Due to the high specificity and sensitivity of FDG PET in detecting lymph nodal metastases pre-treatment, we have previously performed a study to assess the utility of PET in detecting viable tumour in nodes that had shown continuing but incomplete regression early following radical treatment.[13] The ultimate aim of the study was to validate the safety of continued observation of patients whose PET showed no metabolic activity in the residual mass, as opposed to surgical intervention, in the expectation of maintaining organ function. Given the high local complication rate with radiotherapy to the neck followed by neck dissection, neck surgery should be avoided if it is unnecessary (no residual disease) or futile (uncontrolled disease present beyond the neck). The likelihood of achieving a complete response is reduced with increasing nodal size following radiotherapy. The median potential follow-up time from presentation was 34 (16-86) months. Twenty-six patients were alive at the time of analysis. The median size of the residual anatomic mass was 1.5 (0.8-3.5) cm. In 32 of the 39 patients, PET showed no metabolic activity in the residual mass. Five of these patients had a neck dissection and were all pathologically negative. The remaining 27 patients were observed for a minimum of 16 months with only one loco-regional failure (in both the primary site and neck). There were no isolated neck failures. The negative predictive value of PET for active disease in a residual anatomic abnormality was 97%.

Restaging of suspected residual or recurrent disease

In another study evaluating patients with residual masses or symptoms suggestive of disease beyond three months from therapy and who were planned for salvage therapy, we found that PET was clearly superior to conventional restaging techniques and induced management change in 40%.[14] This included avoidance of unnecessary planned surgery in patients with negative PET. Appropriate management change was confirmed in 95% of evaluable cases. Disease presence and extent assessment by PET were significant predictors of survival ($P < 0.0001$), whereas the extent of disease determined by conventional evaluation was not.

Tumour characterisation

In a phase I trial of the hypoxic cytotoxin, tirapazamine, we have reported a high prevalence of hypoxia based on FMISO PET. In a cohort of patients with very advanced disease FMISO PET was positive in 13/15 cases at baseline including 12/15 of primary sites and 8/13 neck node regions.[4] All sites of corresponding FMISO abnormality at baseline showed marked qualitative reduction of uptake within four weeks of commencing therapy consistent with effective hypoxia-targeted therapy. With a median follow-up of 6.9 years, there were only four local-regional failures, while three other patients have died of metachronous lung cancer. The five-year overall survival was 50% (95% CI: 27-73%) and the five-year freedom from loco-regional failure was 68% (95% CI: 38–88%). We have subsequently demonstrated that imageable hypoxia is associated with a poor outcome in patients receiving standard radiotherapy and an excellent local control in patients receiving tirapazamine in a randomised phase II clinical trial.[15] We have now moved to a second generation hypoxia tracer called FAZA which provides higher tumour to background tissue contrast (Figure 3).

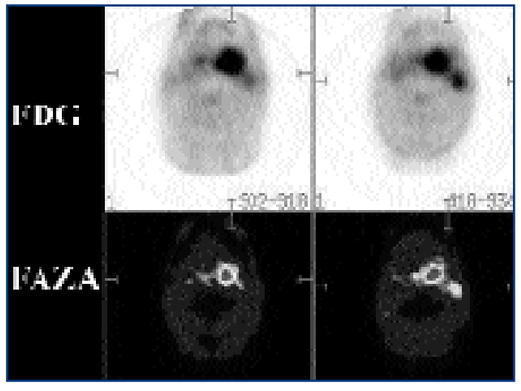

Figure 3
Demonstration of tumour hypoxia by F-18 FAZA.
The upper panel demonstrates active tumour in the left base of tongue and an upper cervical node. Co-registered FAZA PET images in the lower panel indicate that these lesions are hypoxic. Such lesions are likely to be resistant to radiotherapy.

We have also evaluated FLT as a marker of cellular proliferation in various diseases including head and neck cancer, demonstrating the feasibility of using this as a tracer for evaluation of therapeutic response, particularly for tumoristatic as opposed to conventional cytotoxic therapies.

Conclusion

PET is an exciting modality for the evaluation of head and neck cancer with roles across the whole temporal domain of the disease process. In particular, it is likely to be the most important modality in all those situations where local anatomy is distorted. PET/CT with FDG should be a routine tool for patients with locally advanced disease being contemplated for treatment with curative intent.

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TOWARDS DISCOVERY OF NOVEL TUMOUR MARKERS FOR HEAD AND NECK CANCERS

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Abstract

Recent advances in genomic technology, in particular gene expression profiling, may elucidate novel tumour markers or signatures that will predict how various tumours will behave and respond to various treatment modalities. In head and neck cancer, tumour markers may address current functional deficits in treating locally advanced disease. In the context of expression profiling, as achieved by microarray analysis of the relevant mRNA population, multiple studies have examined differences between normal epithelia and head and neck carcinoma. In this context, gene sets which might distinguish metastatic disease have been described. Gene profiling has also been correlated with clinical outcome and the work has been extended to characterise particular gene products as potential biomarkers. Such

Head and neck squamous cell carcinoma (SCC) is among the top 10 most common cancers in Australia.[1] This group of malignancies and their treatment is often associated with marked morbidity and mortality, particularly in patients with locally advanced head and neck SCC.

A tumour marker can be described as any substance produced as a result of cancer growth. These tumour markers have established roles in other cancers for screening, diagnosis, prognosis, therapeutic monitoring and/or detecting recurrence. Well known examples include BRCA1/2, PSA and Her2/neu. These tumour markers can play a key role in tailoring treatment.[2-7] In head and neck cancer, such markers would be invaluable given the resulting functional deficits of treating locally advanced disease.[8-10]

With the completion of the sequencing of the human genome combined with advances in genomics and proteomics, there is a new potential to discover panels of novel tumour markers that may play an important role in the diagnosis/prognosis of head and neck cancers. Increasingly, research is examining patterns of gene expression or protein changes instead of elevated levels of specific tumour markers. These "molecular signatures" are established using genomic and proteomic techniques such as microarray analysis.

What is a microarray?

Microarrays, as the name suggests, are molecules or other small biological substances arrayed in a known, uniform order on a solid support. They can be broadly classified into three general groups: DNA, protein and tissue microarrays. DNA expression microarrays have been the most widely used to date. The development of expression microarray technology has allowed gene expression profiling at the RNA level to be conducted for tens of thousands of expressed genes simultaneously, by hybridising an array of known sequences with labelled cDNA reverse transcribed from the sample RNA. Expression profiling using DNA microarray analysis has been used for cancer classification[11-13] and prognosis-based treatment.[14] Other DNA microarrays designed to examine regions of chromosomal amplification or deletion, or chromosomal methylation are also widely used.

Protein microarrays are currently an emerging technology and are generally a piece of glass on which different molecules of protein have been affixed at separate locations in an ordered manner, forming a microscopic array.[15, 16] These may be used to identify protein-protein interactions, to identify the substrates of protein kinases, or to identify the targets of biologically active small molecules. The most common protein microarray is the antibody microarray, where antibodies are spotted on to the protein chip and are used as capture molecules to detect proteins from cell lysate solutions.

Tissue microarrays are paraffin blocks that contain tissues assembled in array to allow a large number of biopsies to be sectioned simultaneously for immunohistological analysis.[17] The "microblocks" are usually cored biopsies of tumour or clinical specimens of approximately 0.6mm in diameter. These tissue cores are inserted in another separate recipient paraffin block in a precisely spaced, array pattern. Numerous sections of many tissues can be taken for independent tests.[18] These are usually sectioned for immunohistochemistry or in situ hybridisation. Tissue microarrays are a rapid and convenient way to screen a number of tumour markers by antibody staining across a large number of patients.

Discovering novel markers in head and neck SCC

A large effort by many groups has been made to identify novel tumour markers in head and neck SCC over the past few years. Many of the initial studies described global changes in gene transcription that distinguished normal head and neck squamous epithelia from carcinoma. Chin et al studied the common alterations in the transition from mucosa to primary tumour and regional nodes using matched autologous tissues respectively in over 13,000 genes.[19, 20] They found over 1200 gene products showing statistically significant differences in expression in the transition from normal oral mucosa to the primary tumour. Studies from other laboratories have also demonstrated grouping of transcriptional profiles that distinguished pre-neoplastic versus cancerous epithelium.[21] Patients with verrucous leukoplakia and erythroplakia, both premalignant conditions, were found to share a higher degree of relatedness to oral SCC samples than to normal controls. This phenomenon has also been observed by others and may suggest that changes in gene expression may occur before the development of malignancy, raising the hopes of developing tumour markers to detect very early-stage lesions.

More recent research has focused on the elucidation of gene expression profiles distinguishing metastatic disease from non-metastatic disease. Tumours of the oropharynx, hypopharynx and larynx have been found to group significantly according to metastatic cervical lymph node status.[22] A study evaluating the gene expression profiles of 34 hypopharyngeal tumour specimens identified a subset of 164 genes that were associated with metastatic potential, as indicated by patients with or without clinical evidence of metastasis three years after surgery.[23] Others have identified a 116 gene signature set that differentiated primary tumour specimens according to metastatic lymph node status, and showed that tumour specimens from lymph node metastases were similar to lymph node-positive primaries.[24] These authors went on to use the identified gene signature to "predict" the presence of lymph node metastases in a number of patients who were not included in the original data analysis.

A very recent series of studies by Roepman and colleagues has expanded on the metastasis predictor gene expression signature in head and neck SCC. These authors examined expression profiles from 82 head and neck SCC tumour specimens (45 metastatic and 37 non-metastatic) of the oral cavity and oropharynx and established a predictor set of 102 genes that was associated with metastasis. The performance of this predictor set was dependent on tumour tissue specimen storage times, exhibiting improving performance with shorter storage times. When the predictor set was assessed among expression profiles of 22 independent tumour samples, all stored for less than five years, lymph node status was correctly predicted in 86.4% of the tissue specimens.[25] Further analysis has shown that this initial gene set is part of a larger group of 825 genes,[26] with the suggestion that larger gene sets lead to more accurate predictions and are less prone to false negative calls. These findings taken together, suggest that there might be a metastatic gene expression signature present in some primary tumours that predisposes them to metastasise.

A great deal of research has also been conducted into attempting to correlate gene expression profiles from tumours with patient clinical outcomes. In an excellent study, Chung and co-authors identified gene signatures from tumours that clustered into four groups, which exhibited significantly different rates of disease recurrence-free survival.[22] Others have examined over 50 specimens from multiple sites and identified a set of genes with altered expression that grouped patients according to tumour recurrence, and therefore worse outcome.[27] A recent study from our laboratories has shown that elevated protein expression of one particular marker, osteonectin, was a powerful, independent predictor for short disease-free interval and poor overall survival in an independent group of 62 patients, following expression profiling of seven tumour specimens and autologous matched normal controls.[19]

These gene expression markers have the potential to become routinely used tumour markers. It may be possible to detect some or all of these changes by a simple biopsy or even a blood test. The pattern of alteration in these genes may be used as a diagnostic, prognostic and treatment modality indicator. However, many of the genes identified by the various studies are not well characterised and need to be studied functionally. There is also significant validation work required to correlate the changes in expression pattern with clinical outcome. In head and neck SCC, with most recurrence occurring within two years of treatment, it is possible to validate these gene expression changes in a retrospective study and correlating with clinical outcome.[19]

A simple test for a small number of changes however, would be technically easier and probably more widely used. Currently, our best marker alpha-B crystallin, the product of the CRYAB gene, is more sensitive than nodal status or tumour staging in determining disease free interval or overall survival (Figure 1). Tumours with no alpha-B crystallin present as judged by immunohistochemical staining do not develop recurrence regardless of nodal status.[28] This finding is currently being validated in a larger group of patients and to determine if head and neck SCC tumours negative for alpha-B crystallin staining are particularly sensitive to radiotherapy, as all of the nodal positive patients would have received this treatment.

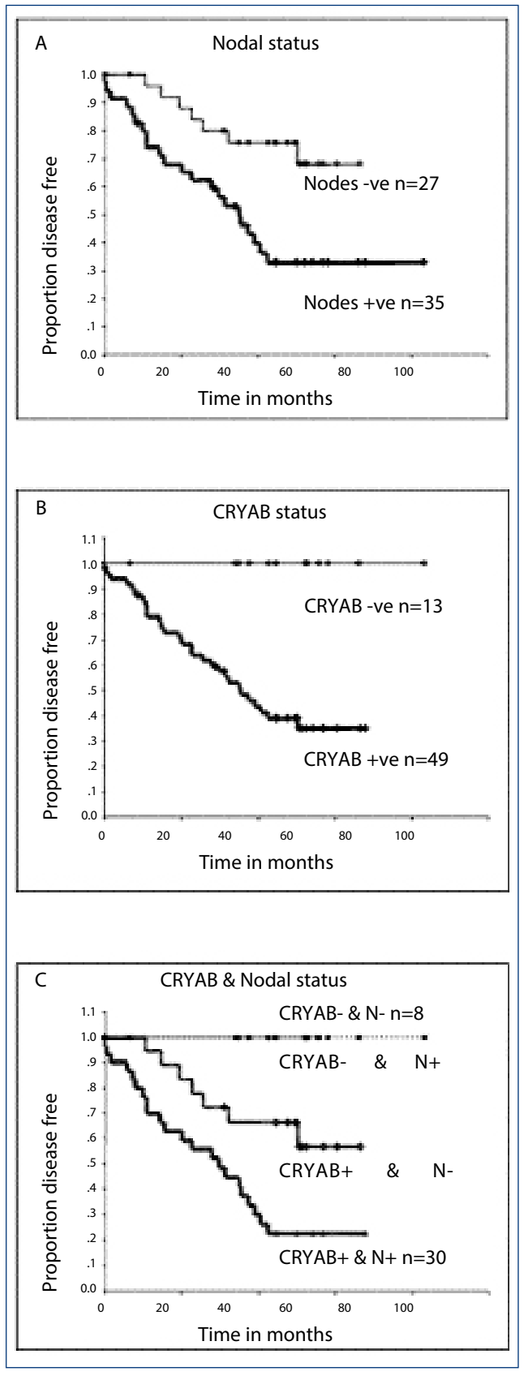

Figure 1
Kaplan-Meier survival curves. A. DFI with nodal status; Log rank P = 0.005. B. DFI with alpha-B crystallin (CRYAB) positivity; Log rank P < 0.001. C. DFI with alpha-B crystallin (CRYAB) and nodal status; Log rank P < 0.001. Taken from Chin et al.[28]

Perspectives

One of the major criticisms of expression profiling studies to date, particularly those attempting to correlate or predict patient outcome, has been the lack of overlap of predicting genes between like studies. It is likely that the variation in tumour specimen characteristics could significantly impact this. With the development of more standardised techniques for sample preparation and data analysis, it is generally considered that these limitations will be overcome. Further, many have criticised the small patient numbers involved in these early studies. Clearly, larger studies of much larger sample sizes comprising tumour specimens of more uniform characteristics need to be undertaken. It is also crucial that any pattern or gene difference from expression profiling analysis be validated in an independent sample series to ensure the robust nature of the finding. Even with these current drawbacks, it remains possible to hope that some of the markers or patterns of markers identified in these studies could in the future be used to detect the presence of head and neck SCC, metastasis of the cancer, or aid in determining the best treatment for the patient. n

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Advanced non-melanoma skin cancers of the head and neck: an overview on management

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Abstract

Non-melanoma skin cancers occur at an epidemic rate in Australia and are increasing in incidence worldwide. In most patients local treatment is curative. However, a subset of patients will be diagnosed with an advanced non-melanoma skin cancer, defined as: a subset of patients with cutaneous squamous cell carcinoma considered at increased risk of developing metastases to regional lymph nodes (high-risk squamous cell carcinoma); all patients with proven metatstatic cutaneous squamous cell carcinoma to regional lymph nodes; all patients diagnosed with Merkel cell carcinoma; and a minority of patients with a basal cell carcinoma. Patients with an advanced non-melanoma skin cancer are often candidates for combined modality treatment. Patients with high-risk cutaneous squamous cell carcinoma may be identified based on primary lesion and patient factors, with most lesions arising on the sun exposed head and neck. In patients with proven nodal metastases the parotid and upper cervical nodes are frequent sites for metastases. Patients with operable nodal disease should be recommended surgery and adjuvant radiotherapy. Despite this many patients still experience relapse and die. Research aimed at improving outcomes, such as randomised trial incorporating the addition of chemotherapy (weekly carboplatinum) to adjuvant radiotherapy, is currently in progress in Australia and New Zealand under the auspices of the Trans Tasman Radiation Oncology Group. All patients with Merkel cell carcinoma (primary cutaneous endocrine carcinoma) should be recommended loco-regional adjuvant radiotherapy.

Non-melanoma skin cancer (NMSC) is the most common malignancy worldwide and a consequence of chronic sun exposure.[1] Most patients (75-80%) will have a small basal cell carcinoma (BCC) and a minority will have a cutaneous squamous cell carcinoma (cSCC), with the sun exposed head and neck the commonest site (70-80%) for a NMSC. The worldwide incidence of NMSC has markedly increased and continues to rise.[2] Australia has the highest incidence of NMSC[3] and in regions of Northern Australia the annual incidence of cSCC in males exceeds 1300/100,000 population.[4] All patients with cSCC are at risk of developing nodal metastases, although overall only a minority (2-3%)[5,6] ever do so. Despite this, hospital referred patients with cSCC often have a higher incidence (10-20%) of nodal metastases. The development of metastases places patients at risk of significant morbidity and death.[7,8]

Patients developing nodal metastases will usually have a high-risk cSCC[9,10] and the number of patients diagnosed worldwide with cSCC makes this a major public health issue. Many Australians die as a consequence of metastatic cSCC, with one Western Australian study documenting 120 NMSC deaths (89 SCC, 22 Merkel cell carcinoma, nine other) over a five-year period, which accounted for ~1% of all cancer related deaths.[11] The morbidity of treating patients with metastatic cSCC is considerable, with most requiring major surgery followed by six to seven weeks of adjuvant radiotherapy. Although the early literature suggested a very poor outcome with current best practice (surgery and radiotherapy), five-year disease free survival is around 70% to 75%.[12,13] Although most patients with NMSC can be considered at low risk of morbidity or mortality, an increasing number of patients are diagnosed with an advanced NMSC defined as: a subset of patients with cSCC considered at increased risk of developing metastases to regional lymph nodes (high-risk cSCC); all patients with proven metastatic cSCC to regional lymph nodes; all patients diagnosed with Merkel cell carcinoma; and a minority of patients with a BCC.

Patients with an advanced NMSC are often candidates for combined modality treatment. The management of these patients should be within the confines of a multidisciplinary team experienced in the management of these often complex cases.

Squamous cell carcinoma

The current clinical staging system inadequately prognosticates for patients with cSCC.[14] Important tumour features such as lesion thickness/depth of invasion, histological grade, or the presence of perineural invasion or lymphovascular invasion are not considered (Table 1). Patient factors such as immunosuppression are also important (discussed later). Management decisions are infrequently made based on just one unfavourable factor since patients often have multiple clinicopathological high-risk factors (eg. thick cSCC (>4mm), recurrent setting, vicinity of parotid gland). Clinicians should be aware of patients with high-risk factors so that appropriate management decisions can

be applied.[15-22]

Table 1
High-risk primary cutaneous SCC features

Management of patients with high-risk cSCC

Features
Thick or deeply invasive (>4-5mm)
Clark level III or greater
Large size (>2cm)
Recurrent
High-grade
Perineural or lymphovascular invasion
Ear/periauricular or lower lip lesion
Rapid growth

Note: Patients usually have a combination of high-risk features

Patients with high-risk cSCC should be recommended wide local excision to achieve oncological excision margins (4-5mm). However, surgery may be constrained by cosmetic and functional consequences and a non-surgical approach (ie. radiotherapy) may be considered. Advanced and destructive cSCC (eg. T3/T4 lesions) may also require complex (vascularised flap) reconstruction. Moh's micrographic surgery (margin controlled excision) is often considered the 'gold standard' in treating high-risk patients. In a large Australian series of patients treated with Moh's micrographic surgery, many with high-risk tumours, only 4% recurred.[23] These control rates concur favourably with the results of other Moh's series and highlight the importance of margin-controlled excision.

There is a role for both definitive (Table 2) and adjuvant radiotherapy, if indicated.[24] Patients with a 2-3cm cSCC probably have a similar outcome with either definitive radiotherapy or surgery, however excision should be considered as the first option. Larger lesions should be considered for combined treatment, although this approach is not always possible. The role for adjuvant radiotherapy is important in the setting of incomplete excision since up to 50% of patients will recur with an associated increased risk of developing nodal metastases.[25] Re-excision is often not feasible secondary to cosmetic and functional constraints. Other pathological features, such as the presence of perineural invasion, may also warrant a recommendation of radiotherapy.

Patients with an incompletely excised cSCC are at risk of both local recurrence and subsequent nodal metastases. There is no consensus in the definition of an acceptable surgical margin. Published recommendations, in the setting of lip and other cSCC, range from 3–10mm.[26-28] In a study of 150 excised NMSC (25% cSCC) a 4mm surgical margin resulted in clearance in 97% of cases, compared with a 2mm excision margin achieving this in only 78% of cases.[29] Adjuvant radiotherapy is an efficacious option in reducing local relapse in the setting of a close or positive excision margin.[27] Observation and expectant treatment in patients with an inadequately excised cSCC is not recommended in light of the increased risk of metastatic nodal disease in the recurrent setting (Figure 1).

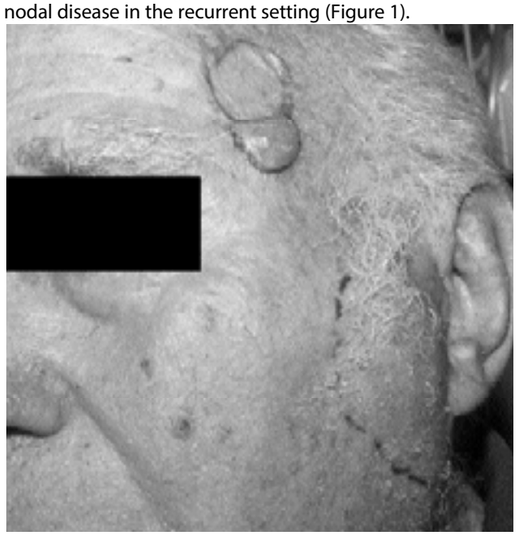

Figure 1
A 65-year-old male with a recurrent left temple SCC occurring at the edge of previous skin graft with concomitant bulky metastatic parotid nodal metastases. The patient underwent major surgery and adjuvant radiotherapy.

Table 2
Patient and tumour factors favouring definitive radiotherapy

Factor	Indication‡
Patient	Older age (>75 years)
	Patient preference (avoidance of surgery)
	Medicated with blood thinning agents (eg. Warfarin)
	Significant medical co-morbidities (risk of perioperative event)
Tumour	Site: Ala nasi, nasal bridge, lower eyelid, lip, inner canthus
	Size: Locally advanced requiring complex surgery

‡ Many of these factors are relative indications only

There are emerging data that sentinel node biopsy (SNB) may have a select role in patients with high-risk cSCC.[30,31] In a series of nine patients with high-risk cSCC, four of nine (44%) were positive on SNB, with two subsequently dying of metastatic disease. All node positive patients had SCC >3cm in diameter and >8mm in depth. The five with a negative SNB remained disease free, although the median follow-up of eight months was short.[30] However the role of SNB in patients with high-risk cutaneous head and neck SCC is evolving and still requires further validation and larger studies.

Electively treating nodes to prevent regional relapse may be considered. Radiotherapy[32] or surgery is an option and the recommendation of one over another is based on multiple factors. There are clinical scenarios where first echelon nodes may be treated at the time of primary treatment. For example, surgery to excise a deeply invasive cSCC overlying the parotid gland may require both excision of skin and a superficial parotidectomy. Similarly, adjuvant radiotherapy directed to a high-risk temple cSCC in the setting of incomplete excision may involve a radiotherapy field that also encompasses the parotid nodes.

Perineural invasion (PNI) occurs in ~5-10% of patients, is usually an incidental (microscopic) finding and is reported to be associated with a higher incidence of nodal metastases.[9] Patients presenting with cranial nerve palsies (often trigeminal and facial) have advanced disease and may not be curable. Diagnosis is often delayed for months or years with patients slowly developing progressive signs and symptoms.[33] Although MRI imaging is the investigation of choice (thickened nerves) early disease may not be detectable and an open biopsy may be warranted.[34] Patients with periorbital cSCC with incidental PNI are at risk of orbital spread and further treatment is usually warranted.[35] Adjuvant radiotherapy with the ability to treat widely and encompass neural pathways is often recommended.

Immunosuppression

Immunosuppressed patients are at increased risk of developing a high-risk NMSC, most often cSCC. This is usually in the setting of an organ transplant recipient, although patients with certain haematological malignancies and also HIV patients are also at risk. The management of immunosuppressed patients with NMSC should be in the context of clinicians experienced with managing transplant patients and following accepted management guidelines.[36]

Evidence suggests that many cSCC in organ transplant recipients exhibit histological features considered high-risk. In one study comparing immunocompetent patients and organ transplant recipient, a significantly higher proportion of organ transplant recipient (17 vs 5%; p<0.0001) had thick (>5mm) tumours with early dermal invasion (7 vs 0.3%; p=0.0001) when compared with immunocompetent patients.[37] Of note, immunosuppressed patients that develop metastatic nodal cSCC have a poor outcome. Martinez et al[38] reported the outcome of 60 organ transplant recipients with metastatic skin cancer (85% SCC) and documented a three-year disease specific survival of only 56%.

Patients developing serious and life threatening cutaneous malignancies may be considered candidates for a significant reduction in their level of immunosuppression.[39] Reducing a patient's level of immunosuppression increases the risk of transplant rejection and possibly death. Renal transplant recipients may revert back to dialysis in the case of rejection, however, cardiac and liver recipients do not have this option. There is also ongoing research to identify newer effective immunosuppressants such as sirolimus-based regimens that in turn may be associated with a lower incidence of skin cancer.[40]

Oral retinoids aim to delay or decrease the incidence of NMSC in organ transplant recipient. Although the mechanism of action is unclear there are limited data to suggest a benefit. In a systematic review of the literature only three eligible randomised trials were identified.[41] All trials were small, but two did suggest a benefit in decreasing the incidence of new NMSC in patients taking Acitretin (25-30mg orally daily for six to 12 months) versus placebo. However, tolerability (headaches, mucocutaneous reactions) with this drug remains a major issue and often necessitates treatment withdrawal.

Metastatic nodal SCC

Most metastatic (60-70%) nodes from head and neck cSCC occur in the parotid gland (+/- cervical nodes). Most patients (70-80%) develop nodal metastases after treatment for a primary cSCC, rather than present with a concomitant primary and nodal disease. A minority (20-30%) will not have an identifiable index lesion and factors not well understood are involved in this subgroup of patients. Median time for the development of nodal metastases following treatment of an index SCC is ~12 months, although late relapse (two to three years) is well documented and justifies ongoing regular follow-up of patients following treatment of a high-risk SCC.[42]

The management of a patient with cutaneous metastatic nodal head and neck SCC has evolved. Most patients that relapse (70-80%) experience loco-regional relapse as the first site of relapse. This finding would suggest that treatment to improve disease control in the head and neck is likely to also impact on survival. Recent publications support best practice in operable patients as surgery and adjuvant radiotherapy.[13,43-45] Patients treated with a combined approach can expect a 20-25% chance of loco-regional relapse and those treated with a single modality (surgery or radiotherapy) can expect a <50% likelihood of achieving freedom from loco-regional relapse. A study from Westmead Hospital, Sydney, confirmed a marked decrease in loco-regional relapse (20 versus 43%) and improved disease free survival (73 versus 54%; p=0.004) with the addition of adjuvant radiotherapy compared to surgery alone. Most recent studies suggest 60 Gy in 2 Gy daily fractions as an acceptable dose of adjuvant radiotherapy to a

dissected nodal region and 50 Gy to the undissected at-risk neck.

Ongoing research

Data from a Peter MacCallum Cancer Institute pilot study[46] suggests a possible role for combined treatment in high-risk cSCC patients to improve loco-regional control. A trial testing this hypothesis has been activated under the auspices of the Trans Tasman Radiation Oncology Group (TROG) with the aim to accrue 265 patients randomised to receive adjuvant radiotherapy (60 Gy) or adjuvant radiotherapy and weekly carboplatin (Post-Operative Skin Trial; POST 05.01). Patients with advanced T3/T4 N0 cSCC are also included in this study to test the improvement in local control and where possible to electively treat first echelon nodes.

The TNM staging system currently assigns all patients with metastatic cSCC as stage N1. Using a modified P (Parotid; P0-3) and N (Nodes; N0-2) clinical staging system, O'Brien et al[47] have validated the benefit of proposed new staging system in identifying patients that have a worse prognosis. A recent large collaborative study from six Australian and North American institutions analysed outcome for patients with metastatic cutaneous head and neck SCC using the proposed PN staging system of O'Brien et al.[47] The findings from this study confirm the utility of separate parotid and neck stages in predicting outcome.[48] Patients with pathological involvement of both the parotid and neck did worse compared with those having only parotid disease.

Merkel cell carcinoma

Merkel cell carcinoma (MCC) is a rare and aggressive primary cutaneous neuroendocrine (small cell) skin cancer. Although most patients with a NMSC are cured by local treatment, patients with MCC have a poor outcome characterised by loco-regional (nodal and intransit) and distant relapse.[49,50]

A clinical diagnosis of MCC is difficult to make. Specific histochemical markers are needed to confirm MCC and exclude lymphoma or melanoma. The presence of cytokeratin 20 (CK 20) and neuron specific enolase (NSE), in association with negative markers for melanoma and lymphoma, support a diagnosis of MCC. Lesions often arise as painless dermal nodules on the head and neck in older Caucasian males. Once pathology confirms cutaneous small cell carcinoma, clinicians need to consider the possibility of metastatic small cell lung cancer, especially in smokers. All patients should have chest imaging to exclude lung cancer or the possibility of pulmonary metastases. Patients presenting with clinical nodal metastases should also have CT scans of the abdomen and of the head and neck if the primary is located here.

Treatment

The aggressive nature of MCC is typified by high rates of early (less than 12 months) loco-regional relapse (20-80%) and distant failure (10-60%).[51] Cancer specific death occurs in greater than 25-30% and those with localised disease have the best chance of cure. Surgery remains the initial treatment in patients with operable disease that are fit for an operation and do not have distant metastases. Defining an appropriate surgical margin is controversial, however wide margins of 2-3cm are recommended in light of the risk of subclinical intradermal invasion. Although proponents of excision alone suggest surgery as appropriate treatment in many patients, in a review of 1024 cases the authors identified 11 series (n=441) that documented local relapse rates with, and without, adjuvant radiotherapy. The mean relapse rate reported with the addition of adjuvant radiotherapy was 10 versus 53% without (p=0.00001).[52] Clinicians should therefore attempt to excise lesions with a negative margin. Most patients will be candidates for loco-regional adjuvant radiotherapy and the necessity to obtain wide excision margins at the risk of a poor functional and/or cosmetic outcome should be avoided.[53]

Local excision without treatment to regional nodes does not address the high-risk of subclinical nodal disease (Figure 2). In an Australian study of patients treated with local excision 33% and 50% of patients, respectively, developed regional relapse with lesions 5-10mm and greater than 10mm in size.[54] Therefore, the argument for local excision only, as adequate treatment for a patient with clinically localised MCC, is difficult to defend based on the high rate of regional relapse, which in turn usually portends a poor outcome.

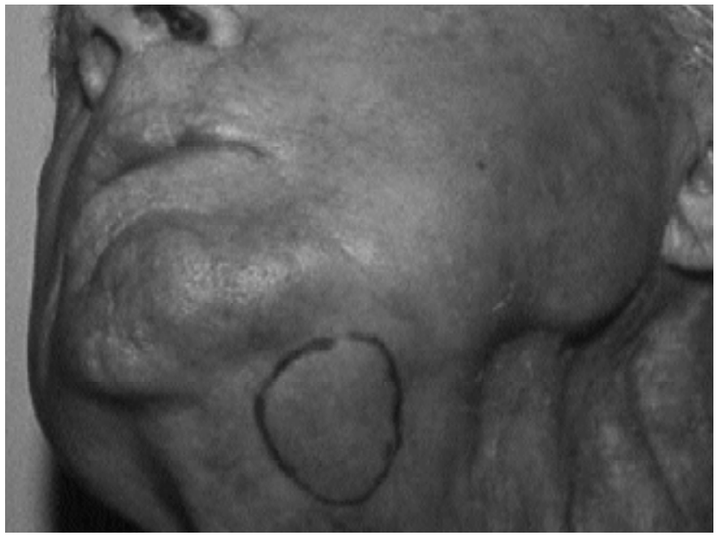

Figure 2

A 75 year-old male with nodal relapse in his left upper neck following local treatment for an 8mm MCC of his upper lip.

Sentinel node biopsy (SNB) may improve the ability to detect subclinical nodal metastases although its exact role is unclear. In a recent meta-analysis (n=122) of patients with MCC undergoing SNB, 32% were found to have micrometatses.[55] The authors reported no significant relapse-free survival benefit (90 versus 70%; p=0.026) to patients undergoing adjuvant radiotherapy in the setting of a negative SNB. Although the authors of this study suggest SNB should be routinely performed in all clinically node negative patients with MCC, further evaluation is required in larger prospective studies.

Patients with nodal disease should have surgery and adjuvant loco-regional radiotherapy. One study demonstrated improved regional control with this multimodality approach, compared with nodal dissection alone (14 versus 43%).[54] Patients with regional relapse are usually incurable either because of untreatable regional disease or the concurrent or subsequent development of distant metastases. In the case of a patient presenting with previously untreated unresectable nodal disease, high-dose radiotherapy (~60 Gy) may 'downstage' the patient so that nodal dissection could follow if disease regression leads to improved operability.

MCC is radiosensitive utilising moderate radiotherapy doses in the range of 45-60 Gy. In some cases patients have been treated with definitive radiotherapy and cured. In a French study nine patients with node negative MCC were treated with radiotherapy alone (median dose 60 Gy) and with a median duration of follow-up of three years none have relapsed, although three have died from unrelated causes.[56] In one series six patients, most with advanced MCC and treated with definitive radiotherapy-obtained tumour control, although most died from subsequent distant relapse.[54] While such anecdotal cases do not add convincing evidence to support a definitive role for radiotherapy in the majority of patients, such cases do highlight the radiosensitivity of MCC to moderate dose radiotherapy even in the setting of macroscopic disease.

With few exceptions most studies report a marked benefit in loco-regional control to the addition of adjuvant radiotherapy. The recent findings of the largest meta-analysis (n=1254)[57] investigating the role of adjuvant radiotherapy in patients with MCC reported patients treated with surgery alone were 3.7 times more likely to develop local recurrence compared with surgery and adjuvant radiotherapy (p<0.001). Similarly, patients treated with surgery alone were 2.9 times more likely to develop regional relapse (p<0.001). A TROG prospective study reported an exceptionally low 17% loco-regional relapse rate in high-risk patients (n=53) treated with radiotherapy and chemotherapy.[58] In a Westmead Hospital study 37% of patients treated with surgery (including seven with nodal dissections for clinical disease) experienced regional relapse compared to 18% treated with surgery and adjuvant radiotherapy (median dose 50 Gy).[54]

The routine use of adjuvant chemotherapy is unclear. In the landmark TROG prospective single arm study, patients needed to have one or more unfavourable features with the authors reporting a three-year overall survival, loco-regional control and distant control rate of 76%, 75% and 76% respectively.[58] These impressive results in patients with poor prognostic features suggests a potential benefit to the addition

of combination chemotherapy. A recent Queensland study compared patients treated with the addition of chemotherapy (n=40) with 62 patients treated without chemotherapy.[59] The authors reported no significant overall survival benefit to those patients receiving chemotherapy (p=0.16) and no improvement in distant control (65 versus 70%; p=0.61). While not excluding a possible benefit to chemotherapy these results further add support for a randomised control trial to confirm the hypothesis that chemotherapy is beneficial.

Patients experiencing systemic recurrence are incurable and have a median survival of three to six months. Patients with systemic disease may be candidates for palliative chemotherapy, although many are medically unfit for this treatment. A minority (20-30%) developing only loco-regional recurrence is still potentially curable although the prognosis remains poor. In a study of 46 patients with recurrent MCC, the overall survival was reported as 37%, although almost half (47%) had only local recurrence/persistence followed by distant (40%) and regional failure (13%), respectively.[60] Clinicians should consider fully restaging patients in the setting of loco-regional failure if there is consideration for radical intent retreatment.

Basal cell carcinoma

BCC is rarely life threatening and there is no accepted definition of a high-risk BCC. However, deeply invasive BCC located on the midface, especially if an infiltrative or morpheaform subtype, should be considered high-risk for local morbidity and be treated appropriately, including a recommendation for adjuvant radiotherapy, if indicated. Unlike SCC the risk of nodal and distant metastases is rare and treatment is aimed at securing local control. In most cases local excision obtaining oncological margins is recommended. Radiotherapy is also an option when tumour and patient factors favour this modality.[61]

Further treatment is often recommended in the setting of an incompletely excised BCC. Of concern is a positive deep margin, particularly when a local flap has been used in reconstruction. In such cases deep recurrence can be difficult to detect. The midface and periorbit are sites where undetected deep recurrence may be associated with significant local morbidity. Approximately 20-30% of incompletely excised BCCs recur,[62] with some clinicians advocating immediate re-excision to achieve a negative margin. The aim of adjuvant radiotherapy is to reduce the incidence of local recurrence by eradicating residual microscopic BCC. Though recurrences are rarely associated with serious consequences, extensive salvage surgery may be required. Patients with the more aggressive, but the uncommon subtype of morpheaform BCC, are at a higher risk of local recurrence and are best not left untreated in the setting of inadequate excision. Similarly, recurrent BCC and infiltrative BCC should also be offered treatment if inadequately excised.

Conclusion

Patients with advanced NMSC are best managed within the context of a multidisciplinary head and neck clinic. Many will be candidates for combined treatment incorporating surgery and adjuvant radiotherapy, with emerging evidence in the setting of metastatic nodal disease and MCC that adjuvant radiotherapy significantly improves outcome. Research within Australia is also currently ongoing to investigate the role of chemotherapy to further improve the outcome for these patients. n

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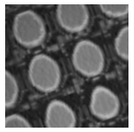

Risks and benefits of sun exposure – implications for public health practice based on the Australian experience

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Abstract

Over recent years, the evidence has been accumulating that vitamin D has a positive impact on our health. This is likely to have an impact on the future of our public health advice related to skin cancer prevention. This paper explores, from a public health perspective based on Australian experience, how skin cancer prevention messages need to be managed in light of new information about vitamin D and in particular, the times when sun protection advice should be provided. Conclusions are drawn in relation to how the vitamin D message can be complementary to the sun D that may run counter to well established skin cancer prevention messages.

Exposure to ultraviolet radiation accounts for around 99% of non-melanoma skin cancers and 95% of melanomas in Australia.[1] On the other hand, there is very good evidence that exposure to sunlight enhances vitamin D levels that can have an impact on improving bone and musculoskeletal health for older people who are vitamin D deficient.[2,3] This paradox creates a significant challenge for those working in public health to ensure an appropriate balance is communicated to the general public that takes into account the risks and benefits of sun exposure.

With Australia having one of the highest rates of skin cancer in the world, prevention campaigns have been part of the Australian public health landscape since the early 1980s. Slogans such as Slip! Slop! Slap! and SunSmart have a very high public profile and there is considerable policy and practice in place that reinforces sun protective behaviour.[4]

The Cancer Council Victoria has the longest standing and best evaluated program in Australia, where there has been population monitoring of sun protective behaviour and attitudes since 1987. Over this time there has been a significant reduction in the desire to tan, improved use of sun protective items such as hats and sunscreen and a significant reduction in sunburn rates.[5,6] The benefit of these campaigns has been a reduction in non-melanoma skin cancer rates in younger age groups.[7]

The improvement in sun protection policies and practices has come about largely because of a long standing integrated health promotion intervention that utilises mass media as the primary method to communicate to the general population, combined with community based interventions. Given this success, it is not too surprising that the media have been very responsive to research reports that highlight the benefits of vitamin

Vitamin D deficiency

In recent years, research has identified findings that were showing high levels of mild vitamin D deficiency (between 25 to 50 nmol/L) in the general populations in the southern states of Australia over winter months. Any levels less than 50 nmol/L can lead to increased parathyroid hormone secretion and high bone turnover.[8] In a Geelong (Victoria 37°S) study by Pascoe et al it was shown that 43% of females over the winter months were mildly vitamin D deficient and 8% of 20-59 year old women were regarded as moderately to severely vitamin D deficient (less than 25 nmol/L).[9] In addition to this, 80% of dark skinned veiled women were noted as being vitamin D deficient. Older people who are institutionalised or housebound are also at a particularly high risk of vitamin D deficiency.[10,11] Vitamin D deficiency is not just confined to adults. In a Tasmanian study, it was found that 10% of healthy eight-year-olds (mean age) were found to be mildly deficient during the winter months.[12]

Vitamin D production decreases during winter when the intensity of ultraviolet (UV) radiation is lower. The body can rely on tissue stores of vitamin D for between 30 and 60 days assuming vitamin D levels are adequate prior to winter.[13] In most cases, any vitamin D reduction during winter is corrected in summer when more sunlight is received with more time spent outdoors. While this correction may occur, it is still important to prevent deficiency during winter as fracture rates increase with deficiency, particularly with older adults.

In 2004, Osteoporosis Australia raised concerns in the media about vitamin D deficiency at the same time that new research by Hughes A-M et al was coming out about possible benefits of sun exposure in reducing non-Hodgkin's lymphoma.[14] Given the significant media attention centred around possible or real benefits of sun exposure, The Cancer Council Victoria considered it was necessary to develop a position statement with the Australasian College of Dermatologists (ACOD), Osteoporosis Australia (OA), Australia and New Zealand Bone and Mineral Society (ANZBMS) and The Cancer Council Australia to ensure consistent information was being provided to the general public.

On 15 July 2004, The Cancer Council Victoria and the National Cancer Control Initiative hosted an expert meeting with representatives from relevant disciplines to investigate whether there was a basis for a common understanding relating to the risks and benefits of sun exposure. A report from that meeting was published, along with a number of key recommendations that had unanimous support from all parties.[15] In addition to this, following the meeting a position statement was approved and released in March 2005 that had the approval of the ACOD, OA, ANZBMS and The Cancer Council Australia.[16] The process of reaching agreement with each of the parties was critical in ensuring consistency in the messages being delivered to the media around the vitamin D issue and to provide confidence to the general community that there was consistent health advice from each of the key agencies.

The position statement resulted in a number of key outcomes directly related to skin cancer control. Essentially it was agreed:

- A balance is required between avoiding increases in skin cancer and maintaining adequate vitamin D levels.
- Sun protection messages needed to shift away from the notion that people have to protect themselves against the sun at all times.
- Skin cancer campaigns need to note that there are benefits and harms associated with sun exposure and that a balance between the two needs to be achieved. This had not been a general perspective of skin cancer prevention messages to date.
- Sun protection messages should refrain from encouraging people to stay indoors; instead they should be about encouraging people to take the right precautions when they are outside.
- Sun protection should only be applicable when the UV index is three or above.

The relationship between sun exposure and other diseases

There is in Australia unanimous agreement by the ACOD, OA, ANZBMS and The Cancer Council Australia that there is high-level evidence for the harmful effects of sun exposure in terms of skin cancer and for the beneficial effects of sun exposure in maintaining adequate vitamin D levels to protect against osteoporosis and bone fracture.[17] However all parties agree that substantially more evidence is required before conclusions can be drawn between sun exposure and a possible beneficial effect with other cancers such as breast, prostate, bowel, or non-Hodgkin's lymphoma and auto-immune diseases such as multiple sclerosis. The biological pathways underlying these empirically observed observations are still not clear and in some instances the epidemiological evidence is equivocal. It was agreed by all parties that it was not appropriate to make statements about a protective effect of UV radiation exposure for these diseases because substantially more studies with good individual exposure measures by season are required.

How much sun exposure is enough?

The most difficult factor in coming to an agreed position statement has been to determine what would be a reasonable level of sun exposure necessary for healthy bone growth and development that will not add to a substantial risk of skin cancer. It was clear amongst OA, ANZBMS and the ACOD that we are still a long way from having sufficient evidence to suggest where this point should be exactly. This difficultly exists almost entirely due to the limitation and paucity of existing research. This issue is also compounded because skin type, age and culturally related clothing practices vary the ability to absorb vitamin D through UV exposure.

Recognising the limitations of existing evidence, a very pragmatic approach was adopted in Australia. Based on evidence relating to osteoporosis and vitamin D, it was agreed one third of an MED to 15% of the body, (eg. the face, arms and hands) on most days of the week would be sufficient to maintain adequate vitamin D absorption to reduce osteoporosis risk.[18] In practice this equates in the Australian context to only 10 minutess sun exposure either side of the peak UV period on most days of the week and two to three hours per week sun exposure during the winter months. This level was acceptable to the ACOD as it was considered that the general population were already likely to be exceeding these recommendations as part of their normal day-to-day activity, even if they were always adopting sun protective measures during periods of high UV radiation. In addition, all parties agreed that the benefit of some sunlight is far greater for general good health than it is detrimental for skin cancer.

Therefore there is no recommendation that people should deliberately expose themselves to the sun to enhance their vitamin D levels. The only exceptions are those people who are at high risk of being vitamin D deficient and when controlled sun exposure outside the peak UV periods may be beneficial to their health if supplementation is not available.

Times of the year and times of the day when sun protection should be applied

The Global UV Index released by the World Health Organization (WHO) in 2002 is a very useful tool to determine when sun protection is required and equally when it is not necessary.[19] According to the Global UV Index that is now the international standard for UV measurement, sun protection should be promoted when the UV Index is three or above.

Figure 1 provides an example of the appropriate times of the year when we should be communicating the sun protection message. For example, Melbourne (Australia 38°S) shows that between the winter months of May and August inclusive, it is unlikely that sun protection will be necessary unless people will be near highly reflective surfaces such as snow and water, or at high altitudes. In the northern hemisphere over the summer months, it shows that the appropriate time for Leeds, UK at 54°N would be that sun protection advice should be reinforced between the months of May and August inclusive. For Glasgow, Scotland at 56°N it would be for a similar duration. Toronto, Canada at 43°N, sun protection campaigns would be appropriate for at least between March and October inclusive.

The UV Index can also be a useful tool to determine what time of the day that sun protection is required. In Australia, the Bureau of Meteorology in conjunction with The Cancer Council have been illustrating for the first time the UV Index in terms of a peak value for the day, as well as the times of day when sun protection is required (see Figure 2). This provides very useful information for the general public to guide their behaviour.

People with dark skin who wear veils, particularly in pregnancy, elderly or infirm people, those with malabsorption syndromes, organ transplant patients and those with personal risk factors of skin cancer will require a tailored health management plan that is likely to include vitamin D supplementation.

Is increased physical activity a key part of the solution?

Of significant note is that mildly deficient vitamin D levels (between 25 to 50 nmol/L) in the general population have been only during winter periods. Notably, children who were obese had lower vitamin D levels and higher levels of vitamin D were seen in adolescent boys who participated in sport.[20,21] Therefore, by encouraging people to be more physically active outdoors in winter months, we will not only be increasing their vitamin D levels, but also importantly contributing to their overall good health. Increasing levels of physical activity will not be a solution however at latitudes where no UV is present over winter months.

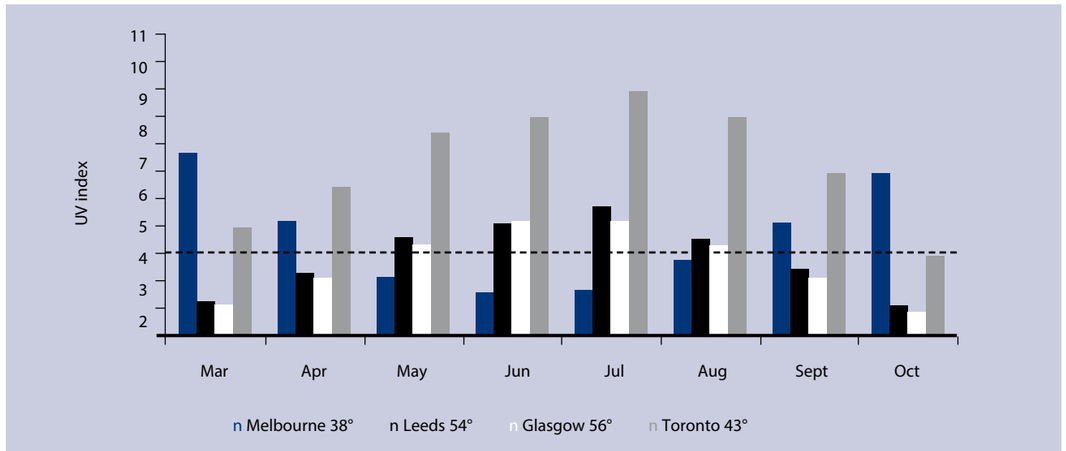
Vitamin D deficiency and sun protection, are the messages complementary?

Vitamin D deficiency in the Australian context in the general population is largely confined to winter months in southern states when the sun protection message is not a relevant public health message. When the Global UV Index is in the moderate to extreme range, undertaking sun protection measures such as regular sunscreen application is unlikely to increase osteoporosis risk.[22,23] A study by Matsouka et al. (Figure 3) showed that while sunscreen use initially reduced vitamin D absorption, this effect was dissipated after seven days.[24]

Conclusion

With appropriate refinements of the sun protection message, sun protection programs do not have to compete with the human need for vitamin D; the two messages can be quite complementary. In terms of

Figure 1
Average UV levels per month by city



UV data for Melbourne, Leeds and Glasgow sourced from Gies P, Roy C, Javorniczky J, Henderson S, Lemus-Deschamps L, Driscoll C. Global Solar UV Index: Australian measurements, forecasts and comparison with the UK. Photochem Photobiol. 2004 Jan;79(1):32-9.

Figure 2
UV Index as issued by the Australian Bureau of Meteorology

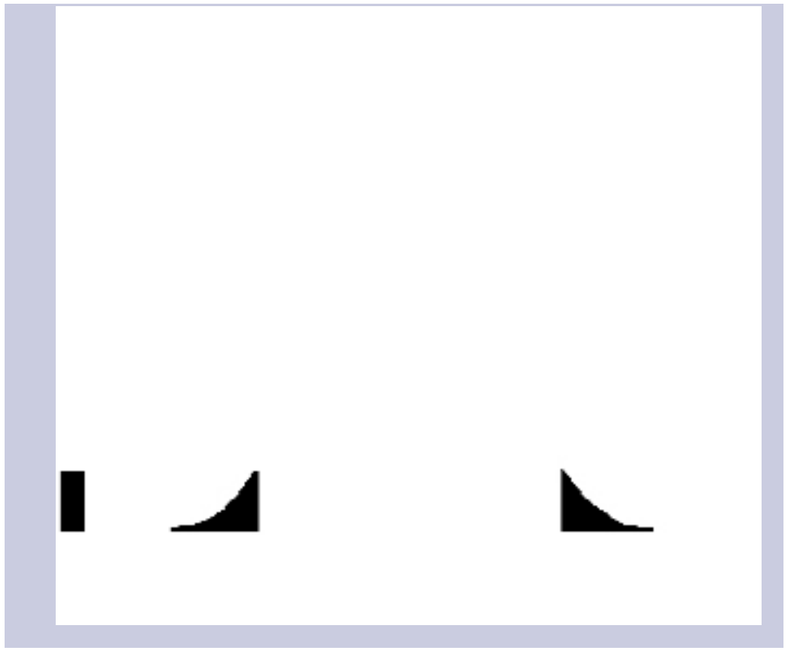
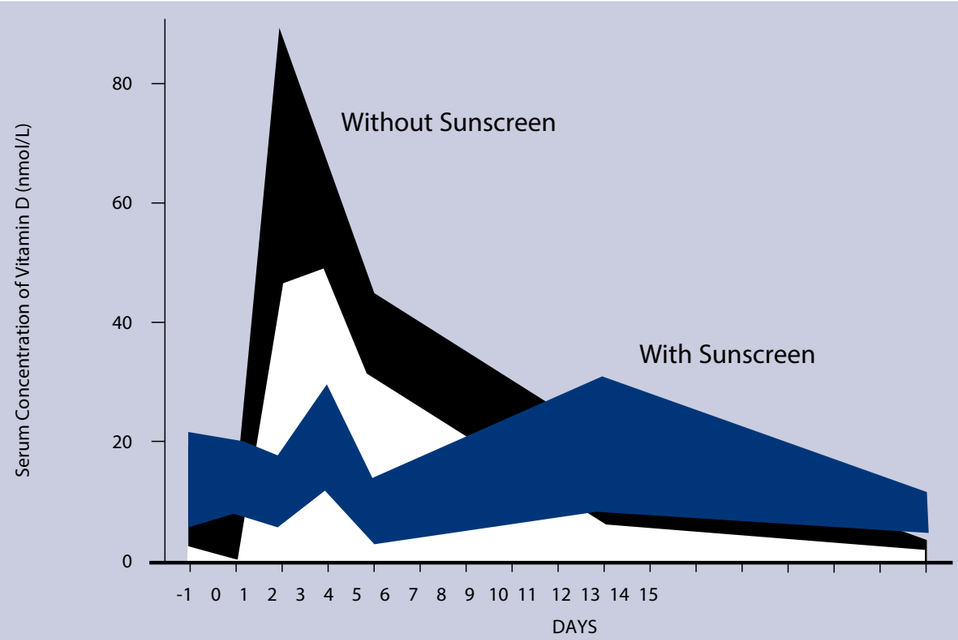


Figure 3



Circulating concentrations of vitamin D after a single exposure to one minimal erythemal dose of simulated sunlight either with a sunscreen, with a sun protection factor of 8, or a topical placebo cream.

Matsouka et al; J Clin Endocrinol Metab, 1987 et al; J Clin Endocrinol

key recommendations going forward, every opportunity should be made to promote the Global UV Index to those responsible for delivering sun protection campaigns, to guide when sun protective behaviour should be encouraged as well as when it may not be required. In terms of public health, we must continue to raise public awareness of potential negative health effects from excessive sun exposure during periods when UV is in the moderate to extreme range. In periods when the UV level is low (<3), it will be important to not encourage sun protective behaviour, except near highly reflective surfaces or high altitudes. In high latitude countries with very low UV levels for a significant proportion of the year, the increased use of vitamin D fortification in food and supplementation for high risk individuals should be considered.

Further research is required to understand the relationship between vitamin D and risk of cancer and autoimmune diseases, and to determine how much sun exposure is necessary to achieve adequate vitamin D levels. This information will help determine the right balance between the need for vitamin D versus the known benefits of sun protection.

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Evaluation of a support workshop for partners of breast cancer patients: a pilot study

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Abstract

In a pilot study, we undertook to assess the efficacy of a support workshop for partners of women with early stage breast cancer. Thirteen male participants attended a two hour discussion group facilitated by a male facilitator. Open-ended and close-ended items specifically designed for this study were utilised to investigate the effects of attending the support workshop. The mean satisfaction scores indicate that partners found attending the workshop very useful. It was found to reduce their sense of isolation and improved perceived support, future outlook, ability to support their partners and families and their understanding of the emotional impact of breast cancer on partners. While a relatively large number of partners indicated a preference for an on-going group, fewer men indicated planning to keep in contact with others in the group. Despite having several limitations including small sample size, lack of a control group and pre-workshop assessment, the results indicate that partners believe it is important to have support groups available

Each year, approximately 11,500 women are diagnosed with breast cancer in Australia.[1] As well as experiencing feelings of fear, distress and grief subsequent to diagnosis, approximately half of these women suffer from anxiety and depressive disorders.[2] While cancer significantly impacts on the functioning of these women, it also affects every member of their families and hence cancer is often recognised to be a family disease.[3,4] Social support and in particular, support of family members, can be of crucial importance to cancer patients' adjustment, well-being and even their survival.[5,6] In this context, partners are widely recognised as playing a special role for these patients.[6-9] Partners are regarded by patients as the most valuable source of emotional support[6] and are involved in meeting many of the patients' social and emotional needs.[5]

Emotional and instrumental support from partners at pre-surgery has been shown to decrease distress at post-surgery for breast cancer patients,[10] while emotional adjustment in women with breast cancer can be predicted by marital support.[11] It has been found that a strong relationship with an adult partner decreased the effects of depressed mood for patients,[10,12] as well as easing the consequences of maternal depression for the children in the family.[12] Emotional support from partners has also been identified as being related to decreased physical problems over time for patients with a recurrence of breast cancer.[13] It has been suggested that the partner's availability provides comfort and reassurance for these women, enabling them to find some positive meaning in their experience and so facilitate their adjustment.[13]

While support by partners and families plays a crucial role in the adjustment of breast cancer patients, these men* and their families experience considerable stress themselves.[14] Baider points out that it cannot be assumed that the family, and in particular the partner, can be natural supporters of the breast cancer patients, but that they may themselves also require help and support.[3] The partner of a breast cancer patient may become increasingly more vulnerable as he faces two challenges: being the primary supporter, he is required to assume new roles in the home and provide instrumental as well as emotional support; while at the same time he must cope with the distress of his wife's diagnosis, her suffering and threat to her life.[15] There are enormous demands on the partner as the primary caregiver for both the patient and the family.[14] When a partner's distress level is high and he uses ineffective strategies, he is less likely to be capable of providing support.[15]

While partners often seem to worry more than the patients themselves, they frequently report receiving less emotional support than the patients.[16] While the crisis of cancer draws attention to the needs of the patient, partners may be left to cope with little or no support.[11] It has been suggested that group support for the partners of women with breast cancer may be a potentially effective treatment intervention as it may reduce isolation, allow partners to share feelings and claim some much-needed time for themselves.[17] In taking care of their own needs, this may facilitate a greater sense of empathy for the women.[17]

Few resources currently exist to provide support to partners of breast cancer patients and there is little literature available on the efficacy of support services

* Previous research has investigated only male partners of female breast cancer patients. The current study is also an investigation of male partners, and the term 'wife' is used to refer to the breast cancer patient.

for these men. A systematic literature search revealed only two previous intervention studies specifically focused on support groups for partners of breast cancer patients.[18,19] Sabo, Brown and Smith compared partners of mastectomy patients that attended 10-weekly two-hour discussion sessions using two facilitators, with partners that did not attend such a group.[19] Results showed that support group members became significantly more communicative with their partners about cancer-related issues and it was concluded that support group experience facilitates adjustment of partners of women who have undergone mastectomy.[19] This intervention included six partners in the group and the outcome was measured using self-reported responses to a study-specific questionnaire.

In a pilot study, Bultz, Speca, Brasher, Geggie and Page conducted a randomised controll trial of a brief psycho-educational support group consisting of six weekly 1.5–2 hour sessions for 15 partners of early-stage breast cancer patients.[18] Three months post intervention, partners had less mood disturbance compared to controls.[18] The men in this study emphasised the experience of feeling normalised through being able to compare their experiences with those of the other partners.[18] Also, patients whose partners attended the support group reported less mood disturbance, greater functional support and greater marital satisfaction.[18] Patients reported that receiving the intervention helped their partners to be better caregivers (86%), and contributed to both an increase in communication (57%) and improvements in their relationship (43%).[18] Patients also indicated that the group sessions provided a stimulus to subsequent intimate conversations with their partners and that their partners were more able to listen, comfort and support them as a result of their participation.[18]

Due to the limited preliminary results of previous research on support groups for partners and the lack of such precedence in the Australian setting, a trial of a group intervention for partners of early-stage breast cancer patients was carried out. As previous studies in this area have been conducted in the US and Canada and notions of masculinity are at least in part culturally determined, it is important to assess the efficacy of support groups for partners in different cultural contexts. This pilot study aimed to examine the feasibility of a group intervention for partners, to explore the needs of partners in relation to such a group and the appropriateness of the structure of this intervention in meeting those needs. In particular, this study aimed to investigate the effects of attending a support group on partners' sense of isolation, perceived support, future outlook, ability to support their partners affected by cancer and their families, and their understanding of the emotional impact of breast cancer on partners. It also aimed to explore whether participants intended to form support networks with other participants and if they preferred an ongoing group or a one-off meeting. Partners' views on the importance of the availability of such support groups, how such a service could be improved and what other services would further assist these men in dealing with their partners' breast cancer were also explored. This pilot study intended to provide recommendations for developing an appropriate support group intervention for partners. For this purpose, it was designed as a process evaluation to elucidate support provision processes by investigating the content and the quality of the group, rather than an outcome evaluation focused on quantified degrees of participant outcomes.

Table 1
Summary characteristics of participants (N=11)

VARIABLE	%
Age (mean 56.3 years, range 36-77)	
30-39	22
40-49	22
50-59	11
60-69	11
70-79	33
Level of education	
Trade/apprenticeship	33
Certificate from college/ TAFE	33
Bachelors degree	22
Postgraduate diploma/degree	11
Language spoken at home	
English	89
Other	11
Marital status	
Married	89
Not married, living together	11
Length of relationship (mean 28.9 years, range 10-51)	
10-19	44
20-29	0
30-39	33
40-49	11
50-59	11
Children	
No	22
Yes, from previous relationship	11
Yes, from current relationship	56
Yes, from both current and previous relationships	11

Methods

Participants and recruitment

The participants of this study were partners of women with early stage breast cancer, selected in line with the study by Bultz et al[18] due to the relative homogeneity within this stage of the disease, ensuring similarities of issues and challenges faced by patients and partners. A letter of invitation was mailed to 148 women who had attended the Randwick Campus of Prince of Wales Hospital between September 2000 and March 2002, inviting their partners to attend a two-hour workshop. A flyer included with this invitation letter explained that an information and discussion evening would be hosted for partners of women with a diagnosis of early breast cancer to facilitate meeting other partners, and hearing about the resources and strategies which helped them and their families. Only women who were known to have partners were contacted. Thirteen partners (9%) accepted the invitation and attended the workshop.

Procedures

This group aimed to provide support through facilitating an open discussion of issues faced by partners, allowing partners to hear others' struggles and their ways of coping with similar challenges. For this purpose, and based on the researchers' extensive counselling experience and their clinical observations, an unstructured discussion group design was selected. Due to the pilot nature of this study and time limitations for the duration of this trial group, similar to the study by Sabo, Brown and Smith[19] our strategy focused on primarily providing support. However, since Bultz et al[18] observed the usefulness of also providing information to partners, a table was set up with various relevant information and medical pamphlets at the venue for the group.

Participants attended the two-hour discussion group facilitated by a male oncology social worker experienced in conducting groups. Two partners of women who were survivors of breast cancer (ie. diagnosed a minimum of two years ago, one pre-menopausal and one post-menopausal) were also invited as speakers. The speakers were invited to share their experiences followed by facilitated general discussion. The speakers were asked to talk at the beginning of the group to ease participants into discussions about breast cancer, as well as to exemplify open sharing of feelings and challenges.

For the purposes of evaluation, at the end of the meeting, a brief anonymous survey and a reply paid envelope was distributed to each participant. A reminder letter was also sent to all participants two weeks later. Eleven (85%) questionnaires were subsequently received. Based on the facilitator's recommendation, a follow-up session was offered to all participants four weeks after the original workshop. Only two participants attended; when contacted, other participants responded that the first workshop had been sufficient.

Measures

Since no reliable and validated quantitative instruments to assess the kind of variables this particular study sought to understand were available, a study-specific questionnaire was designed to evaluate these objectives. In the evaluation questionnaire, participants were asked to provide sociodemographic details and to respond to 17 items assessing satisfaction with the group by selecting from the five response options ranging from "strongly agree" to "strongly disagree". These items were specifically designed for the study (refer to Table 2 for the items). Scores ranging from 1 ("strongly disagree") to 5 ("strongly agree") were allocated, with higher scores denoting greater satisfaction. A mean satisfaction score was calculated by adding all individual scores and dividing by the total number of items. As an adjunct to these questions, the questionnaire also included four open-ended questions: (a) to identify the most useful aspects of the workshop; (b) to identify the least useful aspects of the workshop; (c) to suggest

Table 2
Summary of quantitative measures of satisfaction (N=11)

ITEM	MEAN SCORE* (SD)
I believe it is important for there to be a service that would provide support for partners of women with breast cancer	4.8 (0.4)
I think the workshop was well facilitated	4.6 (0.67)
I have learned more about the emotional impact of breast cancer on partners as a result of attending the workshop	4.5 (0.52)
I would recommend the workshop to other men in my situation	4.5 (0.52)
The workshop met my expectations	4.4 (0.67)
As a result of attending the workshop, I feel more confident in supporting my partner and family in dealing with breast cancer	4.4 (0.67)
I think the venue for the workshop was appropriate	4.3 (0.47)
I think the workshop covered topics which were appropriate to partners of women with breast cancer	4.3 (0.79)
I feel less isolated as a result of attending the workshop	4.2 (0.75)
I think the length of time allowed for the workshop was appropriate	4.2 (0.87)
I feel more supported as a result of attending the workshop	4.1 (0.83)
I feel more positive about the future as a result of attending the workshop	4.1 (0.94)
I think the meeting time was appropriate	4.1(0.54)
I think the number of participants at the workshop was appropriate	4.1 (0.70)
I would prefer an on-going group instead of a one-off workshop	4.0 (0.77)
I think it was important for the workshop to be conducted by a male facilitator	3.5 (1.1)
I am intending to keep in contact with others I have met at the workshop	3.2 (0.87)

Note.* Response options ranged from 'strongly disagree' (1) to 'strongly agree' (5).

changes to improve future workshops; and (d) to suggest services that would further assist partners of women with breast cancer. Answers to these open-ended items were summarised, using open-coding by grouping similar responses into categories.

Results

Demographic information summary

Demographic data for the participants are shown in Table 1. All participants were male, aged between 36 and 77 years, with a mean age of 56.3 years. Equal numbers of participants reported having a trade (33%) or a certificate from college (33%), 22% had a bachelor's degree and 11% had a post-graduate diploma or degree. Most participants spoke English at home (89%; with the remaining 11% fluent in English) and all were married or were in a de facto relationship. The mean length of relationships was 28.9 years (ranging between 10 and 51 years). Fifty-six per cent of couples had children from their current relationships, 22% did not have children, 11% had children from previous relationships and 11% had children from both current and previous relationships.

Responses to closed-ended items

The mean score of individual satisfaction items ranged from 3.2 to 4.8 (with 3 denoting "neutral" and 4 denoting "agree"). The total mean satisfaction score was 4.2 (SD = 0.42). Table 2 provides an overview of the mean satisfaction score for each item. The most highly endorsed item was "I believe it is important to have a service that provides support for partners of women with breast cancer" (mean = 4.8; SD = 0.40). The least highly endorsed item was "I am intending to keep in contact with others I have met at the workshop" (mean = 3.2; SD = 0.87).

Responses to open-ended items

Table 3 provides an overview of responses to open-ended questions on aspects of the workshop that participants found most useful or liked most. The most commonly identified useful aspects were the open and realistic nature of discussions by participants. Finding out how others coped and recognising that they had common concerns and were not alone were also commonly identified.

Few participants identified aspects of the workshop they did not find useful. Most commonly reported were that the workshop had been too short for everyone to talk (27%), and some contributions were anecdotal or too long (18%). Insufficient focus, others' religious views and the facilitator guiding responses were also identified as not being useful.

Finding a way to get the participants to "open up" and either allocating more time or fewer participants for the group were the two most commonly suggested improvements. Other suggestions included having more focus for the group, focusing on particular subjects such as anger and depression and having specialist presenters such as therapists and dietitians.

In identifying services to further assist partners of women with breast cancer, counselling after surgery, hospital facilitators helping partners and an ongoing group with meetings up to three times a year were some of the main suggestions by participants.

Discussion

Evaluation sought to determine the effects of attending a support group on partners' sense of isolation, perceived support, future outlook, ability to support their partners and families, and their understanding of the emotional impact of breast cancer on partners. It also aimed to explore whether participants intended to keep in contact with other participants after the group, partners' views on the availability of such support, suggested improvements and what other services they believed would further assist them in dealing with their partners' breast cancer.

Table 3
Useful aspects of the workshop (N=11)

IDENTIFIED ASPECT	NO. OF PARTICIPANTS WHO IDENTIFIED THIS ASPECT
Open discussion	4
Realistic nature of discussion	4
Finding out how others coped	3
Recognising common concerns	3
Finding out I am not alone	3
Hearing others' stories	2
Capable facilitator	2
Full participation by all members	2
Hospital recognising the importance of partner's role in treatment of patient	1
Learning to deal with partner's feelings that she had been disfigured	1
Hearing that other couples have been brought closer together	1

The mean satisfaction scores indicate that partners found attending the workshop very useful. It reduced their isolation and improved perceived support and future outlook and their ability to support their partners and families. Results also suggest that the workshop increased their understanding of the emotional impact of breast cancer on partners. The results clearly suggest that partners believe it is important to make support groups available for them. They reported that the open and realistic nature of discussions at the workshop, finding out how others coped and recognising that they were not alone and had common concerns were all useful aspects of the workshop. They identified counselling after surgery, hospital facilitators helping partners as well as the patients and having an on-going group with several meetings a year as additional services to further assist partners. While a relatively large proportion of partners indicated that they would prefer an on-going group instead of a one-off workshop, few men indicated that they intended to keep in contact with others from the group. Also, only two participants returned to the follow up session conducted four weeks later. However, this may have been due to participants only being given one week's notice about the follow-up session and also because the follow-up session was conducted too closely to the original workshop.

In response to 148 letters of invitation mailed to women with early-stage breast cancer, only 13 men (9%) responded and attended the workshop. It is unclear whether the low uptake observed is unique to Australian men, given the limited amount of literature reporting on participation rates. Bultz et al reported a 31% participation rate.[18] This pilot study's accrual rate suggests that only a relatively small percentage of men are likely to attend support groups.[18] However, those who chose to attend reported a high degree of satisfaction with this type of service. There are several possible reasons for this relatively low uptake. Firstly, it is possible that it reflects a low level of need for support among partners, although this seems implausible, given the large body of literature reviewed earlier that demonstrates high levels of unmet needs and psychological distress amongst partners. Given that women were contacted up to 18 months post-diagnosis, many partners might have sought support around the time of diagnosis, but may no longer require support once treatment has been completed.

Another likely explanation is that support groups may be a less than suitable strategy to meet men's information and support needs. It has been suggested that men have difficulty talking about their emotions[20] and that they feel they have to give an impression of knowing everything they need to know.[21] These characteristics represent potential barriers to help-seeking in general and attendance of support groups in particular. Also, Krizek, Roberts, Ragan, Ferrara and Lord investigated gender and cancer support group participation by comparing men diagnosed with prostate cancer with women diagnosed with breast cancer.[22] It was found that men were less likely to join a support group, but men who did join attended for the same length of time as women.[22] As the challenge seems to be in getting men to attend their first session, it was recommended that support groups need to be marketed differently for men, for example by referring to the group as a 'men's information group' rather than a 'support group'.[22] Clearly, health services need to be responsive to men's unique needs and innovative methods, such as internet chat rooms, should be explored as potential support strategies. Future studies should assess men's unmet needs and ascertain their preferred support strategies and formats.

This study had several limitations including small sample size, lack of a control group and pre-workshop assessment. Absence of pre-workshop assessment was due to time limitations. The wide age range of participants may have impacted the effectiveness of this intervention, as partners of different ages may have differing needs; possible differences were not explored in this study due to the small sample size. In addition, no information is available about partners who declined participation, it may be that these partners differed in their level and type of support needs from partners who participated in this study. Also, no validated measures of psychological adjustment were utilised for this evaluation as a priori we doubted whether attending a two-hour workshop would have a significant impact on psychological variables. However, given the pilot nature of this study, future studies are now needed to evaluate similar interventions using a control group design with a larger sample size.

This study provides preliminary recommendations for a support group intervention for partners of breast cancer patients. While partners strongly identify the need for a support group, they also appear to prefer an on-going group instead of a one-off workshop. Partners reported a high level of satisfaction with the content and structure of this intervention. However, allocating more time or having fewer participants, as well as facilitating a more open discussion need to be considered for future interventions. This pilot trial is of special interest, in that it has provided preliminary evidence that support groups for partners of women with early stage breast cancer are feasible and effective in meeting partners' self-reported support needs.

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The cancer council australia's student essay competition

Cancer in indigenous australia: a symptom of inequality

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The health status of Australia's Indigenous population is a testament to the failure of a highly developed country to provide for its people in an equitable manner. In a nation where most people can have a reasonable expectation of becoming octogenarians, it seems unthinkable that the average life expectancy of Indigenous Australians is some 20 years lower than that of their non-Indigenous counterparts.

The term Indigenous Australians refers to people of Aboriginal or Torres Strait Islander background who live in Australia. In 2001, Indigenous Australians comprised 2.4% of the total population. Only 30% of Indigenous people live in major cities, leaving 70% in rural and remote areas. This paper is concerned primarily with Indigenous people in rural and remote areas.

A challenge in the detection and management of shortcomings in Indigenous health is the lack of complete Indigenous identification of medical records throughout Australia. In recent years, the cancer registries in Queensland, the Northern Territory and Western Australia have undertaken specific initiatives to maximise Indigenous notification. The NT has reported completeness of Indigenous identification. Where possible, data from these states have been used in this paper.

Cancer in Australia

The word cancer inspires fear in the hearts of many. Malignant disease affects both Indigenous and non-Indigenous populations, though not in the same proportions. In 2004, malignant neoplasms were the largest underlying cause of death in Australia, accounting for 28.7% of deaths.[2] Malignancy accounted for 16.6% of all Indigenous deaths, rendering it less of a burden on this population than on the rest of the Australian people. However, this statistic is deceptive insofar as it fails to identify the most worrisome aspect of cancer death within the Indigenous population. Among non-Indigenous people, the most lethal malignancies are those of the lung, breast, prostate and colon/rectum. These are cancers of which early detection is not always possible for several reasons, including insidious onset and high metastatic potential.

In stark contrast, Indigenous Australians are dying mostly of neoplastic disease of the lung, female genital organs (most commonly cervical carcinoma) and liver (hepatocellular carcinoma) respectively. These are cancers whose prognoses among non-Indigenous people have been dramatically improved by prophylactic screening, immunisation and superior treatment options.

Cancer in Indigenous Australia

While lung cancer has a poor five-year survival rate in the general Australian population, its prognosis in Indigenous Australians is far worse. Mortality from lung cancer is currently 3.6 times higher in Indigenous populations. This has been attributed mostly to the higher prevalence of tobacco smoking, which will be explored later, and a lack of early detection.[3] Symptoms such as haemoptysis and pleuritic chest pain may remain without investigation due to insufficient access to primary health care.

Fifty years ago, cervical cancer was the leading cause of cancer death in women of the developed world. Today, it does not even feature in the top 10 causes of cancer mortality. This considerable advance has been achieved by the corollary of biennial screening of women who have ever been sexually active via the Papanicolaou (Pap) smear test.

While cervical cancer is still the eighth most common cancer in Australian women, screening allows the early detection and treatment, resulting in the prevention of up to 90% of cervical squamous cell carcinomas. However, Indigenous women have 10 times the risk of dying from cervical cancer, which seems in large part to be associated with a low rate of participation in screening. A recent study conducted in Queensland found that participation in screening was, on average, 30% lower among Indigenous women than the rest of the female population in that state.[4,5]

Between 1991 and 1995, death rates due to chronic liver disease and cirrhosis were four times higher among Indigenous people compared to the rest of Australia. In 2003, Indigenous Australians were 12 times more likely to die of hepatocellular carcinoma (HCC) than the general population. These conditions all share one important aetiological agent: the Hepatitis B Virus (HBV).[6]

In 90% of cases, early childhood infection with HBV progresses to chronic infection which increases an individual's risk of HCC 200-fold. Serological studies conducted during the 1980s and early 1990s in the NT indicated that 46.9% of Aboriginal school children in that state carried markers of HBV infection. Vaccination was introduced in Aboriginal communities in the NT in 1998 and has succeeded at lowering the rates of active infection in infants.[7] However, end stage liver failure and other sequelae develop decades after infection and hence those who were infected prior to the availability of vaccination may well suffer complications in the future. The burden of HBV infection shall be felt for many decades to come.[8]

The high prevalence of alcoholism within Indigenous communities compounds the threat posed by HBV infection. While Aboriginal and Torres Strait Islanders are less likely to consume alcohol than non-Indigenous Australians, those who do are more likely to drink to hazardous levels. In the National Drug Strategy Survey, 79% of Indigenous people who consumed alcohol at least weekly did so to a harmful degree compared to 12% of the non-Indigenous population.[9]

It is thus evident that a combination of lifestyle factors and inadequate primary health care is responsible for the natural history of cancer in Indigenous Australians.

Addressing cancer control in Indigenous Australia

Currently there are several axes of disadvantage which contribute to the poorer outcome of malignancy in Indigenous populations. The three main challenges in achieving equality in Indigenous health status are: access to primary health care centres for the early detection of malignant disease; education; and a health workforce which is sensitive to the needs of the Indigenous population. In order to meet these objectives, the essential element is sufficient government funding. Successful government support of the Indigenous health system would involve both adequate levels of expenditure and appropriate use of the funds.

In 2002, government funding of Indigenous health was 22% higher than the expenditure for non-Indigenous Australians. It is commendable that the Federal Government has now recognised the need for unequal per capita funding in favour of Indigenous Australians. However, in a population with a disease burden three times that of the general Australian population, the current level of expenditure is simply inadequate. In a paper commissioned by the Australian Medical Association (AMA) in 2002, Professor John Deeble recommended that an equitable allocation of resources would only be reached by an increased annual expenditure of $250 million.[10]

The Medicare Benefits Scheme (MBS) and the Pharmaceutical Benefits Scheme (PBS) receive a large portion of the Federal health budget. These funds are of little consequence to Indigenous Australians as they have limited access to general practitioners (GPs) and community pharmacies. A high proportion of Indigenous Australians do not have a Medicare card or number and are therefore precluded from access to mainstream health services.[11]

Access to healthcare is a major determinant of health

status. While only 2% of non-Indigenous Australians live in regions described as remote or very remote, these areas are home to 25% of Indigenous people.[12] Per 100,000 people in these areas, there are only 113 medical practitioners, compared to 318 in capital cities.[13] Twelve and a half per cent of discrete Aboriginal communities are located more than 100 kilometres from the nearest hospital. In a population where motor vehicle ownership is low, distance can be a significant impediment to the pursuit of medical care.

Fortunately, most of these localities offer community healthcare centres, funded by the Federal Government. The National Aboriginal Controlled Community Health Organisation (NACCHO) is part of the Indigenous Health Taskforce established by the AMA and has provided 51 primary health care centres in rural and remote areas. In these centres, 70% of staff is of Indigenous background and the goal is to 'deliver holistic, comprehensive and culturally appropriate health care to the community which controls it'.[14] However, the network of these centres is not consistently spread throughout the country and more are required.

The following will address the specific challenges and opportunities in the reduction of mortality from lung, cervix and liver cancer.

Improvement of lung cancer survival rates in Indigenous people is dependant upon two factors. Firstly, accessibility of primary healthcare is essential for early assessment of symptoms, as discussed above. Secondly, tobacco smoking must be discouraged. Just over half of Indigenous people are everyday tobacco smokers, twice the number of non-Indigenous Australians.[9] As a result, Indigenous populations have higher mortality rates from all smoking related cancers.[3] Amongst the non-Indigenous population, advertising campaigns and availability of nicotine replacement therapy (NRT) have seen a reduction in tobacco smoking.[15] In order for these approaches to have an effect on Indigenous populations, they must be 'culturally customised'. Some Indigenous people have indicated a need for NRT, but this must be provided at an affordable price.[16]

Increased cervical screening of Indigenous women is critical in the reduction of cervical cancer mortality. The Federal Government's latest cervical screening initiative is an example of failure to adequately target the Indigenous population. In the 2001/2002 budget, the Government announced a four-year program worth $72 million to increase cervical screening of high-risk communities. The initiative centred upon offering monetary incentives to GPs for maximising the number of Pap smears performed. This program has been criticised for its failure to specifically name Indigenous populations as a 'high risk' category and for insufficient consideration of the current operation of Indigenous healthcare centres. Most NACCHO services are not GP-accredited. Usually, a healthcare worker obtains the tissue samples for an external GP. If the GP receives the benefits, there is no incentive for the centres to increase their cervical screening participation rates. In addition, a quota-based funding system will simply reward centres within communities where women are younger or more willing to undergo screening, while diverting funding away from older or less willing women who may be at the highest risk.[17]

A proportion of the funds would be better spent in education of Indigenous women of the benefits of cervical screening. A lack of female health workers has also been implicated in the low participation rates, hence incentives for women to work in such services may also help. It would also be necessary to extend education about screening to younger girls. A study conducted between 2000 and 2002 in WA found that 44% of Indigenous youth had their first sexual experience at age 16, compared to 23% of their non-Indigenous counterparts.[18]

Strategies to reduce the incidence of liver cancer in the Indigenous population should focus on elimination of the two major aetiological agents: HBV and alcoholism, as well as protection of those people who are already at risk.

Vaccination has been successful in reducing the rates of infection in children and should be made available in all Indigenous communities. The management of those chronically infected with HBV is critical. Antiviral therapy has been successful in preventing the progression to HCC. Serum a-fetoprotein testing of 'at risk' individuals can be conducted at community health care centres as a means of screening. This has proven successful in the reduction of HCC mortality among Indigenous Alaskans.[19]

The issue of alcoholism is complex as it is intertwined with history and social status. "Governments encouraged Aborigines to drink. Then Aborigines were forbidden to drink. Then they allowed some Aborigines to drink and not others. Then prohibition for all Aboriginal people ended. By this time drinking had become a symbol for equality and citizenship."[20] It is necessary to educate Indigenous people about the detrimental effects of alcoholism in order to contradict these long standing misconceptions. Counselling and support during abstinence is paramount.

Insufficient funding and education may not be the only obstacle to improvement of Indigenous health status. A lengthy history of marginalisation and racism lies in the background of interactions between Indigenous and non-Indigenous Australians. The reluctance of the former population to believe that the same administration that had previously stripped it of rights is now interested in its salvation is understandable.[21]

Hence, establishment of a healthcare workforce that empathises with and caters to the cultural and social needs of Indigenous Australia is vital in order to increase participation in screening and check-up consultations. The requisite knowledge and experience of these workers should include: cross-cultural practice; chronic illness management; integrated population and clinical care service delivery; and the provision of emotional and social health services.[22] In view of this definition, it is evident that Indigenous health workers are best equipped to service Indigenous populations. Nevertheless, in 2005, Indigenous Australians constituted a mere 1% of healthcare workers in the country, which is not even proportionate to Indigenous representation within the Australian population. Increasingly, universities are attempting to maximise Indigenous participation in healthcare professions by offering scholarships and access schemes. There is also a greater emphasis on Indigenous health issues in university curricula. These measures will hopefully translate into a more culturally appropriate health workforce in the future.

While it is evident that there is a great shortage of medical professionals in rural areas, the caseloads for specialist staff would be quite low, meaning availability of such services in remote areas would be an expensive and inefficient allocation of resources. However, effective treatment of malignant disease requires access to a multidisciplinary team including oncologists, surgeons and allied health professionals. In order to overcome this problem, specialist outreach programs combined with shared-care have been proposed. These programs would involve the patient travelling to a major centre for initial treatment, following which local care can be arranged via community health centres. This approach has proved to be effective in the treatment of breast cancer in rural areas.[23]

Final word

One can conclude that Indigenous Australians are dying of cancers from which other Australians are increasingly protected. Australian governments have been unsuccessful thus far in ensuring that the technologies which have allowed these advances reach all Australians equally. In order to bridge the resultant gap in health status, more healthcare resources must be directed to rural and remote Australia. Indigenous people must receive education on prevention of malignant disease. They must have access to primary care centres which facilitate early diagnosis and treatment of neoplastic changes. It is the responsibility of current and future healthcare professionals to educate and provide Indigenous Australians with healthcare that is catered to their needs. It is the responsibility of state and federal governments to provide us with the resources to do so. Our task, as medical practitioners of the future, is clear.

*This article is the winning essay in The Cancer Council Australia's student essay competition. As the winner, Ujvala Jagadish attended the World Health Organisation's Collaborating for Cancer Education's Oncology for Medical Students summer school.

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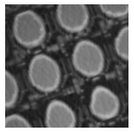


Australian behavioural research in cancer

News

n Centre for Behavioural Research in Cancer (CBRC), Victoria

The Centre for Behavioural Research in Cancer (CBRC) has engaged new staff to work on several projects:

- n development and implementation of internal evaluation strategies for The Cancer Council Victoria (Jane Fletcher)
- n investigations into the special needs of cancer patients (Haley Matic)
- n statistical analysis and report-writing for sun protection research projects (Kris Jamsen)

n Centre for Health Research and Psycho-oncology (CHeRP), NSW

CHeRP presentations over the last few months include PhD student Claire Johnson's findings on perceptions and referral practices of Australian specialists and general practitioners, presented at the European Association for Palliative Care Research Forum in Venice in May. Dr Chris Paul presented Telemarketing smoking cessation: a proactive approach to non-volunteer smokers at the 13th World Conference on Tobacco or Health in Washington in July.

Professor Afaf Girgis was an invited speaker at The Cancer Council WA annual update series in July, making a series of presentations to the public and health professionals. She was also an invited speaker on psychosocial support in geriatric oncology at the Medical Oncology Group of Australia/Faculty of Radiation Oncology Annual Scientific meeting held at Sanctuary Cove in August.

Dr Paul, Professor Girgis and Dr Raoul Walsh have been awarded new funding to carry out the 2nd Biennial Community Smoking Survey, which will continue to track key indicators of community attitudes and practices relevant to tobacco control policies and activities.

Professor Girgis is leading a national team of researchers working on improving needs based palliative care, with funding from the Federal Department of Health and Ageing. The team has recently completed the development of the Palliative Care Needs Assessment Guidelines and a Palliative Care Needs Assessment Tool, aimed at encouraging routine, systematic assessment across the comprehensive range of patient needs, and prompting referral to appropriate specialist palliative care services.

n Cancer Research Prevention Centre (CPRC), Queensland

Recent presentations include:

10th International Congress on Obesity in Sydney (October). Poster by Dr Marina Reeves: The Logan Healthy Living Program – telephone-delivered intervention on physical activity and diet.

Physical Activity and Obesity International Congress Satellite Conference (August/September). Professor Neville Owen: Environmental Attributes and Physical Activity: A Behavioural Perspective on a Key Element of the Obesity-Prevention Agenda.

State Pedestrian Committee Workshop on the new Action Plan for Pedestrians 2007 – 2009 (September). Dr Takemi Sugiyama: Recent Research on Environmental Determinants of Walking.

International Congress of Physical Activity and Public Health in Atlanta (April). Professor Owen: Environmental Attributes as Determinants of Physical Activity: A Behaviorist Perspective.

School of Population Presentation Series (June). Professor Owen: The PLACE Project: What have we learned about how adults' community environments might influence their physical activity?

n Tobacco Control Research Evaluation (TCRE), SA

Jacqueline Hickling attended the UICC World Cancer Congress and the 13th World Conference on Tobacco Or Health and presented several talks and a poster.

n Viertel Centre for Research in Cancer Control (VCRCC), Queensland

The Psycho-oncology Research Unit hosted the 8th Biennial Behavioural Research in Cancer Control Conference in September. The conference was supported by The Cancer Council Australia through its Public Health Committee and was attended by behavioural scientists, program and evaluation staff and management working on cancer control issues in Australia.

Two new doctoral scholarships were recently announced and will begin in 2007. The first, for Indigenous health, will enable us to establish a program of research in the field of Indigenous and Torres Strait Islander cancer control. The second is related to decision making and prostate cancer and will enhance our well-established prostate cancer research program.

Research in the Pipeline

n CBRC

A cluster randomised trial of a shade intervention for secondary schools

In 2003-2006 the National Health and Medical Research Council funded an innovative intervention study to explore an environmental approach for adolescent skin cancer prevention. Dr Suzanne Dobbinson leads a research team at the CBRC examining the efficacy of a shade intervention for secondary schools in a three-year cluster randomised trial. The study aims to objectively assess whether students will use or avoid purpose-built shade. Fifty-one schools with limited available shade were recruited to the study in 2004. Twenty-five were randomly assigned to receive a built shade-sail intervention in winter 2005 and 26 schools provided a control group. Two study sites at each school were defined as suitable for shade development and the sites were monitored by video cameras during 14 weeks of pre-test and 16 weeks of post-test to assess numbers of students using the areas during lunch breaks. Data collection and content analysis of films is now completed with data entry and analysis soon to begin. We anticipate the preliminary results will be available by the end of 2006. The study results will be particularly valuable in informing schools' decisions about whether the large capital expense required to build a shade structure is a worthwhile investment.

Time trends in media advocacy about tobacco

Research suggests that news coverage of tobacco issues can have direct and indirect effects on smoking behaviour, but it is rarely systematically monitored. We coded tobacco-related articles from all Australian national and state capital daily and Sunday newspapers from 2001-2005 using a coding system with high inter-rater reliability. Of 5139 articles, 74% were hard news articles, 12% letters, 8% columns and 2% editorials. Overall, 52% achieved greater prominence by either appearing in the first four pages of the newspaper or being accompanied by an image. News coverage of tobacco issues during this period was dominated by four themes: secondhand smoke issues (31%), health effects (13%), education/prevention (12%) and the tobacco industry (10%). Each article was also coded for the nature of the event covered, in terms of whether it represented progress (66%) or a setback (21%) for tobacco control objectives, or a mixed (8%) or neutral (4%) impact on tobacco control objectives.

We calculated media impressions per capita for each state and Australia overall by factoring in newspaper circulation rates and population size. Over this five-year period, the average Australian would have been exposed to 130 tobacco-related news articles - or one every two weeks. While a majority of coverage is positive for tobacco control, some states and some advocates do better than others, providing lessons for improving media advocacy in tobacco control. For more information, contact Dr Sarah Durkin, Quit Research and Evaluation Manager sarah.durkin@cancervic.org.au.

n CHeRP

Routine assessment and management of cancer patients' psychosocial well-being in outpatient oncology services

In partnership with cancer centres, we are introducing a four step system for the ongoing assessment, identification and management of cancer patients' psychosocial well-being as part of routine care. Step one requires all cancer patients, at three specified clinic visits, to complete an on-line psychosocial assessment via touchscreen computer installed in oncology outpatient waiting rooms. On completion of the survey, a tailored report summarising the individual patient's level of distress is printed and placed in their medical file (with their consent) for follow-up by their health care team (step two). As well as identifying the patient's current issues of concern, the report provides evidence-based strategies for managing the identified issues to facilitate health care providers to offer care that is tailored to the patient's level and type of need (step three). The final step involves benchmarking service performance across cancer centres to enable them to identify strengths and weaknesses in order to improve service delivery. The system is currently being implemented in two cancer care centres in NSW and will be offered to another seven centres over the next year. Funded by the Cancer Institute NSW and The Cancer Council NSW, this system has the potential to improve patient-centred care and provide more objective utilisation of limited psychosocial resources.

n CPRC

Rural and remote breast cancer survivors

Interviews will be conducted with 30 breast cancer survivors, who live rurally in Queensland, to highlight the particular needs of these women specifically regarding physical activity and dietary intake concerns. In addition interest in health promotion interventions and preference for modes of delivery will be ascertained. The findings from the qualitative interviews will be used to guide the development of a lifestyle intervention specifically for rural and remote women survivors of breast cancer.

Childhood cancer survivors

We will test the feasibility of a lifestyle intervention, delivered via mailed print materials, for survivors of childhood cancer. The aim of the intervention is to improve both the dietary quality and physical activity levels of survivors. Long-term survival is often compromised due to long-term side-effects (late effects) of the disease process and/or treatment for childhood cancer. These late effects include cognitive impairment, functional problems, endocrine toxicity (contributing to an increased incidence of obesity), early mortality from second cancers and cardiac or pulmonary disease. We will pilot test the intervention for feasibility and acceptance with participants from the Mater Children's Hospital in Brisbane.

n Centre for Cancer Control Research (CCCR), SA

Evaluation of sun protection in early childhood centres in SA

We are conducting a follow-up survey to assess current trends in sun protection in early childhood centres across SA and the impact of the SunSmart Early Childhood Program. Three hundred randomly selected childcare centres and kindergartens have been asked to report on their sun protection policy and practice via a self-completed survey similar to the baseline survey which was undertaken in 2001. Questions relating to the benefits of and barriers to joining the SunSmart program were also included.

Compliance to the Australia/New Zealand standard for solaria in metropolitan Adelaide

We are about to undertake a study to understand local solaria compliance with the Australia/New Zealand standard. This will provide an evidence base and help determine if there is a need for action surrounding solaria compliance. Our study will follow a similar method to that used in Victoria, using research assistants of different skin types and age groups who will book and attend solaria centres to observe practices and note what information is provided to them. This study will be completed over the summer of 2006-2007.

Qualitative study of GPs perceptions of the new NHMRC guidelines for the management of women with screen detected abnormalities

This project involves semi-structured interviews with a small number of general practitioners in Adelaide and aims to assess the level of awareness of the new NHMRC guidelines; to explore their perceptions around the impact of changes on their practice and on their patients; and to identify their needs around applying the new guidelines. Analysis of interview transcripts will be undertaken to identify common and divergent themes. Findings will help guide The Cancer Council South Australia's efforts to support GPs and their patients in relation to implementation of the guidelines.

n TCRE

Evaluation of the Aboriginal and Torres Strait Islander Cancer Forum

The Aboriginal and Torres Strait Islander Cancer Forum (13-14 September 2006) aimed to increase cancer awareness, improve cancer information and coordination of services in Aboriginal and Torres Strait Islander communities and improve information for Aboriginal and Torres Strait Islander cancer patients. It also aimed to ensure services are culturally responsive. An evaluation (semi-structured interviews with key stakeholders) is planned to ascertain the level of achievement of the conference objectives and to gain feedback on changes needed to provide effective, culturally-responsive cancer treatment and care within these communities.

Tobacco component of the Australian School Student's Alcohol and Drugs (ASSAD) Survey (SA specific)

Smoking prevalence and smoking behaviour were investigated among South Australian school children in 2005 as part of the triennial Australian School Students' Alcohol and Drugs (ASSAD) Survey. This report will present South Australian smoking rates, statistics on other smoking behaviour and influences and knowledge of tobacco harms among students aged between 12 and 17 years of age, examining trends over time.

n VCRCC

Identifying the psychosocial care needs of people with cancer in regional Queensland

We are conducting a study to address the psychosocial support needs of people diagnosed with cancer in regional Queensland. The project will identify the psychosocial patterns of care, psychosocial support needs and adjustment outcomes of people diagnosed with cancer who are seen through the Townsville Cancer Centre. Participants will complete a telephone and self-administered questionnaire twice over a six month period. The questionnaire focuses on patient's knowledge and use of support services, their experiences with the Townsville Cancer Centre and their psychosocial outcomes. This information will be used to identify and develop a model of psychosocial care that can be implemented within Townsville Hospital.

Skin clinics and the diagnosis and management of skin cancer in Queensland

Medical practices devoted entirely to the diagnosis and management of skin lesions are a relatively new and growing aspect of health care in Queensland. This project involves 28 skin cancer clinics and 100 general practitioners and will examine the number and type of skin examinations and how suspicious skin lesions are managed by doctors within the two settings. Funded by the National Health and Medical Research Centre, the study will investigate the role skin clinics play in the diagnosis and treatment of skin cancer in Queensland, and will provide the first direct assessment of the impact and performance of skin clinics in Queensland. It will provide an evidence base for rational decisions about how best to manage skin cancer in the community. The study will also provide doctors with information on their own performance in relation to skin cancer diagnosis and management and where further training would be most beneficial.

Evaluation of The Cancer Helpline and cancer counselling service of the Queensland Cancer Fund.

The aim of this project is to evaluate psychosocial care provided by Queensland Cancer Fund (QCF) Cancer Helpline operators for callers with cancer, or for their carers. Results will enable QCF to determine whether The Cancer Helpline effectively screens callers with cancer, or their carers, for distress and then provides appropriate psychosocial care and/or referral to other services. This project is being extended to include an evaluation of the QCF cancer counselling service.

New Results

n CBRC

The effects of television advertisements for junk food versus nutritious food on children's food attitudes and preferences

Content analyses indicate junk food advertising is prevalent on Australian children's television; healthy eating is rarely promoted. Two studies were conducted: (a) a cross-sectional survey examining associations between children's regular television viewing habits and their food-related attitudes and behaviour; and (b) an experiment assessing the impact of varying combinations of television advertisements for unhealthy and healthy foods on children's dietary knowledge, attitudes and intentions. The experimental conditions simulated possible models for regulating food advertisements on children's television. Participants were 919 grade five and six students from Melbourne. The survey showed that heavier television use and more frequent commercial television viewing were independently associated with more positive attitudes toward junk food; heavier television use was also independently associated with higher reported junk food consumption. The studies concluded that changing the food-advertising environment on children's television to one where nutritious foods are promoted and junk foods are relatively un-represented would help to normalise and reinforce healthy eating. For more information, contact Dr Helen Dixon, Senior Research Fellow, Helen.Dixon@cancervic.org.au.

Tobacco use among Australian secondary school students (ASSAD)

In 2005, the eighth in a series of secondary school-based surveys monitoring the use of tobacco, alcohol and other substances among adolescents was conducted throughout Australia. The survey series commenced in 1984 and has been conducted every three years. The current study is conducted as a collaboration between state and territory cancer organisations, the Commonwealth Department of Health and Ageing and state and territory Health Departments. In 2005, data were collected from 21,805 male and female students aged 12–17 years from 376 schools across Australia. In 2005, at least half of the students aged between 12 and 16 years of age had no experience of smoking cigarettes. Among all students aged 12 to 17 years, 9% were classified as current smokers (smoked in the seven days preceding the survey). The proportion of current smokers increased from 2% among 12 year-olds to 18% among 17-year-olds. The proportion

of students smoking in the previous week doubled between the ages of 13 (3%) and 14 (6%) and reached a peak prevalence of 12% among 17-year-olds. Based on the survey data, we estimated that 140,359 students were currently involved with tobacco smoking in that they had smoked at least one cigarette in the week prior to the study. Using standard questions and sampling measures, we found that the prevalence of current smoking for 12-15 year-olds and 16-17 year-olds in 2005 was the lowest since the survey series began in 1984.

n CHeRP

NSW Smoking Community Survey

CHeRP together with the Health Strategies Division of The Cancer Council NSW have undertaken the first of a series of biennial telephone surveys of NSW residents regarding smoking-related perceptions and practices. The survey provides rapid turn around of data to track key indicators of attitudes and practices relevant to tobacco control policies and activities. The first survey in October-December 2004 involved 3503 NSW residents aged 18 years and over. Households were selected at random from the NSW Electronic White Pages, mailed an information letter and then contacted by telephone to interview one randomly-selected member per household. Study data indicated that government action lags well behind community views in areas such as: smoke free pubs and clubs; smoking in homes, cars and public areas; spending on tobacco campaigns; superannuation fund investment in tobacco; and smoking in movies. Among smokers, levels of quitting activity were high with almost two-thirds of smokers trying to quit in the previous two years and approximately 40% of smokers intending to quit in the next six months. Levels of retail access to cigarettes were very high for almost all smokers and appeared related to cigarette consumption and relapse. Data on use of pharmacotherapy, relapse triggers and use of quitting assistance strategies were also collected.

n CPRC

From partying to parenthood: young women's perceptions of cigarette smoking across life transitions

PhD student Liane McDermott used standardised, open-ended telephone interviews with 80 women from the young cohort of the Australian Longitudinal Study on Women's Health, selected to be never smokers, new adopters, continuing smokers and quitters. The social context of smoking (socialising with other smokers, drinking alcohol and going out to pubs and clubs) was identified as the predominant influence on smoking from the time the young women left home until they settled into a committed relationship or started their own family. Stress was also identified as an important factor as young women experienced various lifestyle changes. An increased sensitivity to the negative aspects of smoking after they turned 21 was reported, and around their mid-20s they became concerned about the addictive nature of cigarettes and their future plans for having children. Motherhood itself was seen to carry increased responsibilities to ensure children were not exposed to passive smoking and there was a perceived importance of positive role modelling to protect their children from becoming smokers themselves. These life stages present opportunities for interventions to prevent smoking adoption in young adulthood and to enhance quitting. McDermott, L J. Dobson A. J. and Owen, N. (2006). From partying to parenthood: young women's perceptions of cigarette smoking across life transitions. Health Education Research, 21, 428-439.

n CCCR

National evaluation of primary school sun protection policies and practices

This evaluation of Australian primary school sun protection policies and practices is the first to include all states and territories and involved a total of 932 schools across the nation. It builds on earlier evaluations of the Primary Schools SunSmart Program conducted in 1998 and 2001. SunSmart schools were found to have a higher standard of policy and practice than non-SunSmart schools, indicating the positive impact of the program for schools involved. Hat enforcement was the most popular sun protection strategy across primary schools, however the results indicate scope for improvement in other areas and particularly in relation to minimising exposure during peak ultraviolet times. There was a significant decline in the proportion of schools regularly making sunscreen available for student use. The inclusion of sun protection strategies in written policy was clearly associated with the corresponding sun protection practice, highlighting the need for the continued development of comprehensive written sun protection policy. Most non-SunSmart schools reported interest in joining the program, with many indicating that more information about the program would encourage them to join.

Sun protection practice among South Australian adolescents

Since 1990, The Cancer Council South Australia has been monitoring the sun protection habits of South Australian adolescents via the Australian School Students Alcohol and Drug survey (ASSAD). The most recent survey was administered in 2005, following identical methodology as in previous years. Although the majority of students answered the skin cancer knowledge question correctly (that skin cancer is caused by ultraviolet radiation exposure) a large proportion still liked to get a tan (70.5%). Also, comparisons to earlier years showed a reduction in many sun protection practices with: a decline in regular hat wearing among boys; a decline in regular sunscreen use in general; and a steady decline in shade seeking behaviour among girls. A concerted effort is clearly needed to develop strategies to reverse current trends in adolescent sun protection practice.

Cancer related information needs and preferences survey

A telephone survey was conducted with 342 cancer patients (from across four hospitals in Adelaide), 216 of their carers and 400 members of the general public to identify the methods each group have used to obtain information about cancer, as well as where and how they would like to receive cancer related information in the future. While doctors remain the most trusted source of information, findings indicate that the internet is the second most popular, additional source of cancer information after booklets and pamphlets, with one in four patients (25%), one in four carers (24%) and one in six members of the general public (17%) having used the internet to access cancer information. This is higher than the proportion of patients, carers and general public who have accessed information via a helpline (10%, 8% and 2%) attended a cancer related forum, talk or education program (10%, 6% and 7%) or joined a support group (11%, 7% and 3%). Online chat groups are rarely accessed by any of these groups (0.3%, 0.9%, 0.8%). The findings do, however, reveal evidence of a technological divide. Not surprisingly the internet was more popular with younger people, those with higher levels of education, those with higher household incomes and those who liked to be involved in making healthcare decisions. The main attractions were convenience, speed and the amount of information that could be accessed. The main reported barriers were not having access to a computer or the internet and not knowing how to use the technology.

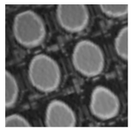
n TRCE

'Progress Against Cancer' newsletter: evaluating The Cancer Council Helpline as a distribution mechanism

The Cancer Council Helpline is a non-medical information and support service. Information provided by The Cancer Council Helpline ranges from prevention to different types of cancer, treatment, services available and emotional support. The Cancer Council Helpline sends out resources to callers who would like information. A trial was conducted with the Cancer Council Helpline to determine whether sending the Progress Against Cancer newsletter to callers (a newsletter normally sent to volunteers and donors) would have any adverse (or positive) effects. All respondents thought it was appropriate for the Cancer Council Helpline to send the newsletter or had no view and 91% either thought the newsletter should be sent to every caller or had no view.

National Youth Tobacco-Free Day

National Youth Tobacco Free Day was held on 5 April 2006. The evaluation involved two studies. The first assessed perceptions of the impact of an event run in Rundle Mall that consisted of music and entertainment for young people. The second study involved an assessment of the use of promotional kits, entry to website competitions and staging of local events celebrating National Youth Tobacco Free Day. Overall, the central event held in Rundle Mall was well received and respondents' perceptions of its impact were favourable. Results of the second study revealed that receipt of the kit appeared to be low, with less than half of those sent the kit recalling that they received it.



NEWS & ANNOUNCEMENTS

Senate calls for gynaecological cancer control

The Senate committee inquiring into the management of gynaecological cancer has called for a number of recommendations consistent with those put forward by The Cancer Council Australia, Clinical Oncological Society of Australia (COSA) and the National Aboriginal Community Controlled Health Organisation (NACCHO) in a joint submission earlier this year.

Among its recommendations released in Parliament on 19 October, the Senate Community Affairs Committee sought government support for: better coordination of patient travel and accommodation schemes; expedited use of Human Papilloma Virus immunisation to reduce cervical cancer in Indigenous communities; improvements in cancer-care referral pathways; and, greater incorporation of multidisciplinary care into cancer workforce training and planning – all of which were supported by The Cancer Council Australia, COSA and NACCHO.

The Cancer Council Australia and COSA hope to work closely with Cancer Australia to develop and implement cancer control policy that will reduce the impact of gynaecological cancer on Australian women and their families.

The Senate's full report is available at: http://www.aph.gov.au/Senate/committee/clac_ctte/gynaecological_cancer/index.htm

Web resource provides missing link to genetic cancer information

More than 4000 Australians diagnosed each year with a familial based cancer can now access a new online resource thanks to a collaboration between The Cancer Council Australia and the National Cancer Genetics Education Group.

The web-based family cancers facility includes information on types of family cancers, genetic testing, family cancer clinics and a searchable directory of resources.

The Cancer Council's Chief Executive Officer, Professor Ian Olver, said that in around five per cent of the 88,000 cancers diagnosed each year in Australia, an inherited faulty gene was a major contributing factor.

"Family cancer can be a difficult concept to understand and there is a lot of confusing and contradictory information around," Professor Olver said. "While the Internet has provided greater access to information, it is not always the right information.

"Our new web resource provides a centralised resource of credible, evidence-based information – making it more user-friendly and reliable for the public."

Spokesperson for the National Cancer Genetics Education Group and project manager with NSW Health's Centre for Genetics Education, Kate Dunlop, said the online resource would benefit not just consumers, but support health professionals such as GPs and others working with cancer patients.

"A busy GP rarely has the time to search through volumes of web based information to provide their patients with relevant and useful support," she said. "Now they can go to one site to get what they need and can feel secure in the knowledge they are directing their patients to evidence-based information."

The new family cancers section on The Cancer Council Australia's website can be viewed at www.cancer.org.au/familycancers.

National launch of survey items on cancer-related practices and perceptions

The Centre for Health Research & Psycho-oncology (CHeRP) has launched a recommended set of items for use in community surveys.

The survey items assess practices and perceptions in relation to breast, colorectal, cervical, prostate, skin and tobacco-related cancers, nutrition, physical activity and alcohol use.

Developed through a national consensus process funded by The Cancer Council Australia, the items are available for inclusion in state-based surveys with the ultimate aim of contributing to a national dataset.

CHeRP Director, Afaf Girgis, said there was an ongoing need to monitor community perceptions and practices in relation to major cancers. "Consistency of items used in state-based surveys will allow interstate comparisons, the first step in achieving aggregation to a national dataset for a range of cancer-related issues," Professor Girgis said.

The survey items were launched at the 8th Behavioural Research in Cancer Control Conference in Brisbane in September and, with an accompanying user guide, are located at: www.newcastle.edu.au/centre/cherp/professionalresources/. The items will be updated periodically.

For further information, contact Dr Chris Paul at Chris.Paul@newcastle.edu.au.

Kylie fans donations deliver new service for breast cancer patients

With millions tuned in to watch Kylie Minogue's cancer story on July 17, The Cancer Council sent a big thank you to her many supporters who kindly donated to the Kylie Minogue Breast Cancer Fund after her 2005 diagnosis.

Within days of the diagnosis becoming public, and Kylie's personal appeal to fans to make a small donation to The Cancer Council in lieu of flowers and cards, the Kylie Minogue Breast Cancer Fund was created.

The donated funds will go to establishing online support for young women with cancer. The online forum overcomes geographic and physical boundaries and allows patients from across the country to talk to

Cancer Australia ready to tackle national priorities

Appointment of a Chief Executive Officer to Cancer Australia has paved the way for the organisation to become operational and address a growing list of national cancer priorities, according to The Cancer Council Australia.

Professor David Currow's appointment as CEO follows the announcement in March of an Advisory Council for the new Federal Government agency.

The Cancer Council Australia's Chief Executive Officer, Professor Ian Olver, welcomed Professor Currow's appointment and said he would be taking on a challenging role with big expectations from the health sector.

"The establishment of Cancer Australia is a significant development and Professor Currow's expertise and experience will help the organisation quickly come to grips with national priorities and issues in cancer control," Professor Olver said.

"There is a real need in Australia for a central agency to coordinate and facilitate the considerable but fragmented research efforts into cancer at the national level. We also need more resourcing to develop and implement national guidelines and to accredit and credential cancer professionals and treatment centres."

Professor Olver said the absence of a central government agency to coordinate national activity had held back the national cancer control effort, particularly the ability to identify gaps in knowledge and prevention programs that could be more readily addressed by a federally resourced agency. He said The Cancer Council had the expertise, resources and networks to help Cancer Australia implement its national cancer control programs.

Cancer Council welcomes Herceptin listing

The Cancer Council Australia has congratulated the Australian Government for adopting the Pharmaceutical

Benefits Advisory Committee's recommendations to subsidise the drug Herceptin (trastuzumab) for women with early-stage HER2-positive breast cancer.

The Cancer Council Australia's Chief Executive Officer, Professor Ian Olver, said the decision to list Herceptin on the Pharmaceutical Benefits Scheme from October was good news for the 2000 Australian women diagnosed with HER2-positive breast cancer each year.

"Studies show that combining standard chemotherapy with Herceptin reduces disease recurrence in women with early stage HER2-positive breast cancer by 46 per cent, saving thousands of lives," Professor Olver said.

"PBS subsidisation will make the demonstrated benefits of Herceptin much more affordable for those 2000 Australian women currently living with HER2-positive breast cancer, a particularly aggressive form of cancer.

"The Cancer Council Australia also welcomes the Government's decision not to restrict eligibility to patients with tumours larger than 20mm, which will help ensure that more women with the potential to benefit from Herceptin will be able to access the drug through the PBS."

Around the traps – what we have been up to

It is always eventful at The Cancer Council Australia and the last few months have seen two great events come to life again.

On August 25 we had our annual Daffodil Day, one of our biggest yet with the country awash with bright yellow blooms and other related merchandise.

By purchasing a daffodil or other item in memory of a loved one, to celebrate a survivor, or to simply give hope to a cancer-free future, hundreds of thousands of Australians helped us move towards our fundraising target of more than $8 milllion.

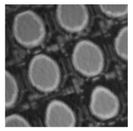
"The continued and generous support of the Australian people and the media of Daffodil Day was truly overwhelming," The Cancer Council's Chief Executive Officer, Professor Ian Olver said.

We put away our daffodil yellow shirts when it rolled into October, as it was time to think pink and harness some serious girl power for our Girls Night In event.

With Girls Night In, women across the country were encouraged to boot the boys for a night in October and get their gal pals together for a Girls Night In and raise money to help find a cure for breast and other women's cancers.

They were asked to simply register as Girls Night In hosts and then invite their female friends, workmates and family to get together for an evening. Guests were asked to donate the equivalent of what they would have spent on a night out.

In its second year, the event proved again to be a



100 Questions and Answers about Bladder Cancer

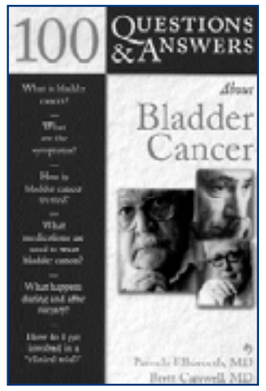
P Ellsworth, B Carswell

Jones and Bartlett Publishers (2006)

ISBN 0-7637-3253-2

147 pages plus index

RRP: $US16.95



This American publication is a resource to help understand bladder cancer and treatment options for this disease. It is designed to answer questions commonly asked by patients about bladder cancer and it is part of a series of 100 Questions and Answers written by medical staff from the University of Massachusetts Memorial Medical Centre.

This interesting and clinically relevant book is an invaluable resource for practical answers to questions ranging from understanding bladder cancer, treatment options, post-treatment quality of life and supports. Aimed at patients with bladder cancer, it is just as relevant and useful for physicians, nurses, health professionals and families who want a current and easy- to-read book on this subject.

The layout is easy to follow with coherent and understandable language. It is divided into eight parts including: background information on the anatomy and physiology of the bladder and cancer; diagnosis and tests; and treatment options including trans-urethral resection of bladder tumour, peri operative chemotherapy, intravesical therapy, immunotherapy, surgery, and non-operative bladder sparing therapy. Also included is information about metastatic disease and end of life care. The glossary of terms is comprehensive, relevant and thorough. An appendix lists websites and information about supports for patients and families, albeit with a US focus.

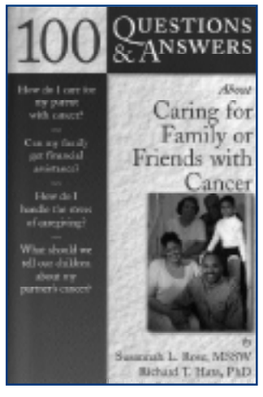
Original in its format, commonly asked questions by patients are covered in a sequential and informative manner. Explanations of medical terms are highlighted and definitions used to explain these are located down the side of the page for easy reference. Photos and clear diagrams help explain procedures. Interspersed in italics throughout each section are comments made by patients about their own experiences, which support what has been written by the authors. This book is unique in that it encompasses detailed information in an easy to understand format that aims to be clear, concise and educational. The use of diagrams and patient experiences makes it a book for everyone with an interest in bladder cancer.

However, there are some weak points. One criticism is the lack of a bibliography and referencing, especially statistics and tables. A bibliography would be a valuable resource for readers who wanted to read further on a specific topic. Being American, the resources for patient support, including organisations and web sites, may not be relevant for Australian patients and families.

Overall, 100 Questions and Answers about Bladder Cancer is a handy, valuable, readable and original resource and I would recommend it to all health professionals who have an interest in the education of patients and families with bladder cancer. It would be a useful resource in an oncology ward library, with relevance to current nursing practice and knowledge.

Karen Hall, The Cancer Council South Australia

100 Questions and Answers about Caring for



Family or Friends with Cancer

SL Rose, RT Hara

Jones & Bartlett Publishers (2005)

ISBN: 0-7637-2421-1 216 pages plus index

RRP: $US16.95

I commenced the first chapter of this book with the expectation that it would answer questions that a person from a non-medical background may raise about cancer and how to care for a person with cancer. This book, authored by two social workers, unfortunately failed to meet my expectations.

The first chapter gave quite a good broad explanation of what cancer was and different treatment options that may be recommended. It then went on to describe the roles of the health care providers that would be involved in the care of a person being treated for cancer. Unfortunately, this was from an American perspective.

Chapter 3 was entitled 'Helping Your Loved One to Cope'. This dealt quite well with possible scenarios and offered potential solutions on how to deal with the emotional ups and downs of a person (or carer) with cancer.

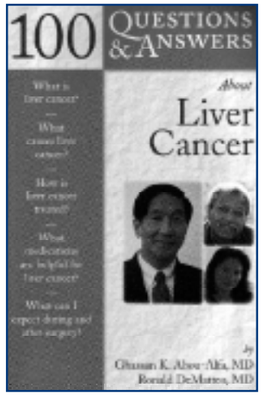
The next chapter 'Caring for the Carer' discussed family issues such as the impact on relationships, what to tell children, changes in family dynamics and discussions about wills. Avoiding 'burnout' for the carer was also discussed.

The remainder of the book, from chapter six onwards was, in my opinion, of little use to the Australian reader. It discussed issues such as home care and the availability of services and equipment, health insurance, social security, employment concerns and the difference between inpatient facilities from an American viewpoint.

The last few pages were a list of general resources – cancer web sites and contact addresses of organisations and groups in the US. For those without a computer, or not living in the US, they would be of little use.

Overall, I found this book easy to read, however, as there was such an emphasis on care and services available in the US, at least half the book would not have relevance to an Australian reader. I feel this book would have benefited from some medical or nursing input to make it a little more 'user friendly' for a cancer carer.

Lynda Horning, Illawarra Cancer Care Centre, Wollongong NSW



100 Questions and Answers about Liver Cancer

GK Abou-Alfa, R DeMatteo

Jones & Bartlett Publishers (2006)

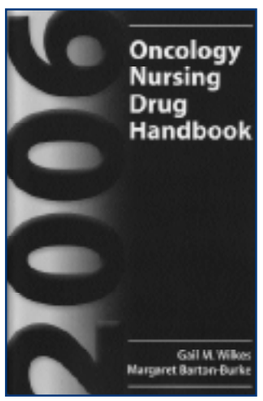
ISBN: 0-7637-4754-8

120 pages plus index

RRP: $US16.95

This book has been written for people diagnosed with liver cancer to better enable them to understand their diagnosis and treatment, and to navigate the treatment required. The two authors work at the Memorial Sloan-Kettering Cancer Centre in New York and are medical specialists in treating liver cancer. The text is broken into nine short, easy to digest sections, making it easy for these to be accessed as needed by the reader including:

- Information about the structure and function of the liver;
- Risk factors;
- Screening;
- Diagnosis and staging;
- Coping with the diagnosis;
- Treatment;
- Cancer-related practical issues;
- Cirrhosis-related practical issues; and
- Social and end-of-life issues.



The information is presented in a consumer-friendly manner and is concise in nature.

It is difficult to evaluate the currency and sources of information presented as there are no refer-ences provided, although specific information is offered including a discussion of particular cancer treatment trials. Directions to find further information is included throughout the text as needed, however these are American sources and are of limited relevance to the Australian reader (for example, financial support agencies). An index is included as a useful pointer to specific topics and a glossary of terms is also provided.

A potential difficulty and source of confusion for the Australian readership is that some of the approaches described are contradictory to current practice here. For example, hospice care is described as a service that is an entitlement available after 'active' treatments, such as chemotherapy, have finished.

This concise book is primarily intended for people diagnosed with liver cancer, but would also be a valuable information support for friends and family. Given that there are few similar Australian resources on this topic it could be valuable here, but should be used with caution given that the information is focused on an American readership.

Kate Cameron, The Cancer Council South Australia

2006 Oncology Nursing Drug Handbook

GM Wilkes, M Barton-Burke

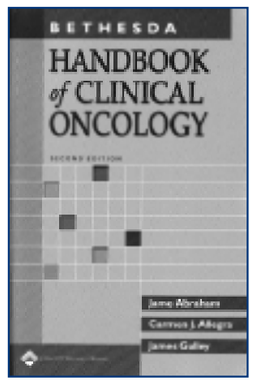
Jones and Bartlett Publishers (2005)

ISBN: 0-7637-3923-5

1196 pages plus index

RRP: $99.00

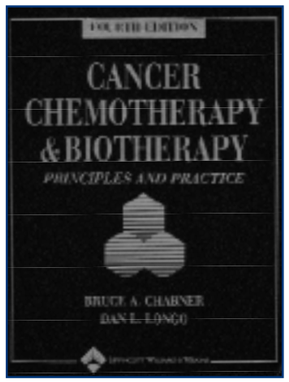
This textbook is a serious American 'heavyweight'. As this is the ninth edition of the Oncology Nursing Drug Handbook, and there is obviously a population of devotees, I took the opportunity to ask my colleagues of their opinions of the text. Those I approached ranged in nursing experience from first rotation of the new graduation program to the most experienced nurses (clinical nurse consultant and ward-based nurse educator). The more recent recruits found the key abbreviations very helpful and the overall format and language easy to follow.



The detail of drug descriptions from class right through to drug interactions, special considerations, potential toxicities/side effects, and the nursing implications make this a valuable resource for all levels of cancer nursing. The inclusion of Appendix 1: Controlling Occupational Exposure to Hazardous Drugs is very detailed and extensively referenced, making it a very good reference tool for health care professionals.

Each chapter is comprehensive, well referenced, and all aspects of drug administration and subsequent care of the patient appear to be included. The authors recognise that prescribing practices may differ elsewhere in the world and that this should be carefully considered, especially by those who are not intimately familiar with adult cancer chemotherapeutic regimens. However, given that the NSW Cancer Institute website is now available to health professionals, this should not present a problem if this textbook is being used as a resource.

In conclusion, I quote two colleagues; "I would use this textbook" and "It would save the clinical nurse consultant from getting a phone call at 2am".



Sally Bone, Cancer Services Community Liaison, Royal North Shore Hospital, Sydney NSW

Bethesda Handbook of Clinical Oncology (2nd Edition)

J Abraham, CJ Allegra & J Gulley (eds)

Lippincott Williams & Wilkins (2005)

ISBN: 07-817511-60

672 pages plus index

RRP: $82.50

The Bethesda Handbook of Clinical Oncology is a text that is clear, concise and complete, making it an excellent reference for any health professional working with patients with cancer. It has been well put together by many cancer clinicians working in major cancer centres in the US.

This book is designed as a quick and ready reference for clinicians working with a patient living with cancer. This edition is updated with the new cytotoxic drugs and dosages, treatment regimens and data from the latest clinical trials. New chapters in the text are written about targeted therapies and the use of complementary and alternative medicines in cancer care.

While this text is not written specifically for nurses, it is an excellent reference for any nurse requiring a handy reference for their everyday nursing care of any patient with cancer.

While supportive care in symptom management is very important in nursing patients with cancer, it is just as important for the nurse clinician to know about the clinical features and current medical management. Whilst this text explores the usual clinically-related chapters on the individual disease states, it also contains concise and informative chapters on supportive care, oncological emergencies and end-of-life care. Information on aetiology, pathophysiology and epidemiology has been limited in order to provide more practical clinical information. Much of the up-to-date information is easily accessible via the inclusion of more charts, tables and algorithms.

The first edition of this text was an excellent handy reference. This second edition has been written for the clinician working in the current health climate, with comprehensive reviews of disease management and pertinent information relating to the more controversial areas of complementary and alternative medicine. It is an excellent reference text for any health care professional working with patients with cancer.

Alayne Reid, Division of Cancer Services, Mater Adult Hospital, South Brisbane QLD

Cancer Chemotherapy and Biotherapy: Principles and Practice (4th Edition)

BA Chabner and DL Longo (eds)

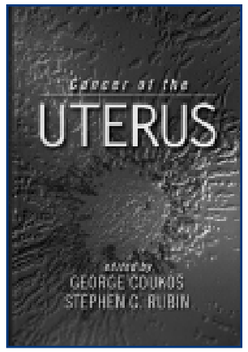
Lippincott Williams & Wilkins (2006)

ISBN: 07-817562-86

846 pages plus index

RRP: $328.90

Cancer Chemotherapy and Biotherapy: Principles and Practice is the updated 4th edition of a popular book which aims to provide the clinician with an overview of the pharmacology of chemotherapy and its application in clinical practice. This is a hard backed book published in the US with a total of 37 chapters, the majority of which are devoted to specific chemotherapeutic agents, while a few chapters focus on the more general aspects of cancer chemotherapy.



Chapter one explores the role of drugs in cancer treatment while chapters two and three provide some readable and useful information on preclinical aspects of cancer drug development and pharmacokinetics. Chapters four and five explore the effects of chemotherapy on fertility and the carcinogenic properties of these agents. Further chapters on the care of central venous catheters and the pharmacogenetics of cancer chemotherapy are comprehensive and provide the reader with a broad insight into these areas.

The chapters relating to individual agents are organised by drug class and although most drugs are included, this information is not structured in the most logical manner and the way in which the classification of drugs is applied appears rather inconsistent. Under each agent or class there is detailed information including a history of the agent's discovery, the chemical structure, a pharmacokinetic profile, mechanisms of action and mechanisms of resistance, all appropriately referenced. The use of illustrations to support the text assists the readers' understanding and a table of key features provides an easy to read summary relating to the properties of each agent. Information on interactions with other agents, toxicities and side-effects is varied according to author and the information on actual therapeutic application in clinical practice is limited.

Further chapters on cancer vaccines, inhibitors of tumour angiogenesis and antibody therapies examine recent developments in these newer areas of therapeutics in cancer and provide the reader with a useful overview of some of the principles and pharmacology of this area of cancer therapy.

In conclusion, this is a useful text to pursue information related to the mechanism of drug action, however it does have more use as a pharmacological text rather than as a practical tool in the clinical setting. This book probably offers no advantage over many other texts with similar content but provides a useful 'desk' supplement to some of the smaller pocket size texts and provides interesting insight into the development of many agents.

Christine Carrington, Medical Oncology, Princess Alexandra Hospital, Brisbane QLD

Cancer of the Uterus

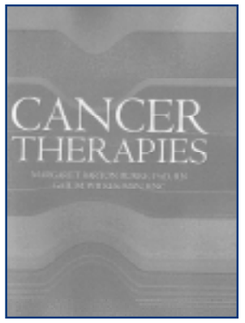
G Coukos, SC Rubin (eds)

Marcel Dekker (2005)

ISBN: 0-8247-5415-8

506 pages plus index

RRP: $85.00



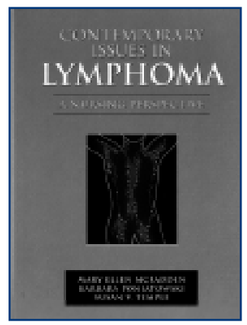
Cancer of the Uterus presents a collection of reviews written by North American scientists and clinicians relevant to the aetiology, pathology, clinical presentation and management of uterine malignancy. The book is most relevant to the medical specialist or advanced medical trainee working in the area of gynaecological cancer, but would also serve as a useful reference book for scientific or nursing staff with a special interest. The book has 18 chapters, with the majority of the book dedicated to the clinical management of endometrial cancer.

The first two chapters discuss the molecular genetics of uterine malignancy and the Hereditary Nonpolyposis Colorectal Cancer (HNPCC) syndrome. This is an informative summary of the current knowledge and recent advances in this area and is presented in an easy to understand format. The figures showing the molecular basis of the progression from normal to hyperplasia and carcinoma of the endometrium are excellent. The recommendations for risk reducing surgery and the limited data to support screening of women with HNPCC are nicely discussed.

Chapters three and four discuss steroid hormone receptors and the effects of Tamoxifen on the endometrium. There is an in-depth review of the genomic and non-genomic pathways of estrogen, progesterone, glucocorticoids and androgens occurring through their receptors. Unfortunately the clinical relevance of the main steroid receptors and hormone effects in relation to endometrial cancer is somewhat lost in the minutiae of this descriptive analysis. On the other hand, there is a good discussion regarding the limited role for screening for endometrial cancer in women taking Tamoxifen.

The pathology of uterine malignancies discussed in chapters five and six are excellent up-to-date summaries of current knowledge in this area. Relevant pathological features and clinical correlations are clearly and concisely presented. The only criticism would be that the photomicrographs would be more useful if they were in colour rather than black and white.

In the remaining bulk of the book (Chapters eight to 18), different authors discuss the various treatment modalities available for endometrial hyperplasia and cancer, including the management of uterine sarcoma. Chapter eight addresses the conservative management of endometrial hyperplasia and provides a sensible outline for the premenopausal woman with early endometrial cancer who wishes to maintain fertility, although it was disappointing that there was no debate regarding the more recent use of progesterone releasing intra-uterine devices. Chapters nine and 10 discuss the surgical staging and treatment of early endometrial cancer including the role of laparoscopy, with some interesting controversies being addressed but left unanswered pending further randomised trials of laparoscopy versus laparotomy. Chapters 11 and 12 address the role of surgery in advanced and recurrent endometrial cancer and are well researched and informative.



Chapters 13 and 14 review the evidence base for the use of radiation treatment for endometrial cancer and

sarcoma. There is a useful discussion of the current status of adjuvant chemotherapy and radiation in the management of patients with uterine papillary serous carcinoma. The roles of hormonal and targeted therapies for endometrial cancer are outlined in chapters 15 and 16.

The final chapter discussing hormone replacement in the patient with uterine cancer was disappointing in that the recommendation was not to consider oestrogen replacement unless symptoms were unable to be controlled by other non-hormonal strategies. This recommendation needs updating in light of the Women's Health Initiative findings for the oestrogen only arm and in view of the increasing knowledge of the long-term benefits of oestrogen only replacement therapy.

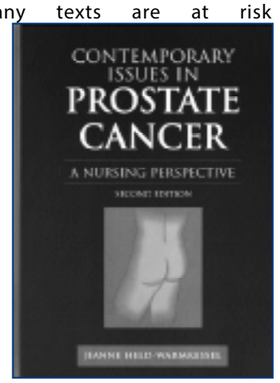
Cancer of the Uterus is a valuable reference book with an excellent summary of the evidence base for current strategies of diagnosis and management of uterine malignancy. Like all reference books, it will require regular updating in line with recent knowledge to retain its usefulness to those working in this area.

Rhonda Farrell, Department of Gynaecological Oncology, King Edward Memorial Hospital, Perth WA

Cancer Therapies

GM Wilkes, M Barton-Burke
Jones and Bartlett Publishers (2006)
ISBN: 0-7637-2682-6
350 pages plus index
RRP: $106.00

It is becoming increasingly difficult to keep up-to-date with the ever-evolving treatments for cancer and many texts are at risk of being out-of-date before they even hit the shelves. Despite this, Cancer Therapies is a well-referenced, comprehensive and modern text with CD-ROM.



The first chapter provides an easy to read overview of the biological basis of cancer that is built on within subsequent sections. Concepts that impact on current cancer treatment development are summarised and provide a natural lead into the next chapter on chemotherapy and cell cycle kinetics.

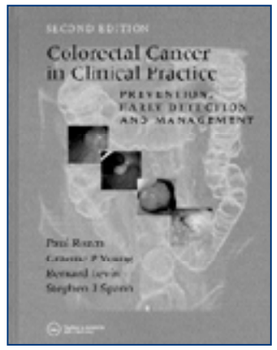
Considering the vast array of chemotherapy drugs utilised, the third chapter is kept relatively brief. Drugs are alphabetically listed for easy reference with basic information including class, mechanism of action, indications, dosing, administration and side-effects. More in-depth information on these agents may be better sourced from an alternate text.

The strength of this text is the three chapters that provide comprehensive overviews on cancer treatments that are new or emerging, considered cutting edge or complex/specialised. Chapter four on biologic therapies for cancer treatment explains basic concepts of tumour immunology and covers the sometimes controversial use of IL-2 and the Interferons. Nursing management of treatment related toxicities is well presented in easy to follow tables and clinical pathways. Haematopoietic growth factors are also covered in this chapter along with experimental treatments such as vaccines and adoptive cellular transfer.

Chapter five provides an overview of molecular targeted therapy. This chapter simplifies complex concepts with the aid of diagrams and examples to clarify important points. Current targeted therapies are listed in table format with information on their mechanism of action, indications, common side-effects and key nursing interventions.

Chapter six is on haematopoietic stem cell transplantation and provides a comprehensive overview on rationale of transplant, types of transplant and the potential complications. Nursing care is the main focus of this chapter and is separated chronologically into pre-transplantation, transplantation and post-transplantation phases. Example nursing care plans are provided along with tables on infection, graft versus host disease and acute renal failure.

The final two chapters deal with issues surrounding safety. Chapter seven touches on infrastructure, drug ordering, safe handling and administration of cytotoxics, use of cytotoxics in non-malignant conditions, standards of practice, clinical competence and education.



Chapter eight provides an interesting read on possible drug interactions with cancer medications. Common interactions are briefly discussed and summarised in tables. The appendix of nursing care plans is in some areas a little out of date.

Overall, I found Cancer Therapies a useful reference, particularly for treatments that fall outside of the traditional cancer therapies. As it is an American book, some of the drug names differ and not all drugs included are available for use in Australia. It is generally easy to read and provides sound theoretical and practical information for the cancer nurse.

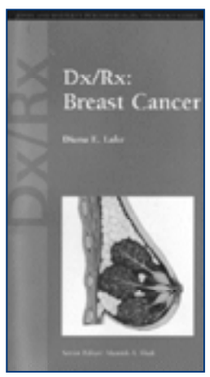
Tracey Doherty, Department of Medical Oncology, Flinders Medical Centre, Adelaide SA

Contemporary Issues in Lymphoma: A Nursing Perspective

ME McFadden, B Ponitowski, SV Temple
Jones and Bartlett Publishers (2005)
ISBN: 0-7637-2957-4
246 pages plus index
RRP: $96.80

Contemporary Issues in Lymphoma: A Nursing Perspective was written by nurses for nurses. This American publication has 12 contributors, many of whom are nurse practitioners and nurses who work in advanced practice roles throughout the US.

The book commences with a comprehensive discussion of the immune system followed by an in-depth and informative chapter on the cytogenetics of lymphoid malignancies. This chapter greatly advances nurses' knowledge and understanding of this ever changing and complicated malignancy.



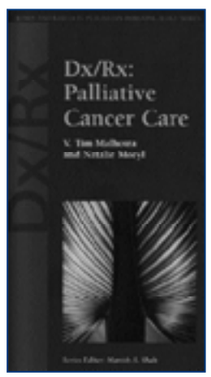
Three chapters are devoted to non-Hodgkins lymphoma, Hodgkins lymphoma and multiple myeloma. They are clearly written, follow the same outline and are very interesting to the reader. They broadly discuss the epidemiology, pathophysiology, standards of care, novel treatment strategies and nursing and patient management issues of each malignancy.

The issues and challenges in lymphoma are reviewed. This chapter discusses in depth many of the disease and treatment related toxicities. The issues may be at diagnosis, during therapy, or present as long-term complications. The chapter highlights that nurses play a pivotal role in educating the patient and family about the disease process, therapies and potential side-effects, and how to access and intervene when toxicities are experienced. It cleverly demonstrates that balancing treatment outcomes, toxicities, survivorship and quality of life issues are an integral responsibility of the oncology nurse caring for the patient with lymphoma.

The role of transplantation in lymphoma and myeloma in this book focuses on autologous transplantation, however it does discuss the role of allogeneic transplantation in these diseases. The chapter clearly outlines the eligibility criteria, stem cell collection process, conditioning therapies, treatment related toxicities and long-term complications of therapy.

The book concludes with a wonderful chapter listing resources for patients. The Leukaemia and Lymphoma Society's Information Resource Centre (IRC) has developed an extensive collection of resources and organisations that cover a wide range of services for patients and families. Despite the organisations being based in the US, I will definitely be accessing the websites and email addresses for my patients.

I enjoyed reading this book and would not hesitate to recommend it to both novice and experienced cancer nurses. The text can complement your knowledge, increase your understanding and challenge you with up-to-date information.



Priscilla Gates, Haematology Unit, Peter MacCallum Cancer Centre, Victoria

Contemporary Issues in Prostate Cancer – A Nursing Perspective

J Held-Warmkessel

Jones and Bartlett Publishers (2006)

ISBN: 0-7637-3075-0

440 pages plus index

RRP: $94.00

This hardcover book is an easy-to-use guide about prostate cancer. The author is a well known cancer nurse who has published two other books on the subject. As the profile of prostate cancer increases over the next few years, books like this one will help nurses further develop the new role of the prostate cancer nurse.

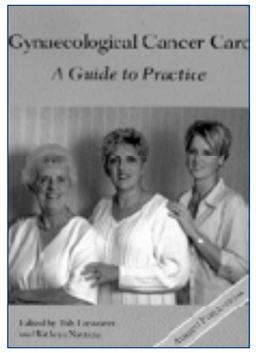
This book is aimed at both the junior and experienced nurse. It brings together a range of nursing specialists covering current treatment options and issues related to the management of prostate cancer. It is an easy to use format; it is well illustrated and as it is written for nurses, it also looks at nursing diagnoses, interventions and outcomes. The use of nursing diagnoses and standards of care will prompt the prostate cancer nurse and other nurses to review their service. It will also be a useful tool for those setting up a prostate cancer nurse service.

This book has four main themes: epidemiology, treatment options, quality of life issues and management of advanced disease. It also discusses the issues of complementary and alternative therapies and their use in men with prostate cancer. In this edition the author has added chapters on brachytherapy and laparoscopic prostatectomy.

Each chapter has an overview of content and references, which are up-to-date and indexed. The use of tables and flowcharts compliment and further enhance the text.

The final chapter deals with support services for patients, families and health professionals, from early detection and screening to end of life issues. It looks at written, internet, psychosocial and support resources. This chapter is helpful, however as the book is American some of the resources aren't as helpful as they could be for the Australian setting.

As an experienced oncology nurse I found this a well structured, concise and easy-to-read text. I would recommend this text to nurses and other health professionals responsible for the management of prostate cancer patients. It is a comprehensive update, which includes most of the current treatment options for patients with prostate cancer with the exception of HIFU (High–Intensity Focused Ultrasound), which is relatively new to Australia.



Pauline Thomson, Cancer Care Centre, St George Hospital, Sydney NSW

Colorectal Cancer in Clinical Practice (2nd Edition)

P Rozen, GP Young, B Levin, SJ Spann (eds)

Taylor & Francis Group (2006)

ISBN: 1-84184-455-1

168 pages plus index

RRP: $75.00

The authors of this book are practising clinicians from Israel, Australia and the US. As such they provide an international perspective to the problem, which although "preventable and treatable", is "one of the major malignancies afflicting the westernised societies, both in terms of incidence and … mortality".

This text is designed around a series of questions and is aimed at the practising clinician. The information is current and evidence-based. It is set out in such a way that encourages browsing as well as directed reading. The book has questions as chapter headings, making the information very accessible.

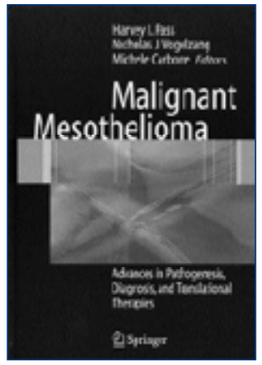
Some of the chapters answer questions that patients may ask such as "how does colorectal cancer develop?" and "is diet important in preventing colorectal cancer?" Others answer questions that clinicians may ask themselves such as "who is at risk from familial colorectal cancer and how can they be managed?" or "how should we follow up premalignant conditions?" The text contains clear diagrams and relevant illustrations.

The chapter about the pros and cons of population-based cancer preventative strategies includes research into patient preferences and cost factors in the discussion and therefore provides a well-rounded look at this issue.

I have a minor quibble with the scant reference to the interdependent roles of various health professionals, not just medical specialists, within cancer prevention and on-going management, but on the whole I found this an interesting and useful text.

This 2nd edition has updated information on risk factors, preventative strategies, screening methodology and cancer therapies. The book is designed as an easy-to-read 'at hand' reference rather than an all-encompassing 'bible'. It fills a need for a busy clinician and would be a worthy addition to the shelf above the desk.

Jenny O'Baugh, Nepean Cancer Centre, Nepean Hospital, NSW



Dx/Rx: Breast Cancer

DE Lake

Jones and Bartlett (2006)

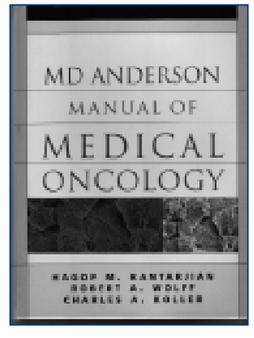
ISBN: 0-7637-2681-8

125 pages plus index

RRP: $56.10

This book is one of a series of handbooks based on the management of common malignancies. The series is published in the US and the statistics within Dx/Rx: Breast Cancer are reflective of this. The book is clearly set out allowing prompt accessibility to information for the reader. The information in the handbook is concise but thorough. The handbook is sequenced into 14 chapters covering the epidemiology of breast cancer to primary care issues for survivors.

The chapters in Dx/Rx: Breast Cancer are bulleted format and incorporate tables and figures for ease of information. The first chapter in the handbook is the epidemiology, risk factors and screening of breast cancer, which refers to the population of the US. The reader can generalise some of the information, but would need to seek further information for location-specific statistics. The second chapter, diagnostic tools and physical examination, is covered adequately in four pages. There is a substantial chapter covering the histopathology, staging, natural history and pathologic prognostic factors of breast cancer. Several chapters cover the management and treatment of breast cancer, including surgical management, hormonal therapy, chemotherapy, the use of monoclonal antibody and radiation therapy. These chapters thoroughly cover the indications for each treatment regimen and would be a valuable reference tool. The final chapters of the book briefly discuss long-term complications of treatment, future therapeutic directions, special conditions such as male breast cancer, prevention trials, hereditary breast cancer and survivorship issues. Each chapter concludes with a thorough current reference list, where the reader can acquire further information if desired.



A sole criticism of Dx/Rx: Breast Cancer is the intended reader is not identified. Through reading the book it is apparent that the handbook is written for medical doctors who diagnose and prescribe for breast cancer. However, it would also be a valuable tool for specialist nurses and junior doctors caring for patients with breast cancer.

In conclusion Dx/Rx: Breast Cancer would be a valuable handbook for medical doctors, specialist nurses and junior doctors to aid in the management and treatment of patients with breast cancer.

Tahnee Oliver, Oncology Unit, Launceston General Hospital, Tasmania

Dx/Rx: Palliative Cancer Care

VT Malhortra and N Moryl

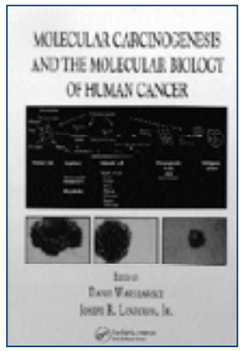
Jones & Bartlett Publishers (2006)

ISBN: 0-7637-2639-7

134 pages plus index

RRP:$US29.95

This handbook is part of the Dx/Rx Oncology series. It is an American publication with the authors coming from the Department of Anaesthesiology and Critical Care and Neurology at the Memorial Sloan-Kettering Cancer Centre. The handbook is very concise and easy to read. It is divided into 19 chapters, with the first nine chapters focused on pain. These chapters include



detailed descriptions of the different pain classifications, requirements of a thorough pain consult, overview of pain medications, opioid conversions and review procedural interventions. There is a dedicated chapter on the use of methadone, despite the authors' statement that this drug is a "last-line" management for neuropathic pain.

The authors then focus on seven symptoms (nausea, vomiting, dyspnoea, depression, anxiety, fatigue and delirium) associated with cancer patients, for which they highlight the pharmacological interventions, but omit any reference to non-pharmacological/allied health interventions for these various symptoms.

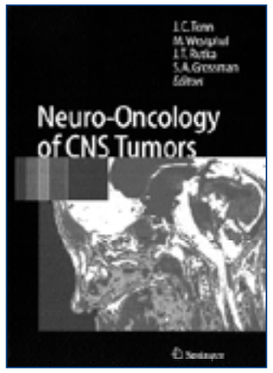
Despite the heading of the book, it is interesting that palliative care does not get a mention until chapter 11. There is minimal reference to the multidisciplinary team throughout the book, which is the cornerstone of the philosophy of palliative care. Cultural issues are mentioned but it is extremely limited with discussion relating to African-American issues only. Chapter 9 is entitled "Special Situations", of which bone metastases and post neuralgia are discussed. It is remiss that these authors' have failed to discuss medical emergencies such as spinal cord compression, superior vena cava obstruction or severe haemorrhage. The final two chapters focus on the stressors and challenges faced by medical oncologists looking after dying patients, which is a positive affirmation, but fails to acknowledge the "other team members" who also participate in the patient/families journey.

Overall, Dx/Rx: Palliative Cancer Care appears to be a comprehensive and valuable reference, particularly in relation to the complexities of pain assessment and pain management. However, my criticism of the book is that it does not sufficiently address issues experienced by advanced cancer patients and lacks depth of the multidisciplinary approach used in palliative care. The handy quick reference guide would be well suited for health professionals and junior medical staff new to the field of cancer care.

Peta McVey, Palliative Care Unit, Neringah Hospital, NSW

Gynaecological Cancer Care: A Guide to Practice

T Lancaster, K Nattress (eds)
Ausmed Publications (2005)
ISBN: 0-9752018-0-8
410 pages plus index
RRP: $79.95



It is refreshing to read such a comprehensive, high quality, international gynaecological textbook written entirely by women. Twenty-eight multidisciplinary health professionals from six countries, all experts in their respective disciplines, have contributed to this excellent publication. The need for such a textbook is evidenced by the dearth of available medical and nursing literature on this subject in comparison to breast cancer.

Written from both a woman-centred and evidence-based perspective, the physical, emotional and social effects of gynaecological cancer, the second most common group of cancers in women, and the most common cause of cancer deaths in women, are addressed throughout. Of the 22 chapters, four of them cover many psychosocial issues in depth, some of which are known to be challenging topics for health professionals, such as: sexuality and body image; spiritual care; social and cultural diversity; and loss, grief and bereavement.

The text is such that it can easily be read from cover to cover, or used as reference book and evidence-based guide to the diagnosis and management of gynaecological cancer. The chapters follow a logical sequence, from an overview of the subject, genetics, risk factors and screening, to the treatment and sequelae of each specific cancer, psychosocial issues and end of life care. Each chapter has a specified framework, summary text boxes and a conclusion, with clear, simple diagrams where required. A comprehensive reference list for each chapter provides an opportunity for further reading on a particular topic.

An additional feature of the publication package is the accompanying two-hour abridged audio book comprising two CDs, which contain short lectures from each chapter. These provide busy health professionals with a convenient guide to the main points covered in the book.

The editors, Tish Lancaster and Kathryn Nattress, are experienced clinical nurse consultants in gynaecological oncology. Having successfully drawn on their own expertise and that of the other health professionals who contributed to the book, they have produced a valuable and essential resource for clinical best practice. Not only will this book help to improve the quality of clinical care, it will ultimately enhance the lives of the many women who experience gynaecological cancer.

Kendra Sundquist, The Cancer Council NSW

Malignant Mesothelioma

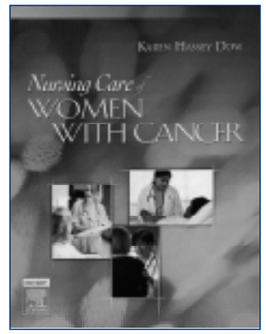
HI Pass, NJ Vogelzang, M Carbone (eds)
Springer-Verlag GmbH (2005)
ISBN: 0-387-22949-3
832 pages plus index
RRP: $US139.00

This is a reference book suitable for departmental and medical libraries and for the shelves of those who have a particular clinical or research interest in mesothelioma, or who are involved in public health administration or industrial litigation.

Drs Pass, Vogelzang and Carbone envisioned a comprehensive text and have achieved it. They have assembled a group of expert international contributors who provide 54 chapters covering carcinogenesis, genetics, clinical presentation, epidemiology, imaging, pathology, current and investigational treatments and the economic implications of the disease.

To be useful such a book must be well indexed; and this is. The individual chapters are well referenced and references are current.

The text is well edited, although there is some repetition, which is inevitable with multiple authored texts. The figures of gene expression arrays, histopathology slides, x-rays and clinical photographs are of good quality and sharply reproduced. The book is well bound and attractively presented. This is a quality production.



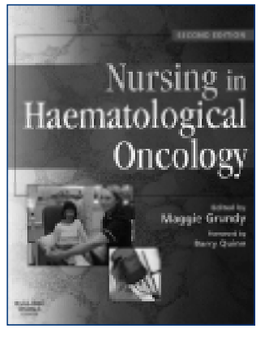
It covers the subject in appropriate scope and detail for a reference volume. However, despite recent advances, malignant mesothelioma remains a lethal disease, and a section devoted specifically to symptom control and quality of life would be appropriate. As the incidence of mesothelioma plateaus in the first world, it will rise further in the third world where cheap substitutes for asbestos are lacking. A discussion of the epidemiology of the disease in the third world would be useful in the next edition. Finally treatment is well covered, but a more critical look at the evidence for the efficacy of what are becoming more widely accepted therapies would enhance the value of the book. Overall it is highly recommended.

Michael Byrne, Dept Medical Oncology, Sir Charles Gairdner Hospital, Perth WA

MD Anderson Manual of Medical Oncology

HM Kantarjian, RA Wolff, CA Koller
McGraw Hill (2006)
ISBN: 0071414991
RRP: $285.00

The MD Anderson Manual of Medical Oncology has, according to the editors, been written as a hands-on resource for oncologists that presents a bird's eye view of medical oncology as it is currently practised at this institution. It was written primarily from the perspective of the medical oncologist and although MD Anderson claims to practise a multidisciplinary approach, it is void of information in some

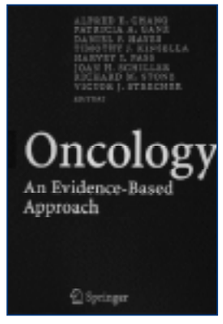


sections covering radiotherapy and surgery.

The manual covers 13 sections: leukaemia, lymphoma and myeloma, blood and marrow transplantation, lung cancer, head and neck cancer, gastrointestinal carcinomas, breast cancer, gynaecologic malignancies, genitourinary carcinomas, miscellaneous tumours, supportive care, palliative care and symptom management and long term survival, with a total of 44 chapters. The lengths of the chapters are variable and range from as few as eight pages (autologous transplantation) to 40 pages for cervical cancer. Haematological malignancies occupy the first 270 pages of the manual.

The text demonstrates a rationale for patient care that is evidence based, with MD Anderson showing their biases as they apply to cancer biology and therapy. They have endeavoured to articulate the rationale of ongoing clinical trials and the importance of clinical investigation.

The manual contains a plethora of tabulated data and graphics, pathology figures, illustrative imaging, algorithms in the form of flowcharts and diagrams to provide the reader with a practical guide to the diagnostic and therapeutic strategies used at MD Anderson. The layout of some pages is somewhat messy, with some pages containing too many graphics. Some of the pathology and radiology images are poorly replicated giving them a blurred appearance.



Overall, the manual is worth a look at, but I am not convinced that it is a must for every oncology department.

Karen Gorzynska, Oncology Unit,
Coffs Harbour Health Campus, Coffs Harbour NSW

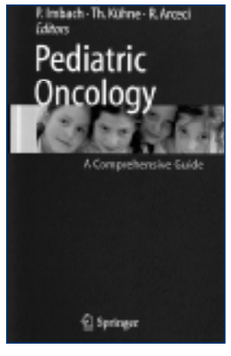
Molecular Carcinogenesis and the Molecular Biology of Human Cancer

D Warshawsky, JR Landolph (eds)
Taylor & Francis (2006)
ISBN:0-8493-1167-5
558 pages plus index
RRP: £85.00

The long-winded title of this book is indicative of both its strengths and its weaknesses. The claim on the back cover is that: "This volume explores molecular information specific to chemical, viral and radiation carcinogenesis, explains the working of cellular oncogenes and tumor suppressor genes, and also introduces the latest genomic and proteomic approaches". All that is laudable, and certainly a strength. The related weakness lies in the need to provide links between these various fields of enquiry.

In structure, the first quarter of the book provides a timely summary of the field once known as 'chemical carcinogenesis'. The term is still understood, but no longer identifies particular scientists, departments, institutes or funding streams. There follows an outline of the basis of molecular carcinogenesis which provides the paradigm for discussions of major cancers (breast, lung, skin, etc.). There are no link-up problems here. There are gaps in knowledge, but the molecular genetic approach to cancer etiology provides a basis for addressing malignant transformation and current approaches to therapeutics. In this context, a chapter on metastasis would have been useful. Also useful would have been a chapters on chemical and viral carcinogenesis at that part of the book in which radiation carcinogenesis is considered. The goal of such chapters would have been carcinogen-gene interactions: the business of relating how chemical carcinogens in particular may be understood as modifying particular genes or signal transduction pathways. In part, such chapters are missing because the pickings are slim.

The challenge for the editors and readers is to link the sections with the last part of the book. The final chapters of the book address regulatory control of carcinogen exposure in terms of bioassay, risk assessment and law-making. It is in this context that agents like dioxins (TCDD) and polychlorinated biphenyls emerge as clear causes for concern. But how are these agents to be understood in terms of the molecular genetics of tumours with which they are associated? Arguably, these 'carcinogens of interest' might have been subject to more detailed discussion in earlier biologically-based chapters.

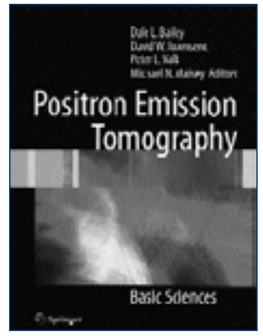


The observations made above are difficulties with current knowledge rather than criticisms of the book under consideration. Regardless of such limitations, this volume is a useful compendium. There is a consistency of style across the chapters and the contributing authors write with authority. The book would be of benefit to anyone seeking to close the gap between biological effects induced by certain classes of compounds and the manner in which carcinogenic hazards are regulated.

Bernard W Stewart, Cancer Control Program, South Eastern Sydney and Illawarra Area Health Service and Faculty of Medicine, UNSW

Neuro-Oncology of CNS Tumors

JC Tonn, M Westphal,
JT Rutka, SA Grossman
(eds)
Sringer GmbH (2006)
ISBN: 3-540-25833-7
696 pages plus index
RRP: $US229.00



This textbook represents at least the third such neuro-oncology tome. While this is very encouraging to neuro-oncologists, I am not sure that it offers much more than previous textbooks. The publication of such a text is a sure sign that neuro-oncology has developed significantly over the last 10 years and that there is now a substantial body of information on this unfashionable subspecialty. The question to be asked of such a book is what does it offer above and beyond previous texts or a regular review of the current literature? This particular textbook has authors from around the world and covers all the usual areas encompassed within neuro-oncology. However, it is almost equally divided into adult and paediatric neuro-oncology and, while this may suit some clinicians, I suspect that most specialists in the field of neuro-oncology are focused either on adult or paediatric tumours, but not both. Thus almost half of the book becomes an irrelevancy to most readers.

I have found that many such textbooks focus too much on the uncommon and less on the common. As a good example, there are 11 pages on high-grade gliomas in this book, which compares poorly to the 25 pages on the rare phenomenon of skull based tumours. Further, the book is, in many respects, out of date even though it was published in 2006. There is only one brief paragraph on the influential Stupp regimen and cites the 2004 ASCO abstract, despite the New England Journal paper being published in 2005. Even more disappointing, there is no discussion on targeted therapies or novel therapeutic strategies.

I would not recommend this book given such concerns. I would suggest that a review of the recent literature in a particular area would be more forthcoming and that a reference to the encyclopaedic text Brain Tumours, edited by Kaye & Laws, would be more worthwhile.

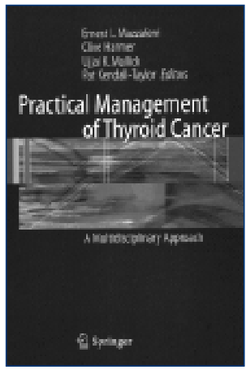
Mark Rosenthal, Director of Medical Oncology, Royal Melbourne Hospital, Victoria

Nursing Care of Women with Cancer

KH Dow
Mosby (2006)
ISBN: 0-323-03639-2
565 pages plus index
RRP: $124.95

This hard-back book is edited by Karen Hassey Dow, a prominent and widely published American oncology nurse. There are 29 chapters written by 36 American and Canadian nurses and allied health professionals.

One assumes from the title that the book is about breast and gynaecological cancers. Interestingly it also includes lung cancer, colorectal cancer and non-Hodgkin's lymphoma. While the inclusion of these three chapters provides an extra dimension for nurses who work with women with breast or gynaecological cancers, I can't imagine that nurses working with the other three groups of patients would specifically seek out this book as it



doesn't cover the other half of their patient population - men.

Chapters on lymphoedema, body image and sexual functioning, anxiety and depression, fatigue, chronic wounds and complementary therapies are those that one might expect to find in a text such as this. However, the addition of chapters on less common subjects such as osteoporosis and cancer, nutrition, sleep and wakefulness, aches, pains and neuropathy, physical activity in cancer survivors, work considerations and spouse and family considerations is refreshing and contributes to the uniqueness of the book. These topics are particularly important aspects of quality of life as increasing numbers of women survive their disease or live through longer periods of remission.

The final section 'Reaching Culturally and Ethnically Diverse Women' is timely and appropriate. It includes four chapters about specific ethnic minority groups and two particularly good chapters; 'Hidden populations of women' (lesbian women, single mothers, women without partners, elderly women) and 'Rural women and cancer'. The description of the challenges for these groups of women in accessing health care is edifying.

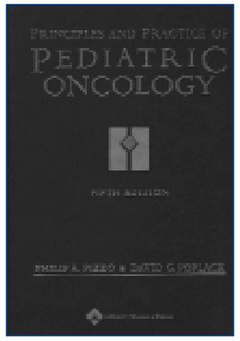
The book has a few minor shortcomings.

While appropriate for an international readership, like most textbooks written by North American authors, lists of resources and mention of health systems and legal issues pertain only to local readers. Despite this, several of the websites are useful.

Disappointingly, chapters on fertility and menopause were not included. The prospect of treatment-induced infertility has become a real concern for many women who are confronted by a cancer diagnosis prior to commencing or completing child bearing. There are increasingly sophisticated options for fertility preservation now available for women with cancer and cancer nurses need to be aware of these. The subject of menopause only rates a total of one page in the entire book. Premature menopause is a well recognised consequence of chemotherapy, pelvic radiotherapy and gynaecological cancer surgery and the experience of menopause for women with cancer is often more challenging than for other women. Furthermore, the impact of treatment induced menopause is well described in current nursing and medical literature.

I often like to source references to read further on a subject and was frustrated by the fact that the last 10 references cited in the chapter on breast cancer are missing from the reference list.

The chapter 'Body image and sexual functioning' has some sections that have been cited directly from other sources without considering that this is a book specifically about women with cancer. Consequently I found it irritating that reference was made to the necessity to offer patients sperm banking, that there was a third of a page devoted to head and neck cancer (when it is not included in the rest of the book) and that suggested assessment questions include 'Has having cancer interfered with you being a father/ husband?' and 'Has your cancer changed the way you see yourself as a man?'.



Despite these, the book is well written, well laid out and easy to read. It is a welcome edition to my personal library and I recommend it for hospital libraries, units caring predominantly for women with breast or gynaecological cancers and the nurses from those units who are prepared to pay $125 for a textbook.

Letitia Lancaster, Department of Gynaecological Oncology, Westmead Hospital, Sydney NSW

Nursing in Haematological Oncology (2nd Edition)

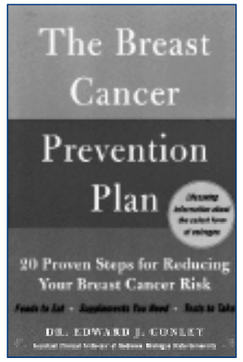
M Grundy (ed)
Bailliere Tindall (2006)
ISBN: 0-7020-2753-7
602 pages plus index
RRP: $99.00

This second edition retains its focus on both senior and junior nurses in haematological oncology. The explanations maintain a basic level for easy comprehension, but also a more in-depth discussion and dissection, which provides a useful resource for experienced nurses. The explanation in the 2000 edition of haematopoiesis was quite simplified and brief, a situation which has been rectified in the 2006 edition, making this text a useful reference point for teaching. This new volume includes a chapter on adolescents with cancer, an important inclusion that addresses some pertinent issues such as compliance, negotiation and refusal of treatment in this unique patient group.

The chapter on nausea and vomiting was reviewed by ward staff and found to be quite comprehensive although repetitive at times. Senior nurses were appreciative of having a text that was written at more intense level, however it was a little overwhelming for the junior nurses. Nevertheless, they were able to understand the explanation of causes of nausea. It was interesting that this chapter notes that nurses are the ones that drive antiemetic administration and therefore have an important role to play in the quality of the hospital experience for patients.

The first edition of Nursing in Haematological Oncology (2000) only dealt briefly with emerging treatments, whereas this edition devotes an entire chapter to immune modulators. The topic of sexuality is also included as a separate chapter from fertility. Too often these topics are bundled together and brushed over; this text identifies the separate issues, and the ability to be able to communicate with patients appropriately and supportively is a requirement reinforced in the discussion.

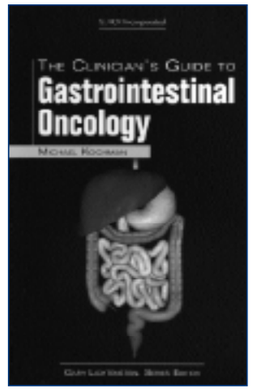
More social and psychological issues are highlighted and management strategies are brought forward in this text. It provides a comprehensive overview of not only clinical interventions and haematological diseases, but also peripheral yet important social and family issues particular to the haematology patient.



I highly recommend this text, not only as a reference for experienced haematology nurses, but as an educational tool for outpatient and ward areas. While it is written from a UK standpoint, the contents are pertinent in Australia, making it a useful text to have in a postgraduate setting. It will consolidate knowledge and answer questions, improving patient care. Hopefully it will inspire Australian nurses to publish a similar book.

Trish Harris, Haematology and Bone Marrow Transplant Unit, Royal Adelaide Hospital, SA

Oncology: An Evidence-Based Approach



AE Chang, PA Ganz, DF Hayes, T Kinsella, HI Pass (eds)
Springer-Verlag GmbH (2006)
ISBN: 0-387-24291-0
1958 pages plus index
RRP: $US179.00

As suggested by the title, this book looks at the complexity of oncology by utilising an evidence-based approach. It is a large heavy book with 113 chapters and many authors, however it is easy to read and should capture the reader's attention due to the layout and style in which it is written. The opening chapter allows the novice or more experienced clinician to gain immediate direction with a succinct introduction to the evidence-based approach to oncology.

It follows on by looking at the principles of chemotherapy, radiation, surgery and targeted/biological therapies. Each of these chapters gives an overall description of its targeted treatment modality using some great diagrams. The "Cancer imaging" chapter is a huge plus for this book as it discusses scanning with positron-emission tomography, utilising some excellent images. Other sections look at supportive care of the cancer patient, management of oncologic emergencies and acute toxicities of treatment. It also covers the cell cycle, carcinogenesis and tumour immunology. The sections on cancer survivorship, informed consent and patient decision-making are well worth a read.

Overall a great book providing comprehensive coverage of the evidenced-based approach to oncology, allowing the readers to make their own decisions. I would recommend this book to all health professionals who have an interest in oncology.

Di Saward, Nursing Education and Research Department,

Peter MacCallum Cancer Centre, Victoria

Pediatric Oncology

P Imbach, T Kuhne, R Arceci (eds)
Springer-Verlag GmbH (2006)
ISBN: 3-540-25211-8
243 pages plus index
RRP: $US99.00

Pediatric Oncology, as stated in the foreword, is "rightly viewed as a clinical and scientific subspecialty of pediatrics". This speciality is unique in many of its processes from disease presentation and diagnosis through treatment to survivorship/death. With today's internet savvy generation, their expectation for information is greater and people's understanding is sometimes skewed by the information they may find. This book provides a collection of concise information through the spectrum of paediatric oncological issues to allow both the health professional, and also some patients and families, to tailor their search for information. Its authors are involved in clinical trial groups and therefore are providing current data.

This book provides 20 chapters covering the leukaemias, myelodysplastic syndrome, myeloproliferative syndromes, the lymphomas, histiocytoses, brain tumours, neuroblastoma, nephroblastoma, the sarcomas, retinoblastoma, germ cell tumours and hepatic tumours. The chapters covering oncological emergencies, nursing care and psychological and psychosocial issues provide a more balanced view of the total care and issues facing this unique group of patients. The contents page is detailed and the chapters easy to find with each page named with its relevant chapter. Its script is in note form, making it an effective and fast reference tool. This book is a good starting point to further refine an information search of relevant in-depth texts and current journal articles.

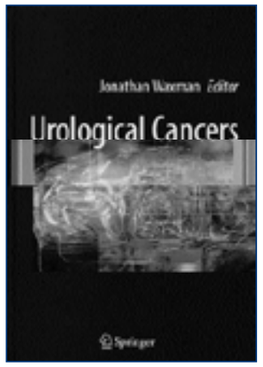
The desired audience was intended to be all people involved in the care of the paediatric oncology patient, including the patient's family (parent and sibling), however I believe its usefulness will be limited for this latter group of readers. Very well informed patients and families may find it useful, but its point form and brief statements may not provide the explanation needed, and some terminology may inhibit understanding. (It may be used to 'check' that the health team has done or explained everything they should). For all practitioners in the MDT of paediatric oncology, this book provides a concise, current and comprehensive tool for a quick review of diseases, their related pathogenesis, genetics, treatment, prognosis and complications.

Hopefully, informed staff will provide information to patients and families, which in turn will empower them to be a part of the decision-making process and help, as the book's editor hopes, "to create an atmosphere of trust, and hope".

Liz Darch, Oncology/Haematology Department, Princess Margaret Hospital for Children, Perth WA

Positron Emission Tomography: Basic Sciences

DL Bailey, DW Townsend, PE Valk, MN Maisey (eds)
Springer (2005)
ISBN: 1-8523-3798-2
382 pages
RRP: €84.95



Positron Emission Tomography: Basic Sciences is a well written book which also covers the roles of Positron Emission Tomography (PET) in clinical settings. This latest edition contains new and updated chapters first published in 2003 with the title Positron Emission Tomography: Basic Science and Clinical practice. As the application of PET expands, diagnostic accuracy has also improved, aided by the new scintillation detectors and the fusion of PET with computed tomography (CT) images. This book provides a detailed discussion of the fusion process and the role of CT for anatomical localisation and attenuation correction, which is now routinely used in a PET/CT image reporting.

What makes this book important and informative to any reader is that it is a collection of chapters written by luminaries in the field of PET. Each succinctly written chapter has extensive peer-reviewed references and the discussion/content in each chapter is up-to-date. This book may be targeted primarily at the nuclear imaging community, but the understanding of the science behind PET imaging can be important for clinicians using PET services. Appropriately in this book, there is also a brief overview of the clinical applications of PET imaging in oncology in chapter 16.

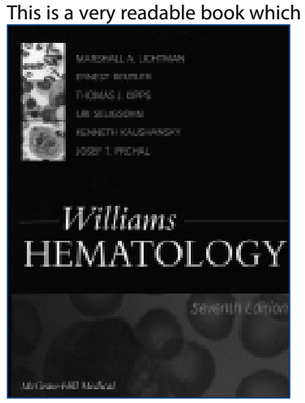
The numerous and strategically placed illustrations make even the most fundamentals of physics, instrumentation, radiochemistry and radiation dosimetry etc. easy to comprehend and thus, this book is suitable for those new and old to the field of PET. We would recommend it to any scientists and clinicians with an interest in medical imaging.

Seu Som and Peter Lin, Department of Nuclear Medicine, PET and Ultrasound, Liverpool Hospital, NSW

Practical Management of Thyroid Cancer: A Multidisciplinary Approach

EL Mazzaferri, C Harmer, UK Mallick, P Kendall-Taylor (eds)
Springer-Verlag GmbH (2006)
ISBN: 1-85233-910-1
434 pages plus index
RRP: $US149.00

This is a very readable book which covers the management of thyroid cancer in a comprehensive manner. The editors are acknowledged international leaders in the field from both sides of the Atlantic including Newcastle-upon-Tyne, Royal Marsden Hospital in London and Ohio State University. They have assembled a small but experienced team of contributors who have provided an excellent and up-to-date review of thyroid cancer.

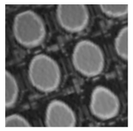


Mazeferri introduces the topic with a masterly overview of thyroid cancer, focusing on the significant increase in thyroid cancer seen around the world over the last three decades. A summary of the investigation and management of thyroid cancer is then provided.

Section 1 covers the UK multidisciplinary approach to management of thyroid cancer, with the UK evidence-based guidelines key recommendations being presented and discussed in detail. Mallick then reviews the multidisciplinary team (MDT) structure, discussing both advantages and disadvantages in relation to thyroid cancer. It must be noted that thyroid cancer is one malignancy where a multidisciplinary team approach with regular MDT meetings, albeit less formalised than the NICE recommendations, have been part of routine practice in many units in Australia for several decades, driven largely by a need for close interaction between endocrinologist, nuclear medicine physician and endocrine surgeon to achieve optimal management. Thyroid cancer and its management are then discussed from the perspective of the patient, the specialist nurse and the clinical psychologist.

The remaining sections of the book deal with specific topics in relation to the management of thyroid cancer, such as the diagnosis of thyroid cancer, surgical and non-surgical management and follow-up. The section on initial surgery is particularly well-written with an up-to-date overview of contro-versial areas, for example Watkinson strongly supports routine central lymph node (Level VI) dissection as part of initial surgery for the N0 neck in papillary thyroid cancer. The following sections deal with a range of other interesting topics, such as thyroid cancer in children, aggressive thyroid cancer, rare thyroid cancers and a very useful section dealing specifically with the issues related to incidental papillary micro carcinoma, providing a balanced viewpoint between the two extreme goals of eliminating all disease and reducing the likelihood of recurrence to a minimum, versus keeping intervention to a minimum whilst accepting some degree of risk of intervention. The final section provides an overview of future developments and directions for research.

Overall the book provides an invaluable practical resource for clinicians and all other team members involved in the



CALENDAR OF MEETINGS

Australia and New Zealand

Date	Name of Meeting	Place	Secretariat
2006			
November			
29 Nov – 1 Dec	33rd Clinical Oncological Society of Australia Annual Scientific Meeting	Melbourne VIC	ASN Events Tel: +61 3 9863 7867 Web: www.cosa.org.au Email: congress@asnevents.net.au
2007			
May			
13-16	Australasian College of Dermatologists 40th Annual Scientific Meeting	Adelaide SA	Australasian College of Dermatologists PO Box 2065 Boronia Park NSW 2111 Australia Tel: 1300 361 821 (Australia only) or +61 (02) 8765 0242 Fax: +61 (02) 9736 2194 Email: admin@dermcoll.asn.au Web: www.dermcoll.asn.au
August			
1-5	Medical Oncology Group Australia Annual Scientific Meeting	Melbourne VIC	MOGA Conference Secretariat c/o Pharmaevents PO Box 265, Annandale NSW 2038 Tel +61 2 9280 0577 Fax + 61 2 9280 0533 Email: moga@pharmaevents.com.au Web: www.moga.org.au
28-31	9th Australian Palliative Care Conference	Melbourne VIC	APCC 07 Conference Secretariat C/- ICE Australia P/L 6 Clarendon Place, South Melbourne VIC 3205 Tel: +61 3 9681 6288 Fax: +61 3 9681 6653 Email:apcc@iceaustralia.com Web: www.pallcare.org.au/Default.aspx?tabid=309
October			
1-7	RANZCR 58th Annual Scientific Meeting	Melbourne VIC	Royal Australian and New Zealand College of Radiologists (RANZCR) Level 9, 51 Druitt Street, SYDNEY NSW 2000 Tel: +61-2-9268 9777 Fax: +61-2-9268 9799 Web: www.ranzcr.edu.au
November			
14-16	34th Clinical Oncological Society of Australia Annual Scientific Meeting	Adelaide SA	Pharma Events Ph: +61 2 9280 0577 Fax: +61 2 9280 0533 Email: cosa@pharmaevents.com.au

International

Date	Name of Meeting	Place	Secretariat
2006			
November			
Oct 29 – Nov 2	1st International Congress on Childhood Cancer (ICCC 2006)	Tehran Iran	Cancer Institute Research Center MAHAK Childhood Cancer Hospital Oshon BLVD, Darabad Tehran, I. R. of Iran 19575-566 Tehran c/o Alireza Mosavi-jarrahi Tel: +98 21 22481010 Fax: +98 21 22481011 E-mail: rmosavi@yahoo.com Web: www.crc.tums.ac.ir/En/home.asp
2-4	4th French Brazilian Cancer Congress	Rio de Janeiro Brazil	Sociedade Fraco-Brasileria de Oncologia Rio de Janeiro, Brazil Tel: +55 24 224 42005 Fax: +55 24 222 12156 Email: dracarlaismael@terra.com.br Web: www.oncologiarfrancobrasileria.com
2-4	7th Meeting of the International Society of Geriatric Oncology (SIOG)	The Hague Netherlands	SIOG - International Society of Geriatric Oncology - by TRM T. Romanyk Gevers Deynootweg 62 2586BN The Hague Tel: +31 70 3318444 Fax: +31 70 3318442 Email: tatjana.romanyk@trm-oncology.com Web: www.cancerworld.org/siog/
5-8	3rd Asian Pacific Organization for Cancer Prevention (APOCP) General Assembly Conference: "Empowering Cancer Prevention in the Asia Pacific"	Bangkok Thailand	3rd Asian Pacific Organization for Cancer Prevention (APOCP) Nagoya, Japan Tel: +66 1 809 7664 Fax: +66 2 955 9986 Email: ktajima@aichi-cc.jp Web: www.apocp.org
5-9	48th American Society for Therapeutic Radiology and Oncology (ASTRO) Annual Meeting	Philadelphia United States	American Society for Therapeutic Radiology and Oncology (ASTRO) Fairfax, Virginia, United States Tel:+ 1 703 227 0170/502 1550 Fax: +1 703 502 7852 Email: meetings@astro.org Web: www.astro.org/
5-10	XVIII FIGO World Congress of Gynecology and Obstetrics	Kuala Lumpur Malaysia	AOS Conventions and Events Sdn Bhd Kuala Lumpur, Malaysia Tel: +60 3 4252 9100 Fax: +60 3 4257 1133 Email: consec@figo2006kl.com Web: www.figo2006kl.com
7-10	18th EORTC-NCI-AARC Symposium on Molecular Targets and Cancer Therapeutics	Prague Czech Republic	Federation of European Cancer Societies (FECS) Brussels, Belgium Tel: +32 2 775 0201 Fax: +32 2 775 0200 Email: ENA2006@fecs.be Web: www.fecs.be
7-10	3rd Asia-Pacific UICC Reach to Recovery International (RRI) Breast CAANCER Support Conference	Mumbai India	3rd Asia-Pacific UICC Reach to Recovery International (RRI) Breast CAANCER Support Conference Mumbai, India Tel: +91 22 24449808 Fax: +91 22 244 49808 Email: vimalk_9@rediffmail.com Web: www.jagruti.org.in
9-10	Satellite Meeting "Modeling for Detection of Environmental	Chiang Mai Thailand	Asia Pacific Organization for Cancer Prevention (APOCP)

Date	Name of Meeting	Place	Secretariat
	Carcinogens and Modifying Agents in the Asian Pacific"		Division of Epidemiology and Prevention, Aichi Cancer Center, Research Institute 1-1 Kanokoden, Chikusa-ku 467-86 Nagoya Tel: +66 1 809 7664 Fax: +66 2 955 9986 Email: ktajima@aichi-cc.jp Web: www.apocp.org/
9-11	2006 ONS Nurse Practitioner Conference	Pittsburgh United States	Oncology Nursing Society (ONS) 125 Enterprise Drive 15275- Pittsburgh, Pennsylvania, USA Tel: +1 866 257 4667 /+1 412 859 6100 Fax: +1 877 369 5497 /+1 412 859 6162 Email: customer.service@ons.org Web: www.ons.org/
10-12	ONS 2006 Institutes of Learning	Pittsburgh United States	Oncology Nursing Society (ONS) 125 Enterprise Drive 15275- Pittsburgh, Pennsylvania, USA Tel: +1 866 257 4667 /+1 412 859 6100 Fax: +1 877 369 5497 /+1 412 859 6162 Email: customer.service@ons.org Web: www.ons.org/
13 - 15	International Conference on Quality Assurance and New Techniques in Radiation Medicine	Vienna Austria	IAEA - International Atomic Energy Agency Ms. R. Perricos, Conference Services Section Wagramer Strasse 5 P.O. Box 100, 1400 Vienna Tel: 43 1 2600 21315 Fax: 43 1 2600 7 E-mail: r.perricos@iaea.org Web: www.pub.iaea.org/MTCD/Meetings/ Announcements.asp?ConfID=146
16 - 18	Cancer and Pregnancy	Orta S. Giulio Italy	European School of Oncology Daniela Mengato - Francesca Marangoni Viale Beatrice d'Este, 37 20122 Milano Tel: 39 02 8546 451 Fax: 39 02 8546 4545 E-mail: conferences@esoncology.org Web: www.cancerworld.org/home.asp
17 - 18	3rd Multidisciplinary Educational Oncology Symposium: Multidisciplinary Approach to Gynaecological Cancers	Johannesburg South Africa	European School of Oncology (James dir.) Yvonne Pyne James Tel: 27 11 463 4064 Fax: 27 11 1041 E-mail: rsvp@yebo.co.za
21-22	Cancer World Conference on Improving Cancer Services	Brussels Belgium	European School of Oncology Mariarita Cassese Viale Beatrice d'Este 37, 20122 Milan Tel: +0039 02 8546 4522 Fax: +0039 02 8546 4545 Email: mcassese@esoncology.org Web: www.cancerworld.org/
24 - 26	11th International Conference: Issues on Tissues	Mumbai India	Asia Pacific Association of Surgical Tissue Banks Tata Memorial Hospital Dr. E Borges Road Parel, 400 012 Mumbai Tel: 91 222 417 7000 Fax: 91 222 414 697 E-mail: info@tmcmail.org Web: www.tatamemorialcentre.com/ newsnevents/apastb.htm
26 Nov – 1 Dec	92nd RSNA Scientific Assembly and Annual Meeting	Chicago United States	Radiological Society of North America (RSNA) 820 Jorie Blvd 60521 Oak Brook Tel: +1 630 571 7879 Fax: +1 630 571 7837 E-mail: reginfo@rsna.org or sdrew@rsna.org Web: www.rsna.org/
27 - 28	BASO-ACS Scientific Conference	London United Kingdom	The Association for Cancer Surgery (BASO) BASO c/o The Royal College of Surgeons of England

Date	Name of Meeting	Place	Secretariat
			35-43 Lincoln's Inn Fields, WC2A3PE London Tel: 02 07 405 5612 Fax: 02 07 404 6574 E-mail: admin@baso.org.uk Web: www.baso.org.uk/content/conference.html
30 Nov – 2 Dec	13th Congress of the European Society of Surgical Oncology (ESSO 2006)	Venice Italy	ESSO 2006 Conference secretariat – Federation of European Cancer Societies (FECS) Brussels, Belgium Tel: +32 2 775 0205 Fax: +32 2 775 0200 Email: ESSO2006@fecs.be Web: www.fecs.be/emc.asp?pageId=719&Type=P

Date	Name of Meeting	Place	Secretariat
December			
7 - 10	1st African Conference on Tobacco or Health	Casablanca Morocco	Moroccan Association for Prevention & Health Education (AMAPES STOP TABAC) Mohamed Bartal 39 Rue de l\'Epi, 20050 Casablanca Fax: 212 2 229 6850 E-mail: bartalmoh@menara.ma Web: www.acthmorocco.org/
9 - 12	The American Society of Hematology 48th Annual Meeting and Exposition	Florida United States	American Society of Haematology - ASH 1900 M Street, NW Suite 200 20036- Washington DC Tel: +1 202 857 1118 Fax: +1 202 857 1164 Email: ash@hematology.org Web: www.hematology.org/meetings/2005/index.cfm
9 - 13	American Society for Cell Biology (ASCB) 46th Annual Meeting	San Diego United States	American Society for Cell Biology 8120 Woodmont Avenue Suite 750 20814- Bethesda, MD Tel: +1 301 347 9300 Fax: +1 301 347 9310 E-mail: ascbinfo@ascb.org Web: www.ascb.org/meetings/am2005/index.html
10-14	VI International Meeting on Cancer Induced Bone Disease	Texas United States	The Cancer and Bone Society Conference Secretariat 2025 M Street, NW, Suite 800 20036 Washington Tel: +1 202 367-1138 Fax: +1 202 367-2138 Email: info@cancerandbonesociety.org Web: www.cancerandbonesociety.org/
2007			
January			
9 - 13	6th Annual Meeting of the Israel Society for Clinical Oncology & Radiation Therapy (ISCORT)	Eilat Israel	Israeli Society for Clinical Oncology & Radiation Therapy (ISCORT) A.M. Knasim 3 Zabotinsky St, Ramat-Gan Tel: +972 3 613 4942/3 Fax: +972 3 613 4941 E-mail: knasim@biggerinvestments.com Web: www.iscort.org.il/
February			
14-17	Annual Assembly of The American Academy of Hospice and Palliative Medicine (AAHPM) and The Hospice and Palliative Nurses Association (HPNA)	Salt Lake City United States	American Academy of Hospice and Palliative Medicine 4700 W. Lake Avenue, Glenview, IL 60025-1485 Tel: 847/375-4712 Fax: 877/734-8671 E-mail: info@aahpm.org
March			
1 - 3	American Psychosocial Oncology Society (APOS) 4th Annual Conference	Texas United States	American Psychosocial Oncology Society Ms. Alison Holcomb 2365 Hunters Way, 22911 Charlottesville Tel: +1 434 293 5350 Fax: +1 434 977 0899 E-mail: aball@apos-society.org Web: www.apos-society.org
1 - 4	The International Network For Cancer Treatment and Research (INCTR) 7th Annual Meeting	Sao Paulo Brazil	Institut Pasteur Cedric Petit-Musin, Meeting Coordinator Rue Engeland 642, B-1180 Brussels Tel: 32 2 373 9314 Fax: 32 2 373 9313 E-mail: cedric@inctr.be Web: www.inctr.org
14 - 17	Primary Therapy of Early Breast Cancer, 10th International Conference	St. Gallen Switzerland	Ms. Beatrice Nair St. Gallen Oncology Conferences Rorschacherstr. 150, POB 9006 St. Gallen

CALENDAR OF MEETINGS

Date	Name of Meeting	Place	Secretariat
			Tel: +41 71 243 0032
			Fax: +41 71 245 6805
			E-mail: info@oncoconferences.ch
			Web: www.oncoconferences.ch

THE CANCER COUNCIL AUSTRALIA

The Cancer Council Australia is the peak national cancer control organisation.
Its members are the leading state and territory cancer councils, working together to undertake and fund cancer research, prevent and control cancer and provide information and support for people affected by cancer.

MEMBERS
The Cancer Council ACT
The Cancer Council New South Wales
The Cancer Council Northern Territory
The Cancer Council South Australia
The Cancer Council Tasmania
The Cancer Council Victoria
The Cancer Council Western Australia
Queensland Cancer Fund

AFFILIATED ORGANISATIONS
Australasian Association of Cancer Registries
Clinical Oncological Society of Australia Inc
Palliative Care Australia

CEO
Professor I Olver MD, PhD, CMin, FRACP, FAChPM, MRACMA

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Mr C Deverall AM
Dr J Dunn
Professor C Gaston
Dr S Hart FRACS
Professor D Hill AM, PhD
Professor W McCarthy AM, MBBS, FRACS
Dr A Penman
Assoc Professor S Smiles RN, RM, ICC, BHA, GradDipPSEM
Dr K White PhD

CLINICAL ONCOLOGICAL SOCIETY OF AUSTRALIA INC

The Clinical Oncological Society of Australia (COSA) is a multidisciplinary society for health professionals working in cancer research or the treatment, rehabilitation or palliation of cancer patients.

It conducts an annual scientific meeting, seminars and educational activities related to current cancer issues. COSA is affiliated with The Cancer Council Australia.

EXECUTIVE COMMITTEE
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Professor D Goldstein MBBS, FRACP

President Elect
Vacant

Executive Officer
Ms M McJannett

Council Nominees
Ms K Cameron RN, OncCert, GrDipN, MNSc
Professor B Stewart MSc, PhD, FRACI, Dip Law
Ms A Woollett

MEMBERSHIP

Further information about COSA and membership applications are available from:
www.cosa.org.au or cosa@cancer.org.au

Membership fees for 2006

Ordinary Members: $160
Associate Members: $100
(includes GST)

INTEREST GROUPS

ANZ Children's Haematology and Oncology
Breast Oncology
Cancer Nurses Society of Australia
Cancer Research
Clinical Research Professionals
Epidemiological
Familial Cancer
Gastrointestinal Oncology
Gynaecological Oncology
Lung Oncology
Medical Oncology
Melanoma and Skin
Neuro-oncology
Palliative Care
Pharmacy
Psycho-Oncology
Radiation Oncology
Regional and Rural Oncology
Social Workers
Surgical Oncology
Urological Oncology