

A Prospective Audit of Inpatient Medical Oncology Consultation Patterns in a Tertiary Teaching Hospital in South Australia

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Abstract: *Objectives:* Given the expanding role of medical oncology practice, with increasing therapeutic options for those with advanced malignancy, we sought to document the population of patients receiving inpatient medical oncology consultation. The aim of the study was to document patterns of inpatient referral to medical oncology in order to better understand service needs. We looked to define the relative frequency of cancer types, stage and treatment recommendations.

Design: A large prospective clinical audit was undertaken between January 2005 and January 2007.

Settings: The audit was conducted at the Royal Adelaide Hospital, a major tertiary referral hospital.

Participants: During the two year study period 1,173 consecutive inpatient referrals for medical oncology consultations were included in this analysis.

Main Outcome Measures: Information was collected regarding patient demographics, referral unit, cancer diagnosis and stage, treatment recommendations and follow-up plans.

Results: The most common referral units were General Medicine (19.8%) and Thoracic medicine (15%). The most common primary sites of cancer were lung (22.6%), colorectal (14.9%), primary brain tumours (9.6%) and head and neck (9.3%). The clear majority of patients had Stage 4 disease (80%) and were thus incurable in most cases. Chemotherapy was recommended in 43.7% of patients, chemo-radiation in 12.6% of patients, radiotherapy alone in 16.9% of patients and best supportive care in 24.1% of patients.

Conclusions: This large prospective clinical audit defines the population of patients referred for inpatient medical oncology consultation at our tertiary hospital. Cancer patients are being cared for by a wide variety of non-cancer specialists. The majority of patients have advanced, non-curable disease but anticancer therapy is provided to most with the intention of prolonging survival and maintaining quality of life.

Keywords: Inpatient consultations, medical oncology, cancer treatment, chemotherapy, hospital consultation.

INTRODUCTION

Patients are traditionally referred to medical oncology services either from the OPD or from other inpatient services. Drivers of inpatient referrals have not been well documented. We sought to review inpatient medical oncology referrals as a first step to better understand service needs. Little is known about types of cancers referred, peaks and troughs in referral numbers, relationships to multi-disciplinary meetings and treatment rates of referred patients.

Care for patients with cancer begins with a timely and accurate diagnosis. Significant proportions of patients with cancer present for the first time to an inpatient setting and require diagnosis and referral to appropriate care as not all patients are suitable for anti-

cancer treatment, with options including palliative care, surgery, systemic treatment or radiotherapy. This is particularly the case for patients with intracranial malignancies where an invasive procedure is required for diagnosis, necessitating an inpatient admission. Medical and surgical specialty units largely manage this early phase of the cancer patient's care, prior to referral to an oncology unit. Changing patterns of referral have an impact on medical oncology units with regard to staffing, budgets and duty rosters. As new treatment options are become available, so more patients can/should be referred. While many patients are first seen in an outpatient setting, inpatient consultation makes up a significant proportion of the workload of hospital based oncology units [1].

This makes it imperative that we understand our referral patterns for proper service planning.

The practice of medical oncology has changed dramatically over recent years. The use of new

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targeted therapies, better survival in advanced malignancy and the evolution of a true multidisciplinary approach to cancer care necessitates a unified system of monitoring both activity and outcomes of treatment [2]. It is in this context we have sought to document, *via* prospective audit, inpatient oncology referral patterns in a tertiary hospital.

Prior studies of medical oncology referrals have identified a perceived lack of therapeutic options as a common barrier to oncology referral. In the current climate of rapidly expanding clinical trial data and emerging new therapies, cancer patients deserve to have their options fully investigated and explained through referral to an oncology service [3]. Prior studies focusing on oncology inpatient consultation patterns have emphasised significant delays in cancer diagnosis due to delay in obtaining diagnostic biopsies and circuitous diagnostic work-up [1, 4]. These studies also noted oncology consultations were rarely required to assist with diagnosis, with over ninety percent of cases referred for management advice.

Non-oncology services have published audits of inpatient referral patterns to enable better understanding of patient and disease patterns with a view to introducing improved evidence-based practices, education of other specialist services and adequate resource provision [5-7].

The Medical Oncology Department at The Royal Adelaide Hospital (RAH), a tertiary care public hospital, admits patients with established cancer receiving systemic therapy under their care. Therefore requests for inpatient consultation by other units within the hospital usually involve new diagnoses of cancer. Patients with undefined medical illnesses are admitted under the care of a large general medicine unit, while patients with specific medical or surgical problems are admitted under the care of specialist medical or surgical units. Consultations are initially seen by a registrar and then jointly with a consultant oncologist. Hospital policy requires all consultations to be seen by the registrar within 24 hours and by a consultant within 48 hours.

METHODS

This prospective audit was undertaken at the Royal Adelaide Hospital for all inpatient consultations undertaken between January 2005 and January 2007.

All consultations during that period were logged in a database, which included patient demographics,

referral date, referring unit, cancer diagnosis and stage, treatment recommendations and follow-up plans.

The study population included patients admitted at the Royal Adelaide Hospital, who were undergoing tests and diagnostic procedures to confirm and categorize the diagnosis of cancer. Information was gathered from patient case notes, hospital electronic databases, referral notes and discussion with patients and their families. The variables included patient demographics, diagnosis, referral teams, time-lapse patterns and outcomes of consultations. All data was de-identified and logged on an Excel spread sheet and analysed. The Human Research Ethics Committee at the Royal Adelaide Hospital granted permission for the study.

RESULTS

During the 24-month audit period, 1,173 inpatient consultations were received, which comprised 433 (36.9%) female and 740 (63.1%) male patients with an age range from 20 to 101 years.

Total patients	Male	Female
1173	740 (63.1%)	433 (36.9%)

Age Range

Youngest	20
Oldest	101

Stage of Illness

II	44	3.8%
III	185	15.8%
IV	938	80%
Unknown	6	0.5%

Treatment Plan

Chemotherapy	513	43.7%
Chemo-radiation	148	12.6%
No chemotherapy	481	41.0%
Hormones alone	31	2.64%

The most common referral units were General Medicine (19.8%) and Thoracic Medicine (15.0%) (Figure 1). Overall surgical units were responsible for 55.2% of referrals compared to medical units (44.8%).

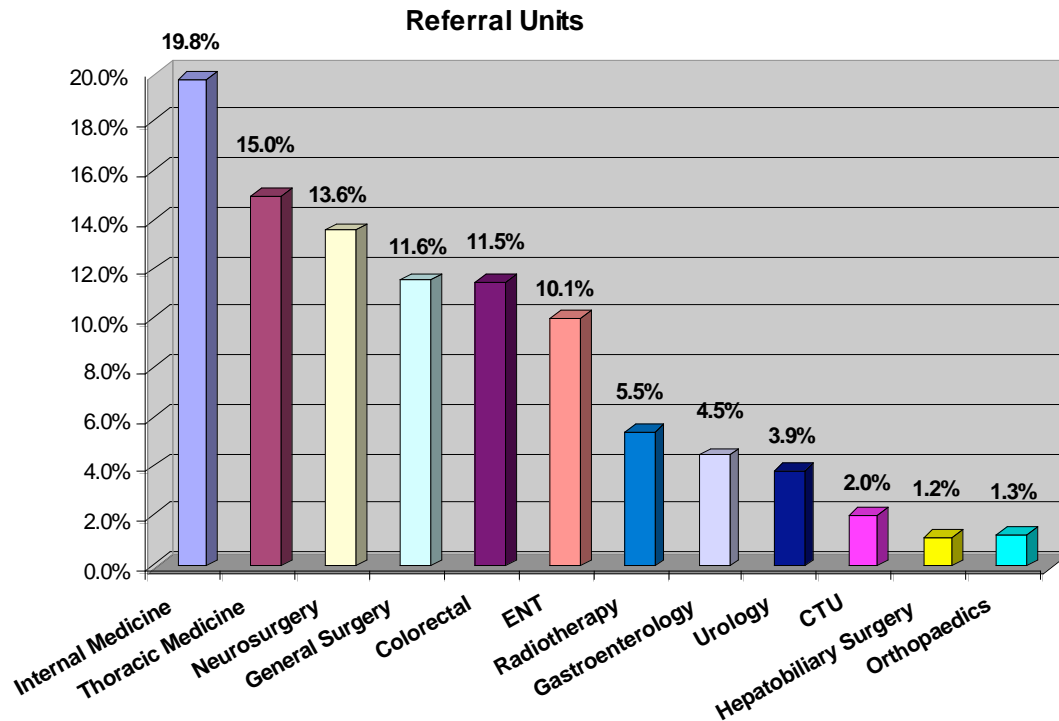


Figure 1: Referral units requesting inpatient oncology consultation.

The most common primary sites of cancer were lung (22.6%), colorectal (14.7%), primary brain neoplasms (9.6%) and head and neck cancer (9.3%). As a group, upper gastrointestinal cancers (oesophageal, gastric, hepatobiliary, pancreatic and duodenal) comprised (11.9%) of primary cancers. No primary site of cancer was determined in 9.5% of cases (Figure 2).

A majority of the patients were found to have Stage 4 disease (80%) and were thus incurable in most cases (Figure 3). Two patients (0.2%) had testicular germ cell tumours while 52 patients (4.4%) had lymphoma, diseases which remain curative with systemic therapy despite advanced stage.

Two outcome measures were recorded in the patient population: planned anticancer treatment and

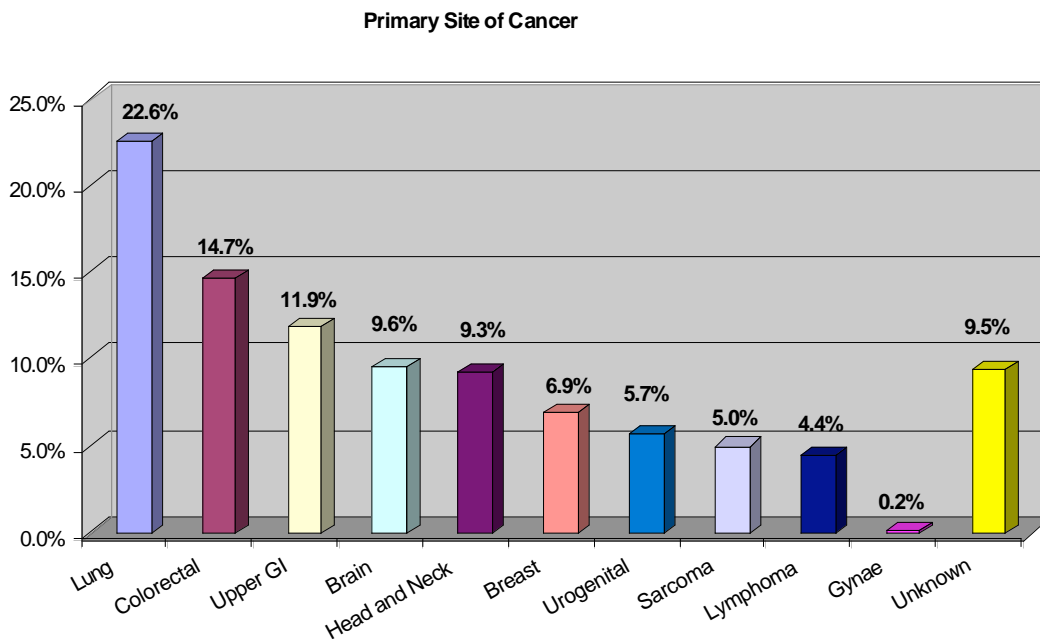


Figure 2: Primary site of cancer.

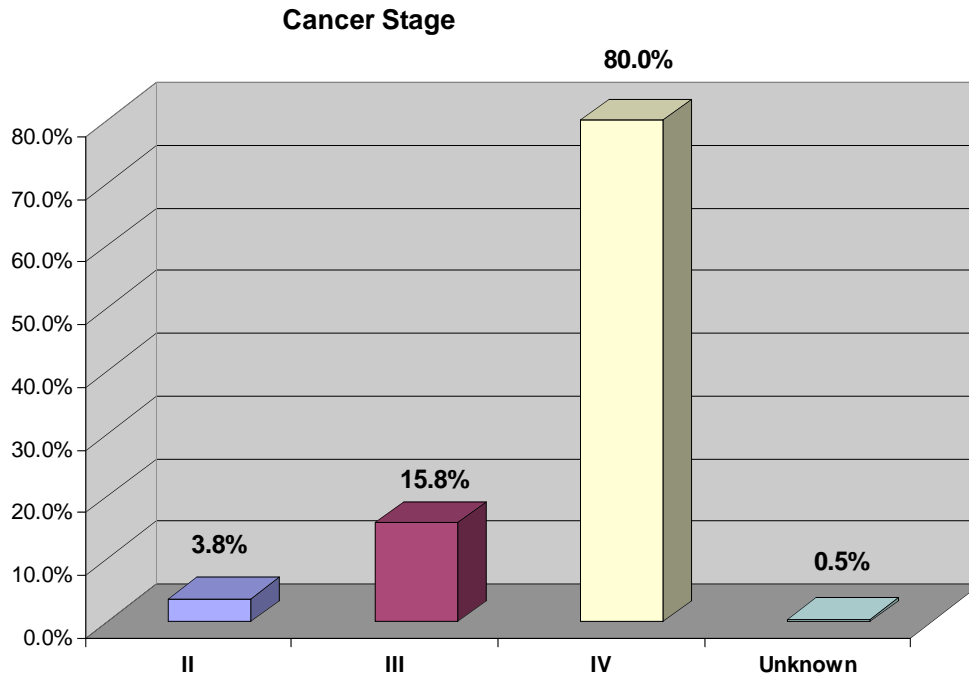


Figure 3: Stage of cancer in inpatient consultation population.

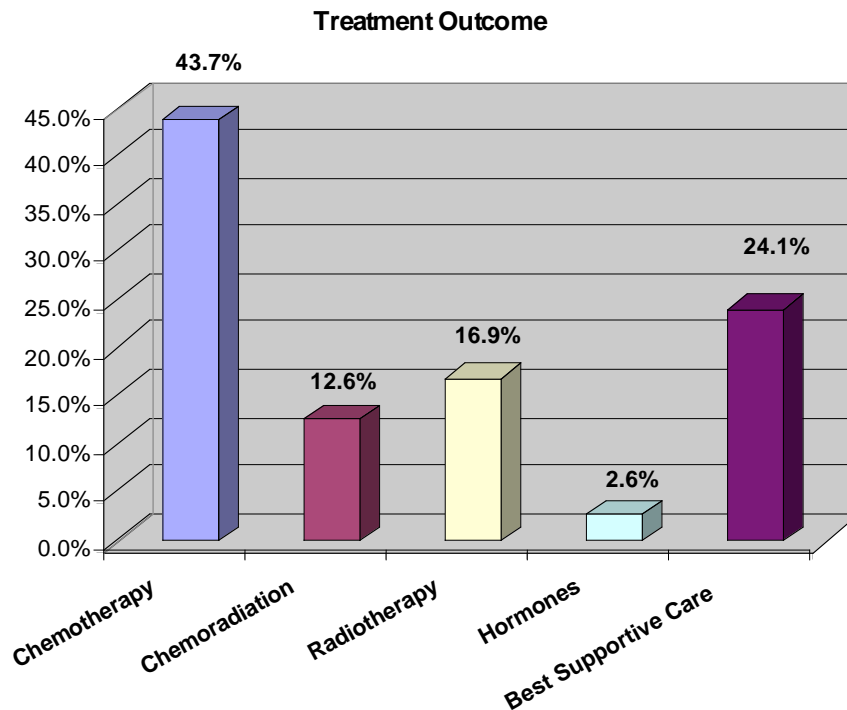


Figure 4: Outcome by planned cancer treatment.

follow-up arrangements. Chemotherapy alone was recommended in 43.7% of patients, chemo-radiation in 12.6% of patients and endocrine therapy in 2.6% (Figure 4). Patients receiving radiotherapy alone accounted for 16.9% of consultations though it is possible other such patients were not referred for medical oncology opinion and thus not captured in this

audit. Best supportive care was recommended to 24.1% of patients.

The most common follow-up arrangement was through the Medical Oncology Unit, with 25% of patients transferred to the oncology ward during the same inpatient stay, while 35.8% were seen in the oncology outpatient clinic. 21.8% of patients were

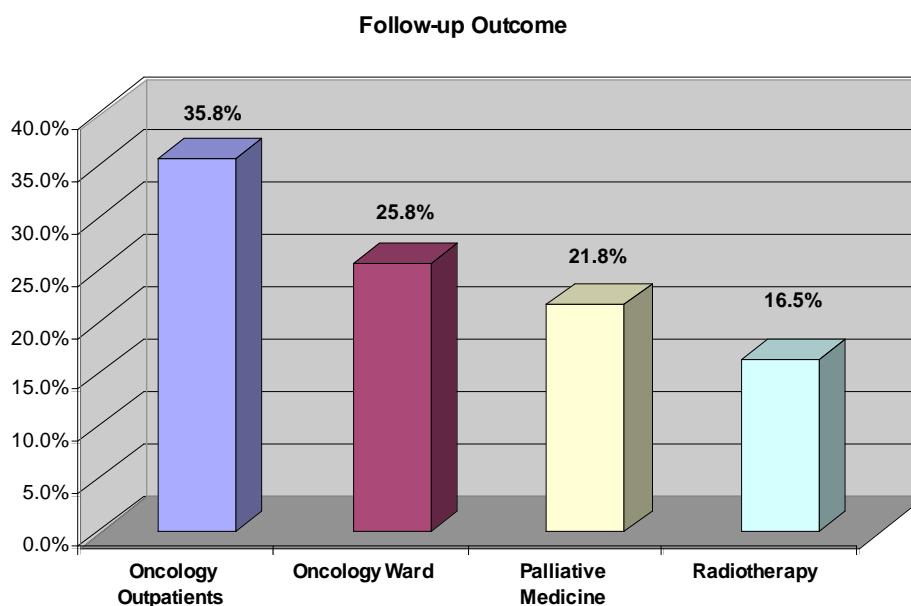


Figure 5: Outcome by follow-up plans.

followed up by the palliative care unit for symptom management (Figure 5).

DISCUSSION

This large prospective clinical audit defines the population of patients, which make up inpatient medical oncology consultation in this tertiary referral hospital. Patients with cancer are being cared for by a wide variety of non-cancer specialists for either diagnostic investigations or management of coexisting problems. Furthermore inpatient consultation by a medical oncology unit is common and results in the provision of specialised anticancer therapies to most patients despite their advanced disease.

There is a disparity in treating patients with regard to demographics, fitness level, co-morbidity patterns and percentage of early stage cancers between the public and private sectors.

The clear majority of patients (80%) had stage IV cancer and were thus incurable. As described earlier a small group of patients with stage IV solid organ malignancies remain potentially curable; those with germ-cell tumours and those with lymphoma (representing 0.2% and 4.4% of patients respectively). The intent of systemic therapy in the majority therefore is palliative where prolonging survival, improving or maintaining quality of life and ensuring minimal toxicity are essential goals of treatment. With 75% of patients recommended some form of anti-cancer therapy we demonstrate the impact of increasing therapeutic options now available in advanced malignancy where

survival advantage and symptom benefit have been demonstrated in clinical trials. This further emphasises the importance of avoiding therapeutic nihilism and seeking oncology consultation for all patients with newly diagnosed malignancy.

The past decade has seen huge strides in cancer care and survival benefits in various cancer types including breast, lung, prostate and colo-rectal cancers.

A further important reason for seeking inpatient oncology consultation, other than provision of systemic therapy, is in guiding and rationalising the clinical work-up of those with a clinical or radiological diagnosis of malignancy. This recommendation challenges the often perceived and perpetuated need for histopathological diagnosis prior to obtaining an inpatient oncology consultation. Early consultation prior to definitive diagnosis has the benefit of identifying those patients for whom systemic therapy will be of no clinical benefit. Those with very limited prognosis or for whom comorbid conditions would preclude systemic therapy can often be identified early in their inpatient stay. In these cases early medical oncology consultation allows further investigations to be rationalised. This model of care is supported by international guidelines and has the benefit of optimising palliation and significant economic savings in avoiding futile investigations [8]. The number of consultations requested prior to definitive diagnosis is not available in this audit, but it is noteworthy that only one of 1,173 patients did not ultimately have their malignancy confirmed pathologically. This suggests the practice of

rationalising and avoiding futile invasive diagnostic procedures was not implemented during this audit period, at least by means of early medical oncology consultation.

There are significant differences between this inpatient population and that seen regularly in the outpatient unit or which might be expected on epidemiological grounds. The primary site of cancer in this population differs significantly from the population incidence. Lung and colorectal primary cancers were the most common tumour types in our audit reflecting their high incidence in the population. Primary brain malignancies were overrepresented (9.6%) reflecting the need for such patients to obtain inpatient biopsy and that the RAH is the main neurosurgical referral centre in the region. Breast (6.91%) and prostate (2.47%) cancers while two of the most common cancers in the population were underrepresented due to their diagnosis and management largely restricted to the outpatient setting.

The other significant change to oncology practise in recent years is the increasing use of multi-disciplinary meetings where surgical, radiotherapy, medical oncology, palliative medicine, radiology, pathology and allied health specialists are able to review new cases of malignancy and referrals to relevant services can be sought. As the sophistication of multi-disciplinary meetings further expands it is likely the role of inpatient medical oncology consultation will diminish. Referral of new cases of malignancy directly to relevant multi-disciplinary meetings is likely to expedite service provision and better identify treatment priorities. It is the author's intention to undertake a further audit of inpatient consultation to identify changes of this service in our institution over time.

This audit demonstrates the significant workload attributable to inpatient consultation and is being used

to guide resource allocation within the medical oncology unit. Inpatient referral is commonly the first contact a cancer patient has with an oncology service and as we have demonstrated most patients are faced with incurable malignancy. Significant time is required to address symptoms, explain investigation results and management options and explore psychosocial concerns. Inpatient oncology consultation also provides the valuable service of education to non-cancer services fostering the multidisciplinary approach required to manage the complex needs of this group of patients. This area of health care needs ongoing research to document changing referral patterns, which is vital on better planning, care and service delivery.

REFERENCES

- [1] Lim E, Rosenthal M A. Diagnosing cancer: changing patterns of care. *Internal Medicine Journal* 2007; 37: 124-6. <http://dx.doi.org/10.1111/j.1445-5994.2007.01246.x>
- [2] Richards MA, Parrott JC. Tertiary cancer services in Britain: benchmarking study of activity and facilities at 12 specialist centres. *British Medical Journal* 1996; 313(7053): 347-9. <http://dx.doi.org/10.1136/bmj.313.7053.347>
- [3] Neugut AI, Grann VR. Referral to Medical Oncology: Are there Barriers at the Gate? *Journal of Clinical Oncology* 2002; 20(7): 1716-1718.
- [4] Farag SS, Green MD, Morstyn G, Sheridan WP, Fox RM. Delay in internists in obtaining diagnostic biopsies in patients with suspected cancer. *Ann Intern Med* 1992; 116: 473-8. <http://dx.doi.org/10.7326/0003-4819-116-6-473>
- [5] Lyne J, Hill M, Burke P, Ryan M. Audit of an inpatient liaison psychiatry consultation service. *International Journal of Health Care Quality Assurance* 2009; 22(3): 278-88. <http://dx.doi.org/10.1108/09526860910953548>
- [6] Ahmad K, Ramsay B. Analysis of inpatient dermatologic referrals; insight into educational needs of trainee doctors. *Irish Medical Journal* 2009; 178(1): 69-71. <http://dx.doi.org/10.1007/s11845-008-0251-y>
- [7] Devasagayam D, Clarke D. Changes to inpatient consultation-liaison psychiatry service delivery over a 7-year period. *Australasian Psychiatry* 2008; 16(6): 418-22. <http://dx.doi.org/10.1080/10398560802074676>
- [8] Diagnosis and Management of Metastatic Malignant Disease of Unknown Primary Origin. National Institute for Health and Clinical Excellence (NICE) Clinical Guidelines, UK. July 2010.