**Decisions for lung cancer chemotherapy: the influence of physician and patient factors**

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**Abstract**

**Purpose:** To review the literature examining how the beliefs and behaviors of physicians and patients influence clinical communication, doctor-patient interaction and treatment decisions for lung cancer treatment.

**Methods:** Literature was obtained via electronic database searches and hand searching of journals from 1990 - 2011.

**Results:** Wide variability in perceptions of the value of chemotherapy in lung cancer is present among both physicians and patients. There is a mismatch in the degree patients and physicians weigh survival, such that patients value survival benefits highly whilst physicians strongly emphasize toxicity and associated symptoms. This lack of congruence between patients and clinicians is influenced by a range of factors and has implications for treatment decisions, long-term survival and quality of life in people affected by lung cancer.

**Conclusion**: The divergence of treatment priorities indicates a need for improved communication strategies addressing the needs and concerns of both patients and clinicians. Patients should understand the benefits and risks of treatment options while clinicians can gain a greater awareness of factors influencing patients' decisions on treatments. Reflecting these perspectives and patient preferences for lung cancer treatment in clinical guidelines may improve clinician awareness.



**Key words:** lung cancer, chemotherapy, decision-making, patient preference

## Introduction

Lung cancer is a common, costly and deadly disease [1, 2]. Lung cancer has a poor prognosis predominately due to advanced stage of disease at presentation and associated co-morbidities [3, 4]. Current evidence and clinical guidelines recommend chemotherapy for all stages of lung cancer, however in practice, the prescription of chemotherapy for lung cancer patients remains inconsistent and varies significantly both nationally and internationally [5-7]. Weighing the risks and benefits of therapy in lung cancer is an important consideration in developing the goals of care [2, 8]. Understanding the views of physicians involved in the diagnosis and management of lung cancer and how these perspectives manifest in clinical decision making is important in addressing barriers to lung cancer treatment and the mismatch between current evidence and clinical practice in chemotherapy uptake.

Recommendations for lung cancer therapy are based on a combination of the estimated prognosis, evidence derived from clinical trials, co-morbid conditions present, and the perceived impact of recommended therapy on survival [9]. Internationally, studies have found significant local variation in clinical practice and uptake of chemotherapy in lung cancer [5-7, 10, 11]. Treatment variations and under-utilisation of chemotherapy suggests there is a need to better understand the factors involved in decisions regarding the use of chemotherapy for lung cancer patients. Clinical decision making is a complex, multifaceted process and requires consideration of both physician and patient factors. Evidence of treatment variation suggests that physician perceptions, knowledge and treatment recommendations have an important impact on treatment choice [5]. Patient

factors also need to be investigated in order to inform physicians on communication strategies and improve clinician awareness. This is particularly important with for patients with lung cancer  because of high rates of morbidity and mortality.[12]

## Purpose

To review the literature examining how the beliefs and behaviors of physicians and patients influence clinical communication, doctor-patient interaction and treatment decisions for lung cancer treatment.

## Methods

Articles were searched via Medline, PsycInfo, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Embase and Google Scholar for the period of January 1990 – February 2011 using the search terms ‘lung cancer’, ‘decision making’, ‘chemotherapy’, ‘patient preferences’ and ‘physician preferences’. Synonyms for the word ‘preference’ were used such as ‘opinion’ and ‘perception.’ Reference lists of obtained articles were also hand-searched. Studies were included if they examined preferences for and perceptions of chemotherapy by both patients and clinicians. Studies that explored both small cell lung cancer (SCLC) and non-small lung cancer (NSCLC) at all stages were reviewed. Only articles reporting in English were included in the review, quantitative and qualitative studies were included in addition to literature reviews. Literature reviews were also reviewed to check for primary source data as well as the interpretation and views of treatment decisions.

## Findings

The key word search retrieved 59 articles, after reading the abstracts 36 articles were included in the review.

*Perceptions and approaches of health professionals*

The central theme across the international literature is that wide variation exists in physicians' perspectives on the value, appropriateness and likely outcomes of various treatment options for people with lung cancer [9, 13, 14]. A study from the United States (US) investigating the beliefs of pulmonologists and thoracic surgeons found that there are wide variations and inconsistencies in beliefs on treatment and prognosis of specialists who guide early therapy and referral for patients with NSCLC [14]. Similarly, wide variation in perceptions of treatment of choice and expected impact of treatment on prognosis within and across specialities was found in US physicians across five specialities involved in lung cancer care – primary care, pulmonary medicine, medical oncology, radiation oncology and thoracic surgery. In particular, opinions differed regarding optimal treatment for stages II, IIIA, IIIB and IV disease and were not based on best practice clinical recommendations [9]. A number of factors can impact on a physician's decision to recommend chemotherapy; these include the individual's age, functional status and the number of co-morbidities. [15].

In Australia, Jennens et al. [13] investigated perceptions of the role of chemotherapy for stage IV NSCLC across 500 Australian health professionals concluding that there is wide variation in levels of knowledge with regards to the use of chemotherapy in lung cancer

between specialist groups. In particular, a distinct bias in approach was evident such that pulmonary physicians, radiation oncologists, and palliative care physicians demonstrated high levels of pessimism about chemotherapy in metastatic (stage IV) NSCLC such that approximately a third of respondents did not believe chemotherapy offered symptomatic benefit in this situation [13]. Similarly, in the US, Perez [9] found a significant proportion of physicians recommended only supportive care for patients with stage IV disease, despite demonstrated benefits of chemotherapy. A Canadian study of 234 specialists, including respirologists, thoracic surgeons, radiation oncologists and medical oncologists, found treatment recommendations and beliefs regarding chemotherapy and survival varied widely, leading the authors to suggest personal beliefs rather than the evidence base guides management [16]. In that study the disparity in doctors' approaches to treatment was such that for stage III lung cancers, 30% believed the addition of chemotherapy to radiotherapy increased survival whilst 70% believed it did not. For stage IV lung cancers, 55% believed chemotherapy increased the median survival whilst 45% believed it did not [16].

Information on factors explaining the varying perception of value amongst medical doctors is limited. Schroen et al. [14] have noted an association between physician characteristics, including length of time since training and NSCLC patient volume, and the holding of beliefs not conclusively supported by the medical literature. Other clinician factors suggested as influencing treatment decisions in this context include communication and prognostic difficulties, the impact of patterns of reimbursement on practice and local availability of treatments [1]. In the context of such varied beliefs, the

nature of clinical communication and how decision making is played out are important considerations in providing appropriate care for cancer patients.

*Perceptions of lung cancer patients: balancing risks and benefits*

The literature notes there is wide inter-individual variability in patients' perceptions of chemotherapy, in particular, in the weighing of the survival benefit versus toxicity risk [17-19] and in willingness to accept systemic treatment [20]. A key theme is that while choices vary widely, overall patients value even small benefits greatly and judge toxicity as less important in their decision making [1, 17, 19, 21], suggesting disease experience influences treatment choice.

A review of the literature on choices of patients receiving chemotherapy near the end of life from 1980 to 2006 concluded that overall, patients would choose chemotherapy for a small benefit in health outcomes [1]. In considering the potential survival, response rate, symptom relief and toxicity of chemotherapy, Japanese lung cancer patients were significantly more likely to accept invasive treatments for a potentially small benefit ["chance of cure", "response but not cure" and "symptom relief"] than the control group of patients with respiratory conditions alone [19]. A systematic review of four studies quantifying the survival benefits judged sufficient to make chemotherapy worthwhile found that smaller benefits were judged sufficient for NSCLC that was metastatic rather than locally advanced, broadly implying that smaller benefits may be sufficient when the baseline prognosis is worse [2] which may further widen the disparity between physician and patient perceptions of the value of chemotherapy.

A large international study comparing patients' and physicians' assessments of the patients' attitudes towards treatment found that patients were much more likely to classify themselves as desiring a maximum extension of survival with high acceptance of toxicity than were physicians *(60% vs 29%)*, while physicians were more likely to categories patients as prioritizing primary symptom relief than the patients themselves *(29% vs 14%)* [3].

The degree of survival advantage required to accept chemotherapy has been related to age [5, 17, 18], although several studies have found no such predictive influence of this characteristic on minimum benefit considered worthwhile by patients [19, 20]. A review of determinants of cancer patient preferences concluded that patients are more positive toward adjuvant treatment in the context of larger benefits, less toxicity, personal experience of the particular treatment and having dependents, especially children living at home [22]. One study found patients' preference to undergo chemotherapy treatment was positively explained by striving for length of life and negatively by striving for quality of life [8]. Other factors suggested as influencing patients' attitudes to treatment and treatment decisions include parenthood status, personal experience of illness, health literacy, functional status and quality of life indicators [23-26]. Previous experience of chemotherapy also seems to influence treatment choice. Chu et al. [3] described that differences in outlook towards lung cancer are influenced by experience with chemotherapy such that chemonaive patients underestimate the extent of toxicity associated with chemotherapy whilst physicians experienced in the area were more focused on avoidance of this toxicity and as such underestimated patients' ability to cope.

Cultural factors can also influence treatment decision making in lung cancer. Hirose et al. [19] noted that Japanese lung cancer patients are less willing to choose chemotherapy for a survival advantage than Canadian patients, suggesting differences in cultural beliefs about illness and death may influence treatment decisions. Perspectives of cultural diversity influence perceptions of autonomy, family involvement and appropriate disclosure, such that Japanese patients and physicians relied more on physician and family authority and emphasised patient autonomy relatively less than their North American counterparts [27]. Thus, cultural factors have a distinct influence on the doctor-patient relationship and how this interaction impacted on decisions about treatment.

The influence of personal characteristics on perceived minimum benefit considered worthwhile by patients remains contested and the preferences of individual patients are varied and difficult to predict. Wide treatment variation suggests non-medical factors beyond patient preference and staging strongly influence the management of lung cancer and the patient's likelihood of receiving treatment, such factors include a patients socioeconomic status, geographical location, and race/ethnicity [4]. The majority of the literature investigating perceptions of chemotherapy relies on potential survival benefit as a key outcome weighed relative to toxicity, however factors influencing patient preference such as symptom reduction, quality of life and symptom response are also important [28], and cognitive and affective determinants of patient preferences need to be better understood [22]

## Discussion

Although chemotherapy is a widely accepted treatment, differences in the perceptions of patients and providers are well established. These variations may result in subsequent negative referral bias, limited presentation of treatment options, and underuse of chemotherapy including for palliative purpose [9, 13]. This review demonstrates that patient views can often diverge with the physician when deciding to undergo chemotherapy.

Meropol et al. [29] found that following consultation, doctors and patients demonstrated clear discrepancies in understandings of perceptions of potential benefit and harm and value of quality and length of life, suggesting patient optimism or sub-optimal communication as explanatory factors. Patient preferences indicate they would choose chemotherapy far more often than health care providers would choose for themselves [1, 3, 20, 21] and for a much smaller benefit [1, 21].

Lung cancer patients have been found to be far more willing to accept a toxic chemotherapy regimen compared with oncologists, surgeons, and controls [21], patients with other respiratory diseases [19], and clinical health staff [20]. This discrepancy in choice has been found to exist when controlling for age, cohabitant status and having children [21]. In essence, there are differences in opinion in the valuing of toxicity and survival between doctors and patients, along with wide variation in beliefs within both

these groups. How such variability of beliefs is played out in clinical communication and the doctor-patient interaction are important considerations {Gattellari, 2002 #64}.

The ways in which physicians' beliefs are expressed and how the risks and benefits of options for treatment are presented are important factors in patients' understanding of their situation and treatment choices. Indeed, the perspective of the patient near the end of life and their assessment of risk and benefits is very different from that of a well person [1]. Patients' knowledge, attitudes and beliefs must be therefore recognized in guidelines, clinical interactions and communications {Clayton, 2007 #63}.

Clear information about the differing toxicity and efficacy of treatment options and directly eliciting patients' views about the relative significance of benefits and risks are important in the clinical interaction [2]. However, it is unclear whether and how improved communication style and/or content would alter the decision-making process, particularly integrating honest information, including financial information, into their decision making [1] and understanding or acceptance of poor prognoses.

These factors underscore the importance of considering the impact of these factors in treatment choices as they may ultimately impact on the survival and quality of life of the patients. Clinicians must be attentive to the decision-making style of the patient [8], their desired level of involvement in treatment decisions [28] and cognitive and affective determinants of patient choice [22] as these seem to influence patient decisions regarding chemotherapy for lung cancer, although their impact is not well understood. The

complexities of these decisions underscores the importance of a multidisciplinary approach and the need to obtain the perspectives of all clinicians involved in care [30]. A value of a multidisciplinary approach is that treatment decisions are not solely based on the dyad of individual patient and clinician and as a consequence there are more checks and balances. Further, compliance with treatment guidelines and recommendations may result in better patient outcomes. Communication strategies and a realistic perspective of prognosis are critical in making appropriate decisions [31].

Based upon this review, it is difficult to provide definitive conclusions on the characteristics of individual patients and health professionals that alter treatment decisions. It is likely factors such as health literacy, and symptom burden influence these. The use of multidisciplinary teams can likely distill the range of views and perceptions. There are only a small number of articles retrieved on this issue therefore it is difficult to derive clear conclusions. Methodological considerations such as sampling and recall bias further limit interpretation of findings. This included both SCLC and NSCLC, in addition to studies examining all stages of lung cancer which limits generalizability. Notwithstanding these limitations, this review has shown that attitudes and beliefs of both clinicians and patients influence treatment choices.

**Conclusion**

Whilst the literature acknowledges wide variability in individual perceptions in both physicians and patients, there seems to exist broad incongruence between doctor and cancer patient perceptions of chemotherapy, such that patients judge survival benefits

more favorably whilst clinicians strongly emphasize toxicity and associated symptoms. Investigating methods of patient-physician communication are warranted to ensure adherence with evidence-based recommendations.

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