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Postoperative Adjuvant Chemotherapy in Completely Resected Non-Small Cell Lung Cancer: Guidance for Nurses

*L. Martelli-Reid, S. Baker, C.A. Smith, Y.C. Ung, W.K. Evans,
and members of the Lung Cancer Disease Site Group*

A Quality Initiative of the
Program in Evidence-based Care (PEBC), Cancer Care Ontario (CCO)
Developed by the Lung Cancer Disease Site Group

Report Date: December 7, 2007

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SCOPE

The purpose of this guidance document is to provide guidance to nursing regarding:

1. What oncology nursing care should be provided to patients receiving adjuvant chemotherapy for resected non-small cell lung cancer (NSCLC) at each point along the care continuum (e.g., pre-treatment counselling, prevention of toxicities, the assessment and management of treatment-related side effects, and survivorship)?
2. What are the major side effects of the adjuvant chemotherapeutic agents recommended for the treatment of completely resected NSCLC (e.g., cisplatin, vinorelbine)?
3. What nursing interventions are most effective in managing or treating the major side effects for the objective of optimizing dose delivery of adjuvant chemotherapeutic agents?

BACKGROUND

The Lung Cancer Disease Site Group (Lung DSG) of the Cancer Care Ontario (CCO) Program in Evidence-based Care (PEBC) has developed a clinical practice guideline, based on a systematic review of the evidence, for the medical use of postoperative chemotherapy in completely resected NSCLC (1). That guideline recommended cisplatin-based chemotherapy as postoperative treatment for patients with completely resected stage II or IIIA disease who are considered fit enough for chemotherapy. Therapy was not recommended for patients with stage IB disease.

These treatment recommendations have broader implications for the management of patients, because chemotherapy-related toxicities need to be appropriately assessed and managed for patients to receive the optimal benefits of therapy. The practice guideline report emphasizes that the potential benefits, limitations, and toxicity of adjuvant treatment should be fully discussed with patients, and the importance of effective management of disease and treatment-related symptoms is increasingly recognised (1). Members of the DSG noted that there is a widely recognized difficulty keeping patients on adjuvant therapy, because of side

effects. Oncology nurses play a vital role in communicating the importance of treatment completion to patients, in helping to remedy toxicity, and in supporting patients across the continuum of care. Nurses fill a number of roles across the continuum of care, including counselling patients on issues related to treatment completion, providing education directed towards the prevention of side effects, assessing and managing symptoms of the disease or previous surgery, and follow-up. Believing that a nursing-specific perspective related to these concerns was necessary to improve care for NSCLC patients receiving adjuvant chemotherapy, the Lung DSG members initiated this nursing guideline report.

This report is intended to be a resource for nurses caring for patients with NSCLC who are receiving adjuvant chemotherapy. In this report, we review the evidence on toxicity and adverse events from adjuvant chemotherapy and highlight priority side effects that are amenable to nursing assessment and intervention. For each of the major side effects, assessment and management strategies are provided, as is advice for meeting patients' informational, physical, and emotional needs throughout the treatment trajectory. The Standards of Care developed by the Canadian Association of Nurses in Oncology/L'Association Canadienne des Infirmières en Oncologie (CANO/ACIO) detail key aspects of effective practice in this setting and form a basis for the advice provided in this report (2).

METHODS

This document was developed by the Lung DSG of CCO's Program in Evidence-based Care (PEBC) and is intended to provide guidance for oncology nurses related to the care of patients receiving postoperative chemotherapy in completely resected NSCLC. A systematic review and clinical practice guideline on adjuvant chemotherapy in resected NSCLC was developed by the Lung DSG in 2006 (1). This nursing document was initiated as an adjunct to that report. While a structured literature search was conducted for published practice guidelines on topics in lung cancer nursing (see Appendix A), the two guidelines found were not based on evidence or specific to the scope of this report (3,4).

Instead, therefore, the Lung DSG developed nursing-specific guidance on this topic by utilizing evidence retrieved in the medical practice guideline report (1), general principles established by CANO/ACIO for nursing oncology practice (2), the Fitch model identifying patient and family domains of need across the cancer care continuum (5,6), and the clinical experiences of Lung DSG members. Additional data on chemotherapy side effects, the electronic version of the Compendium of Pharmaceuticals and Specialties of the Canadian Pharmacists Association (<http://e-cps/pharmacists.ca/CPHA/>), and the Cancer Care Ontario Formulary (http://www.cancercare.on.ca/index_drugFormularymonographs.html/) were searched.

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GUIDANCE

Standards of Care, Nursing Roles, and Competencies

CANO/ACIO statements on nursing standards, roles, and competencies underpin quality nursing practice for patients with lung cancer. These statements are broad in their scope and are applicable to nurses working across all disease sites, including lung cancer. Although the CANO/ACIO statements are valuable as broad guiding principles for nursing practice, more specific guidance is needed on issues that arise in the care of patients receiving adjuvant chemotherapy for resected NSCLC. Lung DSG members reviewed and extended the CANO/ACIO standards of care in order to develop practice-specific guidance for nurses working in this setting. The CANO/ACIO standards reflect the belief that patients are entitled to the following care elements: individualized and holistic care; family centred care; self-determination and access to information to enable decision-making; seamless, coordinated, and continuous

care involving open lines of communication and access to the interdisciplinary team; supportive, knowledgeable, and professional therapeutic relationships; and evidence-based and ethical care in which meticulous symptom management and health promotion is the primary focus. The Lung DSG recommends that nurses caring for patients receiving adjuvant chemotherapy for resected NSCLC adhere to these statements in their practice.

In addition, the Fitch model, which integrates six identified patient and family domains of need (physical, emotional, informational, psychosocial, spiritual, and practical) with nine points of care delivery across the continuum of the cancer journey (pre-diagnosis, diagnosis, dialogue/referral, treatment, rehabilitation, survivorship, recurrent disease, palliation, and bereavement), is a useful conceptual tool to guide nursing practice and underpins much of the following guidance (5,6). As the model illustrates, individuals enter the cancer care delivery system at various points and experience the journey in different ways over time. As patients and their family members move along the cancer care trajectory, they bring their physical, emotional, psychological, social, informational, practical, and spiritual needs with them. These needs ebb and flow as a result of the disease itself, treatment effects and toxicities, and interactions with health care personnel. At each phase of the cancer journey needs will emerge, change in intensity and resolve. If needs remain unmet, patients continue to experience physical and or emotional distress and upheaval. Emotional and physical distress can magnify and compromise compliance with cancer therapy (7,8,9) and increase patients' use of community health services and visits to emergency departments (7,10).

Beginning Adjuvant Treatment

The need for information may be high as patients enter the cancer care trajectory at the treatment phase. The need for emotional and spiritual support may remain constant throughout the course of the illness, and pain and symptom issues may predominate as the disease or treatments progress. Nurses are in an ideal position to support and advise patients and their families on issues related to treatment decisions. They are important resources for patients who have questions and concerns related to therapy, including about the range of available treatment options (e.g., supportive care alone), the goals of therapy, their prognosis, associated toxicities, and the impact of treatment on quality of life. Nurses should act to ensure, through appropriate teaching and coaching, that patients have a necessary understanding of their treatment options, thereby enabling them to make informed treatment decisions that are congruent with their own values and goals for life and living. Nurses should also provide patients and their families with relevant information materials that are presented in a useable written format. This patient information, developed by various organizations, is available on their Web sites, including CCO (<http://www.cancercare.on.ca/>), the American Society of Clinical Oncology (<http://www.peoplelivingwithcancer.org>), and the National Cancer Institute Cancer Information service (<http://cancer.gov/cancerinfo/>).

Rates of psychological distress are highest among lung cancer patients (11). Because of this, it is essential that nurses assess patients for their psychosocial, spiritual, and practical needs and develop appropriate management strategies based on institutional and national evidence-based guidelines. As well, nurses should facilitate access to specialized professionals (e.g., social workers, spiritual care providers, supportive services and networks, peer support). Ongoing evaluation of the effectiveness of implemented management strategies is vital to ensure psychosocial, spiritual, and practical needs are met. Having these needs addressed enables patients to better manage their own needs and allows them to cope with the demands imposed by their illness and treatments (12). Continuity of nursing care is recommended during adjuvant treatment as patients are often seen by many different health professionals, which can be a source of stress and patient dissatisfaction (13).

Post-surgical rehabilitation can be introduced before the initiation of adjuvant treatment. For instance, smoking cessation should be discussed with patients and their families throughout

the cancer journey. As most surgeons emphasize smoking cessation preoperatively, the role of the nurse should be to reinforce smoking cessation after surgery and ensure that the patient has access to appropriate information, referrals, and psychosocial support.

Treatment-Related Toxicities Common to Patients Receiving Adjuvant Chemotherapy

Summary of evidence on toxicity. Chemotherapy toxicities impact upon patients' quality of life, morbidities, and ability to complete planned treatment. The completion of chemotherapy has been a major issue in clinical trials of adjuvant therapy, with major trials reporting only 50% to 70% of patients receiving the planned chemotherapy dose (14,15). A multivariate analysis found statistically significant differences in completion on the basis of extent of surgery, gender and age. Women, the elderly, and patients with pneumonectomy were less likely to complete therapy (16). Of particular concern are the grade 3 or 4 toxicities reported in more than 5% of patients receiving adjuvant cisplatin-vinorelbine (Table 1). These include febrile neutropenia, thrombocytopenia, and anemia (14,15). The most common and severe non-hematologic toxicities associated with cisplatin-vinorelbine include malaise or fatigue (15%). The oncology nurse should keep these factors in mind when supporting patients through treatment.

Table 1: Percentage of patients treated with cisplatin-vinorelbine experiencing chemotherapy-related adverse effects.

	Adverse Events Profile (%)		
	Winton 2005 (14)	Douillard 2005 (15)	
Study (Reference)	Any Grade	Grade 3/4	Grade 3/4
Gastrointestinal			
Diarrhea	23	<1	-
Nausea	80	10	27
Vomiting	48	7	
Constipation	47	3	-
Neurotoxic			
Hearing Loss	21	2	-
Sensory neuropathy	48	2	-
Motor neuropathy	15	3	-
Respiratory			
Dyspnea	18	4	-
Hematologic			
Thrombocytopenia	32	1	-
Anemia	93	7	14
Neutropenia	88	73	85
Infection	22	1	11
Febrile Neutropenia	7	7	13
Biochemical			
ALT elevation	18	<1	-
Bilirubin elevation	4	<1	-
Creatinine Elevation	16	<1	-
General			
Fatigue	81	15	-
Anorexia	55	10	15
Asthenia	-	-	28
Alopecia	32	0	5
Local Toxicity	35	3	-
Phlebitis	-	-	3

Regimens: Winton (14) used cisplatin 50 mg/m² days 1 & 8 q4wks + vinorelbine 25 mg/m² q1wk, and Douillard (15) administered cisplatin 100 mg/m² day 1 q4wks x 4 + vinorelbine 30 mg/m² q1wk x 16 administrations.

Nursing Assessment of Treatment Related Toxicities

During the course of treatment, the oncology nurse plays a critical role in the prevention and early detection of treatment toxicities that impact upon patient quality of life, functional and emotional status, self-care ability, co-morbidities, and ability to complete planned treatment. A focused history and physical assessment prior to the initiation of chemotherapy, and then during the course of treatment, is necessary to determine treatment toxicities and their impact upon patients over time. In addition to treatment-related toxicities, the oncology nurse must also be aware of other common symptoms, which patients may have from the disease itself or as a result of having had a thoracotomy (patients may experience incisional or neuropathic pain). It is also known that 15% to 44% of all patients diagnosed with lung cancer have some form of depression (17,18,19). In addition, sleep-wake disturbances are also common in newly diagnosed lung cancer patients (18).

Because of the large number of assessment tools available, each Lung Disease Site Team should identify those tools that they feel are most useful in their practice and use them consistently to ensure familiarity and usefulness. However, CCO has mandated that the Edmonton Symptom Assessment Scale (ESAS) be used on all cancer patients. Below are some other short-item scales and easy-to-complete measurement tools that provide objective information about the emergence, severity, and effectiveness of symptom and distress management.

Table 2. Assessment tools for the evaluation of chemotherapy-related toxicities and symptom distress.

Tool	Description
Chemotherapy-Related Toxicities	
Common Terminology Criteria for Adverse Events (CTCAE) Version 3 or 4.	http://ctep.cancer.gov/reporting/ctc_v30.html Descriptive terminology developed by the NCI that allow for severity grading (scale) for possible treatment related toxicities.
Performance Status	
Karnofsky Performance Status (KPS) Scale (20)	http://www.promotingexcellence.org/i4a/pages/Index.cfm?pagelD=3348 A measure of functional impairment that is comprised of an 11-point activity evaluation, with an overall score from 0-100 (0=dead, 100=normal).
Eastern Cooperative Oncology Group (ECOG) Scale (21)	http://www.promotingexcellence.org/i4a/pages/Index.cfm?pagelD=3351 A measure of functional impairment, that is comprised of a 5-point activity evaluation, with an overall score of 0-5 (0=normal, 4=completely disabled, confined to chair or bed, 5=dead)
Symptoms	
Edmonton Symptom Assessment Scale (ESAS)	http://www.palliative.org/pc/clinicalinfo/assessmenttools/esas.pdf Items are patient responses to severity of 9 symptoms, as reported on a 10 cm VAS. ESAS correlates closely with physical symptom subscales in the Functional Assessment of Cancer Therapy (FACT), the Memorial Symptom Assessment Scale (MSAS), and with the KPS.
Lung Cancer Symptom Scale (LCSS)	http://www.lcss-ql.com/ LCSS score is comprised of the aggregate scores of 9 patient items (10 cm VAS), and 6 observer items (5 pt categorical). The scale emphasizes physical and functional QOL dimensions, has good sensitivity to all levels of the KPS, and is site specific.

Symptom Distress	
The Memorial Symptom Assessment Scale (MSAS)	http://www.promotingexcellence.org/i4a/pages/Index.cfm?pageID=3410 Patients rate the frequency, severity, and distress associated with 32 prevalent symptoms in cancer patients experienced during the previous week. The scoring provides several validated subscale scores for overall symptom distress, physical symptoms, and psychological symptoms.
Pain Intensity	
The Brief Pain Inventory (BPI)	http://www.mdanderson.org/departments/prg/display.cfm?id=0EE7830A-6646-11D5-812400508B603A14&pn=0EE78204-6646-11D5-812400508B603A14&method=displayfull Patients rates pain intensity with a numeric 0-10 scale (0=no pain, 10= worst possible pain) and the impact pain exerts on daily activity, mood, walking, sleeping, movement, enjoyment of life and relationships with others.
Depression	
Hospital Anxiety And Depression Scale (HADS)	http://www.hqlo.com/content/1/1/29 Instrument designed to detect the presence and severity of mild degrees of mood disorder, anxiety and depression. Scores of 0-7 in respective subscales are considered normal, with 8-10 borderline and 11 or over indicating clinical 'caseness'.
Dyspnea	
Modified Borg Scale	http://ajrccm.atsjournals.org/cgi/content/full/158/5/1557 This 0 to 10 rated scale has the potential to provide quick, easy, and rapid information about a patient's subjective state of dyspnea.
Sleep-Wake Disturbance	
Pittsburgh Sleep Quality Index (PSQI)	http://www.ingentaconnect.com/content/els/00223999/1998/00000045/00000001/art00298 http://www.hartfordign.org/publications/trythis/issue06_1.pdf Global score of sleep quality with subscales relating to sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, and daytime functioning.
Supportive Care Needs	
Supportive Care Needs Survey – Short Form 34 items (SCNS-SF34)	http://www.newcastle.edu.au/centre/cherp/professionalresources/surveys.html Provides an assessment of cancer patients perceived global needs and across the domains of sexuality, psychological, health system and information, physical and daily living, and patient care and support.

Nursing Intervention for Treatment Related Toxicities

Optimal nursing management of treatment toxicities should be initiated before the provision of chemotherapy. Patient education related to the prevention and alleviation of treatment toxicity associated with adjuvant cisplatin-vinorelbine may enable patient participation in self-monitoring for the purpose of early detection and prompt reporting of symptoms and concerns. Nurses should be aware of factors that modify treatment compliance (e.g., extent of surgery, gender and age) and should assist patients in completing treatment through the early detection and meticulous management of treatment toxicities.

Nursing interventions related to the assessment, prevention, and alleviation of chemotherapy toxicities associated with cisplatin-vinorelbine have been thoroughly addressed, and management strategies can be found in the Telephone Nursing Practice and Symptom Management Guidelines posted on the CCO Web site (<http://www.cancercare.on.ca/documents/NursingTelephonePracticeGuidelines.pdf>), the National Comprehensive Cancer Network Web site (<http://www.nccn.org/default.asp>), and the Oncology Nursing Society (ONS) Web site (<http://www.ons.org/outcomes/measures/summaries.shtml>).

The CCO Telephone Nursing Practice and Symptom Management Guidelines provide a symptom assessment guide for the identification of emergent, urgent, and non-urgent parameters; patient-teaching points; follow-up/evaluation/documentation requirements; potential complications; and other possible risk factors. The ONS Evidence-Based Summaries are an extensive source of information that address a wide range of oncology nursing activities. They provide valuable information for nurses measuring and providing interventions for therapy-related adverse effects. In summary, treatment toxicities should be appropriately monitored by nurses to ensure optimal symptom management, to alleviate the burden of treatment, and to prevent complications. The materials outlined above are important resources for nurses towards these ends.

Follow-up Care

Nurses play a key role in the follow-up and rehabilitation of patients following adjuvant treatment for lung cancer. Rehabilitation may occur within medical or surgical oncology practice or in a primary care setting. In addition to providing medical surveillance, nurses are well equipped to provide follow-up on many of the toxicity-related consequences affecting patients who have received adjuvant chemotherapy. A randomized trial of follow-up in lung cancer patients found improved patient satisfaction, earlier detection of symptom progression, better scores for emotional functioning, less severe dyspnea, less peripheral neuropathy, and fewer physician consults in patients also followed by a nurse, compared with patients who received only conventional medical follow-up (22). Nurses must address a number of issues in conducting follow-up, including:

- Providing information on the importance of follow-up care and its specific goals
- Pain management
- Smoking cessation
- General cancer–treatment-related disorders including fatigue, physical disability due to surgery or de-conditioning, sexual dysfunction, neurologic and musculoskeletal disorders, hearing loss, and cognitive impairment
- Healthy lifestyle education
- Issues related to decreased lung capacity
- Supportive counselling
- Signs and symptoms that may indicate cancer recurrence

Nurses should provide information and support to patients as they deal with returning to work, and other survivorship issues. Lung Cancer Online provides information on common survivorship issues and how to support patients at this point in the continuum of care (<http://www.lungcanceronline.org/surviving/index.html>). Nurse-led follow-up clinics for patients who have completed adjuvant chemotherapy should be considered. Further research is required to determine the frequency and nature of the health monitoring required to properly support patients in follow-up care.

CONCLUSION

Members of the Lung DSG noted that in their clinical practice, it was difficult for patients to complete adjuvant cisplatin/vinorelbine chemotherapy due to the side effects and felt that nursing-specific guidance related to these concerns was aid in improving care for these patients. This report highlights the evidence on the toxicity and adverse events that are caused by adjuvant chemotherapy and discusses major side effects and symptoms that are amenable to nursing assessment and intervention. Oncology nurses play a vital role in communicating the importance of treatment completion to patients, in helping to remedy toxicity, and in supporting patients across the continuum of care.

JOURNAL REFERENCE

The following guidance article has been published by the Canadian Oncology Nursing Journal (<http://www.cano-acio.ca>):

- Martelli-Reid L, Baker S, Smith CA, Lacchetti C, Ung YC, Evans WK. Nursing care for patients with non-small cell lung cancer receiving adjuvant chemotherapy: evidence-based implications for practice. *Can Oncol Nurs J* [Internet]. 2008 [cited 2009 Aug 06];18(3). Available from: http://www.cano-acio.ca/en/journal/online_articles_members_only/index.html.

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Appendix A. Search strategy for nurse specific guidelines and evidence reports.

An additional literature search strategy was designed to identify published nursing practice guidelines and evidence-based reports that addressed care for patients with NSCLC receiving chemotherapy. The search included the following databases and periods: AMED (Allied and Complementary Medicine) <1985 to January 2007>, CINAHL - Cumulative Index to Nursing & Allied Health Literature <1982 to February Week 1 2007>, EMBASE <1980 to 2007 Week 05>, Health and Psychosocial Instruments <1985 to January 2007>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 06, 2007>, Ovid MEDLINE(R) <1950 to January Week 4 2007>, PsycINFO <1806 to January Week 5 2007>, the Canadian Medical Association Infobase (<http://mdm.ca/cpgsnew/cpgs/index.asp>), and the National Guidelines Clearinghouse (<http://www.guideline.gov/index.asp>). The search was structured using various key terms for “guideline,” “lung cancer,” and “nursing.” Additional literature not published in academic journals was located through Web searches of prominent professional Web sites or from authors’ files, and also included.