



Evidence-based Series #7-15 Version 2

A Quality Initiative of the Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO)

The Role of Photodynamic Therapy (PDT) in Patients with Non-small Cell Lung Cancer: A Clinical Practice Guideline

Members of the Lung Cancer Disease Site Group

An assessment conducted in December 2016 deferred the review of Evidence-based Series (EBS) 7-15 Version 2. This means that the document remains current until it is assessed again next year. The PEBC has a formal and standardized process to ensure the currency of each document.

[\(PEBC Assessment & Review Protocol\)](#)

The reviewed EBS report, which is available on the CCO web site (<http://www.cancercare.on.ca>), consists of the following four sections:

- Section 1: Guideline Recommendations (ENDORSED)**
- Section 2: Systematic Review**
- Section 3: EBS Development Methods and External Review Process**
- Section 4: Document Summary and Review Tool**

Release Date: December 16, 2013

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Guideline Report History

GUIDELINE VERSION	SYSTEMATIC REVIEW		PUBLICATIONS	NOTES AND KEY CHANGES
	Search Dates	Data		
Original version October 2002	1966-2002	Full Report	Web publication	NA
Updated version November 2005	1966-2005	New data added to original full report	Updated web publication	NA
Version 2 Dec 2013	2005- 2013	New data found in Section 3: Document Summary and Review Tool	Updated Web publication	2005 recommendations is <u>ENDORSED</u>

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Evidence-based Series #7-15 Version 2: Section 1

The Role of Photodynamic Therapy (PDT) in Patients with Non-Small Cell Lung Cancer: A Clinical Practice Guideline

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

Report Date: December 16, 2013

SUMMARY

These guideline recommendations have been ENDORSED, which means that the recommendations are still current and relevant for decision making. Please see [Section 4: Document Review Summary and Tool](#) for a summary of updated evidence published between 2005 and 2013, and for details on how this Clinical Practice Guideline was ENDORSED.

Questions

1. What is the role for PDT in the management of early stage lung cancer?
2. What is the role for PDT in the palliation of patients with symptomatic, locally advanced lung cancer?

The outcomes of interest were response rate, survival, and toxicity. Palliation of symptoms was also of interest for locally advanced lung cancer.

Target Population

This evidence-based series applies to adult patients with primary, non-small cell lung tumours.

Opinions of the Lung Cancer Disease Site Group

The lack of sufficient high-quality evidence precludes definitive recommendations. Instead, the Lung Cancer DSG offers the following opinions based on the evidence reviewed

- Photodynamic therapy could be considered as an option for the treatment of early-stage lung cancer in patients with medically inoperable disease that is accessible by bronchoscopy. Evidence to date suggests that photodynamic therapy may be most effective with small superficial airway lesions, 1cm or less in length. The relative safety and effectiveness of photodynamic therapy compared to radiotherapy, an alternative treatment for patients with inoperable early stage disease, remains undefined.
- In locally advanced and symptomatic lung cancer, photodynamic therapy can contribute to the relief of airway obstruction and hemoptysis, but its role is, as yet, not well defined in relation to other modalities of palliation.
- Serious adverse effects including fatal hemoptysis and respiratory failure can occur; therefore, the suitability of patients for this treatment should be carefully assessed. Since tumour necrosis can result in post-treatment airway obstruction, patients should be closely monitored after undergoing the procedure and toilet bronchoscopies repeated as indicated.

Key Evidence

- Eleven non-controlled studies and one summary paper reporting on the use of photodynamic therapy in early stage lung cancer patients, who generally could not tolerate surgery or refused surgery, showed that photodynamic therapy commonly leads to tumour regression. The reported five-year survival rates in these patients varied from 43.4% to 72%.
- In patients with late stage lung cancer, three randomized controlled trials and four non-controlled studies showed that photodynamic therapy could contribute to the palliation of local cancer-related symptoms. Of the three randomized trials, two comparing photodynamic therapy with Nd:YAG laser therapy and one comparing photodynamic therapy plus external beam radiotherapy with external beam radiotherapy alone, none detected a survival advantage for photodynamic therapy; however, photodynamic therapy did produce improved pulmonary symptom control. There was a significant improvement in the control of hemoptysis and the relief of dyspnea for patients receiving photodynamic therapy plus radiotherapy compared with those receiving radiotherapy alone.
- The most common adverse effect reported in all studies was photosensitivity, which consisted mostly of sunburn. The most serious adverse effects reported were respiratory failure and hemoptysis. The former, resulting from airway edema and tumour necrosis, led to mechanical ventilation in three of 67 patients with early stage lung cancer (two studies). Fatal hemoptysis occurred within one month of treatment in seven of 213 patients (two studies), three with early stage disease and four with locally advanced lung cancer. Three of 20 patients with locally advanced lung cancer also suffered from fatal hemoptysis between two and 18 months post-treatment. The role of photodynamic therapy in producing late fatal hemoptysis is uncertain.
- Contraindications for photodynamic therapy include porphyria or known allergies to porphyrins, tumours that impact on major blood vessels, and existing tracheoesophageal fistulas.

Future Research

Randomized controlled trials comparing photodynamic therapy to surgery, chemotherapy, radiation therapy, and brachytherapy are needed in both early- and late-stage lung cancers, to fully assess the effectiveness of photodynamic therapy and its impact on survival and symptom control.

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