

# Diagnostika in zdravljenje raka pljuč: ali lahko pospešimo diagnostične postopke in skrajšamo čas do začetka zdravljenja?

Delays in the diagnosis and treatment of lung cancer: can the period between the onset of symptoms and the diagnosis and treatment be shortened?

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## Abstract

**Background:** In Slovenia, lung cancer is the second most common cancer among men and the fifth most common cancer among women. Five-year survival is 13 %, and at the time of diagnosis, only 16 % of patients have curable disease. Early cancer diagnosis is associated with better prognosis, so reducing the delay time might increase the number of tumours detected at early stages and might improve survival rates.

The aim of our study was to measure the delays to diagnosis and treatment and assess whether the duration of delays were acceptable with respect to other similar studies and recommendations.

**Methods:** We identified all patients with suspicious lung lesions, who were referred to a specialised outpatient clinic (the “Tumour clinic”) in a one-year period. The Tumour Clinic was established to speed up lung cancer diagnosing. We also analysed time from the first symptoms to the patient’s first visit to a specialist, the time from the first visit to the final diagnosis, and time from the diagnosis of lung cancer to the beginning of treatment.

**Results:** We examined the records of 159 patients with suspicious lung lesions, who were referred to the outpatient clinic between January and December 2008. The mean age of the patients was 67 years (range 20–88 yrs). Seventy-four (53 male, 21 female) of the patients were diagnosed with malignant disease, including 61 cases of lung cancer. The median time from the onset of symptoms to the first visit was 67 days, and the median time from the first visit until diagnosis was 10 days. Another 12 days (median time) passed from the time of diagnosis to the beginning of treatment.

**Conclusions:** Patients diagnosed with lung cancer wait too long before seeking appropriate medical assistance. When referred to a special-

ised outpatient clinic, the diagnosis time of lung cancer and the time from diagnosis to the beginning of treatment were acceptable, but there is still room for improvement.

## Izveček

**Izhodiča:** V Sloveniji je rak pljuč druga najpogostejša maligna bolezen pri moških, pri ženskah pa je na petem mestu. Petletno preživetje je 13 %, ob postavitvi diagnoze pa je le 16 % bolnikov v stadiju, ko lahko bolezen zdravimo radikalno. Rak v zgodnjih stadijih ima dobro napoved izida, zato lahko s pravočasnim odkritjem bolezni uspešno zdravimo ali morda celo vplivamo na izboljšanje preživetja. Namen raziskave je ugotoviti, ali trajanje diagnostičnih postopkov ter čakanje na začetek zdravljenja bistveno odstopata od podatkov v podobnih študijah in nekaterih priporočilih.

**Metode:** Pregledali smo popise bolezni vseh bolnikov, ki so bili napoteni v specializirano ambulanto, v t.i. Tumorsko ambulanto, kjer obravnavamo bolnike s sumom na raka pljuč. Ambulanta je bila ustanovljena z namenom, da bi pospešili diagnosticiranje teh bolnikov in jim tako omogočili zdravljenje v zgodnjem stadiju bolezni. Analizirali smo časovna obdobja od prvih simptomov do napotitve bolnikov v omenjeno ambulanto, čas od sprejema do diagnoze ter čas od diagnoze do začetka zdravljenja.

**Rezultati:** Pregledali smo popise bolezni 159 bolnikov, ki so bili napoteni v tumorsko ambulanto v obdobju enega leta (od januarja do decembra 2008). Srednja starost bolnikov je bila 67 let (20–88). Pri 74 bolnikih (53 moških, 21 žensk) smo ugotovili maligno bolezen, 61 bolnikov je imelo raka pljuč. Srednji čas od prvih simptomov do prvega obiska v ambulanti je bil 67 dni, do diagnoze pa nadaljnjih 10 dni. Srednji čas od diagnoze do začetka zdravljenja pa je bil 12 dni.

**Zaključki:** Bolniki predolgo čakajo na pregled v specialistični ambulanti. Potem ko so bili napoteni v specialistično ambulato, pa se čas do dia-

gnoze in do začetka zdravljenja bistveno skrajša, vendar je pri nekaterih bolnikih še vedno predolg.

## Introduction

Lung cancer is the leading cause of cancer death in North America and Europe. In Slovenia, with two million inhabitants, about 1200 new cases are diagnosed each year. Lung cancer is the second most common cancer among males and is the fifth most common cancer among females. The incidence of lung cancer estimated between the years 2000 and 2004 was 86.9/100,000 for males and 26.3/100,000 for females. The majority of patients are diagnosed at late stages, with locally advanced or metastatic disease which is treated with palliative intent; thus, the prognosis for lung cancer patients remains poor. The main symptoms,

cough and dyspnea, are not specific, and patients are first treated by a general practitioner (GP) for exacerbation of COPD or pneumonia. When thoracic pain is the leading symptom, particularly back or shoulder pain, they are often referred to an orthopaedist. The factors that affect the prognosis in patients with lung cancer are the stage of disease, histology, performance status, comorbidity, age and sex. The overall five-year survival rate in Slovenia is 13%.<sup>1</sup> The stage of disease is dependent on the delays in seeking medical care and in diagnostic workup. Although most studies found no significant association between diagnostic delay and survival,<sup>2-6</sup> some prospective studies showed that patients who were waiting for curative radiotherapy developed incurable disease.<sup>7</sup> Waiting for diagnostic procedures and delays in treatment also cause psychological distress in the patients, and this distress is shown to correlate positively with the duration of the delay.<sup>8</sup>

The aim of our study was to assess the duration and necessity of delays in diagnosis and treatment of lung cancer and whether the duration of the diagnostic procedures was acceptable with respect to other similar studies and recommendations.

## Methods.

The study was performed at the university pulmonary clinic where over 500 new cases of lung cancer are diagnosed yearly. We identified and included only patients with suspicious lung lesions, who were referred to the specialised outpatient clinic by GPs or other specialists, including pulmonologists, in one-year period. The tumour outpatient clinic was established to speed up the diagnosis of lung cancer. We excluded all patients who were referred to a bronchoscopy department directly. We also excluded any patients who were admitted directly to the hospital ward because of other reasons and were diagnosed with lung cancer during their hospitalisation. We analysed the time

**Table 1:** Characteristics of patients with lung cancer

Patients (male, female)	61 (45, 16)
Age yr (range)	69 (43–86)
Smoking, No (%)	
Smokers, ex smokers	52 (85)
Passive smokers	3 (5)
Non-smokers	6 (10)
Referral diagnosis, No (%)	
Non resolving infiltrates	13 (21)
Suspicion of cancer	26 (42)
Round lesions	14 (23)
Atelectases	4 (7)
Haemoptysis (normal X-ray)	3 (5)
Cough (normal X-ray)	1 (2)
Histology, No (%)	
Adenocarcinoma	26 (43)
Squamous cell	22 (36)
Small cell	8 (13)
Non small cell	5 (8)
Disease stage, No (%)	
I-III A	28 (46)
IIIB-IV	33 (54)

**Table 2:** Delays (days) between the first visit to the clinic and the final diagnosis that exceeded 30 days

Patients	Sex yr	Delay from the first visit to diagnosis (days)	Reason	Histology	Disease stage	Therapy
1	M 77	37	Specialist delay	Non small cell ca	IV	Chemotherapy
2	M 75	37	Specialist delay	Adeno ca	I	Surgery
3	F 77	44	Patient delay	Small cell	IV	Chemotherapy
4	M 73	35	Specialist delay	Adeno ca	II	Surgery
5	M 71	135	Specialist delay	Adeno ca	IIIB	Chemo-radiotherapy

from the first symptoms to a patient's first visit to the outpatient clinic, the time from the first visit to final diagnosis, and the time from the day we confirmed the diagnosis of lung cancer to the beginning of treatment.

## Results.

Between January and December 2008, 159 patients with suspicious lung lesions were examined in the specialised outpatient clinic. We diagnosed 74 patients with malignant diseases; 61 (44 male, 17 female) had lung cancers, and 9 patients had other malignancies. Characteristics of the lung cancer patients are presented in Table 1. The rest of the lesions/infiltrates were benign. In the lung cancer group, the median time from the onset of symptoms to the first visit was 67 days (range 7–365), and the median time from the first visit until the diagnosis was 10 days (range 1–135) (Figure 1).

We further analysed in detail patients whose time from the first visit to diagnosis exceeded 30 days (Table 2). One delay was due to the patient's delay. She refused further invasive diagnostics but later changed her mind. Other delays were attributable to additional invasive procedures after negative bronchoscopic results or two consecutive negative invasive procedures.

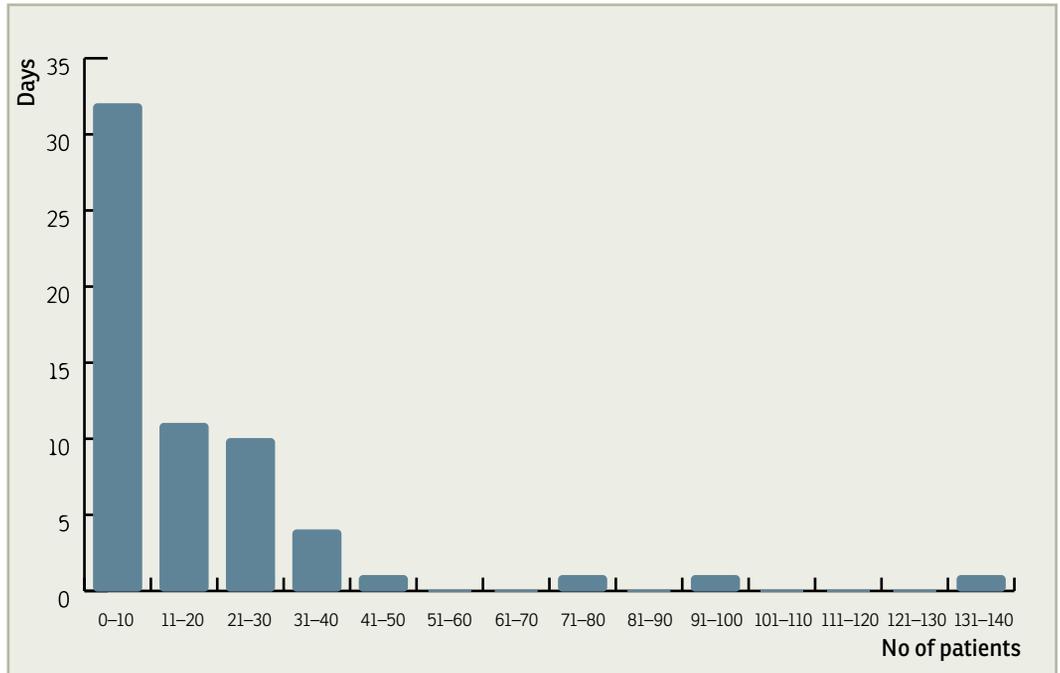
The median time from diagnosis to the beginning of treatment was 12 days (range 3–58) (Figure 2). Eighteen patients were radically operated on (29%), and 40 (66%) were treated by radiotherapy and/or chemo-

therapy. Three patients (5%) received supportive care only.

## Discussion.

The present study provided information about diagnostic delays in the care of patients with lung cancer. The limitation of the study was that we had no objective data about the duration and reasons for the delays before the referral to the clinic. We could not explain why the median time from the first symptoms to the first visit was 67 days. This could be caused by patients' late visit to the GP or by late referral to the specialist. A retrospective audit of the time involved in the management of patients with lung cancer carried out on 194 patients at the Royal Brompton Hospital in London showed similar results. The two-month delay between the onset of the first symptoms and the first referral to a lung specialist includes both patient and GP delays.<sup>9</sup> In Bjerager's study,<sup>10</sup> one-third of the patients who contacted their general practitioner (GP) with signs and symptoms of lung cancer were referred to secondary care after the first contact, but these patients experienced a median 14-day delay due to system delays. Those who were not suspected of having lung cancer by the GP experienced a median delay of more than six weeks. Patients with atypical symptoms had a median delay of more than three months compared to those patients with symptoms, who experienced a one-month delay. Nearly half of the patients developed new symptoms during the period

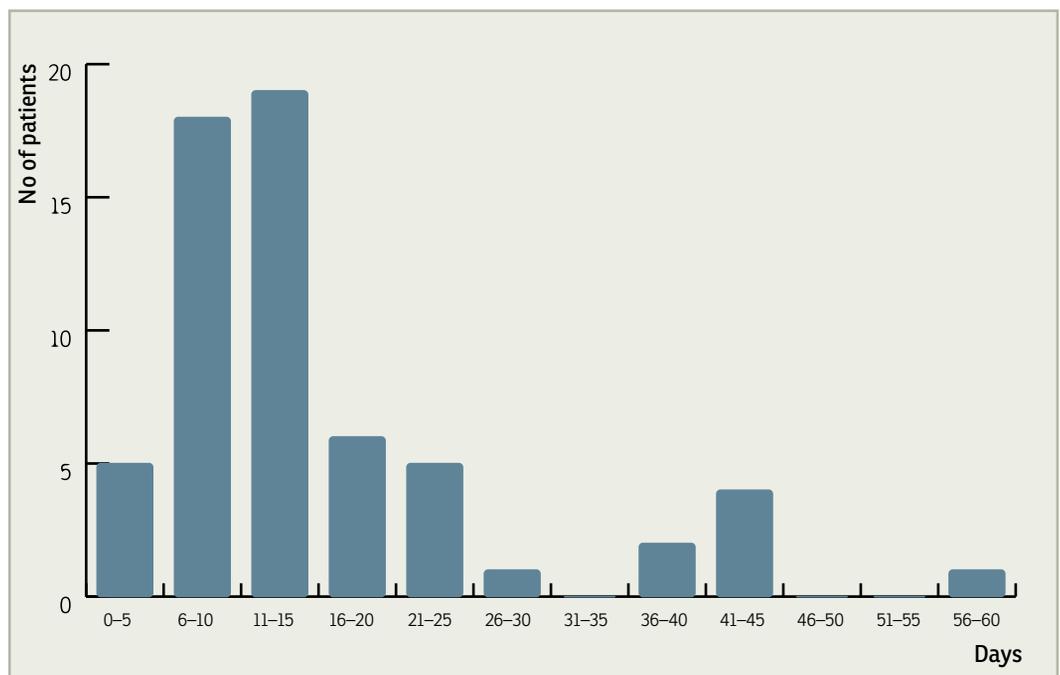
**Figure 1:** Time between the first visit to the tumour outpatient clinic and the diagnosis of lung cancer.



of GP delay. Some delays were technical and were related to health system organisation. The wait time for CT examination is longer for exams requested by GPs than those requested by specialists.<sup>10</sup> This is the reason that we organised a special outpatient clinic, the so-called “Tumour clinic”, where the waiting time is not more than one week, and the waiting time for a CT examination is only few days. GPs and other specialists can refer their patients directly to the Tumour

clinic as soon as the patient has presented with clinical signs indicative of lung cancer or after a suspicious shadow was found on an X-ray.

Our investigation showed that after referral the median time to diagnosis was 10 days. This length of time is comparable to that found in a similar Swedish study,<sup>11</sup> where the median time from the first visit to the specialist to diagnosis was 9 days. A large epidemiological survey from Poland



**Figure 2:** Time from diagnosis to the beginning of treatment.

reported that the median time between the first visit to the doctor and the date of diagnosis was 65 days. However, this study did not differentiate between delays caused by GPs and those caused by specialists.<sup>12</sup> We analysed data for five patients whose specialist delays were greater than 30 days (Table 3). Patients with a negative initial bronchoscopy have a significantly longer delay to treatment.<sup>13</sup> Some delays on the secondary or tertiary level are also technical; the waiting times for some non-invasive (CT, PET, MRI) or invasive procedures are sometimes longer than appropriate.

The median time from diagnosis to the beginning of treatment was 12 days (range 3–58). The recommendation of the Swedish Lung Cancer Study Group<sup>14</sup> is that 80 % of all patients' diagnostic tests should be completed within four weeks after the first specialist visit, and treatment should start within two weeks. Eighty-seven percent of our patients fulfil the first criterion, and 69 % fulfil the second one.

## Conclusions

The present study provided information about the duration and bottlenecks in the diagnosis of lung cancer. The delay in primary health care should be improved. The referral time to the first specialist's appointment should be shorter, probably by motivating GPs to undertake an earlier reassessment of the diagnosis (no resolved pneumonia, haemoptysis, atelectasis, prolonged coughing). A prospective research is needed to analyse this delay. The next problem is how patients can be encouraged to visit their GPs after an episode of early lung cancer symptoms. At the specialist level, we should speed up diagnostic procedures for those patients who need more invasive procedures by careful planning and by the use of a multidisciplinary approach. In further prospective studies, we should investigate what these delays indicate. Although the delays appeared not to correlate with patient survival, rapid diagnostic procedures might increase the potential to detect tumours that are still curable. We must remember that waiting for diagnostic procedures and delaying treatment

cause psychological distress in patients with suspected lung cancer.

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