

# Palliative Care in Oncology

Bernd Alt-Epping  
Friedemann Nauck  
*Editors*



Springer

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# Foreword

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## A Palliative Care Revolution

*Irene*, a 59-year-old patient with cancer of the breast and bone metastases at a London cancer hospital, ruminated on care, treatment, death and bereavement.

She began with

This is a wonderful place....they have a cure for everything

and ended with

They are just going to get me through to Christmas....and then decide what to do with me.  
I'm worried about Bill looking after himself.

I just listened. She took just *6 min* to tell me her story.

Two months later, after her death, her husband, Bill, told me,

She was so thin, her wedding ring fell off – that hurt. She told me it hurt to hug her ... I couldn't even hug her.

The generic palliative care skills of trust building, full attention, listening, reflecting back, open questions and well-paced interspersing of information giving and inquiry were just some of the skills used to coax out what was most worrying for Irene and later her bereaved husband. The skills are almost invisible.

This is one patient's narrative. Narrative medicine encourages us to listen and tease out patients' stories to reach the pain in whatever dimension the patient and those close to them are experiencing it. O'Brien, quoting Elwyn and Gwyn (1999), reminds us, 'for all the science that underpins clinical practice, practitioners and patients make sense of the world by stories' (O'Brien 2013).

Cicely Saunders turned patient narratives and stories into a philosophy and practice of 'total care' for dying people, which revolutionised the care of people with advanced cancer and other conditions with the opening of St Christopher's Hospice, London. The story that founded modern palliative care happened over 60 years ago. The founding patient (Clark 2002, p 273), who inspired the young Cicely Saunders, then a social worker having had to abandon a career in nursing, was David Tasma, a 40-year-old Polish Jewish refugee who was dying of cancer of the rectum, which was inoperable and obstructive, for which he had a colostomy. His symptoms were pain and vomiting. He was a patient at St Thomas' Hospital, London, when Cicely,

driven to improve the experience of people who were dying, spoke with him about her vision to build a place away from a noisy acute ward where people could die in peace and dignity. Cicely Saunders had 28 conversations with David Tasma (Gunaratnam 2013).

At the relatively advanced age of 33, Cicely Saunders started to train in medicine, having been advised by a senior doctor that it was ‘the doctors who abandon the dying’. She then carried out her groundbreaking research: the recording of 1,100 patients talking about their experiences of pain; the only methodology, she told me, was *listening* to patients (Oliviere 2000). From that evolved the concept of ‘total’ pain and the concept of holistic care, i.e. ‘total care’ for body, mind and spirit delivered by a multi-professional team.

David Tasma died on 25 February 1948, having said to Cicely, ‘I want what is in your mind and in your heart’. She took that to be an invitation to mean everything of the mind ‘research, learning and full scientific rigour always matched with the friendship of the heart’ (Saunders 2000) that humanity needed for good care of the dying. He died and left her £500 in his will, declaring that he would not be in her dream of a home where people would die, but he would be ‘*a window in your home*’.

Cicely Saunders founded ‘the home around the window’, St Christopher’s in South London, in 1967, and the window at the original entrance to the hospice is dedicated to David Tasma. People come from around the world to see it. For Cicely Saunders, the window was an important symbol of openness – a call to openness to others and to the world. This openness extends to our professional practice, to our patients, to the families with whom we work, to those whom we train and to ourselves and our colleagues but also to future challenges (Saunders 2000). David Tasma was well qualified to be the founding patient of palliative care. He was experiencing multiple social and spiritual problems of learning a new language, housing and financial needs and employment and searching to make sense in his illness shortening his young life. He also represents disadvantaged patients: minority ethnic and refugee-status and minority communities needing to access good palliative care. So the opening of St Christopher’s hailed a revolution in the care of oncology patients with advanced conditions. The vast majority of palliative care until recent years was for cancer patients. From its inception, palliative care involved the trinity of care, research and education.

So what was the nature of the revolution that one woman inspired by David Tasma and many other patients led?

Barbara Monroe, the current Chief Executive, states that this revolution included

- Meticulous attention to symptom control
- Life, not just death
- Health, not just illness
- Possibilities as well as problems
- The whole individual, not just the physical body
- Families and communities
- Care beyond death into bereavement
- Multi-professional teams and volunteers

- Does not deny suffering – offers support
- Supports coping
- The belief that a little goes a long way (Monroe B, 2010, personal communication)

Forty-six years on, St Christopher's continues to innovate and to evolve modern palliative care and end-of-life care services as contexts have changed.

This book aims to integrate and push forward the knowledge base for palliative care in oncology. The book's comprehensive approach will prove useful for clinical practice including vital elements of good symptom control, good communication at all levels and good family support. Congratulations to the editors, whose expertise in palliative care is renowned and who have collected a number of prestigious contributors in this volume. They open a window for those who wish to learn and gain new vistas in palliative care.

Prof. Ventafrida (2000), one of the founders of the European Association of Palliative Care (EAPC), stated at the very first EAPC Research Congress in Berlin in 2000 that

Palliative medicine is only part of palliative care: 50 %.

The other 50 % is the holistic approach. Both make up palliative care.

Integrating good palliative care with oncology raises many challenging questions. This book holds some of the answers.

London, UK

David Oliviere

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## Part I

# Oncology and Palliative Care: Disease Specific Perspectives

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# Disease-Specific Oncology – Disease-Specific Palliative Care

1

Joseph Anthony Arthur and Eduardo Bruera

## Content

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Cancer is a unique disease which requires special attention to the affected patients and families right from the time of diagnosis. It is a major cause of death in the world and therefore it elicits grave apprehension and concern among many people. In the United States, it is the second most common cause of death, exceeded only by heart disease, and accounts for nearly one of every four deaths. It is estimated that in 2013, about 35 % of all cancer patients will die and 65 % will survive cancer.

Cancer patients undergoing treatment develop peculiar physical, psychological, social, and spiritual needs that require a multidimensional approach to address them (American Cancer Society 2013). Even among those who attain cure, many develop a variety of debilitating treatment-related and disease-related symptoms which can be quite distressing and detrimental to their quality of life. Although the goal of curing and eradicating cancer is laudable, it is quite evident that this has not been achievable in a significant number of patients. Many patients have to learn to deal with the enormous symptom burden until their demise. The overemphasis on the cure for cancer sometimes further obscures our perception of the needs and demands of the unfortunate ones. It is therefore important for clinicians to approach them having the background knowledge of such special needs and to appropriately acknowledge them in clinical practice.

The presentation of palliative care cases can be disease specific, just like in many other medical cases. The disease trajectory, symptom profile, and the needs of cancer patients may be different from those of non-cancer cases. Even among cancer

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cases, there may be differences based on specific disease types and patient demographics such as age, gender, and ethnicity. The delivery of palliative care interventions may therefore vary based on these differences.

In a study done assessing the symptom profile of patients with advanced cancer and those with advanced non-cancer diseases like chronic obstructive pulmonary disease (COPD) and chronic heart failure (CHF) and cirrhosis, it was found that the prevalence of common symptoms was equally high in both cancer and non-cancer with an average of  $10.33 \pm 3.86$  symptoms (Tranmer et al. 2003). However, the type of symptoms varied in cancer patients compared with non-cancer patients. Pain, nausea, unpleasant taste, vomiting, and constipation were found to be more common among cancer patients than non-cancer patients. Shortness of breath and cough were generally more common in non-cancer patients. There were no significant differences in the prevalence of psychological symptoms between the two groups (Tranmer et al. 2003). In another study, the ten most prevalent cancer-related symptoms were pain, easy fatigue, weakness, anorexia, lack of energy, dry mouth, constipation, early satiety, dyspnea, and greater than 10 % weight loss (Walsh et al. 2000). Symptom prevalence was independently affected by age, gender, and performance status.

Different cancer types may have different symptom profiles (Table 1.1). For example, patients with head and neck cancer, lung cancer, and other cancers with predominant lung involvement have more dyspnea. Those with gynecological and gastrointestinal malignancies frequently develop bowel obstruction, nausea, vomiting, and abdominal pain (Tranmer et al. 2003). Patients with gynecological malignancies are most likely to have access to palliative care, probably because of the relatively high symptom burden among them, coupled with the relatively limited systemic therapy options in resistant cases. Contrary to this, those with hematological malignancies are least likely to be referred to palliative care. Similar studies have shown that hematological malignancy patients were more likely to receive aggressive therapy at the end of life (Hui et al. 2010), die in an intensive care unit (Delgado-Guay et al. 2009), and have late palliative care referral (Fadul et al. 2007). This is despite the fact that there is no significant difference in the symptom burden between solid tumor patients and hematological malignancy patients (Fadul et al. 2008). The actual reasons for this occurrence are unclear. However, possible reasons include the following: the disease appears relatively more curable with available therapies even in advanced stages (Cheson 2002; McGrath and Holewa 2007; Hampton 2007), patients with the disease can decline very rapidly (Hampton 2007; Mander 1997) thereby possibly narrowing the window of opportunity for palliative care interventions, and there are difficulties in predicting the course of events with hematological malignancies (Glare et al. 2003; Auret et al. 2003; McGrath 2001). Younger patients were more likely to have access to palliative care (Hui et al. 2012), more likely to have higher symptom expression and reporting (Bernabei et al. 1998; Ahmed et al. 2004), and more likely to pursue aggressive measures than older patients. Married couple were also more likely to have access to palliative care (Hui et al. 2012), probably because the spouse provides extra and immediately available support for the patient regarding issues at the end of life.

**Table 1.1** Examples of common oncologic disease types and their associated symptoms/issues

Disease	Physical	Psychological	Social	Spiritual / existential	Advance care planning
Gastrointestinal	Anorexia, Nausea, Vomiting, constipation, Bowel obstruction Abdominal pain, Fatigue	Anxiety Depression Grief and bereavement Adjustment disorder Addictive behavior Psychotic manifestations	Family conflicts Caregiver distress Financial situation Cultural variations Racial disparities Social support system	Religious affiliation Existential distress Loss of meaning Lack of self-worth Loss dignity Hopelessness	Code Status Living will OOH DNR <sup>a</sup> MPOA <sup>b</sup>
Head & neck	Dyspnea Oral pain Dysphagia Fatigue				
Lung	Dyspnea Cough Pain Fatigue				
Gynecological	Bowel obstruction Anorexia, Nausea, Vomiting Constipation Pain Fatigue				
Breast	Pain Fatigue Delirium				
Hematological	Pain Fatigue Bleeding Frequent infections Delirium				

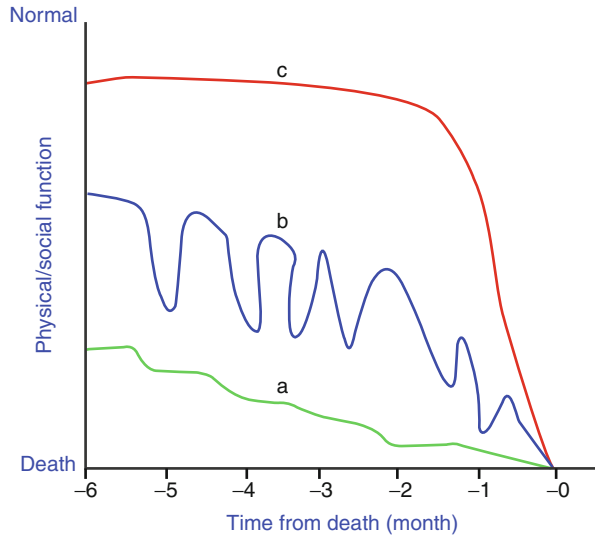
<sup>a</sup>Out of hospital do not resuscitate order

<sup>b</sup>Medical power of attorney discussion

There are also distinct differences between the disease trajectory of cancer and common non-cancer diseases (Fig. 1.1). Dementia disease course is that of a slow, steady, and progressive decline which may be interrupted by periods of cognitive and functional decline usually from acute infections like pneumonia and urinary tract infections (Wolfson et al. 2001; Xie et al. 2008; Walsh et al. 1990). When patients recover from each acute event, they then establish a new baseline cognitive and functional status which is usually lower than the one prior to the illness. They eventually die from those complications. This disease course is also common with old age and stroke. It is estimated that the median life expectancy of most forms of dementia patients is about 4–7 years in many studies (Wolfson et al. 2001; Xie et al. 2008; Walsh et al. 1990). The exceptions are dementias due to Huntington’s disease and Creutzfeldt–Jakob disease which have a relatively shorter life expectancy.

The disease trajectory of end-stage chronic obstructive pulmonary disease is marked by frequent periods of episodic exacerbations followed by incomplete recovery with the administration of rescue treatments like supplemental oxygen, bronchodilators, steroids, and antibiotics. This type of disease course poses a significant challenge to the timing of transition into a more palliative mode of care because these acute interventions transiently give the patients a false sense of

**Fig. 1.1** Disease trajectories over the last 6 months of life for patients with (a) dementia, (b) chronic obstructive pulmonary disease (COPD) and cardiac heart failure (CHF), and (c) cancer (Adapted with permission from RAND Health; Lynn and Adamson 2003)



recovery and improvement, thereby attenuating the true grave and poor prognostic picture of their disease. The disease trajectory of heart failure is similar to COPD with periods of decompensation and recovery close to the prior functional status. They usually die from complications of the disease but this is very unpredictable, compared to cancer (Goldstein and Lynn 2006; Lunney et al. 2002, 2003). Also, significant advancements in the management of heart failure tend to obscure the actual disease trajectory. Interventions like cardiac transplantation, ICD (implantable cardioverter–defibrillator) implantation, and left ventricular assist device are known to improve quality of life and increase survival.

In contrast, the disease trajectory of cancer is one in which the patient functions well with the disease for a prolonged period of time (months to years) until the late stages (usually the last 6 weeks) when he declines rapidly. It is more predictable than the other disease courses (Morris et al. 1986; Lunney et al. 2002, 2003). The main indicators of the rapid decline include poor performance status; symptoms such as weight loss, anorexia, breathlessness, or confusion; and laboratory abnormalities such as high white cell count, lymphocytopenia, hypoalbuminemia, and elevated lactate dehydrogenase or C-reactive protein.

There is always the persistent desire among clinicians, patients, and their families to better understand the cancer disease trajectory and predict the course of events. For the patients and their families, this has key implications in planning the medical care, making very important time-dependent decisions, and generating the best goals of care. It guides the physician to provide the most appropriate form of care, thereby avoiding overtreatment and undertreatment, and informs him during the decision-making process of assisting a patient to transition from cure-oriented care to a palliative mode of care with more emphasis on quality of life. A survey conducted among American physicians revealed that they regularly encounter situations that require prognostication (Christakis and Iwashyna 1998). They do not

feel well prepared for such situations and perceive them as stressful and difficult. There is the belief among physicians that patients might judge them adversely if they make errors in their prediction.

Various differences were observed among physicians regarding their views about the concept of being “terminally ill” (Christakis and Iwashyna 1998). This demonstrates a relative lack of understanding in this area of medicine. We need to understand certain concepts about prognostication. First, prognostication should not erroneously be seen as a static phenomenon but rather a dynamic one which is subject to revision as the disease evolves and new issues arise. Second, prognostication transcends beyond just predicting death or survival to also involve the ability to predict and provide answers regarding inevitable events related to disease progression or recurrence, functional status, drug toxicity, or health-care cost demands (Fries and Ehrlich 1981). Third, the factors used to predict survival in the late stages of the disease are different from those used in the early stages. Diagnostic, pathological, and treatment-related prognostic factors are more useful in early-stage cancer, whereas performance status, the anorexia–cachexia syndrome, systemic inflammation, lymphocytopenia, poor quality of life, and psychosocial factors are more useful during the late stages of the disease (Glare et al. 2008). Of all the prognostic factors studied, performance status is the one most extensively studied. The Karnofsky Performance Scale (KPS) (Evans and McCarthy 1985; Viganò et al. 2000; Loprinzi et al. 1994; Mor et al. 1984), the Australian modification of the KPS (AKPS) (Abernethy et al. 2005; Nikoletti et al. 2000), the Palliative Performance Scale (PPS) (Anderson et al. 1996), and the Eastern Cooperative Oncology Group Performance Status (ECOG-PS) Scale (Loprinzi et al. 1994; Dewys et al. 1980; Rosenthal et al. 1993) are examples of performance status tools which have all been shown to be predictive of survival in advanced cancer patients. Symptoms such as anorexia and/or weight loss (Loprinzi et al. 1994; Wachtel et al. 1988; Viganò et al. 1999; Bruera et al. 1992), dyspnea (Pirovano et al. 1999; Morita et al. 1999; Escalante et al. 2000; Llobera et al. 2000), and cognitive failure (Bruera et al. 1992; Llobera et al. 2000; Morita et al. 1999; Maltoni et al. 1995) have been consistently shown to be predictors of poor survival in advanced cancer patients. Interestingly, neither pain (Bruera et al. 1992) nor opioid use (Portenoy et al. 2006; Maltoni et al. 1999) was considered to be a predictor of poor survival. Quality of life measures (Ganz et al. 1991; Addington-Hall et al. 1990; Langendijk et al. 2000) and laboratory parameters such as leukocytosis, neutrophilia, lymphocytopenia, low serum pseudocholinesterase, low serum albumin, and elevated proteinuria have also been found to predict poor survival (Maltoni et al. 1997).

Prognostication involves two components: foreseeing (coming up with the prediction) and foretelling (communicating the prediction). There are two ways to come up with a prognosis. It is either by using clinical judgment as commonly done in clinical practice or by using statistical methods. It has been shown that using statistical tools is superior to using clinical judgment (Steyerberg and Harrell 2002). There is therefore a consensus on the use of both parameters in predicting survival (Hampton 2007). Examples of available statistical tools include the Palliative Prognostic Score (Mander 1997) (consists of the KPS score, symptoms,

white cell count, lymphocyte percentage, and clinical prediction of survival), the Palliative Performance Index (Glare et al. 2003) (consists of the PPS score, oral intake, edema, dyspnea, and delirium), and the Cancer Prognostic Score (Auret et al. 2003) (a 7-item scale consisting of liver and lung metastases, functional performance status, weight loss, edema, delirium, fatigue, and ascites). There are also links to some web-based prognostic tools available online which may be used (Sinclair 2007).

In summary, just as the presentation of oncologic cases can be disease specific, so do palliative care cases. However, certain symptoms are generally prevalent in most cancer patients irrespective of the cancer type. This is likely because cancer patients are polysymptomatic. A cancer patient may experience symptoms mainly related to the particular organ system but may also exhibit symptoms involving other organ systems. It is also known that although there may be some differences in the physical symptoms, the psychological, social, and spiritual needs of these patients are invariably similar. These multiple physical, psychosocial, and spiritual dimensions of palliative care symptomatology may occur at any phase during the disease trajectory, and palliative care services need to be available throughout this period. The ultimate goal of palliative care is to deliver care that is patient specific rather than disease specific. Therefore personalized evaluation and management is the key to the delivery of a successful palliative intervention.

The ability to understand the disease trajectory and to predict the outcomes of disease conditions is of paramount importance to clinicians, patients, and their families. Regrettably, the concept of prognostication is not well understood even among clinicians. One reason is because the factors used to predict survival in the late stages of the disease are different from those used in the early stages. More effort and research is needed in order to better understand this vital aspect of palliative care.

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# Oncological and Palliative Care for Patients with Lung Cancer and Patients with Breast Cancer: Two Opposite Ends of a Spectrum

# 2

Norbert Frickhofen

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## 2.1 Different Patients

### 2.1.1 The Patient with Lung Cancer

Robert H. was a 68-year-old patient who presented with a recent onset of cough. He used to work in an office. He was married and had two children and two grandchildren. He used to smoke heavily (80 pack-years) until age 60, when his best friend died from pneumonia after suffering from chronic obstructive pulmonary disease (COPD) for many years. Robert was concerned about having lung cancer,

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but he dismissed this possibility because he had not smoked a single cigarette for 8 years. He only talked to his doctor after persisting coughs and 3 months of dispute with his wife. A diagnosis of stage IIIA adenocarcinoma of the lung with compression of the right lower bronchus by mediastinal lymph nodes was made. Molecular workup of the biopsy did not reveal EGFR mutation, ALK translocation, or other findings that would qualify for molecular targeted treatment. He rejected being included in a phase III trial of chemoradiotherapy. Since he was otherwise in good health, he received preoperative treatment with platin-based chemotherapy followed by right bilobectomy and postoperative radiotherapy to the mediastinum.

Fifteen months later, Robert complained about right upper quadrant pain. Multiple liver metastases, an adrenal mass, and two asymptomatic brain lesions were discovered; there was no evidence of disease in the thorax. In a family conference, the patient was informed about the incurability of the disease. Treatment options including palliative care were discussed. He strongly opposed palliative care and agreed to participate in a randomized phase II trial with chemotherapy with or without an experimental, orally administered tyrosine kinase inhibitor. During treatment he suffered from loss of appetite and fatigue and had to be hospitalized twice for fever of unknown origin. Treatment was discontinued after three cycles for progression of the adrenal mass, new brain lesions, and poor tolerability of the treatment. He received whole brain irradiation. His functional status declined during radiotherapy. After repeated discussions and recommendation of organizing palliative care, he rejected further contact with medical professionals and returned home. Two months later the patient came to the emergency room for uncontrolled vomiting. He was dehydrated, had lost 5 kg of body weight, and was unable to walk without help. He was transferred to the palliative care unit, consented to limiting care for symptom control and died 11 days later, 2.5 years after the initial diagnosis and 8 months after the diagnosis of metastatic disease.

### 2.1.2 The Woman with Breast Cancer

Iris N. was a 36-year-old woman<sup>1</sup> when a mass in her right breast was discovered in 1994. At that time, she was married, had an 8-year-old daughter, and worked part-time in a bakery. She was in excellent health, worked out regularly, and neither drank nor smoked. A node-positive invasive ductal adenocarcinoma (NST) stage IIB, grade 2, estrogen receptor positive/progesterone receptor negative was being diagnosed. She decided for mastectomy followed by adjuvant anthracycline-based chemotherapy. Adjuvant radiotherapy was not considered to be indicated after mastectomy. Amenorrhea developed during chemotherapy. She stopped anti-hormonal treatment after 7 months for severe, uncontrollable flushing.

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<sup>1</sup>This manuscript is limited to women with breast cancer. Men comprise only about 1 % of patients with breast cancer, and data and recommendations are derived from small series and expert opinion.

Five years later, a relapse confined to the thoracic wall was detected, again estrogen receptor positive, but also HER2 positive. The mass was resected, followed by radiotherapy and tamoxifen. One year later, asymptomatic bone and liver metastases were discovered. The bone lesions were irradiated, and after 6 months of chemotherapy, which was well tolerated, liver metastases were no longer visible. During subsequent treatment with an aromatase inhibitor and bisphosphonates, liver metastases recurred 6 months after chemotherapy. She received chemoimmunotherapy with a taxane and the newly approved anti-HER2 drug trastuzumab. Complete remission was achieved in the liver (bone metastases stable), which lasted for more than 2 years. During this time, Iris was treated with trastuzumab infusions as an outpatient without any adverse effects. While liver metastases were well controlled, metastatic disease of a supraclavicular lymph node developed in 2003. During the following 10 years, the patient experienced multiple relapses in the liver (with several complete remissions after treatment), locoregional lymph nodes, and bone. She eventually developed pulmonary and peritoneal metastases. All this could be controlled with surgery, radiotherapy, cytotoxic chemotherapy, anti-HER2 treatment, and anti-hormonal agents. Three regimens were delivered in the context of a clinical trial. During these 10 years, she experienced 5.8 years without any anticancer therapy or with only anti-hormonal and bisphosphonate treatment that did not interfere with her daily activities. The longest time without interruption by surgery, radiotherapy, or chemotherapy was 34 months (10/2005–08/2008). She only stopped working in the bakery in 2012. Iris is now, 10/2013, still in a good physical condition, and she awaits the decision of the tumor board on how to best treat her progressive metastases in the lungs and in the abdomen (peritoneum and omentum). She was repeatedly asked whether she were still willing to be treated. She was always surprised by this question since she was doing well and since “the doctors always found a solution in the past.”

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## 2.2 Different Diseases, Different Treatment Options

### 2.2.1 Patient and Disease Characteristics Are Different

The two cases described above are real cases. They have been selected because they illustrate typical patient and disease characteristics and commonly observed courses (Table 2.1).

Robert presented at a typical age of patients with lung cancer. Frequent relapse of locoregional disease and poor results of the treatment of advanced disease are a sad reality both in non-small cell lung cancer (NSCLC) (85 % of cases) and in small cell lung cancer (SCLC) (15 %). In metastatic NSCLC the median survival of patients with good performance status is 8–11 months (Ramalingam et al. 2011). Clinical trials report a median survival of 1,420 months, but this reflects patient selection and is not mirrored in cancer registries (see Sect. 2.2.2). The mean survival times of patients with SCLS are even shorter; this is the less common and typically more aggressive form of lung cancer. Most patients with metastatic SCLC survive only 8–10 months despite treatment (Planchard and Le 2011).

**Table 2.1** Characteristics of patients with lung cancer and breast cancer

	Lung cancer	Breast cancer
Incidence (cases/100,000) USA, whites, incl. Hispanics, 2009 <sup>a</sup>	75 (men)/55 (women)	127
Estimated deaths (cases/100,000) USA, 2013 <sup>a</sup>	63 (men)/40 (women)	22
Median age at diagnosis <sup>a</sup>	70	61
Etiology	90 % due to smoking	Mostly unknown
	10 % unrelated to smoking	10 % hereditary
Stage at diagnosis <sup>a</sup>	40 % early stage, curable	95 % early stage, curable
	60 % metastatic, incurable	5 % metastatic, incurable
Proportion of patients with localized disease (stage I–III) who relapse with incurable, systemic disease	60 % (NSCLC)	20–30 %
	90 % (SCLC)	
Response of metastatic disease to first-line treatment <sup>a</sup>	30 (10–70) % (NSCLC) <sup>c</sup>	30 (20–80) % <sup>c</sup>
	80 % (SCLC)	
5-year overall survival: Central and northern Europe <sup>b</sup> USA <sup>1</sup>	12–15 %	84–85 %
	17 %	89 %
5-year survival with locoregional disease, lymph node negative/positive <sup>a</sup>	54 %/26 %	99 %/84 %
5-year survival with metastatic disease <sup>a</sup>	4 %	24 %

Unless stated otherwise, data are given for NSCLC and SCLC combined. Basic epidemiologic data and overall survival data are derived from the SEER database 2003–2009 (SEER 2013)<sup>a</sup> and EURO-CARE-5, northern and central Europe population (De Angelis et al. 2014).<sup>b</sup> Stage-adjusted survival is depicted in Fig. 2.1; 5-year survival data in Table 2.1 and Fig. 2.1 differ because they are derived from different databases. High-response data represent results of treatment with targeted drugs<sup>c</sup>

Iris was younger than most patients with breast cancer. However, patients of this age are commonly observed in cancer clinics. About 6 % of breast cancer occurs in women younger than 40 years (Cardoso et al. 2012b). A long history of metastatic disease – not always as long as in this case – that can be controlled with multiple treatment modalities is the rule rather than the exception in breast cancer (Mauri et al. 2008). Advanced breast cancer is often a chronic relapsing disease, in obvious contrast to metastatic lung cancer, which can only be controlled for a short period of time.

About 90 % of the patients with lung cancer have a history of smoking cigarettes. The risk of lung cancer increases with the duration and the intensity of smoking (“pack-years”). In a British study with data up to 1990, men who continuously smoked since young adulthood, who did not die for other causes and reached the age of 75, had an absolute risk of dying from lung cancer of about 16 %; the risk was 10 % in women (Peto et al. 2000). A more detailed study of middle-aged British women with data up to 2011 demonstrated a 21 fold increased risk of dying from lung cancer within a 12-year observation period. Two-thirds of all deaths of smokers in their 50s, 60s, and 70s were caused by smoking, including nonmalignant

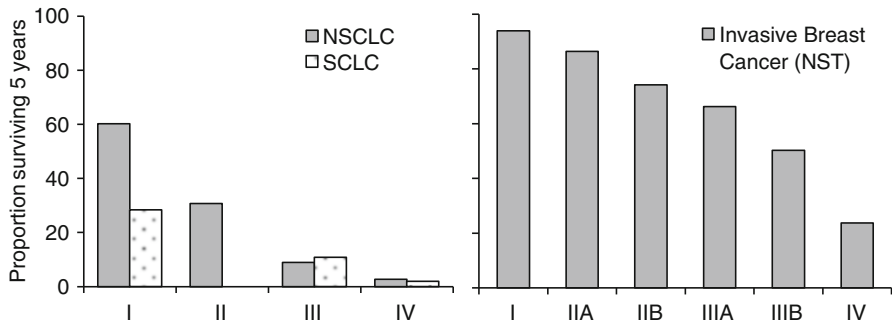
pulmonary disease, vascular disease, and other cancers. Smoking women lose at least 10 years of their lifespan compared with nonsmokers (Pirie et al. 2013). Low-dose CT screening decreases the risk of elderly smokers of dying from lung cancer by about 20 %, but this strategy is debated (Aberle et al. 2013). The strong association with smoking is a heavy psychological burden for smokers with lung cancer.

The cause of breast cancer is usually unknown. Induction by external agents such as radiotherapy to the chest is well described. It is a real problem for women treated as children or young adults (Kenney et al. 2004), but these patients are rare in clinical practice. About 10 % of women with breast cancer have hereditary breast cancer, mostly due to defective gene repair systems. Mutations in the breast cancer-1 or breast cancer-2 genes (BRCA-1/BRCA-2) are the main causes of hereditary cancers. Women carrying these mutations have a risk of breast and ovarian cancer of about 60 % up to the age of 70 (Mavaddat et al. 2013). In these women, not to have cared for genetic analysis or – if they are known to carry the mutation – not to have participated in early detection programs may cause distress. Similar thoughts may plague women with sporadic breast cancer who did not regularly undergo screening mammography.

With a median age of 70 years and a history of smoking, most patients with lung cancer start with a disadvantage already based on their personal characteristics. The chance of age-related deterioration of organ function is significantly higher in a 70-year-old patient with lung cancer than in a 60-year-old woman with breast cancer. Renal function and hearing both decrease with age and may prevent use of important drugs like cisplatin. Cardiac function decreases with age. It may not allow treatment with cardiotoxic drugs and cause unacceptable fluid retention during chemotherapy. Other diseases such as diabetes and liver disease are more common in older patients and raise concern with drug metabolism and drug interaction. Chronic lung disease may limit radiotherapy planning. Smoking significantly aggravates organ damage and adds specific risks due to chronic obstructive lung disease and generalized vascular disease. Cognitive and sensory impairments may affect adherence to treatment plans. All these factors are making lung cancer patients more vulnerable to treatment and may thereby limit treatment options irrespective of the cancer itself (Hoffe and Balducci 2012; Ou et al. 2009; Puts et al. 2014).

Social networks, financial aspects, and patient preferences influence treatment options and treatment choices more than most physicians are aware of. Older patients are more often living alone and have a less developed network of relatives and friends than younger patients. Having a partner is a major determinant of treatment success with respect to early diagnosis, adherence to treatment, coping with cancer, and many other aspects of a life-threatening disease such as cancer (Aizer et al. 2013). Patient preferences vary according to age and type of disease. A widowed male patient with lung cancer has a different way of reasoning than a mother of small children with breast cancer.

Most women with breast cancer do not present with as many adverse cofactors as patients with lung cancer. They are on average younger, have a lower smoking-associated comorbidity, and usually have a much better developed social network than patients with lung cancer.



**Fig. 2.1** Stage-specific 5-year overall survival of patients with lung cancer (*left*) and breast cancer (*right*) derived from the Tumorregister München, Germany (Tumorregister München 2013). Lung cancer survival is shown separately for non-small cell lung cancer (NSCLC,  $n=9,300$ ) and small cell lung cancer (SCLC,  $n=1,874$ ); stage II SCLC survival is not depicted since fewer than 10 patients were at risk at 5 years. Breast cancer survival data are based on 37,000 women. All stages according to UICC 6th edition

## 2.2.2 Treatment Options and Treatment Results Are Different

More than 80 % of patients with lung cancer die within 5 years, whereas more than 80 % of patients with breast cancer survive 5 years (Table 2.1). Cancer is the main reason for dying in patients with lung cancer, whereas many women with breast cancer die from causes unrelated to their cancer.

The tragedy of *lung cancer* is that early diagnosis is rare and that even patients with early-stage disease frequently relapse and die from lung cancer.

About 40 % of patients with NSCLC have a tumor confined to the chest at diagnosis (stage I–III). Most of these patients are treated with curative intent. This has to include surgery and in many patients also adjuvant chemotherapy and radiotherapy. However, survival at 5 years is only about 60 % for stage I, 31 % for stage II, and 9 % for stage III (Fig. 2.1) (Tumorregister München 2013). Only about 25 % of the patients with SCLC are diagnosed with cancer confined to the chest (Ignatius Ou and Zell 2009). Surgery of SCLC is only recommended in very early stages. Most patients are treated with definitive chemoradiotherapy. Survival is even poorer than in NSCLC: only 21–38 % of the patients with stage I SCLC, 18–38 % with stage II, and 9–13 % with stage III survive 5 years ((Shepherd et al. 2007) and Fig. 2.1). Adjuvant radiotherapy to the chest reduces local relapse in both NSCLC and SCLC but has only marginal effects on survival. Adjuvant radiotherapy of the brain is usually recommended for patients with SCLC, since it prevents or delays relapse in the brain and may prolong survival even in advanced disease (Slotman et al. 2008). Adjuvant chemotherapy is standard for treatment of patients with resected NSCLC and SCLC. It increases overall survival after surgery with or without radiotherapy by 4–5 % in both types of lung cancer (Arriagada et al. 2010; Planchard and Le 2011). The small benefit of adjuvant treatment must always be kept in mind when counseling patients. This is particularly important for patients with comorbidities.