

**Cancer comorbidities and complications:  
Proposals for a new approach for health insurers**

**European Social Insurance Platform (ESIP)**

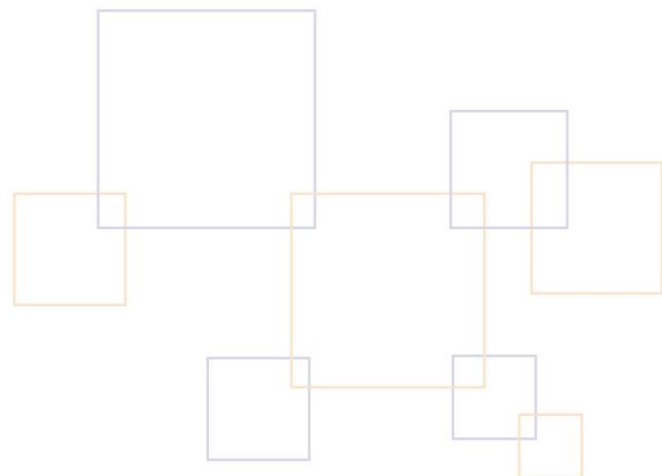
**12-07-2021**

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## About the European Social Insurance Platform (ESIP)

The *European Social Insurance Platform (ESIP)* represents over **50 national statutory social insurance organisations** in **17 EU Member States and Switzerland**, active in the field of health insurance, pensions, occupational disease and accident insurance, disability and rehabilitation, family benefits and unemployment insurance. The aims of ESIP and its members are to preserve high profile social security for Europe, to reinforce solidarity-based social insurance systems and to maintain European social protection quality. ESIP builds strategic alliances for developing common positions to influence the European debate and is a consultation forum for the European institutions and other multinational bodies active in the field of social security.

*Statement regarding positions submitted by ESIP: ESIP members support this position in so far as the subject matter lies within their field of competence.*

Many thanks to **Andrej-Franc Plesničar** for drafting this paper on behalf of ESIP.

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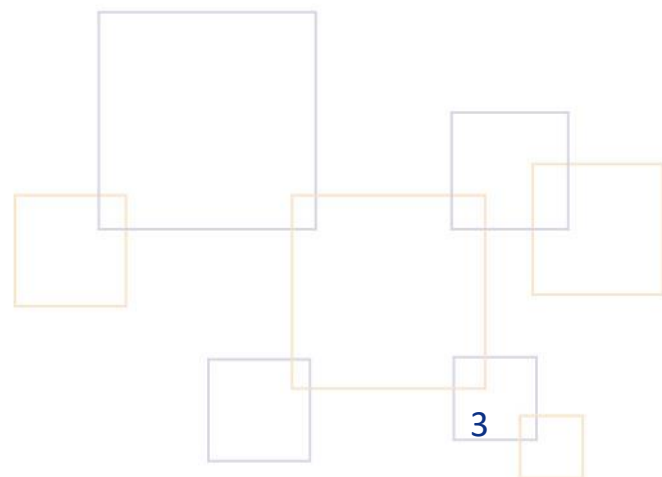
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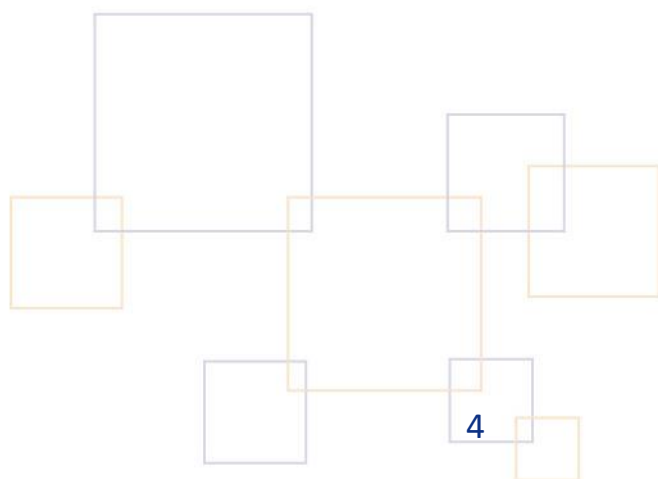
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## ESIP Reflection Paper Cancer comorbidities and complications: Proposals for a new approach for health insurers

### General remarks

- The issue of **comorbidities** is covered in the EU's Beating Cancer Plan in so far it addresses personalised, integrated and coordinated cancer care. The Cancer Plan mentions comorbidities in relation to actions foreseen on research and innovation under the Mission on Cancer of Horizon Europe and in relation to a new European Reference Network on comorbidities. The issue of comorbidities is closely – but not solely – related to cancer care in older patients, as they are most likely to suffer from pre-existing (chronic) conditions. The costs associated with medical treatment addressing cancer and other co-existing conditions significantly increase. Hence, **the issue of comorbidities should be more thoroughly considered and addressed in the implementation of the Cancer Plan**. This would contribute to better quality care for cancer patients with comorbidities as well as their carers and families.
- The use of **personalised medicine** is welcome as a way to promote a person-centred model of care, harnessing the potential of innovative technologies and integrated health data. Initiatives in the field of genomics and access to genomic data could improve personalised risk-assessment, targeted prevention and personalised treatment. Personalised medicine is expected to deliver on “**value-based**” treatment and rehabilitation, where “value-based” refers to “outcome-based” medicine offering targeted and effective care to each individual patient (EXPH, 2019).
- The development of personalised medicine should be reflected in adaptable billing and payment systems, via targeted solutions that promote access to person-centred, safe and effective care while promoting the sustainability of healthcare systems. **Innovative payment models** for innovative treatments could be considered, such as subscription or population-based payment. This would uphold the principle of **solidarity**, allowing healthcare payers to ensure timely access to innovative, safe, effective and affordable treatments.



## Background

Cancer comorbidities and complications related to cancer treatment are very common in cancer patients and are often not properly addressed in research, policy development and treatment (Lee et al., 2011; ECPC, 2019).

In December 2019 the European Cancer Patient Coalition (ECPC) and around 20 other stakeholders issued a Joint Statement with the title *Making cancer - related complications and comorbidities an EU health priority* (ECPC, 2019). In this document comorbidities were defined as the “co-existence of disorders in addition to a primary disease of interest”, and a cancer complication as a “complication resulting from the underlying malignancy or its treatment” (ECPC, 2019). The Joint Statement called on EU policymakers to **“make cancer complications and comorbidities a priority in the EU's Beating Cancer Plan and highlight the effect cancer comorbidities and complications can have on patients and their treatment”**. Precisely, the statement called on EU policymakers to prioritise actions on cancer-related comorbidities and complications by (ECPC, 2019):

- Making cancer-related comorbidities and complications a central part of all policy discussions about cancer care;
- Including tackling cancer-related comorbidities and complications as an individual pillar in the EU's Cancer Plan;
- Leveraging existing EU funding programmes for research on cancer to include cancer-related comorbidities and complications;
- Proactively coordinating prevention strategies and establishing fluid communication channels with policymakers, healthcare professionals across several related scientific disciplines and patients;
- Participating in multi-stakeholder dialogues to agree on concrete next steps to address cancer-related comorbidities and complications.

In general cancer comorbidities and complications are recognised as an important problem, as shown by the results of research on the characteristics of patients with newly diagnosed cancer. The majority of cancer patients of both sexes are over 60 years-old and research has shown that most of them have from one to 18 different comorbid conditions (Wilder Smith et al., 2008; Lee et al., 2011; ECPC, 2019).

A large study from the USA examined physical and mental health of 126,685 individuals with and without cancer (14,897 patients with prostate, breast, colorectal, non-small cell lung, endometrial, bladder, melanoma, non-Hodgkin lymphoma (NHL), and kidney) aged 65 and more, compared with the rest of individuals with no history of cancer (Wilder Smith et al., 2008) [Table 1]. More than 85% of cancer patients and 84% of study participants without cancer reported at least one comorbid condition, and the majority of participants with and without cancer reported more than two (Wilder Smith et al., 2008; Grose et al., 2014). Participants without cancer reported significantly fewer comorbid conditions than cancer patients, with the exception of those diagnosed with melanoma, NHL, and prostate cancer. Cancer patients (other than those with melanoma) had significantly worse physical health

compared with participants without cancer. Non-small cell lung cancer, NHL, breast, colorectal, and bladder cancer patients also reported worse mental health than did participants without cancer. In the four most prevalent cancers (prostate, breast, colorectal, and lung cancer), negative associations between physical and mental health were most pronounced in patients with two or more comorbidities, and in those diagnosed with cancer within the past year (Wilder Smith et al., 2008).

**Different comorbidities occur in correspondence to different types of cancer and cancer complications may also differ due to the type of cancer and its treatment.** A detailed multi-centre study from four cancer centres in Scotland observed 882 patients with newly diagnosed lung cancer from 2005 to 2008 and showed that 87.3% had at least one comorbid disease (Grose et al., 2014) [Table 2]. Severe comorbidity scores were observed in 15.3% of patients. Overall, there were statistically significant variations in comorbidity scores (Grose et al., 2014; Grose et al., 2015). It is possible to conclude that for the group observed, smoking has a significant simultaneous impact on the development of both lung cancer and some of its comorbidities.

In the conclusion of its Joint statement from December 2019, the ECPC emphasized the incidence of **some comorbid conditions and complications of cancer treatment that are more common based on data on cancer patients in Europe** (ECPC, 2019) [Table 3]. **Patients with comorbidities are also less likely to receive appropriate treatment** (ECPC, 2019), because there is limited consensus on how to record, interpret or manage comorbidity in the context of cancer (Lee et al., 2011; ECPC, 2019). In addition, the presence of comorbidities is already from the start adversely associated with trial discussions, trial offers and trial participation itself. **Updating and modernizing trial eligibility criteria could provide an opportunity for several thousand more patients with well-managed comorbidities to participate in clinical trials each year** (Unger et al., 2019).

### **Cancer comorbidities and complications in the context of new health technologies**

The problem of cancer comorbidities and complications is not addressed extensively in the Cancer Plan. It is rarely mentioned directly, with the risk of diminishing the importance of these complex conditions for cancer patients and underestimating the burden of care especially on their families. Since most of these patients are over 60 or 65 years old, it is almost impossible to find one who does not already have one or more pre-existing chronic diseases (Wilder Smith et al., 2008; Lee et al., 2011; Grose et al., 2014).

Cancer patients with comorbidities could easily be described with a newly coined expression as **'super patients'** in terms of the costs associated not only with cancer treatment, but also with the quantities of medicines and care they need for other conditions, amount of time spent on the treatment of comorbidities and all related problems (Spence et al., 2018). As many concepts of integrated and coordinated care emerge, these 'super patients' with cancer and comorbidities should be taken into careful consideration.

**Demographic changes, the development of health technologies and the legitimate needs, demands and requirements of patients and others in society have pushed many healthcare systems to the brink of crisis with high costs and budgetary constraints.** Payment models, local healthcare ecosystems and social determinants of health are now considered by many as the main drivers of desirable changes (Decker WW, 2019), building on the generally accepted guiding principle of solidarity and the emergence of the concept of “value for patients” (Gray, 2007; Porter, 2010), along with their increasingly emphasised central position in healthcare systems. **In this context it seems imperative that new payment and billing models are developed in parallel with new technologies.**

Changes in society and new technologies will shift the power from physicians, care providers, suppliers of medicines and devices to patients and consumers, payers, policymakers and others (Spence, 2018). **Increasing value for people and patients according to the “Quadruple Value” Model (EXPH, 2019) will depend on innovative ways of achieving desirable and favorable outcomes for people and patients, physicians, payers and policymakers, and on increasingly accurate and complex P4 medicine that will be personalised, predictive, proactive and participatory.**

**Innovations will be valued according to their ability to satisfy a common purpose linked to health quality, outcomes and costs (Porter, 2010; Spence, 2018). The increase in value will be further accelerated by the release of the accumulated medical data that will be linked, combined and shared among stakeholders (Gray, 2007; Spence, 2018).** In the age of P4 medicine, genomics, transcriptomics, proteomics, metabolomics and other ‘omics’ (Bousquet et al., 2011, Sagner et al, 2017; Spence et al, 2018), may all be characterized by the recently suggested term ‘humanomics’ because integrated care incorporates treatment based on personal needs, preferences and capacities, interacts with the context in which it is implemented, and its success depends highly on human behaviour (Fitzgerald and Poureslami, 2014). This demonstrates the real importance of integration, personalisation and coordination of care, thereby also showing the **importance of integrating payments with new billing models** that would contribute to prevent or decrease the occurrence and development of certain diseases, including cancer.

The incidence of **comorbid conditions and treatment complications make the field of cancer suitable ground to test a digitally enabled, coordinated and integrated approach to care** (Spence et al., 2018). Certain cancers (for example multiple myeloma) are no longer acute diseases but chronic conditions that must be managed over a period of years (Spence et al., 2018). As the desire to combine and customise treatments based on molecular or other tests grows, there are opportunities for **integrated and comprehensive care that optimises synchronous individual preventive or treatment pathways for cancers and comorbidities.**

### **Cancer comorbidities and comprehensive payment systems**

The ability to move to new outcome and value-based models of care depends on a **vision of value for people and patients that moves away from volume of services to outcomes of treatment and then to achieving outcomes-based value with arrangements for shared**

**savings or even shared risks** (Tsiachristas, 2016; Spence et al., 2018). The **establishment of partnerships with other stakeholders in the healthcare ecosystems** is crucial and should include healthy people and patients, treatment and care providers, payers, producers of medicines and medical devices, digital providers and policy makers.

Progress towards “value-based payments” can be gradual and give meaningful consideration to the experience of all who have already introduced these payment models. Payment methods such as **population-based global payments**, which reimburse all care needed from a specific population for a time period and allocate the resources towards coordination and more integrated care delivery, are already well established in the USA and some EU countries (Tsiachristas, 2016). Major examples of such arrangements are the “Accountable Care Organisations” with population-based payments and “Bundled payments” per patient, per episode or per condition (Tsiachristas, 2016). However, the shift to value-based care specifically for patients with high risks of getting cancer and one or more comorbidities could be accelerated, for example, with the introduction of “**subscription-based models**” that allow consumers (for example healthy people with a number of risks or ‘super patients’) to get higher touch care in increments, making the necessary services more affordable for payers. For physicians, these models allow to dedicate more time to individuals with more complicated medical needs than in today’s volume-focused systems (Spence et al., 2018). This payment model can be appropriately modified for cancer patients and in the event of comorbidities. Before being diagnosed with cancer, patient awareness on healthy lifestyles can be encouraged, following a health promotion approach. Out-of-pocket payments would be neither tolerated nor needed.

A necessary condition is, of course, the **digitalisation of the health information system**, which together with the aforementioned alternative billing and payment models allows patients and others to satisfy their increased expectations by delivering personalised and improved health outcomes, amplified by empowerment, personalisation of treatment and meaningful use of data.

Finally, **affordability** is mentioned only briefly in Chapter 5.2 of the Communication on the Cancer Plan and the Plan does not include any targeted action on affordable access to diagnostics and treatment – for instance regarding the use of “Liquid biopsy” in the framework of “Cancer Diagnostic and Treatment for All” initiative, an initiative that could however be regarded as one of the steps in the development towards a personalised medicine approach. While the mention of affordability creates a link between the Cancer Plan and other EU initiatives (Green Paper on Aging and particularly the new Pharmaceutical Strategy, etc.), further consideration should be given to aligning the Cancer Plan with the affordability agenda under the Pharmaceutical Strategy whose principles and objectives should be applied to cancer treatments as well. As healthcare payers we recall that any **healthcare system should be accessible, effective and sustainable and financial affordability is one crucial element to increase accessibility.**



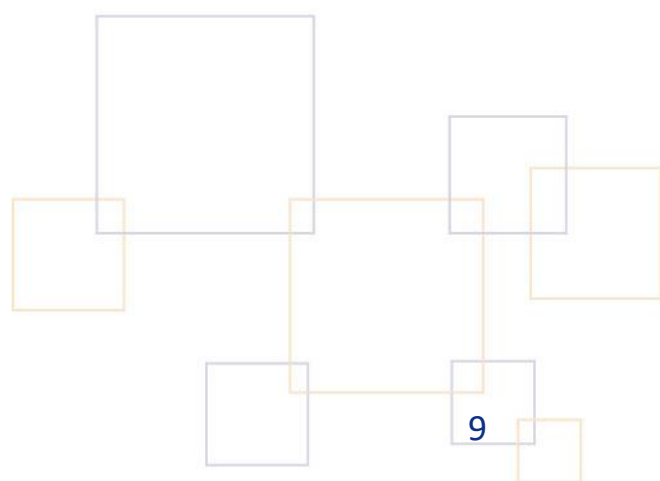
## Conclusions

**Future innovations will be linked to the ability to create comprehensive and personalised sets of data** for each individual providing a better understanding of risk factors and promoting preventive interventions before symptoms and signs of disease, including cancer and its comorbidities, become clinically noticeable.

Data should be used to improve prevention as well as care delivery. In this context, **outcome- and value-based payment models** will help put people and patients at the core of healthcare systems, provided that **new multistakeholder partnerships are established**. Payers, along with others, should integrate these innovative payment models, while ensuring transparency of claims and cost data and actuarial analyses at an early stage. **These payment models could therefore be considered to uphold the principle of solidarity**, allowing healthcare payers to ensure timely access to innovative, safe, effective and affordable treatments, and following the accepted vision and mission of payers in health insurance (van Lente and Dawson, 2020). These new payment models could sooner or later also include life-long “investments in health” by all stakeholders.

With the rapid pace of developments in technology, every person could have their own digital double at birth, growing and aging along with them. It is possible that with these developments, especially in the field of ‘omics’, there will be less need for large randomised control trials. Instead of involving large numbers of people, divided into experimental and control groups, to study the effect of a drug or an intervention on a single clinical condition, the effects of multiple drugs or interventions on multiple physiological systems or diseases could be examined in just one person. Notwithstanding, randomised clinical trials should remain the gold standard to ensure the safety, quality and efficacy of new treatments prior to their approval.

Furthermore, it will be possible to **design tailored treatments for each patient after the diagnoses of cancer and comorbidities**. Such personalised treatments will be more efficient with fewer side effects. **Artificial Intelligence systems will enable multidimensional diagnostic systems** to make decisions about which drugs and supportive care are the best choices for a specific patient with, for example, breast cancer, heart failure and diabetes, and capture data in real time to inform the future health choices of others. **Truly personalised care should deliver outcome-based treatment for the measurable benefit of patients and their families, while promoting the sustainability of healthcare systems and upholding the principle of solidarity.**



## References

Bousquet J, Anto JM, Sterk PJ, Adcock IM, Chung KF, Roca J, Agusti A, Brightling C, Cambon-Thomsen A, Cesario A, Abdelhak S, Antonarakis SE, Avignon A, Ballabio A, Baraldi E, Baranov A, Bieber T, Bockaert J, Brahmachari S, Brambilla C, Bringer J, Dauzat M, Ernberg I, Fabbri L, Froguel P, Galas D, Gojobori T, Hunter P, Jorgensen C, Kauffmann F, Kourilsky P, Kowalski ML, Lancet D, Pen CL, Mallet J, Mayosi B, Mercier J, Metspalu A, Nadeau JH, Ninot G, Noble D, Oztürk M, Palkonen S, Préfaut C, Rabe K, Renard E, Roberts RG, Samolinski B, Schönemann HJ, Simon HU, Soares MB, Superti - Furga G, Tegner J, Verjovski - Almeida S, Wellstead P, Wolkenhauer O, Wouters E, Balling R, Brookes AJ, Charron D, Pison C, Chen Z, Hood L, Auffray C. Systems medicine and integrated care to combat chronic noncommunicable diseases. *Genome Med* 2011; 3: 43. doi: 10.1186/gm259.

European Cancer Patient Coalition (ECPC). Joint statement: Making cancer - related complications and comorbidities an EU health priority. Brussels: ECPC, 2019. <https://ecpc.org/wp-content/uploads/2020/07/Final-Cancer-Comorbidities-Joint-statement-1.pdf>.

Expert Panel on effective ways of investing in Health (EXPH). Opinion on Defining value in "value-based healthcare. Luxembourg: Publications Office of the European Union, 2019.

Decker WW. The U.S. has fantastic health care, the problem is... Eden Prairie, MN: Optum Inc, 2019.

FitzGerald JM, Poureslami I. Chronic disease management: a proving ground for health literacy. *Popul Health Manag* 2014; 17: 321 - 323. doi: 10.1089/pop.2014.0078.

Gray M. How to get better value healthcare. Oxford: Oxford University Press, 2007.

Grose D, Morrison DS, Devereux G, Jones R, Sharma D, Selby C, Docherty K, McIntosh D, Loudon G, Nicolson M, McMillan DC, Milroy R, Scottish Lung Cancer Forum. Comorbidities in lung cancer: prevalence, severity and links with socioeconomic status and treatment. *Postgrad Med J* 2014; 90 (1064): 305 - 310. doi: 10.1136/postgradmedj-2013-132186.

Grose D, Morrison DS, Devereux G, Jones R, Sharma D, Selby C, Docherty K, McIntosh D, Nicolson M, McMillan DC, Milroy R; Scottish Lung Cancer Forum. The impact of comorbidity upon determinants of outcome in patients with lung cancer. *Lung Cancer* 2015; 87: 186 - 192. doi: 10.1016/j.lungcan.2014.11.012.

Lee L, Cheung W Y, Atkinson E, Krzyzanowska MK. Impact of comorbidity on chemotherapy use and outcomes in solid tumours: A systematic review. *J Clin Oncol* 2011; 29: 106 - 117. doi: 10.1200/JCO.2010.31.3049.

Porter, M., What is value in health care? *N Engl J Med* 2010; 363: 2477 - 81.

Sagner M, McNeil A, Puska P, Auffray C, Price ND, Hood L, Lavie CJ, Han ZG, Chen Z, Brahmachari SK, McEwen BS, Soares MB, Balling R, Epel E, Arena R. The P<sub>4</sub> health spectrum - a predictive, preventive, personalised and participatory continuum for promoting healthspan. *Prog Cardiovasc Dis* 2017; 59: 506 - 521. doi: 10.1016/j.pcad.2016.08.002.

Sarfati D, Koczwara B, Jackson C. The impact of comorbidity on cancer and its treatments. *CA Journal for Clinicians* 2016; 66: 337 - 350. doi: 10.3322/caac.21342.

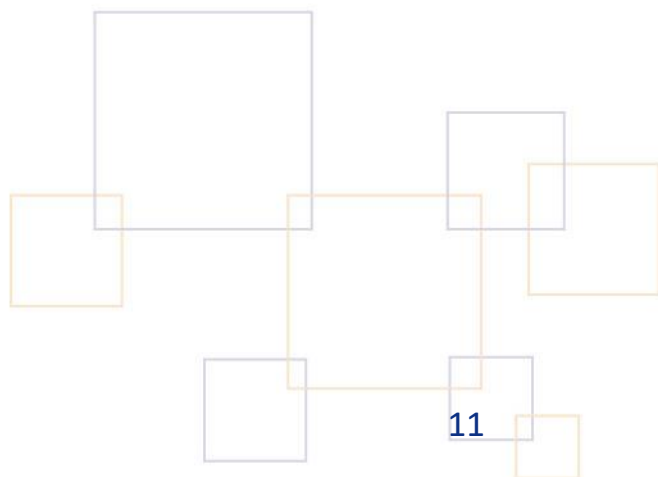
Spence P, Licking E, Evans J, Bean A. When the human body is the biggest data platform, who will capture value? London: Ernst & Young LLP, 2018.

Tsiachristas A, Stein KV, Evers S, Rutten-van Mölken M. [Performing economic evaluation of integrated care: highway to hell or stairway to heaven?](#) *Int J Integr Care*, 2016 Oct-Dec; 16(4): 3. doi: [10.5334/ijic.2472](#)

Unger JM, Hershman DL, Fleury ME, Vaidya R. Association of patient comorbid conditions with cancer clinical trial participation. *JAMA Oncol* 2019; 5: 326 - 333. doi: 10.1001/jamaoncol.2018.5953.

van Lente EV, Dawson C. Reflection on national strategies for new medicines coming to the market. Brussels: MEDEV, 2020.

Wilder Smith A, Reeve BB, Bellizzi KM, Harlan LC, Klabunde CN, Amsellem M, Bierman AS, Hays RD. Cancer, comorbidities, and health - related quality of life of older adults. *Health Care Financ Rev* 2008; 29: 41 – 56.



## Tables

**Table 1:** Proportions of cancer comorbidities in patients with various types of cancer and no cancer in USA. Adapted from Wilder Smith et al, 2008.

Comorbid Conditions	Cancer (%)	No cancer (%)
Hypertension	54.06	52.87
Angina/CAD	15.05	13.98
Congestive Heart Failure	7.06	6.14
Myocardial Infarction	10.55	9.20
Other Heart Condition	22.10	19.68
Stroke	8.57	7.46
Emphysema, Asthma, COPD	13.39	11.94
Crohn's Disease, IBD	5.63	4.56
Arthritis-Hip	36.40	35.28
Arthritis-Hand	31.81	32.19
Sciatica	21.63	21.15
Diabetes	17.30	15.78

**Abbreviations:**

CAD: Coronary artery disease

COPD: Chronic obstructive pulmonary disease

IBD: Inflammatory bowel disease

**Table 2:** Proportions of cancer comorbidities in patients with lung cancer in Scotland. Adapted from Grose et al, 2014.

Comorbid conditions - Lung cancer	Value (%)
Weight loss	53
COPD	43
Renal impairment	28
Ischaemic heart disease	27

**Abbreviation:**

COPD: Chronic obstructive pulmonary disease

**Table 3:** Some of the more common comorbid conditions and complications of cancer treatment in cancer patients in Europe. ECPC, Joint statement: "Making cancer-related complications and comorbidities an EU health priority", December 2019.

Cancer associated thrombosis/venous thromboembolism
Coexisting cancer and cardiovascular diseases.
Pain
Mental health problems
Neurologic complications
Malnutrition/undernutrition
Obesity
Celiac disease