



# THE VALUE OF SURGICAL ONCOLOGY IN THE MANAGEMENT OF CANCER PATIENTS

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## 1. INTRODUCTION

It is estimated that there were 18.1 million new cases and 9.6 million cancer deaths worldwide in 2018. (1) In males, lung cancer is the most commonly diagnosed cancer and the leading cause of cancer death, followed by prostate and colorectal cancer for incidence, and liver and stomach cancer for mortality. Among females, breast cancer is the most commonly diagnosed cancer and the leading cause of cancer death, followed by colorectal and lung cancer for incidence, and vice versa for mortality; cervical cancer ranks fourth for both incidence and mortality. Overall, the top 10 cancer types account for over 65% of newly diagnosed cancer cases and death. (1)

More importantly, cancer incidence is estimated to double by 2035. (2)

Cancer is the second-leading cause of death worldwide, second only to cardiovascular disease. Globally, deaths related to cancer increased by 45% between 1990 and 2013. In a recent update, the Global Burden of Disease study group noted that cancer-related mortality increased by 17% between 2006 and 2016. (3) Cancer is expected to rank as the leading cause of death in the near future and the single most important barrier to increasing life expectancy in every country of the world in the 21st century.

There are several factors that can be driving this increase, such as an ageing global population and an increase in exposure to cancer risk factors linked to social and economic development.

## 2. THE ROLE OF THE SURGEON IN CANCER

Surgery is a key component of cancer care and 80% of cancer patients will require some form of surgical intervention during the course of their disease. It is

estimated that by the year 2030, 45 million surgical procedures will be required. (3) Additionally, in some less-developed regions of the world, surgery may be the only viable treatment option for several reasons. Despite the increasing incidence of cancer and the need for surgery as a treatment, only 25% of the patients worldwide will receive safe, timely, affordable, and **HIGH QUALITY** surgical care. Surgeons have a central role in cancer prevention, diagnosis, treatment and research, leading the diagnostic and treatment pathways for most cancers. In most cancers, surgeons are the first specialist that the patient meets. Cancer surgeons are involved in the whole process from counselling patients about their diagnosis through to surgery and aftercare. Historically, many of the great advances in cancer research have been led by cancer surgeons. (4) Along with advances in medical and radiation therapy, surgery remains a modality with the potential to cure most solid cancers.

Cancer care is evolving from one of generalized cancer care by a single surgical oncologist to one of personalized cancer care by a multidisciplinary oncology team with combination therapies that are aiming to achieve both the best possible survival and quality of life in cancer patients. As a result, the surgeon, who 40 years ago would often be the only specialist to have contact with most cancer patients, can no longer work in isolation and may take a leading position in the multi-disciplinary team. Although the surgical procedure itself is the most characteristic element of the profession, a surgical oncologist has a much wider responsibility in caring for cancer patients. What differentiates surgical oncology from other areas in surgery is the oncology experience and expertise needed in dealing with all aspects of cancer management in a multidisciplinary fashion. Working in a multidisciplinary team, the surgeon has a good knowledge of the benefits and downsides of all treatment modalities, not just surgery but also radiotherapy, interventional radiology and systemic therapy. In many settings the surgeon is the clinician who best knows the patient and should therefore guide the discussion on the different treatment options, keeping in mind the preference

of the patient. In addition to the important role of cancer surgery in locoregional control of the primary tumour and lymph nodes, in this era of personalized treatment with more effective systemic therapy there is also an increasing role of surgery in the metastatic setting, with new concepts like oligometastatic disease. Often it is also the surgeon who follows the patient throughout their treatment journey similar to a chronic disease process.

The progress of medical genetics and gene profiling now allows identification of 'at-risk' individuals for specific types of cancer where prophylactic or risk reducing surgery may be of benefit. Surgeons should play a role in the decision-making process to evaluate that the indications for risk reducing surgery are clinical and oncologically justified.

Research, in particular clinical research, is associated with better outcomes for patients. Cancer surgeons will need to recognize and overcome the challenges of carrying out surgical trials by identifying the type of studies where they can best contribute, collaborating with other experts to embed relevant surgical endpoints early in the design of such trials. (5) There is great need for research to demonstrate and establish the impact of surgery in an oncological field that is mainly driven by advances in cancer biology and immune-oncology, yet, only 1% of cancer patients are recruited into surgical oncology trials in Europe.

Translational research is a major area where surgeons can not only be tissue providers but also shorten the gaps and delays that inhibit the translation of biomarkers, drugs and stratification tools into the practice of surgical oncology. (6) Cancer surgeons cannot remain as bystanders but become equal partners and leaders in clinical trial development, implementation and dissemination.

### **3. SURGICAL ONCOLOGY AS A SPECIALTY**

The increasing complexity of multidisciplinary cancer care has evolved with the evolution of the surgical oncology sub specialization within general surgery.

There is a great variability in the recognition of surgical oncology as a specialty in Europe. In some countries there are those who treat a specific cancer site as a cancer surgeon who has a comprehensive working knowledge of the medical and radiation oncology options for that cancer. In others there are those who treat a spectrum of cancers as the principle surgeon, often working in isolation without full recourse to a multidisciplinary team. This variation commonly reflects the health economy in the individual countries.

The most important reason for surgical oncology specialization is the evidence from multiple studies that “high volume” cancer centers and surgical specialists have better outcomes for treating complex or advanced cancers. There is a great variation in performance, and this can be related to surgeon activity and workload including how many specific cancer patients they operate a year (volume), subspecialty certification, and the hospital setting. Surgeon factors predict rates of postoperative complications and even cancer outcomes after selected surgical procedures. (7, 8) For example, of 27 studies examining surgeon outcomes based on training and specialization, 25 found that specialized surgeons had better outcomes for cancer surgery than non-specialized surgeons. (9)

Many studies have shown the benefits of specialist care. In breast cancer the multidisciplinary approach to management has improved survival. (10) In the UK where specialized breast units with specified quality control measures have been in place for decades surgeon, unit volume has a marked influence on patient management and treatment. (11) In other cancers, centralization of specialist surgical services can improve patient outcomes.(12)

There is a clear need for surgical oncology to be recognized as a specialist discipline since there are a huge variation in outcomes from cancer across Europe and it is imperative to raise standards and to establish pan-European quality standards in cancer surgery.

The ability to develop adequate surgical oncology training depends on the

presence of robust educational systems that promote training in all oncologic domains and helps to maintain competency across surgical practice. The training of surgical oncologists worldwide is extremely variable and cancer surgery will only improve with standardization and harmonization of the training curricula. For a cancer surgeon to be an effective member of the multidisciplinary team, they must be fully aware of the relevant medical and clinical oncology treatments and interventions in order to work collaboratively; this interdisciplinary understanding must be a key component of any training programme.

The Global Forum of Cancer Surgeons includes cancer surgeons from across the world who speak as one cohesive voice to address inequities in surgical care for cancer patients globally.(13) Their initial qualitative pilot survey identified barriers to surgical care with multiple common themes for the various surveyed countries. (14) The Global Forum has also developed a position statement to provide a set of requirements for training surgical oncologists globally. Based on previous respective professional society training curricula and requirements, (15-17) a global curriculum aims to provide the essential and common requirements for training surgical oncology professionals. Despite worldwide differences in cancer service provision, the requirements for training a surgical oncologist globally to provide optimal cancer care are uniform. The position statement supports a flexible and modular curriculum that can be adjusted to the individual countries with their specific characteristics.

The lack of adequate surgical care for cancer patients is related to many factors. One is the lack of surgical advocacy that represents the leadership of surgical oncology to influence cancer policy. The European Society of Surgical Oncology represents the voice of surgical oncologists in Europe and its representatives are working as advocates at the European and national level to promote the importance of standardization of training and the need for all patients to have access to high quality cancer surgery.

Today's cancer surgeons need to be highly trained medical professionals and be able to make cancer surgeries routine, safe, and highly effective. (18)

Training is, however, not just for the next generation. There is rapid change occurring currently with new innovations such as technological advances, genomics and artificial intelligence (AI). Trained surgeons need to be able to embrace these developments as they are introduced so that they can be introduced safely into practice and be the trainers for those young surgeons who are starting on their careers.

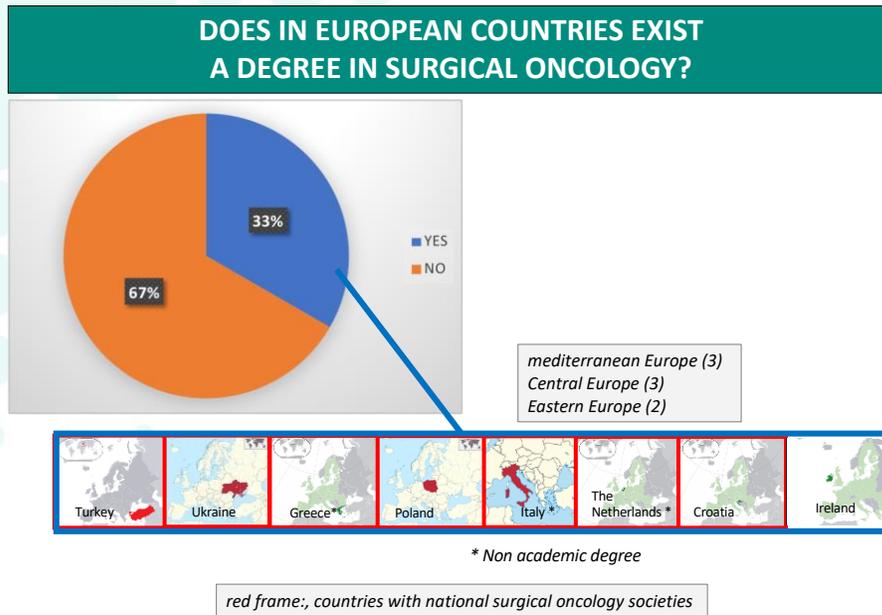
### ESSO SURVEY

In 2018 ESSO tried to map the recognition of surgical oncology as a subspecialty in Europe by contacting the representatives of affiliated Surgical Oncology Societies from 24 different countries. Czech Republic, Estonia, Latvia, Lithuania, Lichtenstein, Luxembourg and Malta were not included.

As double-blind check a questionnaire was sent to ESSO European members. Of those, 23,4% responded (534 out of 2260).

Participants completed a 19-question survey that included information about organization, education and certification of the surgical oncologist profile.

It was evident, as shown in the survey, that the professional figure of the surgical oncologist is not recognized in 20 out of 24 countries (83 %). The only countries where surgical oncology is a subspecialty are the Netherlands, Poland, Ireland, and Turkey. In other countries as Germany, a certification according to a fellowship program is ongoing, in the UK the surgical oncologist is an academic appointment and in Denmark, the certification is delivered within each Cancer Center.



Surprisingly, a certification or accreditation system for oncology centers is present in 15 countries out of 24 (62%) as comprehensive cancer centers, hub referral centers or cancer care units, delivered by the Ministry of Health in 7 countries, national surgical societies or medical federations / colleges in 7 and by EOCI in one.

68% of responders were not even aware of the core curriculum that was put together at the Global Forum in Surgical Oncology by ESSO, SSO and other Surgical Oncology Societies. (13)

ESSO is running a surgical oncology exam and a breast surgery exam under the umbrella of the European Union of Medical Specialties (UEMS), designed to certify that a surgeon has knowledge across the breadth of cancer surgery with advanced level expertise in their own specialist discipline. The standard of the exam is set at the level of a fully qualified cancer specialist surgeon working to the latest European quality standards and protocols. The exam is designed to evaluate both a candidate's theoretical and factual knowledge and their ability to

apply this knowledge in the surgical and non-surgical elements of modern multidisciplinary cancer care.

#### 4. ROLE OF ESSO IN THE ESSENTIAL REQUIREMENTS FOR QUALITY CANCER CARE

There has been a growing emphasis on driving up quality in cancer organizations. The European Cancer Concord (ECC), a partnership of patients, advocates and cancer professionals, has recognized major disparities in the quality of cancer management and in the degree of funding in Europe, launching a European Cancer Patient's Bill of Rights, a patient charter that underpins equitable access to optimal cancer control, cancer care and research for

Europe's citizens. (19)

It follows an assessment of the quality of cancer care in Europe as part of the first EU Joint Action on Cancer, the European Partnership for Action Against Cancer (EPAAC, <http://www.epaac.eu>), which reported in 2014 that there are important variations in service delivery between and within countries, with repercussions in quality of care. Factors such as waiting times and provision of optimal treatment can explain about a third of the differences in cancer survival, while lack of cancer plans, for example a national cancer plan that promotes clinical guidelines, professional training and quality control measures, may be responsible for a quarter of the survival differences.

The EU Joint Action on Cancer Control (CANCON), which replaced EPAAC from 2014, also focused on quality of cancer care and in 2017 published the *European Guide on Quality Improvement in Comprehensive Cancer Control*. This recognized that many cancer patients are treated in general hospitals and not in

comprehensive cancer centers (CCCs) and explores a model of ‘comprehensive cancer care networks’ that can integrate expertise under a single governance structure. Research also shows that care provided by multidisciplinary teams (MDTs) result in better clinical and organizational outcomes for patients. (<https://cancercontrol.eu/archived/cancercontrol.eu/guide-landing-page/index.html>)

MDTs are viewed as the ‘gold standard’ for the management of cancer patients. It is currently mandatory for all new cancer cases, early and advanced disease, to be discussed at an MDT. Alongside oncologists, radiologists, radiation oncologists, pathologists and specialist nurses, the surgeon is a key member of this team and in the decision-making process.

### *Breast Cancer*

At the European level there has been widespread effort to establish universal,

dedicated units only for breast cancer, following several European declarations that set a target of the year 2016 for care of all women and men with breast cancer to be delivered in specialist multidisciplinary centers. While this target was not met, as detailed in a European Breast Cancer Council manifesto calling for universal breast units, (20) the view of the ERQCC expert group is that healthcare systems must strive to adopt the principles of such dedicated care for all types of cancer. (21)

Breast cancer incidence varies across European countries but affects about 1 in 10 women and is a substantial health burden on society, and has been estimated to cost about 13% of the total cancer healthcare costs in the EU, the highest of any cancer, and second in overall economic burden after lung cancer. The estimated incidence of breast cancer in 2018 in Europe was about 416,000 with

a European age standardised rate of 145/100,000). Estimated incidence was highest in Belgium (204/100,000), Luxembourg and the Netherlands, the lowest in Romania (90/100,000) and Poland; generally, incidence is lower in South and East Europe, but data from these countries may be incomplete due to issues with cancer registries. Estimated mortality in 2018 was about 100,000, with the highest European age standardised rates in Croatia (43/100,000), Iceland and Ireland, and the lowest in Spain (23/100,000), Finland and Norway. (22)

Breast cancer is not only a population health problem, but also a socio-economic problem with huge economic burden caused by lost productivity. Stark inequalities in clinical outcomes and access for breast cancer patients across Europe, indicate how diverse European healthcare systems are in terms of their capacity to provide equal high-quality care for all. Inequalities exist not only among countries but also among regions within the same national boundaries. Even though breast cancer incidence is higher in Northern, Southern and Western Europe, survival is higher in those regions than in Eastern Europe where outcomes are poorer due to late diagnosis, lack of coordinated cancer

care and low access to systemic therapies.

Breast cancer and advanced breast cancer thus remain a serious threat to women, families and to European society.

Breast cancer is one of only three cancers where there is robust evidence for the benefit of population screening (cervical and colorectal are the other two) and most European countries have introduced mammography screening programmes, most commonly screening women between the ages of 50 and 70 at 2 year intervals to detect small tumours that have no symptoms.

Breast surgery remains the original and most effective 'targeted' therapy: excision of early cancer is curative and for more advanced disease surgery improves local disease control. Breast cancer surgery is still the

main therapeutic option in breast cancer treatment. Patients with a diagnosis of breast cancer stage 0, I, II and III will have surgery as part of their multimodal treatment. Around 25% of patients with stage IV will also benefit from surgical procedures along their treatments. The surgeon has a pivotal role in minimizing breast surgery to what is required to achieve the best oncological, functional and aesthetic outcomes.(23)

### Colorectal Cancer

Colorectal cancer ranks the 3<sup>rd</sup> in incidence and 2<sup>nd</sup> in terms of mortality globally. Incidence rates are higher in European countries as Hungary, Slovenia, Slovakia, the Netherlands, and Norway, but also in Australia/New Zealand, Northern America, Asia (Japan and the Republic of Korea), and Uruguay. As pointed out by the latest Globocan report by IARC, this disease can be considered a indicator of economic development since rates increase in parallel with Human Developing Index (HDI) (<https://doi.org/10.3322/caac.21492>). (24)

The increase in incidence appears to be related to dietary and lifestyle factors, whereas the mortality declines seen in HDI countries reflect improvements in

cancer treatment modalities, therapies, surgical oncology practice and management. (25)

Screening programs are still a matter of concern among European countries, with respect to both compliance and national implementation. Despite the Council of Health Ministers recommending about 15 years ago population-wide screening campaigns using the fecal occult blood test for all EU citizens ranging 50-74 years, only Slovenia, Ireland, France and UK have implemented their programs and only 14% of European citizens are actively participating in colorectal cancer screening programs. (26, 27) Participation rates are higher in the Netherlands -

up to 70%, although only citizens older than 55 years old are enrolled and in the Spanish Basque country, where a 75% participation rate was achieved, and 92% of all patients tested positive also adhered to colonoscopy. Most importantly, these screening campaign implementations resulted in 48% of patients diagnosed at Stage I in the Netherlands and Slovenia.

The prioritization of screening programs would accordingly result in lower rates of late stage at diagnosis, and would also be beneficial as a cost effective approach. Nevertheless, up to one third of colorectal cancer patients are diagnosed at Stage IV of disease. Moreover, current international guidelines recommend to perform neoadjuvant chemotherapy (NAC) for locally advanced – non metastatic rectal cancers (ESMO/NCCN guidelines) and the vast majority of these patients are treated with surgical resection and diverting stoma, reporting also urinary and sexual dysfunction and a low QoL.

On the other hand, tumor down-staging following NAD could result in a complete response, occurring in about 10-20% of the patients who were treated with NAD prior to surgery, (28) encouraging minimal invasive or organ preservation strategies.

### *Esophageal and Gastric Cancer*

Esophageal cancer is the 19th most common cancer in Europe. Incidence in Europe was approximately 46,000 in the year 2012 (34,500 in 27 European Union countries), and there were approximately 39,500 deaths (30,000, EU), and the 5 year survival number (prevalence) was approximately 47,000 (38,000, EU). It is rare in young people. There were wide differences in incidence and mortality among countries, with Western European countries including the UK, Netherlands, Ireland and Belgium with the highest rates, and the lowest in countries including Macedonia, Greece and Cyprus. European men have a much higher incidence of esophageal cancer than women, about 4:1, although for junctional tumours that arise in the stomach the ratio is lower.

Adenocarcinoma (ACA) of the esophago-gastric junction has increased greatly in incidence in the past few decades in developed countries and has been among the most rapidly increasing of all cancers – while squamous cell cancer (SCC) rates have remained stable (SCC is by far the more common type in developing countries). More recently the incidence of ACA has tended to stabilize and mortality rates in the EU of men have been declining.

Gastric cancer is the 5th most common cancer worldwide and the 7th most common in Europe. Incidence in Europe was about 140,000 in the year 2012 (81,000 in 27 European Union countries), and there were about 107,000 deaths (58,000, EU), and the 5 year survival number (prevalence) was about 193,000 (118,000, EU). Patterns of incidence and mortality are very different in Europe to esophageal cancer – Eastern European countries including Albania, Belarus, Macedonia and Russia have the highest rates, while Western European countries, including Sweden, Switzerland, France, Norway and the UK the lowest. More men than women have gastric cancer. Generally, incidence of non-cardia gastric cancers has fallen, but cardia cancers have increased in incidence. By far the most common form of gastric cancer is ACA.

Male gender and older age are risk factors for OG cancers. Smoking and alcohol play an important role for oesophageal cancer, and poor diet (including high salt intake) for gastric cancer. Obesity is particularly associated with a rising

incidence of junctional cancers (with current research investigating obesity types and gender differences). Carcinogens from some occupations are risk factors for gastric cancer.

The most important associated conditions for oesophageal cancer are gastro-oesophageal reflux disease (GORD) and Barrett's oesophagus, a premalignant condition for oesophageal ACA. For gastric cancer, *Helicobacter pylori* infection (which the International Agency for Cancer Research identifies as a carcinogen

for gastric cancer), and Epstein Barr virus infection are associated precancer conditions.

Symptoms that lead to a diagnosis of oesophageal cancer include difficulty in swallowing (dysphagia), lack of energy and strength (asthenia), gastrointestinal bleeding, weight loss, vomiting, indigestion, heart burn and chest pain. Common gastric cancer symptoms include dysphagia, asthenia, indigestion, vomiting, weight loss, early satisfaction of appetite and anaemia.

However, many patients develop non-specific symptoms related to digestion and commonly self-treat which induces a delay in diagnosis. Many patients therefore present with advanced disease, with in the UK approximately only 35% presenting with disease for which curative treatment is possible.

Although screening is carried out for gastric cancer in Japan and South Korea, as there is high incidence in these countries, population level screening programmes are not appropriate in Europe for either oesophageal or gastric cancer, but there are some guidelines to screen individuals who may be at higher risk.

The EURO CARE study (1999–2007) reported a mean 5 year survival for esophageal cancer of 12.4% and an overall 5 year survival for gastric cancer of 25.1%. Across the European regions, esophageal cancer patients in Central Europe, particularly Belgium, had the best survival while the poorest were in Eastern Europe. For gastric cancer, Southern Europe had the best survival while Ireland and the UK, and Eastern Europe, the lowest. Developments in treatment

have improved outcomes in intended curative treatment with combination chemotherapy, with or without radiotherapy, and subsequent surgery resulting in 5-year survival rates of approximately 50%. However there still remains variation in the provision of services for patients with esophageal and stomach cancer. Patients are still undergoing surgery before discussion by the multidisciplinary

team often by general surgeons, thus preventing best possible treatment planning. Standards of care are established in many countries but increasing awareness of such standards remains a challenge.

### Hepatobiliary cancers

Hepatocellular carcinoma (HCC) is a leading cause of cancer related deaths. Hepatitis C is the most frequent risk factor for HCC in the Western world, but chronic hepatitis B infection is the main risk factor in East Asia and sub-Saharan Africa where incidence rates of HCC are the highest.

Surgery, including liver transplantation (LT), remains the most efficient treatment of patients with HCC. However, <30% of patients with HCC are eligible for surgery, mainly because of the multiplicity of the lesions which often occurs on a background of chronic liver disease. Surgery is safer, with an acceptable overall mortality rate in cirrhotic patients (<5%); also, good long-term survival, up to >50%, is achieved after adequate anatomical resections.

Mortality rate for hepatectomy in cirrhotic patients was >10% two decades ago. The improvements in surgical techniques of hepatic resection have resulted in a dramatic decline in the operative mortality of hepatic resection for HCC and allowed major resections in selected cirrhotic patients.

Biliary tract cancers, namely cholangiocarcinoma and gallbladder cancer, are less common in the West than HCC. The worldwide incidence of cholangiocarcinoma is highest in Asian countries such as Thailand where liver fluke infection is endemic. Gallbladder cancer incidence is highest in Chilean females, the main risk factor being gallstones. (41). The mainstay of curative intent treatment is surgical resection, which allows a 5-year survival in the order of 40-50% depending on tumour stage. There are ongoing studies investigating the role of liver transplantation, with neo-adjuvant chemo-radiotherapy, for early stage cholangiocarcinoma.

The hepatobiliary MDT is crucial to ensuring other treatment modalities are considered, including clinical trials whenever possible and best supportive care where appropriate. This quality assurance process optimizes patient care on both curative and palliative pathways.

### *Pancreatic cancer*

Pancreatic cancer is one of the most lethal tumours, killing about 92% of patients within five years of their diagnosis. It is the fourth cause of cancer death in Europe, with 132,600 cases diagnosed and approximately 128,000 deaths in 2018. (29) Despite a few improvements in treatment in recent years, mortality remains very high, with survival standing at 8% or less at five years. This is mainly due to the advanced stage of most tumours at diagnosis, and the lack of any effective screening tests. Pancreatic surgery plus perioperative therapy (adjuvant chemotherapy) is the only potentially curative treatment, but only 10-20% of patients with pancreatic cancer are diagnosed with localized, surgically resectable disease. The majority of patients present with metastatic disease and are not candidates for surgery, while surgery remains underused even in those with resectable disease owing to historical concerns regarding safety and efficacy. (30)

Perioperative mortality has decreased due to advances in safety of surgical techniques, and added to the systemic chemotherapy and new agents, survival rates have slightly increased. (31) The combination and advances in surgery and systemic therapy has extended the indication of surgery to locally advanced cancers. Surgical resection of primary pancreatic tumor with or without residual liver disease can be considered in selected cases after primary chemotherapy and it is associated with improved survival. (32)

Because pancreatic surgery is among the most technically complex and risky interventions, there is clearly a need of a sufficient patient caseload to ensure frequent practice. A meta-analysis, including studies from different countries with disparate health care systems, has provided strong evidence for an inverse

association between higher hospital volume and lower mortality after pancreaticoduodenectomy. (33)

### Sarcoma

Sarcomas are cancers that are classed as 'rare', which means they have an incidence of fewer than 6 per 100,000 a year. The incidence of adult soft tissue sarcomas (STS) is about 4 per 100,000 a year in Europe.

Management of patients with STS differs according to patient characteristics, tumour presentation, and histopathologic features, mostly sarcoma subtype and tumour grade; more than 40% of first histological diagnosis are modified when a second opinion is requested to a pathologist with expertise in sarcoma. (34) Also, only one in two to three patients is managed consistently with recommendations included in clinical practice guidelines for treatment of sarcomas. (35-38)

Surgery is the mainstay of the treatment of sarcomas, especially in primary disease. All non-metastatic adult-type primary sarcomas are resected when possible as part of frontline treatment; surgery alone can cure more than half of adult-type sarcoma patients. (39, 40) The quality of resection directly determines the 5-year risk of local recurrence, estimated between 10 and 20% in specialized centers, with the objective to attain 10%. The surgeon's experience with soft-tissue sarcoma, as part of a multidisciplinary treatment, is key in achieving the best adequacy between oncological resection and favorable functional outcome.

For patients with metastatic disease and local recurrence, surgery can also be an important part of treatment. Surgical margins are a major prognostic factor concerning the risk of local recurrence in limbs. En-bloc resection is a determinant prognostic factor of overall survival in STS and retroperitoneal sarcoma (RPS). Again, the experience of the surgeon is a prognostic factor of overall survival, and surgery at a sarcoma centre achieves better outcomes. (41) Surgery is burdened by the highest incidence of deviation from guidelines underlying that patients with early stage STS. In early stage STS surgery is the

primary standard treatment option with a direct impact on the cure rate but many are often managed outside referral centres and sarcoma networks. (35, 38) Unplanned initial excision for STS of extremities and trunk wall are performed in up to 40% of patients, particularly for small and superficial tumours in young patients. (42)

Unplanned surgery, also called “whoops surgery”, has implications for the subsequent management of patients as plastic reconstructions are frequently needed at re-excision. (42) Second surgery is also compounded by estimated extra costs compared to primary excision. The lack of a preoperative plan affects outcomes of patients with sarcomas seated in the abdomen and retroperitoneal space, which are often treated in general surgery departments with no specific expertise and these tumours are sometimes referred for persistent disease after index surgery. (43) These patients are at higher risk of early postoperative mortality, subsequent recurrence and death compared to patients who have a complete resection of their tumours at a referral institution. (44)

Criteria to certify sarcoma expertise of institutions and surgical professionals are debated and health authorities have only recently started identification of these centres and creation of treatment networks in Europe as well as in several countries. (45) The European Reference Networks (ERNs) are intended to provide highly specialized healthcare for rare or low prevalence complex diseases or conditions including rare cancers. Out of the 24 ERNs recently established, three are for rare cancers: EURACAN on all adult rare cancers, EuroBloodNet on all haematological diseases, and PaedCan on all paediatric cancers. Sarcomas of soft tissues and bone are included in EURACAN which gathers 66 Health Care Providers in 17 European countries, and 22 Associate partners (Patients Advocacy Groups, rare disease stakeholders).

Success of these initiatives will depend upon properly allocated resources and policy to recognize and certify the professional figure of the sarcoma surgical oncologist, limiting management of patients with STS outside referral centres or treatment networks. These advances are expected to have a major impact also

on clinical and translational research with potentiality to furtherly improve patient outcomes.

### Melanoma

Melanoma is a highly deadly skin cancer, rising in incidence among fair-skinned people in Europe. Melanoma cancer incidence in the EU reaches 90,000 new cases annually and melanoma of the skin is considered one of the fastest rising forms of cancer, with higher numbers in the Scandinavian countries, Switzerland and Austria. Due to ageing of the population, the number of melanoma patients will remain high over the next decades. Exposure to ultraviolet light is a known risk factor for this disease. (1)

Early diagnosis of melanoma is crucial to favorable outcomes. Surgery is still the mainstay of melanoma treatment, though the role of the surgeon is changing. If melanoma is diagnosed in its early stages, surgical resection of the lesion is associated with favorable survival rates. However, melanoma is an aggressive malignancy that tends to metastasize beyond its primary site. Once melanoma is advanced, surgery is no longer sufficient and the disease becomes more difficult to treat. Knowledge of and experience with the biology of the disease and melanoma specific decisions and procedures is essential. As in other cancers, inequalities exist in availability and access to new innovative treatments between North-western, Central and South-eastern Europe, leading to differences in survival. Therapies used for advanced locoregional disease, like electrochemotherapy, CO<sub>2</sub> laser treatment, intra-lesional oncolytic virus therapy and isolated limb perfusion, are not available in all hospitals treating melanoma. (46). This disparity in care will continue as there is an increasing complexity of care for advanced disease, including new therapies that implies challenges and inequalities in patient's care.

## 5. INCREASED AWARENESS OF THE IMPORTANCE OF CANCER SURGERY IN THE CANCER PATIENT CENTERED MODEL

The rising cancer burden in the future will have consequences for the management of cancer patients. There is a need to raise awareness of the vital role that surgical disciplines play in the treatment of cancer for curative and palliative intents. There is an urgent necessity to decrease the major disparities and the lack of surgical care in many countries around the world.

It is essential that standards of surgical care supported by robust evidence are available to all patients. We are on the verge of an extremely exciting time for surgical innovation with technological advances including robotic assisted surgery, radiologically guided minimal access surgery and organ sparing surgery. These innovations must be fully evaluated to ensure patient safety and their place in the spectrum of surgical options. We also have a responsibility to ensure the public, policy makers and colleagues fully understand what these innovations have to offer and are used in appropriate treatment paradigms.

Cancer Surgery is present across all stages of cancer. From the treatment of early disease, to the later stages where surgery can be performed after neoadjuvant systemic treatments. Selected patients with metastatic disease can benefit from surgery. Risk reduction surgery are becoming the best reduction strategies in some types of hereditary cancer.

The European Society of Surgical Oncology will carry the surgical leadership on the European arena and will work together with the rest of Societies involved in patient's cancer care to influence the health policy makers to design the programs to be able to deliver high-quality, timely, safe, and affordable surgical care to patients with all types of cancer.

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