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# THE IMPACT OF COMORBIDITY ON SURGICAL OUTCOMES IN OLDER ADULTS WITH CANCER

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**OBJECTIVES:** *To provide an overview of the impact of comorbidity on surgical outcomes and postoperative geriatric events in older adults with cancer, and review key components of quality perioperative nursing care of older adults with cancer.*

**DATA SOURCES:** *Journal articles, research reports, state of the science papers, position papers, and clinical guidelines from professional organizations.*

**CONCLUSION:** *The high prevalence of multiple comorbidities and the associated burden of geriatric events in older adults after cancer surgery have a substantial impact on surgical outcomes, quality of life, and health care costs. Practical and efficient models of comprehensive assessment, prevention, and management of postoperative geriatric events and comorbid conditions are needed to improve surgical outcomes for this vulnerable cancer population.*

**IMPLICATIONS FOR NURSING PRACTICE:** *Oncology nurses practicing in clinical and research settings have a responsibility to arm themselves with evidence-based knowledge and resources to improve the perioperative care of older adults with cancer.*

**KEY WORDS:** *cancer, comorbidity, geriatrics, surgery.*

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0749-2081

<http://dx.doi.org/10.1016/j.soncn.2016.11.008>

**C**omorbidity, or the coexistence of chronic disorders in addition to a primary disease of treatment,<sup>1</sup> is common among cancer patients. Like cancer itself, the prevalence of comorbidity increases with age, but chronologic age and comorbidity do not always coexist.<sup>2</sup> In Medicare beneficiaries (aged 65 years or older), 15% to 25% of individuals with cancer have two or more comorbidities.<sup>3</sup> Compared with age-matched controls, older adults with cancer have a greater prevalence of comorbidities.<sup>4</sup> Comorbidity is distinct from other related constructs, such as frailty (multi-dimensional state of decreased physiologic reserve that results in increased vulnerability to stressors<sup>5</sup>) and functional status (ability to perform everyday tasks), and each of these constructs is an independent predictor of outcomes.<sup>2,6</sup> Comorbid conditions have a direct impact on cancer treatment outcomes and toxicities, and increases the risk of morbidity and mortality. In surgery, the coexistence of cancer and comorbidity complicates surgical risk, perioperative care, and postoperative recovery. The purpose of this article is to 1) provide an overview of the impact of comorbidity on surgical outcomes in older adults with cancer; 2) describe common geriatric events after cancer surgery; and 3) review the current recommendations on assessment and perioperative nursing care of older adults with cancer.

**ASSOCIATION BETWEEN COMORBIDITY AND SURGICAL OUTCOMES**

Table 1 presents a list of comorbidities with high prevalence in patients with cancer. The association between comorbidity and cancer treatment outcomes is largely related to the specific modality of treatment and the type/severity of comorbid conditions.<sup>2</sup> In general, higher rates of postoperative complications, higher intensive care unit admissions, longer length of hospital stay, and higher in-hospital mortality have been reported across most cancer types, including head and neck, thoracic, gastrointestinal, breast, prostate, and kidney cancer resections.<sup>7-17</sup> The physiologic changes of aging, the higher prevalence of comorbidities in older populations, and their combined impact on vital organ systems play an important role in a patient’s ability to tolerate cancer surgery. In several large population-based studies from Europe, findings

**TABLE 1.**  
**Common Comorbidity in Cancer Patients**

Cardiovascular
Hypertension
Coronary artery disease
Peripheral vascular disease
Arrhythmia
Abdominal aortic aneurysm
Pulmonary
Chronic obstructive pulmonary disease (COPD)
Endocrine
Diabetes
Metabolic Syndrome
Hypertension
Obesity
High blood glucose
High triglyceride
Low high-density lipoprotein (HDL) levels
Musculoskeletal
Arthritis

suggest that reduced pulmonary function, chronic obstructive pulmonary disease (COPD), cardiovascular diseases, and neurological comorbidity were associated with higher postoperative morbidity and mortality in patients with colorectal cancer.<sup>8,10,18,19</sup> Among lung cancer patients, vascular diseases, insulin-dependent diabetes, COPD, and poor pulmonary function were predictive of postoperative complications.<sup>19,20</sup>

Cardiovascular events, such as arrhythmias and conduction abnormalities, increase with aging. Impaired cardiac function as a result of physiological stress during surgery is a common cause of postoperative death in older adults; approximately 11% of postoperative complications are cardiovascular-related.<sup>21-23</sup> Perioperative fluid depletion is common in general, but not well-tolerated in older adults. The resulting depletion of intravascular volume, in addition to the physiologic stress of surgery, can adversely affect cardiovascular functioning in the elderly patient.

Physiologic changes related to respiratory functions include changes to the chest wall, respiratory muscles, lung parenchyma, and vasculature.<sup>24</sup> Pulmonary function measures, such as maximal voluntary ventilation, forced expiratory volume 1 (FEV1), and vital capacity (VC), are all decreased with aging.<sup>24</sup> The current evidence suggests that about 9% to 18% of older adults suffer from postoperative respiratory complications after major non-cardiac and thoracic surgery.<sup>25</sup> Respiratory comorbidity prevalence is high in cancer

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