Geriatric Surgical Oncology

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Introduction

Older adults are the fastest growing cohort requiring surgery and have the greatest incidence of cancer [1–3]. The median age at cancer diagnosis is nearing 70 years, and by 2030 nearly 70% of incident cancers will be in older adults [4–6]. For older adults, cancer care decision-making has inherent complexities due to altered risk-benefit profiles, underlying health status, remaining life expectancy, and heterogeneity in patient values and goals [7–9]. Older adults often place higher importance on outcomes such as long-term functional independence, quality of life, and avoidance of prolonged recovery [10–13]. Recommendations applicable to geriatric surgical oncology emphasize preoperative discussions regarding personal goals and preferences, while incorporating counseling about older adult-specific outcomes such as postoperative delirium, functional decline, loss of independence, and long-term care admissions [14–21]. However, age alone does not adequately describe the diversity in health status of older adults with cancer [22, 23]. Focused consideration

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F. C. Wright et al. (eds.), *Surgical Oncology Manual*,
https://doi.org/10.1007/978-3-030-48363-0_13

Table 13.1 Approach to older adults with cancer when surgery is a treatment option [25–28]

Confirm diagnosis and clinically stage cancer
Assess for vulnerability using a geriatric screening tool with defined measurement properties
Refer for CGA if abnormal geriatric screening or other age-related concern
Assess risk of surgery using surgical risk tool with defined measurement properties
Estimate underlying life expectancy using a prognostic tool with defined measurement properties
Describe treatment options in light of above assessments including options for preoperative optimization based on CGA and prehabilitation
Elicit goals and values from patient to make treatment recommendation
The following sections provide further detail on aspects of this approach

on patient assessment, patient-centered decision-making, and perioperative care for older adults tailored to individual needs will optimize disease control and quality of life [24]. This chapter acts as an overview to guide the integration of geriatric principles into the overall surgical care of older adults with cancer (Table 13.1); it does not provide cancer-type specific considerations or treatment recommendations.

Terminology

- *Geriatric Oncology*: The practice of geriatric oncology incorporates geriatric principles into the care of older adults with cancer. This includes tailored assessments, decision-making, and treatment options including addressing geriatric syndromes. A *geriatric oncologist* may have a background in geriatric medicine, medical oncology, radiation oncology, or surgical oncology along with expertise in the care of older adults with cancer. All clinicians caring for older adults with cancer can apply these principles to practice and seek expert consultation when needed.
- *Older Adult*: To avoid negative stereotypes and discriminative connotation, the preferred term for referring to individuals aged 65 and older is "older adult" and including a specific age range as relevant [1]. The diversity in physiologic, functional, and social health among older adults must be recognized [29, 30].
- *Comprehensive Geriatric Assessment (CGA)*: A CGA includes assessment by a trained assessor in all four cardinal domains: physical health (comorbidities, medications, nutritional status), functional status (basic and instrumental activities of daily living), psychological status (cognitive and emotional), and socioeconomic factors (living situation, financial resources) [31, 32]. Typically, CGA includes a multidisciplinary team with geriatric expertise using structured and validated instruments in each domain sufficient for diagnosis and management. Importantly, CGA also includes implementation and monitoring of a treatment plan for identified deficits.
- *Geriatric Screening*: In contrast to CGA, geriatric screening involves the use of abbreviated evaluations not requiring advanced geriatric training [31]. Many geriatric screening tools have been developed with varying degrees of

methodological rigor and investigation of measurement properties [33–37]. While many studies have aimed to assess the prognostic and predictive value of individual geriatric screening tools, geriatric screening is best used to identify older adults who would benefit from CGA [31–33, 35].

- *Geriatric Syndromes*: Geriatric syndromes are multifactorial health conditions that are common in older adults and manifested by multiple interacting contributing factors [38]. Examples include delirium, dementia, falls, frailty, sarcopenia, pressure ulcers, malnutrition, and incontinence.
- *Frailty*: Frailty is a state of vulnerability to stressors associated with a multisystem decline in physiologic reserve and function and increased risk of adverse health outcomes [39–43]. Frailty is operationalized both as a *cumulative deficit model* reflecting coaction of intrinsic and extrinsic factors and as a *phenotype model* reflecting multidimensional biological changes [39, 40]. Many tools now exist to screen for frailty to predict adverse outcomes, and an abnormal screen prompts a comprehensive assessment for treatment planning [44, 45].
- *Sarcopenia*: Sarcopenia includes loss of skeletal muscle mass, strength, and physical performance [46–49]. Some definitions use muscle mass alone, but incorporating a measure of strength or performance is recommended [46–48, 50–52]. Examples of measurements include cross-sectional imaging (skeletal muscle index, total psoas index, total psoas volume, total psoas area), bioimpedance analysis, dual X-ray absorptiometry, grip strength, physical performance batteries, and timed walking tests. Depending on the definition, prevalence of sarcopenia in surgical oncology patients ranges from 12% to 78%, but when a measure of strength or performance is included, prevalence ranges from 12% to 21% [52]. In surgical oncology, sarcopenia is associated with reduced overall survival and increased complications; this association is greater when a measure of strength or performance is included [51, 52].

Frailty for Surgeons

Frailty is associated with increased risk of falls, disability, hospitalization, functional dependence, chemotherapy intolerance, and poorer postoperative outcomes including overall complications, postoperative mortality, readmission, need for institutional care, and overall survival [42, 53–60]. Frailty is present in 10–20% of the general older adult population and up to 40% of older adults with cancer [57, 61, 62].

Several definitions exist. Those without frailty are described as fit, well, or robust. Some definitions use a range from very fit to very severely frail, some use a dichotomous definition of fit versus frail, and some have a middle category between fit and frail labeled as pre-frail or vulnerable [40, 42, 57]. Over 70 tools exist to measure frailty, many without validation [42, 63]. Broadly these are use for screening using either single or short assessments or comprehensive assessment [45]. Others have been designed for research purposes using administrative data. A CGA can identify frailty based on the number of identified deficits and has the

advantage of identifying deficits amenable to intervention [57]. Gold-standard frailty measurements include the Rockwood Frailty Index assessing accumulation of deficits across 30–70 items and the Fried Frailty Phenotype of weight loss, low activity, weak grip strength, slow gait speed, and exhaustion [64–66].

Given the association of frailty with poorer postoperative, functional, and oncologic outcomes, surgeons should routinely include a geriatric screening tool when assessing older adults with cancer and use the screening results to prompt referral for CGA [63, 67–70].

Assessing Older Adults Before Cancer Surgery

Traditional metrics of risks such as ASA physical status (American Society of Anesthesiologists), ECOG performance status (Eastern Cooperative Oncology Group), Karnofsky performance status, and clinical judgment alone miss important modifiable deficits and underestimate treatment intolerance, complications, impairments in function, and mortality [53, 71–77]. Older adult-specific assessments should be used [21]. An approach that uses brief geriatric screening tools to select older adults who should be referred for CGA is a practicable approach for surgeons [28, 33, 34, 78]. There are several goals of preoperative assessment outlined in Table 13.2.

Geriatric Screening Tools

Many screening tools have been developed to identify vulnerable older adults who are most likely to benefit from referral for CGA [31–36, 42]. These tools offer feasibility over CGA, but each has incumbent tradeoffs in comprehensiveness. These screening tools vary in the domains assessed, method of administration, time to complete, and test properties [28, 33, 34]. Surgeons should select a tool based on resources available, and familiarity or recommendations of local geriatric services. At minimum, surgeons caring for older adults with cancer should select one screening tool to use routinely. This can be done by the surgeon or trained delegate (e.g., residents, physician assistants, and nurses) and some are self-administered by

Table 13.2 Goals of preoperative assessment [18, 19, 28, 32]

Provide estimates of postoperative outcomes and competing causes of death and poor outcomes to aid decision-making and preparedness planning
Identify areas of vulnerability that may be optimized, including candidates for prehabilitation
Tailor treatment choices and supportive care
Anticipate postoperative needs
Plan for early rehabilitation
Delirium prevention and monitoring strategies
Proactive discharge planning including caregiver preparation and home care needs

patients. Older adults with an abnormal screening test score can then be referred to local multidisciplinary geriatric service for CGA and recommendations [63, 67–70].

Geriatric screening tools to identify vulnerability or frailty (an abnormal score should prompt CGA)

- Two commonly used geriatric screening tools that are sensitive for abnormalities in CGA and for postoperative outcomes in older adults with cancer are VES-13 (Vulnerable Elders Survey-13) (Table 13.3) and the G8 (Table 13.4.) [34, 79–81]. Both can be done in <5 minutes. VES-13 can be self-administered and G8 is administered by a healthcare professional. G8 has better sensitivity but worse specificity than VES-13 [34]. The G8 has been optimized in a single prospective cohort study to a shortened 6-item G6 tool with improved performance on internal validation, but it is yet to undergo external validation [82].
- Other available tools include GFI (Groningen Frailty Indicator), FRAIL Scale, SAOP2 (Senior Adult Oncology Program 2), Abbreviated CGA, TRST (Triage Risk Screening Tool), Clinical Frailty Scale, Edmonton Frail Scale, and PRISMA-7.

Other than frailty, if resources are available, additional single domain assessment tools that often are included as part of a CGA can be used (Table 13.5). Components that are most associated with postoperative outcomes and offer targets for interventions are functional status, cognition, depression, nutritional status, and comorbidities [86–88].

Table 13.3 Vulnerable Elders Survey-13 (VES-13) [42, 79]

Category		Points
Age (years)	<75	0
	75–85	1
	≥85	3
Self-rated health	Good, very good, or excellent	0
	Fair or poor	1
Physical disability	Difficulty with any of the following Stooping, crouching, or kneeling Lifting or carrying objects as heavy as 10 lbs Reaching or extending arms above shoulder level Writing, handing, or grasping small objects Walking a quarter mile (400 m) Doing heavy housework	0 (0 items) 1 (1 item) 2 (≥2 items)
Functional disability	Need assistance because of health/physical condition for any of the following: Shopping for personal items Managing money Walking across the room (cane or walker okay) Doing light housework Bathing or showering	0 (0 items) 4 (≥1 item)
A score of ≥3 is abnormal (frail)		

Table 13.4. G8 Tool [80]

Item	Answers	Points
Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing, or swallowing difficulties?	Severe decrease in food intake	0
	Moderate decrease in food intake	1
	No decrease in food intake	2
Weight loss during the last 3 months	Weight loss >3 kg	0
	Does not know	1
	Weight loss between 1 and 3 kg	2
	No weight loss	3
Mobility	Bed or chair bound	0
	Able to get out of bed/ chair but does not go out	1
	Goes out	2
Neuropsychological problems	Severe dementia or depression	0
	Mild dementia or depression	1
	No psychological problems	2
Body mass index (BMI, kg/m^2)	<19	0
	19 to <21	1
	21 to <23	2
	≥23	3
Takes >3 medications per day	Yes	0
	No	1
In comparison to other people of the same age, how does patient consider their health status?	Not as good	0
	Does not know	0.5
	As good	1
	Better	2
Age	>85	0
	80–85	1
	<80	2
A score of ≤14 is abnormal (frail)		

A mobile app for frailty screening (Essential Frailty Toolset) has been developed to assess patients undergoing aortic valve replacement [89]. The Essential Frailty Toolset has not been assessed in general surgery or oncology patients, but it is a simple four-item tool and is free to download (frailtytool.com).

Table 13.5 Single domain tools to consider if resources are available

Tool	Domains evaluated	Abnormal score	Time to complete	Comments
Timed Up and Go (TUG) [83]	Rise from chair, walk 3 m (10 ft), and return to sitting in chair	>12 s to complete	<1 minute	Simple test; requires timer and walking space Associated with major postoperative complications
Falls [84]	Ask patient about falls in the past 6 months	Report of any fall in the past 6 months	<1 minute	One-third patients had reported a fall when asked Strongly associated with postoperative complication and institutional discharge Sensitivity for frailty unreported
Mini-Cog [85]	Cognitive screening tool 3-word recall (scored 0–3) Clock drawing with all numbers and time set to 10 past 11 (scored 0 or 2)	≤3	≤3 minutes	Short screen for cognitive impairment Associated with postoperative complications, institutional discharge, and death at 6 months Poor performance with limited education
Nutrition	BMI Weight loss MNA-SF	BMI < 21 <80% of ideal weight or weight loss (>5% in 1 month or 10% in 6 months)	1–3 minutes	Associated with increased complications, hospital stay, and mortality [18]

BMI body mass index, *MNA-SF* mini nutritional assessment short form

Comprehensive Geriatric Assessment

CGA (Table 13.6) reveals unrecognized health issues, predicts postoperative outcomes, and can influence oncologic and non-oncologic treatment decisions [105–107]. In hospitalized patients, CGA has been associated with decreased mortality and functional decline at 3, 6, and 12 months.

CGA is recommended by multiple clinical oncology societies for those aged 70–75 years or older and those who are younger with age-related health concerns [18, 20, 32, 90, 108, 109]. If resources do not allow this, then geriatric screening tests can be used to select older adults for CGA [63, 67–70]. For CGA, any of various models and combinations of tools that assess the cardinal domains are acceptable [31, 32, 90]. Some geriatric oncology centers have developed electronic assessments [110, 111]. The Preoperative Assessment of Cancer in the Elderly (PACE) is a battery

Table 13.6 Comprehensive geriatric assessment [32, 90]

Domain	Example tools	Impact	Treatment options [90]
Functional independence	ADL (Katz index) IADL (Lawton scale)	Impairs independent living Adverse health-related outcomes Treatment complications Increased risk of death Falls typically multifactorial Consider impact of chemotherapy-associated neuropathy [91]	Home care assistance Prehabilitation, anticipate postoperative rehabilitation Physical therapy Exercise program/ falls prevention program Occupational therapy Home safety evaluation Medication review for falls
Physical performance [92, 93]	Grip strength Gait speed Timed Up and Go (TUG) Short Physical Performance Battery (SPPB)		
Falls [94]	Prior falls history Location and circumstance		
Comorbidity [95]	Charlson Comorbidity Index (CCI) Cumulative Illness Rating Scale-Geriatric (CIRS-G)	Perioperative considerations Severe comorbidity may be more life-limiting than cancer diagnosis	Optimize medical management
Nutrition [96]	Mini Nutritional Assessment (MNA) Unintentional weight loss Serum albumin BMI	Treatment complications Increased mortality Increased hospital stay Poor adjuvant chemotherapy tolerance	Dietician Specific dietary recommendations Oral care Social work, home care, occupational therapy
Polypharmacy [97]	STOPP/START Criteria [98] Beers Criteria [99] Medication Appropriateness Index (MAI)	Drug interactions Adverse events Altered renal or liver function Medication appropriateness	ACS-AGS guidelines for perioperative medication management [21] Pharmacist medication review Geriatrician management
Social support	Living situation Power of Attorney Availability of caregiver(s) Social isolation Financial status	Impaired treatment tolerability Prolonged and difficult recovery Difficulty with discharge planning	Social work Transportation assistance Home care assistance Caregiver support Spiritual care

Table 13.6 (continued)

Domain	Example tools	Impact	Treatment options [90]
Cognition (MCI, dementia, and delirium)	Mini-Cog (screening test) Montreal Cognitive Assessment (MoCA) Mini-Mental State Exam (MMSE) Rowland Universal Dementia Assessment Scale (RUDAS) [100] Confusion Assessment Method (CAM) for delirium	Capacity for informed consent Ability to follow complex treatment instructions Risk factor for postoperative delirium	Delirium prevention strategies [101, 102] Involve caregiver Involve SDM if capacity for informed consent is lacking Evaluate home supports Review medication appropriateness
Psychological status (depression, anxiety, distress) [103, 104]	Geriatric Depression Scale (GDS) Patient Health Questionnaire (PHQ-9) Distress Thermometer (DT)	Poor QoL Caregiver burden Functional decline	Geriatrician or PCP treatment Psycho-oncology Social work/ counseling Geriatric psychiatry
Other geriatric syndromes	Urinary incontinence	Social withdrawal and dermatitis Increased infections Increased health care costs	Lifestyle and pharmacotherapy
	Pressure ulcers	Physical restriction and social isolation Increased infections Increased health care costs	Multidisciplinary wound care team
	Osteoporosis	Falls and fracture risk	Geriatrician or PCP treatment
	Sarcopenia	Disability, hospitalization, and death	Dietician and nutritional recommendations Exercise program
CGA should be conducted by a team with geriatric expertise Specific tools used are not standard but should include assessment in all four cardinal domains of physical health, functional status, psychological status, and socioeconomic factors and include management plans for identified deficits [31, 32]. Individual tools can be used alone or in shorter batteries for screening			

ACS-AGS American College of Surgeons and American Geriatrics Society, *ADL* activities of daily living, *CGA* comprehensive geriatric assessment, *IADL* instrumental activities of daily living, *MCI* mild cognitive impairment, *PCP* primary care provider, *SDM* substitute decision-maker

investigated in older adults having cancer surgery [60]. Treatment strategies exist for deficits identified on CGA; however, specific guidance on how oncologic treatments should be altered based on CGA is not yet available.

Estimating Surgical Risk

Frailty, abnormal geriatric screening tests, and CGA are associated with surgical outcomes; however, several prognostic models have been developed aiming to give individual estimates of postoperative outcomes [35]. Few meet high-quality methodological standards for development and validation in older adults and older adults with cancer [88, 112–115]. The American College of Surgeons (ACS) Surgical Risk Calculator is a commonly used prognostic model that has undergone sound development, validation, and recalibration to improve test performance (Table 13.7) [116, 117].

Estimating Life Expectancy

Estimating an older adult's underlying life expectancy can assist with contextualizing treatment choices for cancer control by relating life expectancy with the risk of cancer-related morbidity, recurrence, and death. Discussing overall prognosis is helpful in supporting patients make choices about their healthcare and may strengthen the physician-patient relationship [118, 119]. Clinician predictions of life expectancy are often inaccurate, and prognosis calculators are helpful (Table 13.8) [7, 123–125]. An easy-to-use web-interface with life expectancy calculators informed by a systematic review of prognostic indices is available (ePrognosis) [7, 126]. Project Big Life also developed and validated a newer population-based life expectancy calculator with an easy-to-use web-interface [122, 127].

Table 13.7 Prediction model to estimate surgical risk

ACS Surgical Risk Calculator (riskcalculator.facs.org/RiskCalculator)	Web-based calculator Presents risk referenced against average patient Printable patient-friendly report	Outcomes of most interest Serious complication Death Return to OR Discharge to institution (short-term only)

Table 13.8 Free web-based life expectancy calculators

ePrognosis (eprognosis.ucsf.edu/calculators/#/)	Multiple calculators available Informed by systematic review [7] Lee Schonberg Index is most relevant [120, 121] Estimates 5-, 10-, and 14-year mortality Prints or emails patient-friendly report
Project Big Life (www.projectbiglife.ca/)	Canadian population-based prediction model [122] Patient-friendly online results display

Communication and Patient-Centered Decision-Making

Results of geriatric screening, CGA, life expectancy, and surgical risk estimates allow more informed patient-centered decision-making [26, 68]. There are no high-level clinical trial data to guide specific oncologic treatment modifications, but treatment recommendations should incorporate multidisciplinary recommendations in a shared decision-making model that integrates the patient's preferences and values [18, 20, 24, 28, 42, 68, 87].

For a fit older adult, standard treatments are appropriate. Based on patient preferences, tailored options can be considered (e.g., watch and wait, local excision, no surgical axillary staging, omission of radiotherapy after breast conserving surgery).

For a vulnerable or frail older adult – or when life expectancy is short enough that cancer control is a lesser priority due to low likelihood of cancer-related morbidity or mortality – management options include prehabilitation, less-invasive or organ-sparing treatment, or a palliative/non-curative symptom management approach.

Inadequate assessment and communication pitfalls can lead to nonbeneficial interventions with unintended consequences and unwanted burdens [26, 128, 129]. Uncertainty can lead to pressures for more aggressive treatments, and well-informed patients may choose differently [130–132]. Poor quality of the decision-making conversation, lack of shared decision-making, and unexpected poor postoperative quality of life all contribute to regret [133].

If surgery is chosen, it is important to discuss goals and preferences. Surgeons may discuss surgery with a "fix-it" model, convey risk as "big surgery", and insist on "surgical buy-in" to aggressive interventions in the case of major complications, and patients focus on logistical concerns [134–136]. However, an approach that narratively describes the types of patient-centered outcomes that are reasonably possible conveys more meaningful information [137]. Simply asking what a patient "wants" can lead to unattainable expectations or unexpected excessive burden [128, 138–140]. Explore and understand the types of patient-reported outcomes that would be unacceptable to the patient and the relative importance of longevity-based or comfort-based care if major complications occur, particularly a prolonged trajectory of accumulating complications [141, 142]. Question prompt lists are being investigated to facilitate discussing choices, expectations if everything goes well, and what happens if things go wrong [143].

Preparing for Surgery

What Is Prehabilitation?

Prehabilitation is a coordinated process aimed at improving the capacity of a patient to withstand an upcoming stressor like surgery. For patients with frailty, interventions that have been tested include physical activity, protein or other nutritional supplementation, psychosocial interventions, medication management, pharmacotherapy, and multifaceted interventions [68, 144]. Currently available evidence for

prehabilitation, particularly in oncology, is mixed and inconclusive [145–149]. Multifaceted prehabilitation guided by CGA is likely to be most effective, with high yield for programs incorporating supervised combined nutrition and exercise interventions in individuals at increased risk of functional decline or with functional deficits at baseline.

Nutrition

Malnutrition is a common finding in older adults with cancer, particularly gastrointestinal cancers and when symptoms like anorexia, early satiety, nausea, and vomiting are present [96]. Malnutrition is associated with postoperative complications, mortality, and decreased survival [96, 150].

There are many tools to screen for malnutrition, or it may be identified on CGA. Screen with BMI (≤21), unintentional weight loss (>5% in 1 month or 10% in 6 months), serum albumin (<35 g/L), or MNA-SF (Mini Nutritional Assessment-Short Form) [96, 151]. If a patient screens positive for malnutrition, refer to a dietician if available and for CGA for suggested interventions (Table 13.9). Additionally, follow standard ERAS pathways with preoperative carbohydrate load, short liquid fast, and early postoperative diet [17].

Caring for Older Adults After Surgery

The American College of Surgeons and American Geriatrics Society provide detailed recommendations for older adults undergoing surgery (these are not specific to oncology) [17, 21]. Largely, older adults should be cared for similarly to younger adults, including ERAS pathways, with added attention to proactive early

Table 13.9 Suggested interventions for malnutrition (best done with dietician involvement) [96, 152]

Nutritional counseling	Individualized Focus on protein intake; recommend minimum of 20-35 g protein/meal and at least 1 g/kg/day Oral nutrition supplements typically low in protein; use protein-rich preparations Whey protein isolates or whole milk powder contain high-quality proteins
Pharmacologic	Anti-emetics Pain control Branched-chain amino acids (leucine) promote protein synthesis in older adults (renal impairment is contraindication) Omega-3 fatty acids (fish oil) may improve appetite and body weight (2 g/day) Insufficient evidence for cannabinoids Corticosteroids considered to increase appetite (<1–3 weeks, usually not used due to numerous side effects)
Physical activity	Daily aerobic and strength training; can stimulate appetite and anabolism

Table 13.10 Postoperative considerations requiring added attention in older adults [17, 24, 68]

Proactive early mobilization [153]	Remove barriers (crowding furniture) and restraints (proactive removal of Foley and nasogastric tube, saline lock intravenous) Up to chair at meal times even if not eating; active range-of-motion exercises if in bed; head-of-bed at 30 ° if aspiration risk Encourage ambulation; walking aids as needed Physiotherapy as needed
Delirium prevention [101, 102]	Avoid physical restraints, orient to surroundings (lighting, clock, date), family members present, sleep hygiene (limit nighttime interruptions, early waking, and napping during daytime), hearing and visual aids Optimal pain control, but limit opioids as much as possible Avoid inappropriate medications Screening with Confusion Assessment Method (CAM); is a work-up of suspected delirium for reversible causes, and prevent complications Antipsychotics (risperidone, olanzapine, quetiapine, or ziprasidone) at the lowest effective dose for shortest possible duration considered if behavioral measures have failed and severely agitated, distressed, or threatening substantial harm to self, others, or both
Avoid inappropriate medications	Beers or STOPP-START criteria [99] Avoid benzodiazepines (e.g., lorazepam), anticholinergics (e.g., dimenhydrinate), and antihistamines (e.g., diphenhydramine) Limit opioids as much as possible

mobilization, avoidance of inappropriate medications (Beers criteria), delirium prevention, and discharge planning including caregiver education, home care planning, rehabilitation planning (Table 13.10) [17, 24, 68].

For vulnerable patients who undergo surgery, although largely studied in emergency and orthopedic surgical populations, a proactive geriatric co-management strategy may provide some benefit [70, 154–156]. While all routine postoperative management applies to older adults, older adults are at increased risk for the hazards of hospitalization including delirium, malnutrition, pressure ulcers, falls, restraint use, functional decline, and adverse drug effects [24, 157]. Postoperative geriatrics teams can assist with management of medications and chronic medical conditions; prevention, recognition, and treatment of common postoperative complications including delirium; and discharge planning and caregiver education for post-hospital care [17, 24, 70].

Toronto Pearls

- In general, age is not the primary consideration to guide decision-making for cancer treatment, and older adults have unique vulnerabilities that require assessment beyond the traditional preoperative evaluation.
- Many resources exist that can be adapted to local clinical environments (Table 13.11).
- Surgeons, or a delegate, should employ a screening tool to guide referral for CGA when planning cancer treatments.

Table 13.11 List of key guidelines and geriatric oncology resources [27, 28]

Guideline or resource	Contents
International Society of Geriatric Oncology (SIOG) (www.siog.org/content/comprehensive-geriatric-assessment-cga-older-patient-cancer)	Guidelines Screening Tools (Geriatric 8, Triage Risk Screening Tool, Vulnerable Elderly Survey-13) Geriatric Assessment Tools
Cancer-Type Specific Guidelines	SIOG breast cancer guideline [158] SIOG rectal cancer guideline [87] SIOG colorectal cancer guideline [159]
ACS-AGS preoperative and perioperative guidelines [17, 21]	Detailed recommendations for older adults undergoing surgery not specific to oncology
AGS Postoperative Delirium [101, 102]	Detailed recommendations for prevention, screening, diagnosis, work-up, and management
American Society of Clinical Oncology (ASCO) Geriatric Oncology (www.asco.org/practice-guidelines/cancer-care-initiatives/geriatric-oncology)	Compilation of geriatric oncology resources, tools, updates, and research
Cancer & Aging Research Group (CARG) Tools http://www.mycarg.org/SelectQuestionnaire	Online Chemo-Toxicity Calculator Online Geriatric Assessment Tool in multiple languages
Senior Adult Oncology Program (SOAP) Tools, Moffitt Cancer Center (moffitt.org/for-healthcare-providers/clinical-programs-and-services/senior-adult-oncology-program/senior-adult-oncology-program-tools)	Chemotherapy Risk Assessment Scale for High-Age Patients (CRASH) CalculatorCumulative Illness Rating Scale-Geriatric (CIRS-G) Calculator SAOP2 Screening Questionnaire
ConsultGeri, The Hartford Institute for Geriatric Nursing (consultgeri.org/tools/try-this-series)	Geriatric assessment tools with video tutorials

ACS-AGS American College of Surgeons and American Geriatrics Society

- Surgeons should identify local resources available to assist in caring for older adults with cancer as these will vary.
- Results of screening and CGA as needed, risk of surgery estimation, and life expectancy estimation should be combined with patient preferences in a shared decision-making model to guide treatment choices and perioperative planning.

This systematic multidomain and holistic approach to provide assessment and intervention in the perioperative settings optimizes life prolongation, geriatric syndrome prevention, subjective well-being improvement, and functional status.

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