Physical activity for cancer patients

Clinical risk assessment for exercise clearance and prescription

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Cancer is an important cause of both morbidity and mortality, currently accounting for approximately 1 of every 4 deaths in North America.[1,2] However, survival rates are continually increasing, as diagnostic and surgical techniques are improved and ever more effective local, regional, and systemic therapies are introduced. Approximately 66% of patients now live for at least 5 years following a first diagnosis of cancer, and more than 14.5 million North Americans live with such a history.[1,2] Today's family physician must thus be prepared not only to diagnose cancer, but also to provide appropriate lifestyle advice to manage the long-term consequences of cancer diagnosis and therapy.

There are diverse physiologic, psychological, and psychosocial responses to both the diagnosis and the treatment of cancer.[3-8] The range of effects calls for a multidisciplinary approach, with physical activity (PA) and exercise training interventions increasingly becoming integral to long-term patient management. Conventional cancer therapies induce adverse symptoms, often with unfavourable lifestyle changes, including a decrease in habitual PA and weight gain.[9] These changes have negative effects on patients' quality of life and can limit their ability to undertake the activities of daily living. However, increasing evidence indicates that both of these adverse developments can be attenuated by participation in regular PA.[5,6] On the basis of this burgeoning evidence base, several investigators and clinics have started to examine the important contribution of PA and exercise training to supportive care before, during, and following cancer therapy. In general, gains in cardiorespiratory fitness have been accompanied by decreased fatigue and enhanced overall quality of life.[3-8] Cancer-specific, evidence-based assessments of the risks and benefits of PA are thus needed by family physicians, qualified exercise professionals, and other members of the allied health team.

This article provides an executive summary of findings from a systematic review of the cancer-specific literature,[10] undertaken as one in a comprehensive series of analyses examining the risks of PA in patients with various chronic diseases. The information contained in this article forms the foundation for the newly created Physical Activity Readiness Questionnaire (PAR-Q+) and electronic Physical Activity Readiness Medical Examination (ePARmed-X+).[11] We briefly discuss PA risk assessment in patients with cancer based on currently available adverse event–related data, and introduce decision trees that facilitate clinical decision making for the family physician.

Discussion

Current empirical evidence suggests a low incidence of adverse events related to PA in patients with cancer. In essence, PA appears relatively safe and should improve physiologic and psychosocial outcomes for most patients. Although likely dependent on the characteristics of the cancer and the type of treatment selected, by far most reported events are cardiovascular, and patient monitoring during training should be selected appropriately with this in mind. At this stage of clinical understanding, it is not possible to offer detailed recommendations for all types of cancer. However, patients with pulmonary or bronchogenic cancers might be at particular risk of adverse events, given both the pathophysiology of the disease and the likely comorbidity secondary to their smoking history.[12,13] Other diagnoses that warrant added caution include multiple myeloma, a disease associated with osteolytic bone lesions that increase the risk of bone fractures,[14] and head and neck cancers associated with tobacco or alcohol abuse, where there is an increased likelihood of associated cardiovascular disease.[15,16] Because of the higher risk, such patients merit preliminary electrocardiograms, exercise testing, and (for persons with multiple myeloma) bone scans. However, if test results are unremarkable, such patients can be cleared for the same PA programs prescribed for other patients with cancer.

Based on current evidence, we have arrived at 5 conclusions and associated evidence-based recommendations (**Table 1**), from which a clinical decision tree has been derived (**Figure 1**).

Conclusion

After reviewing the current evidence, we have arrived at the following 5 conclusions.

1. The systematic review demonstrates a risk-to-benefit ratio favouring a recommendation of PA for all patients with cancer.
2. There is no evidence supporting specific absolute or relative contraindications to PA in adults with cancer. Nevertheless, an informed evaluation of potential contraindications has allowed the development of a simple clinical decision tree, based on the best available knowledge and clinical experience (**Figure 1**). This allows appropriate decisions to be

Table 1. Evidence-based recommendations for PA screening in cancer patients

CONCLUSION NO.	RECOMMENDATION	LEVEL*	GRADE†
1	The demonstrated benefits of exercise training on select physiologic and psychosocial outcomes, the promising observational data on the relationship between regular PA and cancer reoccurrence and overall survival, combined with the low incidence of adverse events, suggest that the risk-to-benefit ratio favours the recommendation of PA for all cancer patients	II	B
2	The American Thoracic Society and the American College of Chest Physicians absolute and relative contraindications appear appropriate for general PA in cancer patients, but should be modified to include absolute contraindications for the presence of extensive skeletal or visceral metastases and anemia	II	B
3	During screening by a secondary qualified exercise professional,‡ the primary question should focus on the type of cancer diagnosis; information on the type of cancer is of direct relevance to the risk of exercise-related adverse events as well as the recommended exercise prescription	III	B
4	Patients undergoing therapy require referral for blood and ACG tests, and possibly exercise testing and cardiac imaging to assess left ventricular ejection fraction	III	B
5	Patients who have received previous cytotoxic chemotherapy are considered to be at moderate risk and require referral to a physician or other allied health professional for PARmed-X assessment, ECG, and exercise testing; those who have not received previous chemotherapy are considered to be at low risk, do not require a referral for PARmed-X assessment, and should be encouraged to exercise at low to moderate intensity	III	B

ACG—angiocardiography, ECG—electrocardiography, PA—physical activity, PARmed-X—Physical Activity Readiness Medical Examination.
*Level I evidence includes randomized controlled trials; level II evidence includes randomized controlled trials with important limitations or observational trials with overwhelming evidence; level III evidence includes observational trials; and level IV evidence includes anecdotal evidence or expert opinion.
†Grade A recommendations are strong; grade B recommendations are intermediate; and grade C recommendations are weak.
‡An example of a qualified exercise professional is a Canadian Society for Exercise Physiology Certified Exercise Physiologist, who has specific training in exercise testing and training for persons with chronic conditions.

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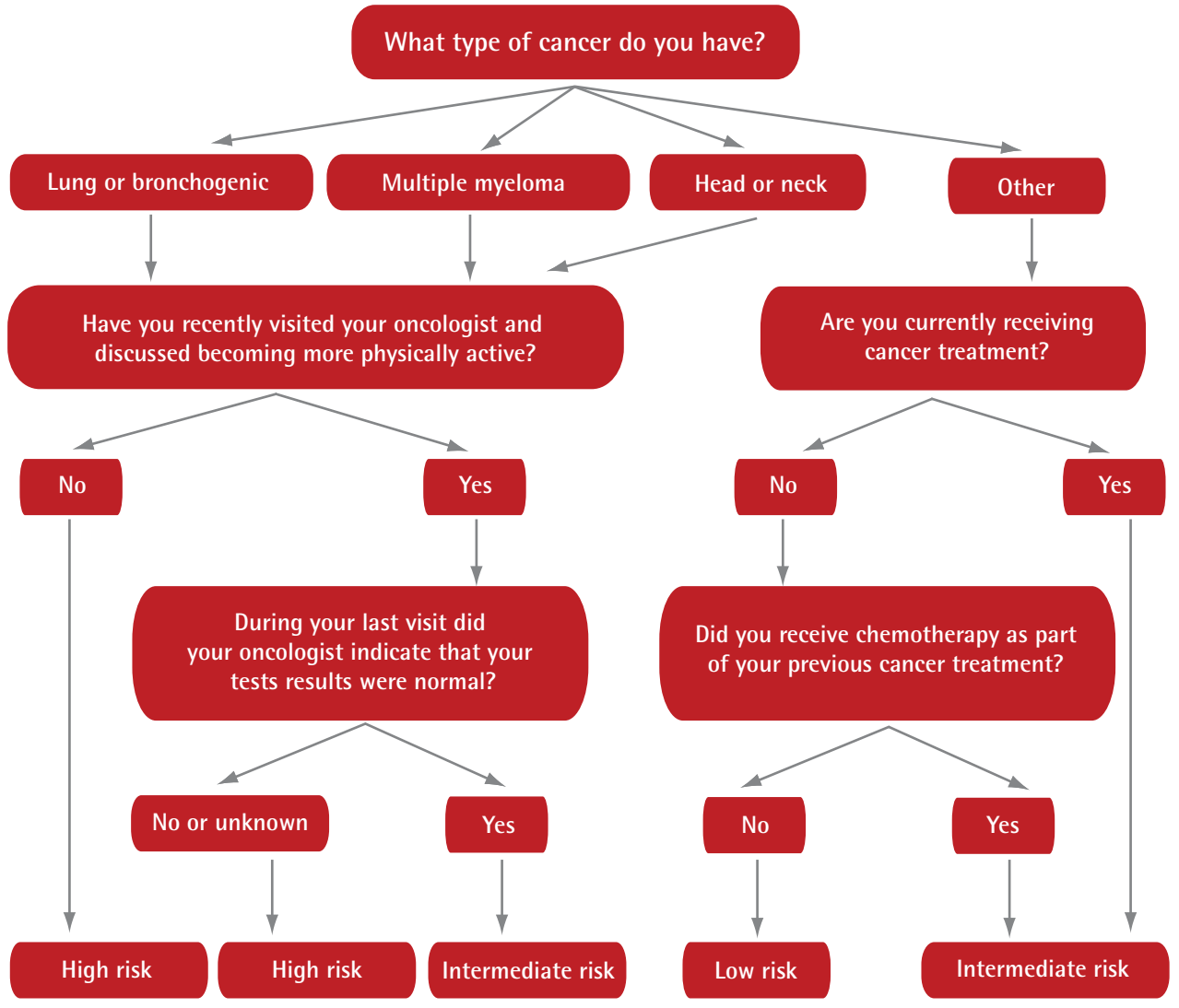
Figure 1. Clinical decision tree for assessing the risk of adverse events during physical activity in cancer patients: *This decision tree can be used to categorize a patient as high, intermediate, or low risk, and the requirements of physical activity prescription and monitoring can be determined accordingly.*



made concerning the type of exercise to be prescribed, and the level of supervision that will be required.

3. A previous diagnosis of cancer in a patient who is now seeking approval of an exercise program does not require further referral to an oncologist; secondary screening can be undertaken by a qualified health or exercise professional, using the clinical decision tree provided.
4. Conventional and novel treatments of cancer can have a range of adverse effects on the cardiovascular system, and these might increase the risk of an adverse cardiac event during PA, with direct implications for exercise prescription.
5. Previous cancer treatment might also be associated with a diverse range of subclinical cardiovascular complications, sometimes persisting for decades following the initial diagnosis. These complications also might increase the risk of an adverse cardiac event during PA, with direct implications for the exercise prescription.

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Competing interests
None declared

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