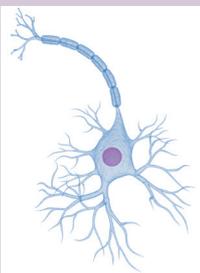


■ CNE Article

# Neurologic Complications of Cancer and Cancer Therapy

Alixis Van Horn, RN, MSN, APRN-C, CHPN, and Cynthia Harrison, RN, MSN, NP



© Hemera/Thinkstock

When neurologic complications occur as a result of systemic cancer and cancer treatment, they can be more disabling for patients than their primary cancer and significantly impair functioning in varied domains. However, recognizing neurologic signs and symptoms as complications of cancer and its treatment can pose a challenge for healthcare providers. Oncology nurses must develop a high index of suspicion for neurologic complications when examining or interviewing patients who present with neurologic symptoms or deficits and have a known systemic cancer. The purpose of this article is to help oncology nurses identify the common presentations of those complications and understand the ways in which they occur, with the hope that early identification will facilitate appropriate medical intervention and slow the progression of neurologic deficits and systemic decline.

Alixis Van Horn, RN, MSN, APRN-C, CHPN, is a nurse at Tufts Medical Center in Boston, MA, and Cynthia Harrison, RN, MSN, NP, is a nurse practitioner at Columbia University Medical Center in New York, NY. The authors take full responsibility for the content of the article. The authors did not receive honoraria for this work. The content of this article has been reviewed by independent peer reviewers to ensure that it is balanced, objective, and free from commercial bias. No financial relationships relevant to the content of this article have been disclosed by the authors, planners, independent peer reviewers, or editorial staff. Van Horn can be reached at [alixisvanhorn@aol.com](mailto:alixisvanhorn@aol.com), with copy to editor at [CJONEditor@ons.org](mailto:CJONEditor@ons.org). (Submitted September 2012. Revision submitted October 2012. Accepted for publication November 5, 2012.)

Digital Object Identifier:10.1188/13.CJON.418-424

Neurologic complications that occur as a result of systemic cancer and its treatment can be more disabling for patients than their primary cancer. Patients' neurologic function—their ability to communicate, read, walk, feed, and care for themselves, or even to recognize their families and friends—can be markedly impaired. The consequence of those losses to the patient are wide in scope and can include a loss of independence, confinement, and premature death. The families of patients also may suffer high levels of distress and disruption because their loved ones face alteration or loss of their unique traits and many of their capabilities.

Identifying neurologic signs and symptoms as complications of cancer can be challenging for healthcare providers for several reasons. Many patients with cancer are at an age when neurologic deficits present as consequences of aging, or as a new onset of a neurologic disorder such as Parkinson or Alzheimer disease. Importantly, neurologic decline can have a subtle and insidious presentation and may be hard to identify from the other symptoms that may distress the patient. Oncology nurses, therefore, must have a high index of suspicion for those complications when examining or interviewing patients who present with neurologic symptoms or deficits and have a known systemic cancer. This article is intended to help oncology nurses identify the common presentations of

these complications and understand the pathways by which they occur in the hope that early identification will facilitate appropriate intervention from healthcare providers and help slow the progression of neurologic deficits and systemic decline in patients with cancer. Figure 1 shows various tools to help oncology nurses educate themselves and their patients about neurologic symptoms.

Neurologic complications can be categorized as direct or indirect, based on their underlying cause (DeAngelis & Posner, 2009). Direct complications refer to those caused by metastases or spread from the site of the primary cancer to the central nervous system (CNS) or the peripheral nervous system. In the CNS, metastasis may involve the brain or spine parenchyma or the subarachnoid space. In the peripheral nervous system, spread usually moves by infiltration of nerve roots, plexi, or muscle from neighboring malignancies. Indirect complications refer to those resulting from treatment (chemotherapy or radiation), from abnormal immune responses to cancer (e.g., paraneoplastic syndromes), or as a result of coagulation disorders causing cerebrovascular complications. The suppressive effect of cancer and its treatment on the immune system also can result in infectious complications within the nervous system, and chemotherapies may cause toxic metabolic conditions (e.g., coagulopathy, paraneoplastic syndrome, encephalopathy) that result in neurologic complications.