■ *CJON* Writing Mentorship Article

Update on New Therapies With Immune Checkpoint Inhibitors

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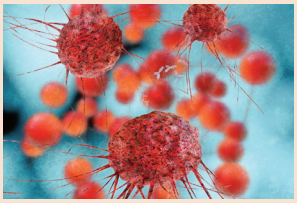

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Background: Immunotherapy has had a long history in cancer treatment and, with recent breakthroughs, new drugs are available that have shown promising results.

Objectives: The current article discusses an overview of immune function, including immunoediting and the theory of immune checkpoints, as well as specific drugs that have been approved as immune checkpoint inhibitors. Additional discussion includes a review of nursing implications and administration, side effects, adverse events, and the future of immuno-oncology.

Methods: This review of literature focused on locating, summarizing, and synthesizing data from published articles, the American Cancer Society, U.S. Food and Drug Administration, and literature from pharmaceutical manufacturers that focused on immunotherapy treatment options that use checkpoint inhibition. Search criteria included articles published from 2005–2015 and archived in CINAHL®, OVID®, and PubMed databases using the key words *immunotherapy, immune checkpoint inhibition, PD-1, PD-L1, CTLA-4,* and *oncology*.

Findings: Cancer therapy targeting immune checkpoint inhibition has shown promising results and continues to evolve. Oncology nurses need to remain abreast of new immune-modulating therapies to understand their efficacy, as well as side effect management.

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With the success of new therapies using immuno-oncology agents, immunotherapy is increasingly seen as an effective treatment for cancer (Mendes, 2014). Many patients with cancer who were previously out of treatment options have new hope.

Using the immune system as a tool to battle cancer is not a new idea. As early as 1891, Coley's toxins, an immunotherapeutic mixture of bacteria, were used with patients with cancer (Ito & Chang, 2013). When William Coley lost a patient to metastatic sarcoma after performing radical resection, he began to review medical records and identified that patients who developed postoperative infections had higher survival rates than those that did not (McCarthy, 2006). With this observation, he worked under the assumption that the immune system was triggered by the infection, which resulted in an immune response that also fought the underlying cancer. Coley continued to test his theory, claiming a five-year survival rate of 50% in patients treated with the toxins. After his death, his daughter published data from his cases, supporting a near-complete regression in 500 of 1,000 cases (McCarthy, 2006).

Clinical research in the late 19th century was not as regimented or rigorous as it is today; therefore, Coley's results were difficult to replicate. Based on questionable results and poorly documented patient follow-up, the approach did not gain favor. As a result, the use of chemotherapy and radiation became the standard treatment modalities for cancer (Ito & Chang, 2013). Immunotherapy has been revisited a number of times since then. Many drugs have

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