New Therapies Bring On a Golden Age.

For oncologists, it seems that over the past five years or so we have entered a new "golden age" of research into and development of new treatments for cancers. In particular, we have seen a move away from the focus on chemotherapy (which can kill both cancerous and normal cells, frequently with considerable toxicity) and toward "immunotherapy" and "targeted" therapy. Immunotherapy involved medicines that stimulate the patient's own immune system to battle the cancer. Targeted therapy involves medicines that interrupt cell function pathways unique to cancer cells, killing them preferentially, sometimes more effectively than chemotherapy with much less toxicity. In some cases these developments have quickly revolutionized our approach to certain malignancies.

A prime example is the current revolution in treating metastatic melanoma. This deadly skin cancer is increasing in frequency. An estimated 75,000 patients will be diagnosed with melanoma in the US in 2014, and nearly 10,000 will die of the disease. Until very recently, oncologists had few treatment options for patients in whom melanoma had spread. Treatments have been fraught with serious side effects and have been only marginally effective. In short, melanoma has been a major challenge for oncologists. But the past three years have seen great promise for our ability to manage melanoma more effectively, with the emergence of new immunotherapy and targeted therapy medicines for this cancer.

We witnessed the first major breakthrough in melanoma treatment in 2011, with a drug called ipilimumab—which thankfully goes by the trade name Yervoy. Yervoy, an immunotherapy, appears to work by enhancing the ability of the patient's immune system to recognize melanoma cells as "bad", so that the immune system itself, rather than chemotherapy, will kill them. Oncologists found that with Yervoy, rates of response to treatment and, more importantly, duration of patient survival, nearly doubled.

Shortly following Yervoy, several additional medicines have emerged (Zelboraf, Tafinlar, and Mekinist). Like Yervoy, these new medicines are not traditional chemotherapies. Instead, they work in patients whose melanoma carries a certain gene mutation called BRAF, by disrupting and inactivating certain melanoma cell processes, caused by the BRAF mutation, that are unique to melanoma cells but not normal cells. These "targeted" therapies (targeting the abnormal cell processes in melanoma cells) are also dramatically more effective than earlier conventional melanoma treatments with considerably less toxicity.

Most recently, this year the FDA approved for melanoma an entirely new drug: Keytruda. This medicine, like Yervoy but through a different mechanism, also stimulates the patient's own immune system to battle the melanoma cells much more effectively. Keytruda has caused a great deal of excitement for oncologists. Its response rates may be even higher than those of Yervoy, but additionally it appears effective even for patients who have shown cancer progression after receiving Yervoy. Thus, Keytruda provides a new layer of therapy for the sequencing of treatment options for melanoma patients. In the very near future we will likely see combinations of these new medicines further enhancing the effectiveness of melanoma treatment. We will also likely see their use following surgical resection of melanoma in patients who show no residual cancer, administered to prevent the development of melanoma spread to other sites from occurring at all. These medicines may also show significant effectiveness against other cancer. This is truly an exciting time for oncology.

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