

Treatment Utopia

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We are approaching a time when a physician will consider treatment for a newly diagnosed cancer patient not with a single modality, but with a complete complement of 'tools' that can be applied according to the diagnosis, molecular profile, and the presence or absence, magnitude and distribution of metastases. This is what Drs Hellman and Weichselbaum, in their excellent viewpoint on the "Importance of local control in an era of systemic therapy", are driving at in this issue of the journal.

It may be a while before these tools will be encompassed by a single physician but we have actually come a long way in integrating treatment in some tumors, such as breast cancer. Thirty years ago the treatment of breast cancer was applied in the following sequence: radical mastectomy, postoperative radiation therapy, and, if the patient relapsed, hormone therapy, and, if she relapsed again, but only then, chemotherapy. The results of this treatment sequence were not impressive.

Today we can offer lumpectomy and radiotherapy together as part of the primary treatment, with excellent cosmetic results, and effective systemic therapy at the same time. These approaches, coupled with the detection of disease at earlier stages using screening mammography, have resulted in a pleasing increase in survival rates and reduction in mortality with a markedly improved quality of life.

But there is another dimension to the concept offered by Hellman and Weichselbaum, and that is scheduling.

We physicians are creatures of habit. Surgeons operate whenever they can gain the use of the operating rooms, radiotherapists, for the most part, treat patients 5 days out of each week, not because we know it is the best

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schedule but because of interposing weekends, and medical oncologists treat patients on 'days 1 and 8' because of succeeding weekly clinics.

If one can be permitted to animate the cancer cell, it could be easily visualized smiling, in some distant place, at the thought of the ease with which its armies can circumvent our best efforts. Cancer cells don't divide on schedule.

In addition to treating tumor deposits wherever they are, what we need is to treat only at appropriate intervals. We now have the tools to look for the molecular targets that are the critical rate-limiting steps for each tumor. Once we have identified these targets and developed the corresponding inhibitory drugs and biologicals, which are already being successfully developed, we will then need to know the ideal schedule for effective administration.

The tools available to the oncologists of the future should allow them to measure, *in vivo*, the expected impact of a specific treatment within an individual patient, such as the induction of apoptosis, or the expression of a specific gene or genes, and its duration. This would enable the physician to give the next treatment based on real-time information, only when appropriate. That would surely result in some odd schedules that would tax the administration of our clinics. It would also require imaging and monitoring devices not available to us today, but also not too difficult to imagine, in the context of the technology revolution we are experiencing. We need to make an effort to research this kind of approach. We, of course, would also need regulatory flexibility equal to the capacity of the cancer cell to circumvent our rigid protocols. Now that would be Utopia.

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Competing interests

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