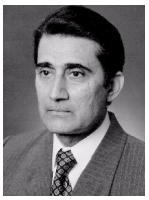
THE OXYGEN MODEL OF CANCER

Majid Ali, M.D.



The "Oxygen Model" of cancer is a *unifying* model that integrates all aspects of the causation and treatment of cancer that I know. A healthy cell breathes oxygen for energy. A cancer cell shuns oxygen and ferments sugar instead for its energy requirements.

This is the crucial difference between the energetics of those two types of cells. From that we can expect that any element that threatens the oxygen order of the human body will promote cancer growth. That, indeed, is the case. It also follows that any therapy that improves the oxygen function can be expected to enhance the body's defenses against cancer. That is also borne out by clinical experience.

Those are the two centerpieces of all my efforts to understand and treat cancer. Except when an early cancer can be removed completely with surgery, *the state of the oxygen in the body—not chemotherapy or radiotherapy—determines the long-term health and quality of life of the patient.* Persons with one cancer are more likely to develop a second unrelated cancer. Thus, the state of the oxygen in the body is also crucially important for individuals who are fortunate to have an early cancer completely removed*. This central place of oxygen in the treatment of cancer is the primary message of these articles in this booklet.*

The "Oxygen Model" of cancer (Figure 1) for understanding the *basic* nature of cancer described in this booklet is based on that. And so is the "Oxygen Protocol" for treating cancer (Figure 2). Oxygen drives all energetic, communication, detox, and defense functions of the body. It is a molecular messenger par excellence—the ultimate spin doctor of human biology. In 2000, I devoted *Oxygen and Aging* to the larger subject of the oxygen order of human life.*

In that book, I present a large body of clinical, microscopic, and biochemical observations that originally allowed me to recognize the oxygen issue of *paramount* importance: the matter of how cells shift in their affinity for oxygen under different conditions. I recommend *Oxygen and Aging* to readers who wish to read more about the many Dr. Jekyll/Mr. Hyde roles of oxygen in health and disease.

The deeper one's understanding of oxygen issues, the easier it is for the person with cancer to make the changes that allow a full life. That is an important lesson my patients with cancer have taught me. I have seen the magic of 'cancer diets,' 'curative herbs,' and 'energy cures' work, but only temporarily. Denial of foods is depleting. Euphoria of eating 'curative foods' offers but an empty hope. The change that is necessary for living *fully* after the diagnosis of cancer is made requires a deeper respect of life—a much deeper commitment to some higher purpose in life.

THE OXYGEN CONDITIONS

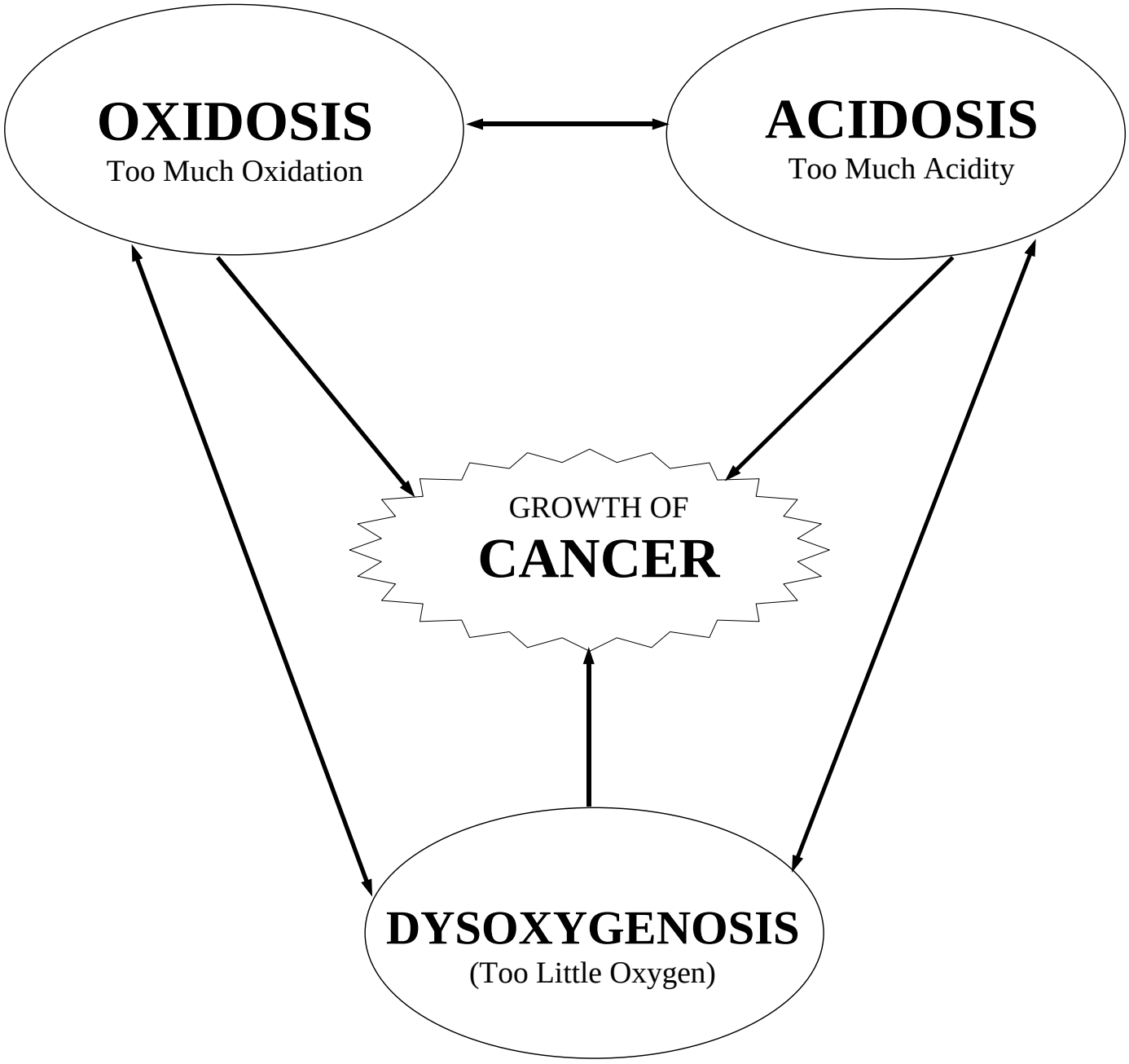
The Oxygen Model is not merely about dumping oxygen into the body—with oxygen by mask, hydrogen peroxide foot soaks, intravenous infusions of ozone, hyperbaric oxygen, and by other approaches—though all of those therapies greatly help. The Oxygen Model is about understanding the "oxygen conditions" that preserve health and those that set the stage for the development and spread of cancer. The oxygen conditions, for instance, are profoundly influenced by the spiritual equilibrium in one's life—or absence of it. Anger is dysoxygenative—it causes oxygen dysequilibrium. Demands for consideration, understanding, or love are dysoxygenative.

Sugar in the American diet robs people of oxygen. The scientific basis of that is clear. But that is not the complete story. A little girl lovingly brings to her grandfather suffering from cancer a piece of her birthday cake. Denying that *also* robs the grandfather of oxygen. Which threatens oxygen more? Eating that cake or denying? No physician can offer a simplistic answer to anyone. The right answer can only come from deep within the state of that grandfather. Understanding sets one free. But that level of understanding cannot come merely from listening to rabid speeches

*I refer professional and advanced readers to my *Dysoxygenosis and Oxystatic Therapies,* the third volume of *The Principles and Practice of Integrative Medicine.*

THE OXYGEN MODEL OF CANCER

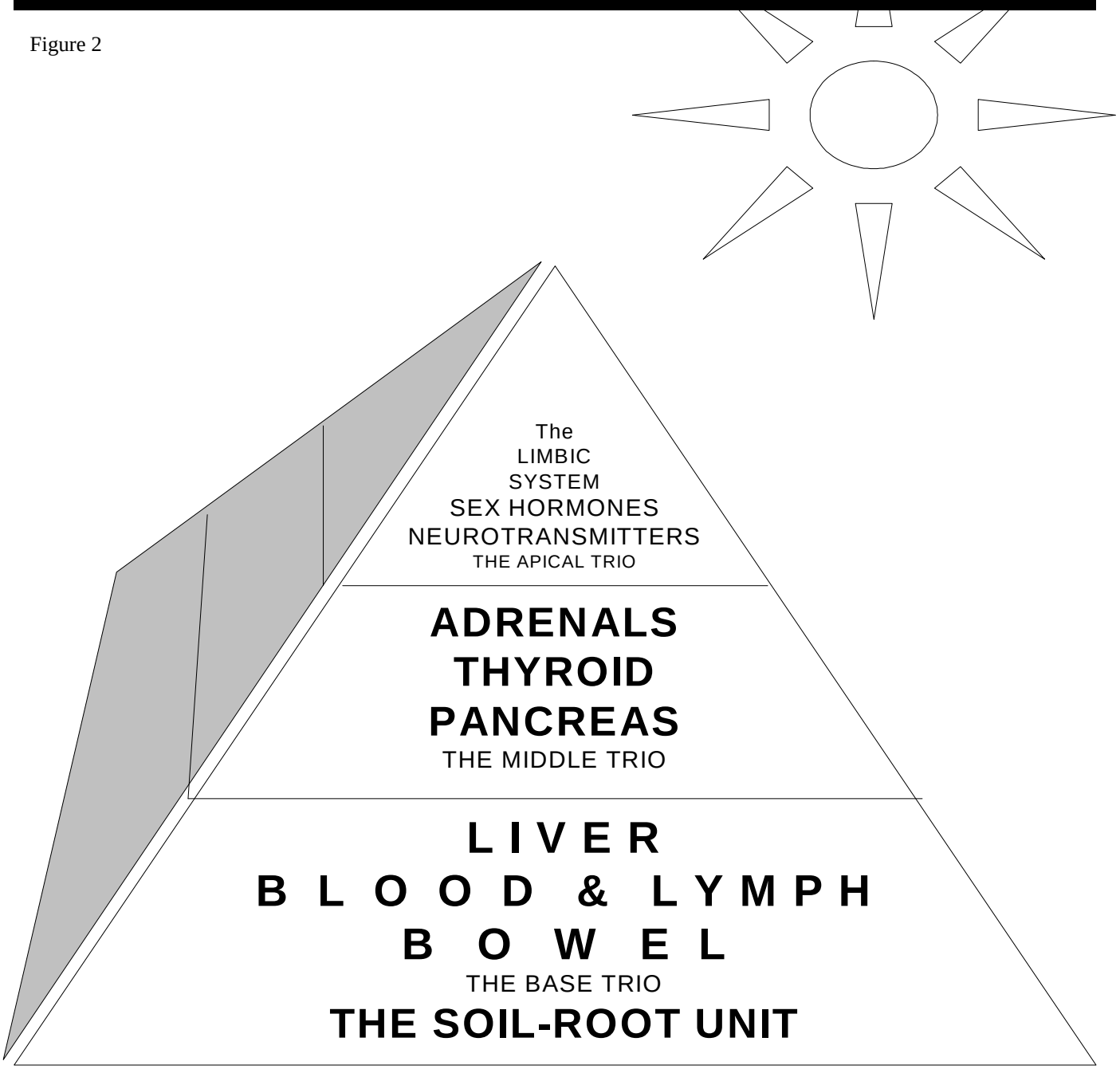
Figure 1



THREE ESSENTIAL ASPECTS

THE SUN-SOIL MODEL
for Controlling Cancer

Figure 2



CLINICAL PRIORITIES
FOR RESTORING OXYGEN HOMEOSTASIS

against sugar from health evangelists on the radio. (Maybe eating a bite or two, while returning the little girl's smile, and quietly dumping the rest when she is not looking will help.)

The relationships between oxidosis (too much oxidation), acidosis (too much acidity), and dysoxygenosis (deranged cellular oxygen utilization) are schematically shown in Figure 1.

Similarly, the Oxygen Protocol for the treatment of cancer is not merely a matter of providing oxygen by any of the methods mentioned previously. The Oxygen Protocol for treating cancer is about creating those oxygen conditions that:

1. Activate substances in the body that kill cancer cells;
2. Invigorate immune cells that fight cancer cells;
3. Control the destructive behavior of cancer cells;
4. Coax cancer cells to relinquish their resistance to oxygen;
5. Prevent cancer cells from making protective cocoons around them (discussed later);
6. Prevent toxic acids produced by cancer cells from accumulating in the cells and further poisoning oxygen enzymes and disrupting oxygen genes; and
7. Make it difficult for cancer cells to find a hospitable environment in distant tissues to colonize (to form metastases).

OXYPHILES AND OXYPHOBES

In nature, there are cells that love oxygen. I call them oxyphiles. There are cells that have a phobia against oxygen, and so I call them oxyphobes. There are other families of cells that are metabolic two-timers—they readily change their "oxygen-preference" when their environmental conditions change. Again, I recommend *Oxygen and Aging* for many valuable insights into the oxygen conditions, in response to which healthy cells and normal body flora of microbes shift their metabolism.

A subject that is seldom, if ever, addressed is how cancer cells damage healthy cells in their vicinity and cause an oxygen shift in them—turning oxyphiles into oxyphobes, further spreading the dangerous chemistry of deranged oxygen metabolism. This is yet another important aspect of the Oxygen Model of cancer.

A BOOK OF CANCER BY PERSONS WITH CANCER FOR PERSONS WITH CANCER

For forty-six years, I have studied cancer as a student of medicine, as a surgeon, as a pathologist, as an immunologist, as a clinician preoccupied with oxygen equilibrium (homeostasis) in the body, and finally as an integrative physician deeply interested in the spiritual dynamics of healing. Most importantly, in this book I have striven to see and investigate the problem of cancer through the eyes of my patients with diverse types of cancers. For that reason, I consider this volume to be a book of cancer by persons with cancer for persons with cancer.

As a young surgeon in Pakistan and later in England, I considered cancer as a mass (tumor) to be cut out. The person who harbored that mass seemed of no concern to me. Young surgeons are brought up that way. 'Prepare that colon cancer in the North ward for the operating theater,' was a kind of communication I received from my professors. Then I never thought about the use of the word *theater* for operating room. It is hard to avoid theatrics when one wields a scalpel over a draped-over, anesthetized being strapped to a table. Surgery, to a young surgical mind, is about skills—not about the silent world of fear and uncertainty of the person with cancer, extending months and years after the 'procedure' is over.

As a young pathologist in the United States, I learned that one does not talk about restoring an immune system damaged by chemotherapy in hospital oncology conferences. That is where 'men' are separated from 'boys.' 'Men' do not engage in the taboo subjects of 'building up the immune system' with chicanery of nutrient therapies and herbal concoctions. I do not recall if ever the word *healing* was spoken in thousands of those conferences. That was a word of the 'fringe medicine.' Real men of medicine were to remain above that. All that changed when I began my work with integrative medicine and started to look at cancer through the eyes of my patients.

I KNOW I WILL DO WELL

About five years ago, I saw a woman with a highly malignant form of lung cancer called oat

cell carcinoma. Oncologists at our hospital always 'gave' less than six months to live to persons with this type of cancer in spite of all possible treatments. As I read her biopsy report, my mind drifted to hundreds of lung cancers that I had diagnosed and to hundreds of conferences in which oncologists had simply shrugged when asked to comment. The woman facing me chatted away, talking about her plans. 'I have a church full of friends praying for me. I have a good oncologist. And, Dr. Ali, I have you. I know I will do well.' I kept my thoughts to myself and looked at her daughter on the next chair, holding a toddler in her lap. Her eyes were red from crying. It was clear to me that the oncologist had spoken plainly to the daughter about the expected outcome, but not so to the patient herself. Or, perhaps he had, but the patient had not understood well what had been said. Or, that she was still in denial. Or, her hope had drowned out the words of her oncologist.

During a visit several months later, she excitedly told me about a cruise ticket that her daughter had bought for her as a gift. She chatted away about many other things. Some months ago (nearly five years after her initial visit), her chatting remained unabated. 'Has she chatted away her oat cell cancer?' I asked myself. 'Or, does her hope continue to drown out all the noises in life? She simply lives on.'

I DON'T THINK IT'S CANCER

In the preceding, I described my work in the fields of surgery, pathology, and integrative medicine that led me to develop the Oxygen Model of cancer and to formulate the Oxygen Protocol for treating it. What may be possible with the insights provided by the Oxygen Model of cancer (for understanding the nature of the problem) and the treatment plan based on the Oxygen Protocol for cancer? The case history given below is of a man with prostate cancer. It is taken from an article I published in Capital University's The Journal of Integrative Medicine 2000;1:143-151:

There are yet other higher dynamics of belief in healing that doctors find very unsettling. One of my patients had prostate cancer diagnosed with a biopsy over ten years ago. He declined surgery, radiation treatment, and hormone therapy. Instead, he employed natural therapies and some herbs with hormone activity. Following is a conversation that took place during his recent visit with me.

"Dr. Ali, I don't think I have cancer," he said matter-of- factly.

"Good," I responded.

"No, I mean I really do not have cancer," he added with a smile.

"Okay," I returned his smile.

"I don't think you understood what I said," he became serious. "It has been over ten years. I don't think it was cancer."

"Oh! I get it. You mean that the biopsy was not read right, is that it?" I asked.

"Yes," his face lit up.

"That's easy to check. If you bring me the slides I will look at them and tell you what I think."

"Here, I have the slides," he reached for his pocket and pulled out a slide pack.

I examined the faded slides. There was no question the biopsy showed a prostate cancer.

"This is what we pathologists call prostate cancer." I tried to be gentle after I finished examination of the slides.

"I don't think it is cancer," he spoke firmly that time.

"Well...."

"It has been over ten years," he cut me off. "My PSA is down. My bone scan is negative. I have no pain. I have no urinary problems. What kind of cancer is that?" he asked with a wink.

What kind of cancer, indeed! I wondered. Whatever he had certainly did not behave like cancer. He is right. I cannot find any tumor on examination nor is there any laboratory evidence of cancer. Who am I to insist that it is cancer?! "We know so little." I returned his wink and changed the subject. The man was sustained by his belief.

At the time of this writing (fall of 2004), he still has no clinical signs of cancer. He is living a full life.

ON DEFYING DOCTORS' DIAGNOSES —AND PROGNOSES

No one with cancer should—in my view—let a doctor set limits on her/his life. I have seen quite a few patients who spoke words similar to those given below:

My doctor told me I had a year or so to live, and that I should put my things in order. That was nine years ago. I'm still here. My doctor died some years ago.

In my new book Oxygen and Cancer, I also include case histories of some persons with very aggressive and advanced cancers who also responded well for many years, like the man with

prostate cancer whose case is described above. When I see someone with a seemingly very difficult situation—for example, when cancer grows rapidly following chemotherapy—I cannot predict the clinical outcome. Still, the principles of the Oxygen Model are fully applicable and the therapies of the Oxygen Protocol are as necessary for that case as they were for the patient with prostate cancer described above. Of course, the sicker the patient, the more compelling the case for the Oxygen Protocol. Thus, I explain both the Oxygen Model (for understanding) and Oxygen Protocol (for treating) to every person with cancer.

If clinicians like myself never saw instances of long, useful life years after the patients were told they had a year or so to live, we would have simply quit treating cancer—as I wanted to do on many occasions when I lost someone. But it is the survivors who close that option for us. They gave me the courage to go on.

THE STRENGTH OF THE OXYGEN MODEL

The strength of any model rests on its two fundamental aspects: First, it explains what is observed. Second, things get done better with it. A good model provides a rational basis for formulating plans of action that are then validated—or refuted—with true-to-life experiments. For a medical model to be valid, it should have a strong explanatory power for clinical findings, and it should provide logical basis for formulating treatment plans that may be proven safe and effective with *long-term, true-to-life* clinical outcome studies, or discarded if the results do not justify that conclusion. I believe the Oxygen Model has a strong explanatory power for diverse clinical patterns of cancer, as well as the laboratory abnormalities encountered in the patients. More importantly, this model provides for a scientifically sound basis for the Oxygen Protocol for treatment of cancer. Above, I gave the story of the woman with oat cell cancer of the lung. She lives at a level of her own. But there are many other levels of existence after the diagnosis of cancer has been made. Later, I present other case histories to shed light on yet other levels of cancer control and healing.

In the Oxygen Model of cancer presented in this issue, all aspects of the disease are seen through the prism of oxygen metabolism. Specifically, cellular oxygen dysfunction—within cancer cells as well as that in noncancerous cells surrounding the malignant cells—is considered as the centerpiece in all attempts to understand any and all aspects of cancer. Specifically, that includes:

1. Local behavior of tumors;
2. Spread to distant locations (metastasis);
3. Generalized effects of the tumor on rest of the body ("cancer toxicosis");
4. Choice of therapies for eradicating local disease;
5. Choice of therapies for controlling widespread tumors;
6. Evaluation of responsiveness—or absence of it—of the tumor to the therapies employed; and
7. Long-term plans for the prevention of recurrence of second cancers.

THREE STORIES FOR THE OXYGEN MODEL

The Oxygen Model of cancer has three *core* aspects:

1. It recognizes abnormal oxygen metabolism—the absence of oxygen homeostasis, in the scientific terminology—as the *fundamental* metabolic derangement in cancer cells;
2. It calls for unfaltering focus on the search for *all* elements that cause, maintain, or exaggerate the degree of oxygen dysfunction in cancer cells, *as well as in noncancerous cells in the vicinity of cancer cells*; and
3. It provides the scientific basis of the treatment plans, both for destroying tumor cells as well as for the possibility of coaxing them to return to a healthful behavior.

To explain the above three essentials of the Oxygen Model of cancer, I sometimes tell my patients three stories. The first story, *The Marathon Runner, the Canary, and the Brewer's Microbes*, illustrates the *basic oxygen dysfunction* in cancer. The second story, *The Photographer and His Roses,* underscores the need for keeping a sharp focus on the oxygen dysfunction—both for the clinician and the patient—while searching for factors that increase the degree of that dysfunction and promote cancer growth. The third story, *Pantotropha: the Metabolic Two-Timer,** explains the scientific

*The scientific name of Pantotropha is *Thiosphaera pantotropha*.

basis of the Oxygen Protocol for treatment of cancer, in which the focus is on creating conditions that do not permit destructive behavior of cancer. It sheds some light on the tantalizing possibility of reversing the oxygen dysfunction in cancer cells and preventing their disorderly growth and destruction of surrounding tissues. This story also offers valuable insights into the nature of some cancer-related phenomena which cannot be explained in any other way, such as tumors remaining unchanged in size and clinically silent for long years.

THE FIRST STORY:
THE MARATHON RUNNER, THE HUMAN CANARY, AND THE BREWER'S MICROBES

Human canary is my term for a person with greater vulnerability to synthetic and natural agents that disrupt oxygen metabolism and cause widespread cellular dysfunction. In 1994, I introduced this term in *The Canary and Chronic Fatigue* to focus on how *cumulative* injury to cellular energetics causes chronic fatigue, tissue pain, and brain dysfunction.

Following is the first story for understanding the *fundamental* metabolic derangement in cancer. A man has three pounds of grapes. He offers one pound of those grapes to a marathon runner, the second pound to a human canary, and the third pound to a brewer. The fate of those three portions of grapes—in my view—tell the story of disturbed cellular energetics in cancer better than anything else I have read or heard in my study of cancer during the last 46 years.

The marathon runner's metabolism is optimized for superior cellular energetics. His "oxyphile" cells love oxygen. The grapes will turn into juice in his mouth, and that juice will be rapidly absorbed from his stomach. In the liver, muscles, and other tissues of the body, the grapes will be readily turned into:

1. Clean energy;
2. Clean water;
3. Clean carbon dioxide; and
4. Extremely small amounts of acids.

The marathon runner will use the clean energy to maintain his superb health. He will use clean water to hydrate himself for preserving cellular energetics. He will breathe out carbon dioxide, and will promptly expel the extremely small amounts of acids through his kidneys. The end result: the grapes energize him without creating any residue of toxic acids. In metabolic terms, he will extract about 30 units of cellular energy from every unit of the grape sugars. This is called the respiratory mode of cellular energetics (ATP production, in technical terms).*

The fate of the second pound of grapes in the body of the human canary will be different. Since the oxygen order of life in a human canary has been disturbed, the defective metabolic machinery of that person will not metabolize the grapes as the cells of the marathon runner did. Incomplete breakdown of grape sugar will result in production of excess acids and alcohols. The existence of this problem can be readily proven by measuring the increased urinary excretion of those substances (discussed later in this book).

Excess of toxic acids and alcohols produced from incomplete combustion of grape sugars will further clog the oxygen machinery of cells. As a consequence, the canary will develop yet more fatigue, tissue pain, and brain fog. I might point out here that nearly all clinical problems of human canaries can be resolved. Human canaries get well when *all* elements blocking their oxygen metabolism are systematically identified and effectively addressed.

The marathon runner in the respiratory energy mode of metabolism will be energized by grapes, but the human canary will be severely de-energized by grapes because the canary's metabolism has been degraded to a partially fermentative mode with alcohol and acid production. Understanding this difference between the cellular energetics of the marathon runner and a human canary—in my view—is crucially important for understanding the core energy dysfunction in cancer: a cancer cell cannot utilize oxygen properly and produces large quantities of toxic acids and alcohols.

Next, let us consider what happens to the pound of grapes given to a brewer, who crushes them and adds to them his microbes for

*In biochemistry terms, one mole of glucose will yield about thirty moles of ATP molecules (cellular energy currency) in the human respiratory mode and only two moles of ATP in the microbial fermentative mode.

CLEAN ENERGETICS, DIRTY ENERGETICS

The normal human oxygen-driven metabolism—the respiratory energy (ATP) production model—is cleaner, far more efficient, and yields larger amounts of usable energy. Fermentation, by contrast, is far less efficient, 'dirtier' in the sense of producing acids and alcohols, and yields far less usable energy—two versus thirty units, as indicated earlier. This is explained by the existence of a far more diverse enzyme arsenal of oxyphilic human cells than that of cancer cells, oxyphobic microbes, and a certain number of cells in human canaries. Humans have most of the fermentative enzymes of microbes; the oxyphobic bugs, by contrast, do not have the human enzymes necessary for complete digestion of foods. Enzymes, of course, are catalysts of metabolic reactions in living beings.

To summarize, nearly all cells of the marathon runner love oxygen and hate acidity. A variable number of cells of a human canary become oxygen-shy, compromising the cellular energetics. Under ordinary conditions, oxyphobic microbes hate oxygen and love acid. Also, under ordinary conditions, cancer cells hate oxygen and love acid. The important difference between the cellular energetics of a person with cancer and a human canary is this: All cancer cells in a tumor mass have oxygen dysfunction, whereas a variable number of the canary cells still have healthy oxygen metabolism. In my experience, the larger the number of dysfunctional cells in the body, the more disabled a human canary.

THE PHOTOGRAPHER AND HIS ROSES

My second story concerns the second most important issue in the field of cancer: unfaltering focus on *all* the elements that threaten oxygen order of the body in an individual with cancer. What is required is a diligent and systematic search for all the *visible* and *invisible* sources of toxins that inactivate or destroy enzymes that are driven by oxygen for optimal cellular energetics. The major groups of toxins in the context of cancer include mycotoxins, toxic metals (mercury, lead, aluminum, and others), carcinogenic pesticides and herbicides, and synthetic environmental pollutants. It is regrettable that those crucial issues are seldom, if ever, given due consideration in hospital tumor board and oncology conferences. I know that. For several years I moderated those conferences. During 33 years of my hospital work, I do not recall any oncologist ever raising the issue of the total body burden of mercury and other toxic metals in his plans of treating cancer. Nor of environmental pollutants and how to remove them from the body. Indeed, the discussion of those subjects was never allowed in hospital conferences.

My second story is intended to emphasize the need for diligent search for *all* elements that put in jeopardy oxygen metabolism and homeostasis. Needless to say, the degree of stress on oxygen homeostasis in a given individual is determined by the *cumulative* load of all "oxygen-stressors." Here is that story.

A man had two passions in his life: growing roses and photographing every aspect of his plants. In the morning, he surveyed his plants with pride and joy before leaving for work. His evenings were devoted to a close scrutiny of his flowers and to taking pictures. His rose garden was a delight to behold—for him, for his neighbors, and for passersby. A troubled teenager in the neighborhood often saw him engrossed with his rose bushes. One day, he planned a cruel trick on the man. During a rainy night, he heavily sprayed the rose plants with a potent herbicide.

The next morning, the man noticed that the flowers on some plants seemed different. The soil was obviously wet and the plants were well-hydrated. 'Why do those flowers look different?' he mumbled to himself. He brought out his camera from the house and snapped pictures of those flowers. Then he went to work. On his return from work, he noticed that some flowers were wilting. Troubled by that sight, he went into the house, grabbed his camera, and shot many more pictures of the wilting roses. Next, he spent hours in developing those pictures and scrutinizing them for clues to what ailed his flowers. He was disappointed. He slept fitfully that night, awoke early next morning, and rushed out. He was jolted by the sight of his garden. Many more flowers had wilted and some leaves were browning. Alarmed, he held some of the leaves in his hands and wondered about what had happened. There was no mistaking it. Something was terribly wrong with all of his rose bushes. He ran to the house, pulled his camera, and shot several more rolls of film.

Baffled and deeply saddened, he went to work. All day he remained distraught, his mind

returning to his roses every few minutes. He took off early from work and was horrified at the first glance at his garden. All of his beloved flowers were dead. Most leaves had browned out. All plants drooped. 'Oh, my God!' he cried and then held his head in agony. Dazed, he looked at the dying plants for long minutes. Then he rushed in, brought out his camera, and began a frenzy of shooting pictures. Again he spent hours developing photographs and examining them with a magnifying glass. There were no clues. That night he did not sleep. Nor could he go to work the next day. All day long, he looked at his dead plants and at the photographs of those plants. Beside himself with insufferable sorrow, he took yet more photographs and spent yet more hours searching for clues to the death of his roses. He found none. More days passed. He kept staring at his dead garden, taking yet more pictures, and pouring over them with his magnifying lens.

During the 29 years of my work as a hospital pathologist, I saw oncologists, radiologists, surgeons, and pathologists engaged in sprees of shooting pictures—CAT and PET scans, ultrasounds, photomicrographs of biopsy tissues—with nary a mention of the *real cellular* metabolic disasters that were literally devouring their patients from within. After the patients died following chemotherapy and radiotherapy, we performed autopsy examinations and took yet more pictures of dead and dying tissues. The purpose was to certify that, based on what we had discovered, the patient *had* to die and the clinicians had done 'all' that could have been done. But, was that really true? Nutritional, herbal, and detox therapies, of course, were never mentioned.

I was the chief pathologist in the hospital. No, no oncologist ever asked me to change my autopsy findings to exonerate him. No direct words to that effect were ever spoken. *It was simply understood that the autopsy findings were to be presented in such a fashion that all questions about the appropriateness of care were categorically squashed.* Then I did not recognize the full dynamics of happenings in the morgue, but now I do.

We were like that photo-grapher—relentlessly engaged in a frenzy of snapping pictures, tirelessly staring at them in futile efforts to understand what was happening to our patients. That was followed by more surgery, more chemotherapy, and more radiotherapy. The special nutritional and detox needs of persons made very sick by chemotherapy and radiotherapy were never spoken about. No one ever dared to utter the word *healing.* There was no consciousness of the possibilities of healing for some of those patients through a serious study of their deranged cellular energetics and by restoring the oxygen homeostasis. We were doctors, doing our doctoring thing—business as usual.

PANTOTROPHA: A METABOLIC TWO-TIMER

I use the third story of the microbe Pantotropha to illustrate the *core* element of the Oxygen Protocol for treating cancer—the design for an integrative treatment plan for coaxing cancer cells to abandon their malignant behavior. This is an area in which the most injustice has been done to persons with cancer. All public funds allocated to cancer research for decades have been totally controlled by the chemotherapy industry, directly or indirectly. At recent commencement exercises at Capital University of Integrative Medicine, Washington, D.C., Congresswoman Constance Morella told us that her Congressional Committee has allocated about $110 million for research in the so-called alternative medicine. Not one dollar of that—to my knowledge—went to any alternative or integrative clinician for conducting outcome studies of *integrative* management plans.

Pantotropha is a metabolic two-timer—a microbial species that is highly skillful in extraction of energy from sewage when oxygen is essentially absent *and also* when oxygen is available. First identified in 1983 in sewage plants, this microbe can energize itself with sulfur and nitrogen compounds in the absence of oxygen. When oxygen is available, it switches to an oxygen-driven metabolism mode and efficiently extracts energy from a wide array of inorganic substances by aerobic respiration.

Evidently, the bug is wise in the ways of managing its genetic pool to serve dual roles under changing conditions of oxygen availability. Indeed, in sewage plants, bursts of oxygen are introduced periodically to invigorate this microbe for enhanced sewage treatment. It is noteworthy in this context that there are many other microbial metabolic two-timers.

Can a cancer cell, like pantotropha, be a metabolic two-timer— thriving in the absence of

oxygen but also able to do well when oxygen is present? Otto Warburg, a German chemist who won two Nobel Prizes for his discovery of oxygen- and hydrogen-transferring enzymes, asserted that cannot be so. Fully in awe of his achievements, I believe he was off the mark on this account. I see strong clinical evidence (presented below) that a cancer cell *can* be a metabolic two-timer. Under certain conditions, cancer cells do abandon their oxygen-hating behavior and join the community of peaceful cells with physiological mode of metabolism.

The singular challenge in the field of cancer—in my view —is this: Can we create oxygen conditions in the body that coax a cancer cell to stop hating oxygen and return to the normal oxygen-driven cellular energetics? In other words, can cancer cells be persuaded to switch from a microbe-like fermentative to the physiologic respiratory mode of ATP production? That is a tantalizing possibility. But what may be realistically hoped for here?

My patients with prostate cancer have convinced me that it *is* possible in most cases to create microecologic conditions in which prostate cancer cells abandon their destructive behavior for extended periods of time. That was the case with nearly all my patients with chronic lymphocytic leukemia. Every physician who regularly treats cancer knows of at least some instances in which his patients denied the medical prognosis and lived active lives for long years. Physicians who vigorously prescribe nutrient, herbal, oxygen, and spiritual approaches know something more important: A good number of their patients did well for years when they were able to follow sound programs, and deteriorated rapidly when they reverted to old ways of consuming sugar (a potent acid producer) and toxic foods (that disrupt bowel ecology), and allowing incremental exposure to environmental toxins (that overburden the liver), and engaging in toxic thoughts (nursing anger and a sense of being victims).

The cancer literature includes descriptions of a large number of programs for treating cancer without chemotherapy and/or radiotherapy, including those published by Gershon, Kelley, Pauling, and others. *The crucial point there is: When one critically examines the components of* all *those programs, the common denominator is improvement of oxygen utilization in cells, though none of them recognized oxygen homeostasis as the centerpiece of the program.* That recognition encouraged me to continue to pursue the Oxygen Model for understanding and the Oxygen Protocol for treating cancer during many periods of doubt and uncertainty.

AN OVARIAN CANCER, TWENTY YEARS LATER

In 1995, in *RDA: Rats, Drugs and Assumptions,* I described a case study of an ovarian cancer in a young woman. It was too far advanced to be removed completely at surgery. Inexplicably, it shrank and stayed as a dormant mass in the pelvis for twenty years. Below, I reproduce some text from that book relating to that case history.

> One day I finished the first draft of this chapter, David Landers, M.D., a good friend and a past Director of Gynecology and Obstetrics at our hospital, came to review the pathology slides of a case. The patient was a 44-year-old woman when he removed and I diagnosed a highly aggressive ovarian cancer in 1974. The cancer had already broken through the surface of the ovary—an extremely poor prognostic sign (in mainstream thinking), since it indicates the spread of the tumor to the various crevices of peritoneum that line the inside of the abdomen like a continuous sheath. It is generally accepted as an indication that the cancer is beyond surgical cure. The patient was given radiotherapy after her surgical wound healed. Three years later, Dave explored her abdomen as a "second-look" operation and found no evidence of residual neoplasm.
>
> Now, in 1994—twenty years after the initial surgery—I diagnosed cancer on a needle aspiration biopsy of a small area of tissue thickening around the rectum observed with a CAT scan. What puzzled Dave most was that he had been aware of this area of thickening for a few years. It hadn't changed in its measurements and caused no discomfort for the patient. A few days later, he removed the thickened tissues along with the segment of rectum that the tumor had invaded. I asked my staff to pull out the 1974 tumor slides and compared them with the tumor excised in 1994. Except for some color fading in the slides of the initial tumor, the two tumors looked exactly the same.
>
> I asked Dave how might we understand such a case. Were there any clinical clues to the behavior of the tumor? It was a highly malignant tumor that broke through the surface of the ovary twenty years earlier, seeding the abdominal cavity. In 1977, the operative search for any residual tumor was negative. Where did the present tumor come from? If it was there all those years, why did it remain dormant—deep in the

pelvis—for so long? Dave knew that the tissue thickening—a now proven and highly malignant cancer—was there for a few years. What was holding it back? Immune surveillance? That's the usual answer. But what caused the immune surveillance to break down in some people and not in others? Dave offered advancing age as a possible explanation.

The cases like the one described are not rare. Every senior pathologist can recall several cases in which a highly malignant cancer inexplicably became a 'sleeping dog' for years or decades. I do not believe such cases can be understood except through a clear understanding of the basic nature of the oxygen derangement in cancer. Some readers might wonder why I do not focus on genetic mutations in such cases. My simple answer is this: Highly malignant cancers have hundreds, if not thousands, of mutations, and it is well-established that the number of those mutations continues to increase with time by a process called genetic instability. Some strong influences have to be applied to arrest that process. *That influence is—in my view—none other than oxygen.*

SPONTANEOUS REMISSION OF CANCER

When I was a young surgeon-in-training, I saw my professors snicker at the subject of spontaneous remission. So I learned to snicker at it too. (I have sometimes wondered if apprentices in any other profession ever become so blind in their subservience to their masters as in surgical disciplines.) Years later, I found out that some doctors, including professors, do become open to the possibility of spontaneous remission of cancer. That happens *only* when they themselves develop cancers.

What is spontaneous remission of cancer? It is a term used when cancerous tumors disappear without medical treatment, or when tumors shrink or disappear several months or some years after chemotherapy and/or radiotherapy had failed completely. For a person with cancer, what can be better than spontaneous remission? If that is so, why should we physicians be so irked by the very mention of that? One explanation is that we are afraid that admission of spontaneous remission of a cancer, after we had failed miserably, diminishes our authority or status—and, of course, our livelihood. Another explanation is that physicians commonly see the devastating consequences of delayed treatment of cancer when patients lose valuable time waiting for spontaneous healing. So physicians dismiss spontaneous remission as a dangerous form of denial by the patient —or, worse, a case of deliberate deception by practitioners who denounce traditional therapies for cancer. That is a real issue. I have also encountered such cases, regrettably quite frequently, when the possibility of curative surgery was lost under the guidance of ill-informed advisers.

Sidestepping those issues, the phenomenon of spontaneous remission, however uncommon, gives us crucially important insights into the behavior of cancers under certain conditions. It lends additional support for my view that the biologic behavior of cancer changes for the better under certain conditions. I believe that occurs in most, if not all, cases because changes in cellular microenvironment coax the cancer cells to relinquish their two-timer habits and stay faithful to normal oxygen metabolism with respiratory ATP production.

AN INSIGHTFUL EXAMPLE OF SPONTANEOUS REMISSION: PREGNANCY CURES A CANCER

Let us consider the example of the *cancer that can be counted upon for altering its malignant behavior and joining the community of healthy cells that surround it.* That is the case of the cancer that arises in the lining of the uterus in young women who repeatedly miss ovulation. If such a cancer is shown to experienced pathologists without giving them details of the clinical presentation of the case, they cannot tell it apart from highly malignant and fatal (if not removed expeditiously) cancers in women without problems of ovulation. And yet, *this cancer can be counted upon to undergo spontaneous remission when pregnancy occurs and the uterine lining harboring it prepares itself for carrying pregnancy.* How marvelous! Pregnancy cures a cancer!

How may we explain the behavior of malignant cells in such a cancer? Evidently, conception does not physically eradicate *every single cancerous cell in such a case.* Rather, gestation alters the microecologic conditions so they can no longer support destructive malignant behavior. With changing hormonal influences, some fermentative-to-respiratory (FTR) shift must occur for the cells to return to their healthful oxygen order.

In the context of changing behavior of cancerous cells, I have been most impressed by a group of about 30 patients with biopsy-proven prostatic cancers whom I managed with primary focus on direct oxystatic therapies (described later in this book) for one to fifteen years. All of them had refused surgery and radiotherapy for their cancers. Most of them did not receive any synthetic hormonal intervention. Some of them received such treatment for short periods of time. Many of them used soy-derived and other phytofactors intermittently. As determined by direct rectal examination, their tumors have shrunken or remained unchanged. They have shown no other clinical or laboratory evidence of progression of disease with therapies designed to maintain oxygen equilibrium and preserve their antioxidant defenses. It has been clear to me that the prostatic lesions diagnosed histologically as cancers did not metabolically behave like malignant neoplasms. The exception to that favorable outcome occurred in less than five percent of cases. *In some cases, bone scans showed metastases and the PSA values were in the hundreds. Still, they responded to the therapy and PSA values returned to normal (or very close to the normal) range.*

CANCER CONTROL WITH ENERGY THERAPIES

Work with electricity offers further support for my view, though the evidence is indirect and limited at this time. The behavior of cancers can be positively altered in some cases. Nikola Tesla (1856-1943), the Serbian inventor of AC current, considered humans as electric beings. He regarded diseases as disturbances in the energy fields of the body. How fascinating that one of the greatest inventors of the West should come to the same conclusion about diseases as did the ancient Chinese who mapped out acupuncture meridians!

Tesla left no clear record of having treated cancer with electric energy. However, his 'Tesla machine' has continued to spark interest ever since. Over the decades, some 'Tesla enthusiasts' have claimed to have improved the Tesla machine and obtained good results treating cancer with it. I have personally observed only limited benefits so far among some patients treated with that approach. However, I have a strong sense that Tesla was right in his basic premise.

Can the cellular energetics in cancer be restored to normalcy for long periods of time with the Tesla approach? I believe that can be achieved if sufficient funding can be made available for technical enhancements and extended clinical trials. Indeed, I see Tesla therapeutics playing an important role in treating cancer in the future. I have good reason for my belief.

In 1949, the *American Journal of Obstetrics and Gynecology** reported the existence of a strong negative charge on the cancer cells in a tumor of the uterine cervix. Ten years later, *Science*** reported *control* of cancer by normalization of the surface charge of cancer cells in mice. Regrettably, those enormously significant leads were not followed.

Why? Because in the United States, the pharmaceutical industry determines which research leads are funded and which ones are killed. And, of course, there are no drug dollars to be made by controlling cancer by normalizing cancer cell surface charges.

I have no doubt that other forms of energy—light, sound, and others—will be harnessed in the future to treat cancer by correcting the basic state of oxygen disorder in cancer cells. Progress in nanotechnology has already spawned the new field of *sonocytology,* in which important advances are being made. Sound, first and foremost, is a pressure wave created by some force impacting on molecules that spreads and is registered when it strikes the eardrum. Why would we not expect that healthy cells, cancer cells, and even microbes create some pressure waves, no matter how weak? Atomic force microscope (AFM) is the name given to the nanotechnology device designed to measure sounds made by individual cells. I might mention here for the general interest of the reader that pulsations of even the smallest of cells have been recorded. In some cases, those vibrations make the cell walls rise and fall three or more nanometers—about fifteen carbon atoms stacked on top of each other—at the astonishing rate of up to 1,000 times per second. With such sophistication in technology, sonar therapies for cancer may not be in too distant a future.

* Langman LJ, Burr H S. A technique to aid in the detection of malignancy of the female genital tract. Am J Obstet Gynecol 1949; 57:274-81.

** Humphrey CE, Seal EH. Biophysical approach toward tumor regression in mice. Science 1959;130:388.

Is it likely that someone at some future date will propose an "Energy Model" of cancer in which one or more forms of energy will be shown to drive the oxygen order of life in health—and the development of cancer as a disorder in the energy fields? Yes, that is possible. However, I believe that will not invalidate the Oxygen Model of cancer and the Oxygen Protocol, but will merely extend those models.

CHEMOTHERAPY WORSENS OXYGEN DYSFUNCTION IN CANCER

The main reason chemotherapy has a dismal record is that it does not address any of the critical issues of deranged oxygen order in cancer cells. The main tragedy in the field of oncology is that oncologists do not learn about therapies that can support the oxygen metabolism during chemotherapy.

Chemotherapy wreaks havoc on the various aspects of the oxygen order in healthy cells. It does work well in most childhood cancers because—in my view—children have an enormous capacity to withstand severe punishment to that oxygen order. Chemotherapy drugs significantly contribute to oxidosis (too much oxidative stress), acidosis (too much acidity), and dysoxygenosis (oxygen dysfunction) in many ways. It is for that reason that nearly all cancers become much more aggressive and grow rapidly if they return following chemotherapy.

After over six decades of intensive work with chemotherapy agents all over the country—as clearly shown by national statistics cited in the preceding chapter—I see no evidence that any of the available chemo drugs can bring forth the necessary fermentative-to-respiratory shift. Indeed, all currently used chemo drugs increase the degree of the crucial energetic disorder in cancer: the microbe-like fermentative metabolism. By contrast, I see much hope in the newer drugs that restore normal oxygen-driven cellular communications. I recognize much potential in the clinical benefits of antibodies directed against signaling molecules that sustain and perpetuate malignant cell replication. Some notable examples of such agents are the newer drugs, including Gleevec, Iressa, Herceptin, Rituxin, Avastin, and others. But, there is something far more important of interest here: good old oxygen.

OXIDATIVE THEORY OF CANCER

In 1958, in King Edward Medical College, Lahore, I learned my first definition of cancer: uncontrolled multiplication of cells which, if not removed promptly by a surgical procedure, proves fatal. Many factors— viruses, parasites, and chemicals, such as those in chimney soot—were thought to be involved in the causation of cancer. But what I remember most is that none of the professors *ever* told us that she/he knew what was the causative factor in *any* of the hundreds of patients with cancer we saw. It was always enigmatic. That did not change during the years of my surgical training in England. During 29 years of my pathology work in the United States, the literature on the causation of cancer grew enormously —to a point that no one ever thought it could be read in twenty lifetimes, let alone in one. Indeed, it became a taboo subject. Older doctors were simply amused whenever any intern or resident brought up the question of what causes cancer. That remains the way things are in the hospitals even now.

In 1995, I surveyed a large body of studies on the subject of the cause of cancer and recognized one common denominator in all proposed or putative mechanisms of carcinogenesis: molecular oxidative injury. Oxidation is a process of degradation and decay—loss of electrons (energy) in scientific jargon. That year, in *Rats, Drugs and Assumptions,* I put forth my oxidative theory of cancer, summarizing my view that too much (accelerated) oxidative injury is the common pathway in all known phenomena that sets the stage for the development of cancer. Furthermore, unrelenting oxidative stress from any and all causes is the single most important mechanism that favors the growth of malignant tumors.

THE OXYGEN THEORY OF CANCER

In 2001, looking through the prism of oxygen homeostasis, I extended that hypothesis and offered the following definition of cancer:

Cancer is destructive behavior of cells incited and perpetuated by many factors that cumulatively lead to anomalous oxygen signaling. It has six other *principal* characteristics: (1) respiratory-to-fermentative (RTF) shift in ATP production; (2) production of prodigious quantities of organic acids—lactic acid

and others; (3) creation of a cocoon of coagulated proteins around malignant cells to exclude functioning host immune cells and their soluble defense molecules; (4) uncontrolled cellular replication that disrupts local tissue architecture; (5) colonization of distant tissues in which the destructive behavior of neoplastic cells continues; and (6) under certain conditions, a cancer cell can be coaxed to alter its behavior.

Coaxed to alter its behavior! From a clinical standpoint, this last attribute of cancer, in my view, should be accepted as the singular aspect of interest, both for the patient and the practitioner.

Except when a cancer is totally removed by a surgical procedure, the long-term outcome with cancer therapies depends on how effectively oxygen homeostasis is achieved and preserved. This statement may raise some eyebrows. But this conclusion seems inescapable to me in light of personal pathologic, clinical, and research observations.

A major strength of the oxygenative-dysoxygenative (OD) model of carcinogenesis—in my view—is that it is fully consistent with the focus of Warburg on glycolysis; of Pauling on antioxidants; and of others on environmental, viral, and genetic factors in considering the etiology and treatment of cancer. In Figure 1, I schematically present the three essentials of the oxygen model of cancer: acidosis, oxidosis, and dysoxygenosis.

CANCER CELLS PUNISH NONCANCEROUS CELLS

A cancer severely punishes healthy cells that come in its way. Cancerous cells smear the surfaces of noncancerous cells with their toxic acids—blocking their membrane channels, receptors, and pumps. They clot proteins in the fluids that bathe noncancerous cells, and so rob them of their nourishment. The process of protein clotting also reduces blood and lymph flow in healthy tissues, so devitalizing them. By those and other nefarious activities, cancer cells also cause mutations in genes of noncancerous cells. The cumulative results of all those phenomena is *deoxygenation of noncancerous cells*. In other words, cancer cells cause cancer-like metabolic changes in noncancerous cells, and then literally cannibalize them.

The full impact on oxygen homeostasis of normal cells lying close to malignant cells is seldom fully appreciated in discussions of cancer biology. This is not merely a theoretical concern. It is the ability of cancer cells to devitalize surrounding healthy cells and the ability of healthy cells to subdue cancer cells by their oxygen-driven metabolism that determines the long-term outcome in the treatment of cancer. In my view, this is a crucial issue when the goal is altering the behavior of malignant cells. In the battle between cancer and noncancer cells, the outcome does not merely depend on the genomic characteristics of malignant cells, as is being increasingly claimed in oncology circles, but also on the metabolic resilience of the host cells.

By inflicting incremental oxidative and dysoxygenative stress—my term for influences that cause oxygen dysfunction, not merely a lack of oxygen—cancer cells literally 'metabolically dehumanize' noncancerous cells, promoting the respiratory-to-fermentative shift that I have previously described in the cells of human canaries. Evidently, cancer cells thrive in oxidative-dysoxygenative conditions, whereas host cells attempting to cordon them off are suffocated by those microecologic conditions. Thus, I believe this explains a common observation in integrative practices: Many patients with cancer who clinically do well with vigorous adherence to integrative management programs (that preserve oxygen homeostasis and redox equilibrium) deteriorate rapidly when they abandon such therapies.

WARBURG WAS RIGHT, WARBURG WAS OFF THE MARK

The German chemist Otto Warburg clearly and emphatically designated the fermentative metabolism of a cancer cell as its *fundamental metabolic lesion.* That, of course, was an enormous contribution to our understanding of cellular energetics of cancer. I begin my definition of cancer with the fermentative aspect of the metabolism of a cancer cell to recognize that contribution, as well as to emphasize the crucial clinical significance of Warburg's assertion.

Warburg took pains to underscore his notion of the irreversibility of the metabolic (glycolytic) shift in cancer. That notion—it seems to me —is open to question. Warburg wrote:*

***** See *Dysoxygenosis and Oxystatic Therapies,* the third volume of *The Principles and Practice of Integrative Medicine,* for this and other citations.

> For cancer formation there is necessary not only an irreversible damaging of respiration but also an increase in fermentation—indeed, such an increase of the fermentation that the failure of respiration is compensated for energetically.

Fully in awe of Warburg's contribution to the field, here I express my opposition to his view of irreversibility of cancer. My primary argument against Warburg's view is the experience of many of my patients who have lived—and are living—long healthful lives with oxystatic therapies, and without surgery, radiotherapy, or chemotherapy, years after the initial diagnosis. Similar cases are not unknown to integrative clinicians.

I now underscore my definition by clearly identifying cancer as a "cellular behavioral disorder." To underscore the *core* metabolic derangement in cancer, I state that all dynamics of a cancer—first and foremost—are driven by deranged oxygen metabolism designated as dysoxygenosis.

This view of cancer, evidently, is at variance with a multitude of others that hold as common denominators the issues of genes and cascades of regulatory and downstream effectors initiated by mutated genes.

In 1931, Warburg was awarded the Nobel Prize in medicine for his discovery of oxygen-transferring enzymes. Thirteen years later, he won a second Nobel Prize for his delineation of hydrogen-transferring enzymes. (He was prevented from receiving that prize by the Hitler regime because he was Jewish.) During that period he recognized the energetic shift in malignant cells alluded to earlier. The following two quotes from his writings are noteworthy for the succinctness of description of his view of cancer:

Since the respiration of all cancer cells is damaged, our first question is, How can the respiration of body cells be injured? Of this damage to respiration [of cancer cells], it can be said that at the outset that it must be irreversible, since the respiration of cancer cells never returns to normal.

Warburg went on to designate the shift in the oxygen-related energetics of a cancer cell as the *prime* cause of cancer, to which all secondary causes contribute. Consider the following quote from a special lecture he delivered on June 30, 1966, at the meeting of the Nobel laureates at Lindua, Germany:

> There are prime and secondary causes of diseases...Cancer, above all other diseases, has countless secondary causes. Almost anything can cause cancer. But even for cancer, there is only one prime cause.

Warburg, of course, was referring to oxygen in the above quote. The implications of Warburg's notion of the fundamental difference between the metabolism of a cancer cell and a normal cell were both profound and clear. It meant that oxygen-related issues must be in the centerfield in *all* considerations for treating cancer. Initially, Warburg's seminal discovery sparked intense interest about the potential of oxygen therapeutics for the treatment of malignant neoplasms among a large number of European and American clinicians. Those therapies included: (1) direct oxygenative (nasal oxygen, oxygen baths, and others); and (2) indirect bio-oxidative therapies (intravenous infusions of ozone and hydrogen peroxide).

WATCHFUL WAITING:
Toxic Chemotherapy or Nothing At All

In 1991 while working on *The Butterfly and Life Span Nutrition*, a physician-friend from Chicago called me about his wife's health difficulties. I took some notes of that conversation and later added the following text to a chapter in the book:

> My wife has an abnormal protein spike in her blood. The hematologist at the medical school tells me there is nothing he can do now. 'Don't let a quack give her vitamins,' he told me. 'When it turns into myeloma (a type of bone cancer), we will hit her with chemotherapy.'

My friend had a choice of words for this hematologist which are not printable in a book like this.

On several occasions, I saw patients who were told they had prostate cancer. Then they were advised a 'watchful waiting' approach by their urologists and oncologists. Their responses were not much different than of my physician-friend whose wife had a protein spike in her blood.

At our center, we have about 25 patients who were diagnosed to have a form of leukemia. They were also advised a watchful waiting approach until their blood counts rose enough to be treated with chemotherapy.

The above cases illustrate a 'toxic-chemo-drugs-or-nothing' mindset among doctors. It continues to baffle me why none of them ever make the effort to investigate nonchemotherapy options that might exist for such cases. Is it possible that none of them ever become aware of the good clinical results obtained in most cases with nutritional, herbal, detox, and spiritual approaches? If that were true, that's even a sadder circumstance because it reflects very poorly on their clinical interests and abilities. But I know that is not the case. Indeed, I know for

fact that many of my patients years later pointedly told their doctors (who had advised a watchful waiting approach) their successful stories. Their doctors were not interested.

Enter the Oxygen Model of cancer! This model renders untenable the deplorable advice of watchful waiting for *any* form of cancer, or even any precancerous lesion. Since an oxygen disorder is the *fundamental derangement in cancer, and since many useful things can always be done to try to restore oxygen equilibrium (homeostasis), the very idea of telling anyone that nothing can be done about her/his cancer becomes absurd.*

CHANGING PSA VALUES WITH AIR TRAVEL

Air travel stresses oxygen in many ways. In 2000, in *Oxygen and Aging* I related some case histories to illustrate some patterns of ill health associated with long flights. I also introduced the term *air travel dysoxygenosis* for that association. Below, I reproduce a case history from *Oxygen and Aging* to illustrate the effects of travel on the behavior of cancer in some cases. Specifically, the table below shows the data for changing PSA values with repeated trip to Europe from the United States. The text following the table includes some other relevant information.

A 65-year-old man with prostate cancer traveled to Europe for a two-to-three-week vacation yearly from 1996 to 1999. After each trip, his PSA value rose. (PSA is a marker for prostate cancer.) After the first trip, the PSA value returned to the pre-travel number after two months with his nutrient and herbal protocols. A year later, he went to Europe again and had his PSA measured there. There was no change. When tested again on his return, his PSA value had nearly doubled. The value returned again to the pre-travel level with his regular program. Table 4 shows PSA values before and after each trip.

My purpose in including the above case history is not discourage persons with cancer from air travel. Rather, I wish to underscore the importance of threats to oxygen homeostasis that might come in many disguises. It think it is very useful to consult one's physician before extended air travel so that some additional measures (described in later sections of this book) can be taken to protect oxygen homeostasis during the trip.

CONCLUDING COMMENTS

In closing this article, I repeat that the Oxygen Model of cancer is a unifying model with a strong explanatory power for various cancer-related clinical events. Rather than focus on individual factors that cause cancer—as is the case in the prevailing thinking—this model calls for an integrative thinking about *all relevant* factors that collectively stress oxygen metabolism and set the stage for the development of cancer. Once cancer has developed, the Oxygen Model calls for a systematic evaluation of each of those factors so that an integrative program can be designed to effectively address them.

When an early cancer is completely removed by a surgeon, it should still serve as a clarion call for that individual. The development of that cancer is a clear indication that genetic and environmental factors exist that not only resulted in the first cancer but also render that person more vulnerable to second cancers. It is well established that those who develop one cancer are more likely to develop additional cancers in other body organs. In such cases, the Oxygen Model of cancer calls for a diligent review of all elements that might have threatened the oxygen order of life—oxygen homeostasis, in the present context—in the patient. The Oxygen Model is sharply focused on seizing that opportunity.

PSA Values Changing With Air Travel

Date	PSA Values Before Trips	PSA Values After Trips	Comments About Treatment*
1995	12.2	22	on phytohormones
1996	7.9	23.2	on phytohormones
1997	21.1	25.3	on Zoladex and Casadex
1998	23.5	32.2	on PC-SPESS
1998	3.6	11.1	on PC-SPESS
1999	2.5	3.1	on PC-SPESS
1999	2.2	6.6	on PC-SPESS
2000	1.1	3.3	* On antioxidant andHerbal protocols throughout