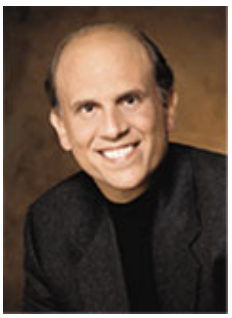
National Cancer Summit



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Rethinking the War on Cancer: Moving From a War of Attrition to a Plan of Attack

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In 1971, long before there was MTV, CNN or cellular telephones and when I was still the young head of a research department in New York, Texas Instruments was developing the first pocket calculator. Intel introduced the microchip. And the President of the United States in a speech to the American people declared war on cancer. He promised a cure within the decade.

By 1976, five years later, the "Viking I" spacecraft had beamed back detailed pictures of Mars' desert-like terrain. A team at the Massachusetts Institute of Technology announced the synthesis of a functioning gene. And as the war on cancer neared the promised half-way point, my father was diagnosed with what proved to be a fatal case of malignant melanoma.

By 1993, 22 years had passed and personal computers were in 31 million American homes, 58 million households were wired for cable, and 15 million Americans had become regular users of the Internet. It was also the year that scientists discovered the gene suspected of causing Lou Gehrig's disease. By 1993, the President's promised "cancer cure" deadline was 12 years overdue even though each of the five subsequent U.S. presidents had reaffirmed the war on cancer and six more of my relatives had died from it. 1993 was also the year that I was diagnosed with advanced prostate cancer, a disease for which there is still no cure.

By 1995, 25 years since the war on cancer was declared, Powerbooks have made those first Texas Instrument calculators seem like relics and silicon chips drive everything from microwave ovens to missiles. Yet victory still eludes us in our efforts to find a cure for cancer. In 1971, 335,000 Americans died of the disease. This year, that number will climb to 547,000 — nearly as many Americans as have lost their lives fighting for this country in this century.

And the numbers continue to climb. One in three American families will be touched by cancer, and one out of five babies born in the United States today will someday die of the disease -- a greater risk than was faced by our parents or grandparents. Ten million Americans have lost their lives to this disease since the War on Cancer was declared. No one is immune. Not one of the most powerful men in the world — President Bill Clinton, nor one of the world's wealthiest and most successful entrepreneurs — Bill Gates of Microsoft. Sadly, both these men recently lost their mothers to cancer.

Clearly, we have not mobilized all possible resources to win the war on cancer. On the eve of the 25th anniversary of that war, we are in danger of snatching defeat from the jaws of victory by becoming fatigued, unfocused and complacent. It is as if we've accelerated to the top of the mountain, and instead of letting scientific momentum push us forward, we have put our foot on the brake. Today we run the risk of rolling backward and losing valuable ground that could take a generation to make up.

Recently proposed reductions in research by both the public and private sectors threaten to stall the efforts of scientists who have tried to apply to cancer the same ingenuity as we saw them

depicted as using in the film, "Apollo 13." The war against cancer, like the effort to rescue the hobbled Apollo 13, is a race against the clock — a race that, ironically, one of those Apollo 13 astronauts ultimately lost in his own fight against the disease. The choice is ours: We can sit back and wait for a cure in a generation or two, losing at least another 10 to 20 million more American mothers, fathers, children, co-workers and friends. Or we can mobilize and find a cure now.

It is time to *rethink the War on Cancer, moving from a war of attrition to a new plan of attack*. Due to changes in government funding and the new realities of health care economics, we must rethink the strategies of financing the war on cancer and how to execute our offensive. The solution lies in a committed and sustained international mobilization. Cancer is not just an American problem; it's worldwide. Financial and human capital from around the world needs to be mobilized. At the same time, we must dramatically expand the level of private sector involvement, including support from communications and technology companies to create "virtual laboratories" that will enable researchers to collaborate and pool their resources without wasteful duplication of time and effort.

The United States has successfully led and participated in previous international mobilizations. Seven critical elements are required: leadership, communications, collaboration, technology, financial resources, human capital, and most of all, *the will to win*. The most recent example of such a convergence came during the 1991 Gulf War. The success of that effort provides ten road signs we might follow in re-thinking the war on cancer:

1. Internationalize the War on Cancer: Over the last several generations, the United States has led the world in medical research, treatment and scientific innovation. Today, cancer patients from around the world travel to the United States for its superior research and treatment. It represents one of the most unappreciated crown jewels of the American economy and has an immeasurable positive influence on our balance of payments. Nevertheless, our medical research infrastructure is now in danger of weakening from the weight of neglect and lack of sufficient funding. Recent reductions by both the public and private sectors make it all but impossible to sustain even current research efforts. Moreover, it moves us no closer to what I believe is the more realistic minimum $20 billion annual investment that is needed to deploy the technological and human resources necessary to finally bring the war on cancer to an immediate end.

While this amount is nearly 10 times more than the National Cancer Institute's current $2.2 billion budget, it pales in comparison to the $61.1 billion the nations of the world allocated to win the Gulf War. This international collaboration resulted in the United States contributing less than 15 percent of the direct costs, as opposed to the more than 90 percent it contributes to worldwide cancer research. In the Gulf War, some of the other major contributors included Saudi Arabia and Kuwait ($16 billion each), Japan ($10 billion), Germany ($6.5 billion), United Arab Emirates ($4 billion) and South Korea ($355 million). Moreover, 50 different nations combined their efforts under American leadership in the Gulf War, with 39 countries contributing human resources in the form of troops and support personnel. The total spent for the eight-month military effort is more than twice as much as the roughly $30 billion that the nations of the world have dedicated to the war on cancer over the past quarter-century.

The same international commitment is needed in the war on cancer. Today, more than 90 percent of all cancer deaths occur outside the United States, and rates continue to soar particularly in industrialized nations. Yet we have not succeeded in drafting other nations in this battle. Indeed, other governments have made a relatively small investment on scientific and clinical cancer research. Japan, for example, with the world's second largest economy, currently plans to spend only $543 million on cancer research over ten years, less than 3 percent of the United States' estimated commitment.

This is not just an American race against cancer. It must involve the entire human race.

2. Investing in the War on Cancer Makes Economic Sense: In the early 1980s, Lee Iacocca came to me with a problem: Every automobile manufactured by Chrysler contained more in medical costs than it did in steel. Iacocca needed an innovative health care cost-cutting solution. We found it by helping to build a company called Medco Containment, which was established under the leadership of Marty Wygod. Medco's mission was to reduce health care expenses by improving the management of an individual's prescription drug needs. Through the use of national pharmacies, generic drugs and other programs, the company was able to deliver prescriptions at a fraction of the cost. The result was billions of dollars in annual savings to patients, governments

and companies like Chrysler. And for Medco's investors, our $30 million initial investment in 1983 grew to $6.6 billion when the company was sold to Merck a decade later.

Time-efficient and cost-effective health delivery systems are just two ways to reduce medical costs. Another way is through increased investments in medical research, which will become even more critical with our aging population. Today, the fastest-growing segment of the U.S. population is Americans over the age of 85; the second-fastest are those over the age of 75. Since 1960, the nation has grown by 60 million people — almost all of them over the age of 18. Whereas one out of every three Americans used to be under the age of 18, now it's only one out of four. This demographic shift is also occurring in other countries, such as China, Japan and Mexico. Since most cancers occur in people over the age of 40, the aging of the world's population will inevitably increase cancer health care costs.

"Pay now ... or pay more later" was the advertising slogan for an oil filter product. The manufacturer astutely tried to convince consumers to make a relatively small investment in the product now rather than risk a much more expensive outlay later. The same logic can be applied to the war on cancer, particularly as government spending decisions point to reduced funding on an inflation-adjusted basis. While I would be the first to admit that efficiencies can be achieved, it must be with an eye to the long-term: Currently cancer is costing the nation over $100 billion a year in direct and indirect health care costs that can only be reduced through cancer prevention, early detection, and discovery of a cure.

Research investments pay. A ten-year, $175 million clinical trial supported by the National Institutes for Health demonstrated that complications of diabetes can be prevented or delayed with tight control of blood glucose levels. A regimen of glucose monitoring and insulin injections administered daily resulted in significant reductions in diabetic retinopathy and a 50 percent reduction in kidney damage. The research revealed that a $1 billion increase in expenditures to prevent or delay diabetic complications can save approximately $8 billion annually in medical costs.

3. Recruit a World-Class Scientific Cancer Team: One of the keys to success in the Gulf War was the ability to dispatch troops already proficient in the use and deployment of modern technology.

The same approach is needed in the war on cancer. It is estimated that fewer than 10 percent of the world's leading chemists, biologists and other scientists have ever worked in the field of cancer. While those working in cancer labs today include many of the most dedicated and productive researchers in science, the fact remains more talent is needed. Too many scientists have been dissuaded by the lack of sustained financial commitments by the public and private sectors. Fit-and-start funding has increasingly made cancer research a low-growth endeavor — not a magnet for the international mobilization required to find a cure.

Winning the war on cancer requires a multi-disciplinary approach — and a means to break down the language barrier that exists between the different kinds of scientists critical to the cancer effort. We need mathematicians and their ability to master matters as small as microprocessing and as large as astrophysics. We need physicists and engineers who can develop the sensitive techniques required for making measurements and miniaturizing biological, chemical and detection procedures. We need chemists to help bring new ways to synthesize and analyze the biological molecules of life. We need biologists to bring insights into what has been created through 3.7 billion years of evolution. We need computer scientists to develop the techniques necessary to analyze the massive amounts of information these other scientific disciplines are making available to cancer research. Finally, we need clinicians and patients to apply these laboratory techniques in the real world.

At the same time, we must work to preserve the infrastructure and talent already in place in scientific labs across the world. Recent research-and-development cutbacks by many pharmaceutical companies have already resulted in approximately 100,000 layoffs — with an estimated 200,000 more employees projected to lose their jobs by the end of the decade. We are at risk of dismantling teams of medical researchers who might hold the keys to unlocking the next great medical secret. A potential solution to this dilemma may be the creation of a matching grant program between for-profit companies and government. This would help spread the risks, as well

as any future rewards, while at the same time preserving the medical research infrastructure needed to ultimately aid in finding a cure for cancer and other diseases.

4. Coordinate Worldwide Cancer Resources: Another strength of the Allied Gulf War effort was the ability to coordinate the resources of different nations toward a common goal. Rather than dispatch 50 different countries on the same mission, creating unnecessary duplication of time and effort, the Allied nations were organized to focus on distinct tasks that added up to a unified and ultimately successful effort.

The war on cancer needs a similar decision-making structure to reduce duplication of effort and cut through fossilized forms and procedures. To be effective, we must link up scientists, clinicians, patients and even laypersons in a "Manhattan Project" set in the information age. But unlike the bricks-and-mortar investments that were made to assemble the hydrogen bomb scientific team all under the same roof, the investments needed for today's war on cancer should be in communications technology. For example, Intel's new "Proserve" system will make it possible for scientists to communicate through full-motion videoconferencing and document-sharing. It is this type of "virtual laboratory" that will foster greater collaboration and reduce duplication of research.

5. Accelerate the Pace of Technology Transfers from Space and Military to Medical Applications: The technological successes that have come from decades of work by government space and military agencies, in cooperation with private enterprise, should now be deployed in the war on cancer. *Let us use the technological advances from the Cold War to help us win the cancer war.*

Movement in that direction has already begun. The Jet Propulsion Laboratory has started to explore ways to use its computing storage and sequencing technology in medical research. Similarly, NASA is developing advanced ultrasound instrumentation that promises to advance space travel as well as provide high-resolution imaging techniques. The outgrowth of this could be applied to breast examinations without the radiation exposure of mammography. In addition, other government agencies — from the Department of Defense to the CIA — have developed computing and imaging technologies that could have applicability to cancer research.

While these efforts are significant, they are not enough. We need to systematically review all the technology that's been developed through decades of public and private investments in the nation's military and space programs. After the technology has been identified, a crash effort must be made to determine which applications can be converted to research.

6. Push the technological envelope. We have made great strides in computing speed, storage capacity and sequencing. By one estimate, everything in computing -- from memory and size to information processing speed — has doubled every 18 months for the last 30 years. If the same advances had been applied over the last three decades in the American automobile industry, today's Chevy would be the size of a toaster, cost $200 and get 150,000 miles per gallon.

Using computer databasing techniques that did not exist just five years ago, scientists should be creating and analyzing libraries of cancer genes that may well hold the key to determining what differentiates normal cells from malignant ones. No longer do scientists need to study just one gene or one protein at a time. They should be using new technology that makes it possible to look at tens of thousands of genes simultaneously and find out how they differ. They should also be using other new tools, such as the one which enables researchers to take a single drop of blood from a patient, extract a single piece of DNA and amplify it a million-fold.

At the same time, advanced robotic laboratories should be created around the world to conduct large-scale biorational drug screening operations. Ten million chemical compounds still exist today — more than 10 percent of which are owned by three companies, Merck, Dupont and Eastman Kodak. Yet according to the National Cancer Institute, only an estimated 46,500 compounds have ever been tested against cancer cell lines. For a relatively small $30 million investment, 37 prototypical advanced robotic devices — each costing $800,000 — could test in a single year four times as many compounds against cancer cell lines as have been tested since the start of the war on cancer.

7. Create a "World Library of Organic Chemicals": There is no central depository for the ten million chemical compounds known to be in existence today. In addition, many of those who own the compounds lack the incentive or the financial ability to conduct testing against cancer cell

lines. If these methods are allowed to continue, a generation from now only a small fraction of existing compounds will have been tested. That's why action is needed. An international consortium should be formed to facilitate the rapid testing of every known chemical compound against cancer cell lines. To expedite these tests, we can now employ currently existing robotic devices which individually perform 2.5 million tests a year. If discoveries are made, the marketing and/or royalty rights could go back to the owners of the organic chemicals.

8. Accelerate the approval of new drugs: The time required to develop a new drug continues to increase. According to the Pharmaceutical Research and Manufacturers of America, the drug development and approval process took 8.1 years on average in 1960s, 11.6 years in the 1970s, and 14.2 years in the 1980s. Today it takes 14.8 years. If a cure for a particular kind of cancer were discovered tomorrow, under current regulation it might take 10 to 15 years to get it approved for full distribution.

Similarly, the costs of discovering and developing a new drug continue to soar — from $54 million on average in 1976 to $359 million in 1990. The increasing length and cost of drug development represent a rising barrier to innovation — and threaten the United States' leadership role in drug discovery. Rather than draining time and energy pointing fingers at who might be at fault, let us figure out what we can do to get more drugs to patients more quickly.

That was the purpose of a working meeting sponsored by the Prostate Cancer Foundation last July in Washington, D.C. The meeting, led by noted scientist Dr. Louis Lasagna, brought together scientists, activists, cancer research organizations and government agency representatives, including the Food & Drug Administration. The result of the day-long meeting was a "white paper" that recommended, among other things, possible changes in Phase Three trial procedures that could reduce the time and money required for the approval of cancer drugs. Collaborative efforts such as these represent the best hope for future reforms.

In addition, we must do more to encourage companies to allocate resources to research and development for cancer. Extending patent lives is just one step in the direction of fostering greater investments in this area.

9. Develop strategies to quickly get product to the marketplace: Like a business, our goal should be to quickly get product to the marketplace — to the patients fighting for their lives. Scientists should be spending their time implementing their ideas — not spending months to years writing grant proposals, and then waiting additional months or years for approval and funding.

At the Prostate Cancer Foundation, we have tried a new approach to the funding of cancer research. Grant applications are restricted to five pages, and approval is granted within 30-45 days. By comparison, the federal grant process requires mountains of paperwork and an approval process that often takes up to 16 months, even for renewal.

After three years, the Prostate Cancer Foundation's fast-track strategy seems to be working. There has been a more than six-fold increase in the number of applications and more than $20 million in grants have been awarded to hundreds of researchers in 22 states, the District of Columbia, Canada, Scotland, Holland and Israel. It is already the world's largest private source of funding for prostate cancer research, eclipsed only by the National Cancer Institute.

10. Mobilize Cancer Patients and Families Around the World. In the Gulf War, more than 800,000 men and women from around the world served on the front. And several million more support personnel provided backup. More than a half-million of the front-line troops were Americans in their late teens or early 20s — vital, young adults with 40 or more years in further life expectancy. Yet they answered the call of our nation's leaders to leave their jobs and families and risk their lives for a country and a cause obscure to many of them. More than 350 never made it home.

Today there are an estimated eight million cancer survivors just in America alone — men and women who in many cases have life expectancies measured in months, not years. Many would gladly enlist as foot soldiers in an effort to help cure a disease that in many cases will be genetically passed on to their children and grandchildren.

I am one of those patients. Though my cancer is now in remission, I would gladly participate in clinical drug trials or donate tissue and blood for laboratory study. Most of my fellow cancer

survivors need just one thing: Leadership. *They need to be told what they can do.*

In 1961, John F. Kennedy challenged the American people to ask themselves what they could do for their country. Today, eight million cancer survivors in the United States — joined by tens of millions other survivors from around the world — are asking what *we* can do to help save our own lives and those of future generations.

Since the war on cancer was declared, there have been six U.S. Presidents, five Speakers of the House, and six Senate Majority Leaders. Each has been well intentioned in helping lead the war on cancer, but the leadership has not been sustained steadily over time. The American people would not and should not stand for a military war to drag on for 25 years and claim more than 10 million American lives. Yet despite growing fatalities and demoralization of our troops, the war on cancer has been allowed to drift. It's time for real leadership from both the president and Congress.

There will be those who say we must practice patience—that we still lack the information to mount an effective offensive against cancer. But anyone ever involved in war knows that great costs can result from further delay. A very wise military leader recently put it to me this way: "There always comes a time when you must get on with the battle. You cannot sit back and do nothing, because you'll never have perfect intelligence on the enemy. Base your battle plan on the best information you have and be ready to modify your strategy and line of attack. The important thing is just to get on with it."

That military leader is General H. Norman Schwarzkopf, commander of our Allied forces in the Gulf War. As a fellow prostate cancer patient, General Schwarzkopf also believes this military lesson should be applied to the war on cancer. The fact is, we have plenty of information to wage our offensive. What we need now is an international mobilization to finally get the job done.

At the very least, we owe this not only to ourselves ... but to our families and our future generations.

We have strived to leave our children a world devoid of war, yet more American lives will be lost in one year to cancer than were lost in all the wars of this century.

We have strived to leave our children with a country free from debt, yet we are burdening them with massive medical costs associated with an aging population and ever-increasing rates of cancer.

We have strived to leave our children with a world that celebrates and cherishes the sanctity of a single human life, yet we are unwilling to make the financial and moral commitments necessary to lift the burden of cancer from the next generation.

Through sins of omission as well as commission, we have created a world where one in five will have their lives cut short by cancer. This is too great a burden to leave to our children and grandchildren.

For those children and the children of future generations, let us find a cure for cancer. Let us do it now.

Let us choose life.