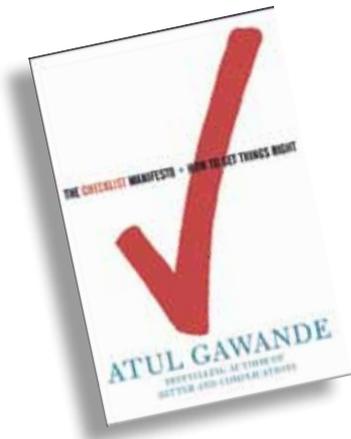


Reviews and reflections

David A. Bennahum, MD, and Jack Coulehan, MD, Book Review Editors



The Checklist Manifesto: How To Get Things Right

Atul Gawande
New York, Metropolitan Books, 2009

Reviewed by David A. Bennahum, MD (ΑΩΑ, University of New Mexico, 1984)

In *The Checklist Manifesto*, his latest lucid and elegantly written analysis of how to improve health care, Atul Gawande addresses the idea that the simple introduction of checklists to patient care can reduce costs and save lives. In each of his books and essays Gawande has engaged the reader's interest with stories that illustrate specific points and problems. Here he begins with a surgical case that had been recounted to him by a physician colleague about a patient who had almost exsanguinated from an abdominal stab wound so deep it had cut the aorta.



There are a thousand ways that things can go wrong when you've got a patient with a stab wound. But everyone involved got almost every step right—the head-to-toe examination, the careful tracking of the patient's blood pressure and pulse and rate of breathing, the monitoring of his consciousness, the fluids run in by IV, the call to the blood bank to have blood ready, the placement of a urinary catheter to make sure his urine was running clear, everything. Except no one remembered to ask the patient or the emergency medical technicians what the weapon was.

"Your mind doesn't think of a bayonet in San Francisco," John could only say.^{p3}

The staff knew that the patient had been stabbed, but he was comfortable and talking so no one thought to ask with what and then consider the possible consequences of a deep stab wound.

In the second case, a patient undergoing surgery to remove a cancer of the stomach suddenly went into cardiac arrest. Because the patient had a low potassium before surgery the anesthesiologist had given him corrective dose of potassium. Gawande in his understated but dramatic style quotes the surgeon.

I was chagrined at having missed this. An abnormal level of potassium is a classic cause of asystole. It's mentioned in every textbook. I couldn't believe I overlooked it. Severely low potassium levels can stop the heart, in which case a cor-

rective dose of potassium is the remedy. And too much potassium can stop the heart, as well—that's how the states execute prisoners.

The senior anesthesiologist asked to see the potassium bag that had been hanging. Someone fished it out of the trash and that was when they figured it out. The anesthesiologist had used the wrong concentration of potassium, a concentration one hundred times higher than he'd intended. He had, in other words, given the patient a lethal dose of potassium.^{p6}

The patient was lucky and survived, but Gawande uses these stories to argue for a simple method to prevent such errors, a checklist. In the first chapter he writes about problems of extreme complexity and how training and practice can achieve astonishing results; but he argues that in medicine we expect miracles such as that offered by penicillin. We have lost the discipline that a methodical approach requires. More than 50 million operations are performed annually in the United States and Americans undergo an average of seven operations in a lifetime. Yet we suffer 150,000 post-surgical deaths each year. Gawande writes:

Moreover, research has consistently showed that at least half our deaths and major complications are avoidable. The knowledge exists. But however supremely specialized and trained we may have become, steps are still missed. Mistakes are still made.^{p31}

To better understand this idea Gawande turns to the introduction of checklists in 1935 by the U.S. Army Air Corps when it was flight-testing the aircraft that would become the B17 bomber, the famous Flying Fortress. After a number of flight failures the aeronautical engineers realized that the complexity of the modern airplane required not better test pilots but rather a simple method to prevent mistakes, the checklist. He follows this by reminding the reader of the four vital signs to which a fifth sign, pain, has recently been added and asks whether these are not checklists that guide nurses.

Gawande recounts the remarkable experience of Dr. Peter Pronovost at Johns Hopkins in 2001. Pronovost identified five steps that a physician must take to place a central line and then asked the nurses to observe whether every physician unfailingly followed each step. In more than a third of the patients, doctors skipped at least one. Pronovost then persuaded the hospital administration to allow the nurses to stop any physician who had skipped a step. Over the next year “the ten-day line-infection rate went from 11 percent to zero.”^{p38} Only two line infections occurred over the next fifteen months! Pronovost had proven that checklists raised baseline performance.

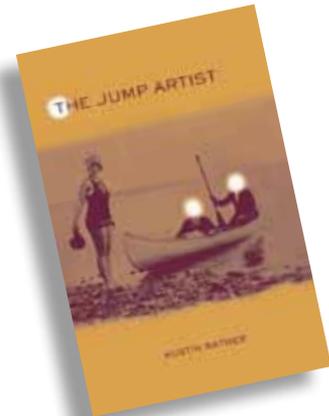
Gawande then goes on to explore the use of checklists in several industries and the literature on complexity. He reports that researchers have defined three categories of problems: simple, such as baking a cake; complicated, such as sending a rocket to the moon; and complex, such as raising a child. He notes the evidence in favor of checklists for simple and complicated problems, then asks whether checklists are also helpful in situations of great complexity. To address that question he cites data from the building industry about the construction of massive skyscrapers. And there again he found checklists at every level and “an annual avoidable failure rate of less than 0.0002 percent.”^{p71}

Gawande finds that checklists “are not comprehensive how-to guides, whether for building a skyscraper or getting a plane out of trouble. They are quick and simple tools aimed to buttress the skills of expert professionals.”^{p128} He writes that on January 14, 2009 the World Health Organization came out with a “Safe Surgery” checklist. The very next day Captain Chesley B. Sullenberger III saved U.S. Airways Flight 1549 after a flock of Canada geese flew into and stalled his aircraft’s engines. While the cool demeanor, good judgment, and experience of the pilots and crew were crucial, no less so were the years of attention to detail and the relentless discipline of their aviation checklists.

This is a marvelous and elegant book. It is an important if very simple—but not simplistic—contribution to the medical literature, as is almost everything that Gawande writes. While most of the book focuses on the application of checklists to technical practice, there is one point that I found very appealing. Gawande describes that as a surgeon introducing the checklist to his own surgical teams he now asks that they begin each operation by reintroducing themselves to each other, thereby leveling the distinctions between physicians, nurses, and technicians and creating a team of the moment for the benefit of the patient. Captain Sullenberger pointed out that he and his crew were also a team, each equally important to the final outcome. At the core of *The Checklist Manifesto* is a plea for an ethic of relationship between individuals who work together on any project and especially for those with a commitment to excellent patient care.

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The Jump Artist

Austin Ratner
New York, Bellevue Literary Press, 2009

Reviewed by Jeffrey L. Ponsky,
MD (AQA, Case Western Reserve
University, 1971)

In the tradition of Chekhov, Somerset Maugham, and William Carlos Williams comes another MD who writes beautiful and compelling literary fiction. Austin Ratner, a graduate of Johns Hopkins Medical School, turned to fiction as a career after receiving his MD. His debut novel, *The Jump Artist* is a worthy addition to the ranks of literary historical fiction.

The history that forms the basis for the novel is fascinating and largely unknown. Philippe Halsman was a young Latvian Jew hiking with his father in the Tyrolean Alps when his father fell to his death while walking behind Philippe on the hiking path. In an affair dubbed in Europe “The Austrian Dreyfuss Affair,” Philippe was arrested and convicted of his father’s murder and imprisoned in an Austrian jail for two years, despite only circumstantial evidence. The young, still adolescent Halsman was thrown into a world of horror and only released by a pardon, not an exoneration, after the tireless efforts of his sister Liouba and the assistance of human rights activists all over the world, including such notables

as Albert Einstein, Thomas Mann, and Eleanor Roosevelt. After being released from prison, the young Halsman was expelled from Austria permanently and went to Paris, to try fulfill his father's dream for him of becoming an engineer or doctor. After much struggle, Philippe became a well-known Parisian photographer, only to flee Paris as the Nazis invaded. Penniless and stateless, Philippe emigrated to the United States and rose to become one of the country's most celebrated photographers of the 1950s and 1960s. His name may be unfamiliar, but his work we all know: the famous headshot of Albert Einstein, Marilyn Monroe in a white dress backed into a corner, Salvador Dali with the curling moustache, the Duke and Duchess of Windsor jumping in the air. Halsman had more *Life* magazine covers to his credit than any photographer in history.

The story of *The Jump Artist* is compelling as an arc from despair to triumph, but it is not in the straightforward telling of the story that this strong debut novel succeeds. Rather, Ratner writes the inner life of a human being who has experienced a level of trauma beyond imagination. His vivid descriptions of prison, of helplessness, and of the unearned, but agonizingly felt, guilt of a victim and survivor are so richly imagined that the reader feels that he comes to know the interior Halsman. We feel his adolescent struggles with a father whom he loved and venerated but was irritated by, his haunting sense of loss, his shocked passivity in the face of victimization, and his self-loathing, so common in victims of trauma. As he tries to make sense of his surreal experience, he moves to art just as the surrealist movement is gaining sway in Europe, and his use of the camera begins to move him into the outside world. The camera captures the full range of human emotion, from the surreal to the playful to the beautiful. As Halsman slowly allows love and art into his life, he reclaims his life. Ratner's use of language and his strong artistic storytelling draws the reader deep into Halsman's

world and, as the novel builds, we root for his success, hoping he will overcome the tragedy of his youth. It is not just the story that stays with you, it is Halsman the human being.

As physicians we are always struggling to understand the human condition. This stunning novel does what all truly fine novels should do. It illuminates an understanding of the human condition through its moving exploration of trauma, suffering, and redemption.

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Henry Kaplan and the Story of Hodgkin's Disease

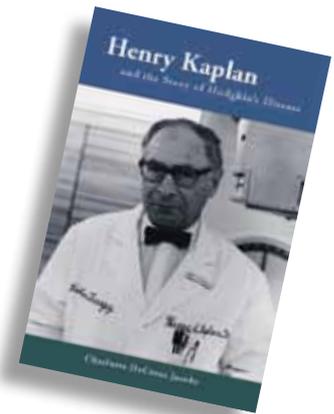
Charlotte De Croes Jacobs
Stanford, California, Stanford University Press, 2010

Reviewed by William M. Rogoway, MD

The 1960s and early '70s were times of significant change in the approach to cancer therapy in this country. As the hazards and potential benefits of radiation therapy became more widely appreciated, it became a powerful treatment tool. At the same time, drugs were developed that not only led to tumor shrinkage, but, in the case of childhood leukemia, could eradicate disease. Henry Kaplan was a towering figure in this heady time of oncologic creativity.

Charlotte Jacobs traces Kaplan's beginnings in Chicago as the older son of Russian immigrants, recounting the early death of his father and his determined mother's struggles to keep the

family afloat financially and to further her favorite child's ambitious goals. This story is interwoven with the history of the gradual recognition of Hodgkin's disease as an entity, from Thomas Hodgkin's original cases to Dorothy Reed's defining pathologic description, as well as the development of radiation therapy from a scientific curiosity to a



therapeutic tool. By the time Dr. Kaplan graduated from Rush Medical College in 1941, a rudimentary understanding of the disease with which he became so identified existed and radiotherapy had been used as treatment.

Dr. Jacobs outlines Henry Kaplan's rapid professional trajectory from trainee to chairman of Radiology at Stanford Medical School at age twenty-nine; the remainder of the book is devoted to his diverse and impressive scientific and personal achievements. The over-riding theme is that of a brilliant physician driven to ever-more ambitious goals.

Where does one begin? The Stanford linear accelerator that permitted higher energy and more targeted x-ray therapy, the willingness to deliver higher doses of radiation to wider fields in the quest for Hodgkin's disease cure, the identification of the mouse leukemia virus and the search for a human viral etiology for malignancy, attempts to create antibodies to human tumors. Kaplan gained

credit for all these, sometimes leaving the contributions other investigators played in these advances forgotten or little noted. While he played a pivotal role in the clinical development of the accelerator and aggressively pushed its use forward, other clinicians at other centers were moving in the same direction. Dose escalation and contiguous uninvolved field therapy built heavily on the work of the Canadian Vera Peters, and an understanding of the logical pattern of Hodgkin's disease spread was very much a product of his colleague Saul Rosenberg. Kaplan never did identify the elusive human tumor virus and monoclonal antibody success was left to others.

Kaplan's lasting scientific achievement was the rigorous investigation of Hodgkin's disease. He and his associates pioneered the randomized clinical trial, answering one question and proceeding to the next in single institution studies with the single-minded goal of curing the disease and lessening the complications of therapy.

Concurrent with his science, HSK, as his associates knew him, attempted to reshape Stanford's medical school in his image. From the time he became chairman of Radiology, he assumed a leadership role in creating a research-oriented school as the university moved its medical school campus from San Francisco to Palo Alto. He was instrumental in recruiting a sterling faculty that included three future Nobel Laureates. As his department grew, he envisioned a nationally sanctioned comprehensive cancer center, but as his dream threatened to dominate the school, close colleagues withdrew support and the center never happened. This was a devastating and embittering defeat. His struggles, sometimes very contentious, with deans and other faculty were legendary, his failures and successes are carefully chronicled.

There were forays as well in the national scientific scene and HSK played a key role in refining the 1971 National Cancer Act that paved the way for a dramatic increase in funding for cancer

research and NCI independence.

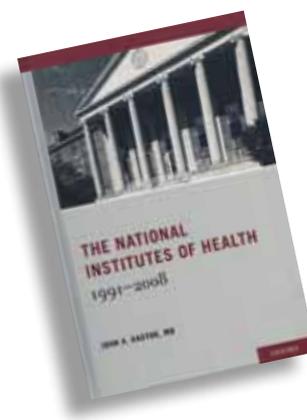
Throughout his career, HSK developed a few close professional and personal relationships. These were significant scientists whose common characteristic seemed to be the same drive, ambition, and dismissiveness toward others less forceful. Perhaps most interesting is the thorough account of his evolving friendship with Dr. Vincent DeVita, who was key in developing curative combination drug therapy for Hodgkin's disease that rivaled Stanford's radiotherapy efforts and who ultimately became the director of the National Cancer Institute. In interviewing over one hundred of his colleagues, patients, friends, and family members, Dr. Jacobs was able to bring detail to HSK's fascinating and multifaceted life and his impact on others. Particularly revealing are first-person recollections of confrontations with associates and friends whose views differed from his. His close, though imperfect, relationship with his children is tenderly presented.

Dr. Jacobs has authored a loving account of a powerful figure. While the chronology is painstaking, I'm not sure that one comes away with a balanced picture of this giant of American medicine. As Dr. Jacobs writes toward the end of her book, "anonymity wasn't Henry's way. If you had the chance to reach your goal, you grabbed it."³¹⁰ He began poor with a very visible physical deformity, a brilliant mind and a desire to achieve. He worked tirelessly and with tremendous self-assurance built a scientific career that was outstanding. While not detailed in the book, at a time when radiation oncology was a relatively new discipline, his early trainees became department chairs at half a dozen academic medical centers. He had talents and a drive beyond most, but alienated many associates and his own brother. While warm and compassionate toward patients, he could be dismissive to associates. While he was very public in much of what he did professionally, his humanitarian work was carried out with much less flourish. He was

a complex and flawed man, but indeed a visionary who brought a scientific rigor to the practice of oncology and helped move Hodgkin's disease from an untreatable malignancy to one for which cure is now the rule. Dr. Jacobs' book is a riveting read, meticulously covering a time of dramatic creativity in American medicine while also revealing the personal infighting that took place behind the scenes.

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The National Institutes of Health: 1991-2008

John Kastor
New York, Oxford University Press,
2010, 271 pages

Reviewed by Jack Coulehan, MD
(AQA, University of Pittsburgh, 1969)

When I did my internship at the Hospital of the University of Pennsylvania, John Kastor was a rising star in Penn's Division of Cardiology. He was also one of my favorite attending physicians, partly because of excellent teaching and obvious commitment to

patients, but also because of his compassion for students and house officers. At the end of my rotation with Dr. Kastor, he invited our whole team to his home for dinner. And a splendid evening it was! I remember that dinner as an island of warmth and conviviality in the often turbulent sea of internship. Since then, Kastor has become one of the nation's most prominent cardiologists and a leading figure in American medical education. He is the author of several important books on academic medicine, including *Governance of Teaching Hospitals* (2003), *Specialty Care in the Era of Managed Care* (2005), and *Selling Teaching Hospitals and Practice Plans* (2008). These works focus, in particular, on issues of governance in large health care institutions.

In his new book, *The National Institutes of Health: 1991–2009*, Kastor turns his attention to “the premier organization for performing and funding biomedical research in the United States.”^{pxi} The book is primarily a description of the structure, function, mission, finances, and priorities of the NIH over nearly two decades, a period that spans the terms of three NIH directors: Bernadine Healy, Harold Varmus, and Elias Zerhouni. While the author presents plenty of “hard” historical facts, the real energy of his book arises from its human perspective: 222 interviews of present and past NIH administrators and scientists and other knowledgeable observers, conducted over a nearly two-year period. The text relies heavily—and appropriately—on quotations from these interviews, which provide the reader with a sense of living history.

The NIH consists of twenty research Institutes and seven Centers, five of which serve as providers of infrastructure and support for the institutes. The NIH budget in 2008 was around \$29 billion, eighty-five percent of which supported extramural research, i.e., grants to universities, hospitals, and laboratories throughout the United States. Another ten percent funded the intramural research program, which

employs over one thousand scientists at its Bethesda campus, as well as a large number of trainees. The final five percent of the budget was devoted to administration. The individual research Institutes range in size from the enormous National Cancer Institute (NCI, \$4.8 billion budget) and National Heart, Lung and Blood Institute (NHLBI, \$2.9 billion) to the tiny National Institute for Nursing Research (NINR, \$139 million). It requires over seventy separate administrative entities—and their acronyms—to fully characterize the structure and governance of the NIH. Fortunately, the reader need not internalize most of this alphabet soup to gain a basic understanding of the organization, although for the interested masochist Kastor provides an appendix listing every single acronym and its meaning.

As an academic physician, I found some of the trends described in *The National Institutes of Health* especially interesting. First, although I was aware that the NIH budget had grown in the 1990s, I had no idea of how much. During the six-year period 1998 through 2003, its budget more than doubled from \$13.6 to \$27.1 billion, an average increase of about fifteen percent per year. Even more amazing was the sustained average annual eight and a half percent increase over the preceding twenty-seven years (1971–1997). On the other hand, during most of the Bush era (2003 through 2008), the NIH budget, when corrected for inflation, suffered an annual decline.

Another interesting point was the historical trend of the NIH's intramural research training program. Kastor writes of the “yellow berets,” physicians commissioned in the United States Public Health Service and assigned to the NIH in the 1950s, '60s and '70s, who provided the nation with a large pool of budding physician scientists. In subsequent decades, as the doctor draft ended and NIH research training became less attractive to young physicians, the size of this pool decreased, resulting in the NIH having more difficulty

recruiting physician investigators for its intramural programs. However, the NIH still provides the major source of financial support for the training of physician scientists through its Medical Scientist Training Program (MSTP), which supports MD/PhD students in medical schools throughout the country.

Finally, I learned for the first time about the “Roadmap for Medical Research,” a strategic plan developed in 2002 and 2003 by then-NIH director Elias Zerhouni. Zerhouni wrote, “It was clear to me that science had changed, but the NIH had not.”^{p179} A “convergence of concepts and methodologies” had made many of the traditional rigid distinctions between disciplinary Institutes outdated. Zerhouni initiated a process to answer such questions as “What are today's scientific challenges?” and “What are the roadblocks to progress?” This led to a strategic plan, which, among other things, placed new emphasis on clinical research. Zerhouni also set aside funds for Roadmap projects, a practice later endorsed by Congress when it created the “Common Fund” as a separate pool of money to support the initiation of innovative interdisciplinary projects.

In *The National Institutes of Health: 1991–2008*, John Kastor has written a clear, concise, and highly informative book that will serve as a useful entry-point for anyone interested in gaining a basic understanding of the structure and inner workings of the NIH. As a bonus, the book also presents a human perspective on the NIH's recent history, with fascinating insights on the process, as well as examples of the content, of NIH intramural research.

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