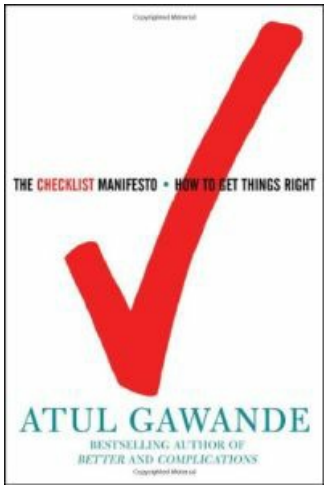

Book The Checklist Manifesto

How to Get Things Right

Atul Gawande
Metropolitan Books, 2009

Recommendation

Some of the most highly trained and respected professionals in the world rely on the humble checklist to keep them organized and out of trouble. Tremendous advances in scientific knowledge now overwhelm practitioners in many fields – to the point that they make regular but frequently avoidable mistakes. Boston-based surgeon Atul Gawande chronicles how his research into the aviation, construction and investment industries helped shape the World Health Organization's production of a two-minute, 19-point surgical checklist that has saved countless lives worldwide. While not designed to be a how-to manual, Gawande's book provides sample checklists, instructive examples and plenty of food for thought about how to create and fine-tune checklists that fit your job and your organization's mission. *BooksInShort* prescribes this eye-opening report to anyone responsible for complex tasks or for the lives of others and particularly to readers who plan to check into a hospital anytime soon.

Take-Aways

- Two factors explain human error: "ignorance and ineptitude."
- Ignorance exists because people still have a lot to learn about the world and how it works. Ineptitude occurs when knowledge exists but people don't apply it correctly.
- Science has given professionals capabilities beyond their abilities to use them effectively.
- Many professional fields "have become too much airplane for one person to fly."
- The aviation industry learned as early as 1935 that flying modern airplanes requires diligent use of specific checklists outlining even mundane procedures.
- The demise of the "Master Builder" led architects, engineers and contractors to create highly sophisticated systems of written checklists and communication standards.
- The pressure of making fast life-or-death decisions plagues medical professionals.
- "Getting the steps right" in many medical procedures is "brutally hard," even for highly trained specialists. One oversight can prove fatal to a patient.
- In early 2009, the World Health Organization developed a two-minute, 19-point checklist that has since prevented countless surgical complications and deaths.
- Professionals must set aside their egos, accept human fallibility and use their checklists.

Summary

"The Problem of Extreme Complexity"

Humans like to think of themselves as being in complete control of their world, but, more often than not, they must deal with failure. Such defeats stem, in part, from what philosophers Samuel Gorovitz and Alasdair MacIntyre call "necessary fallibility"; that is, despite scientific advances, some efforts people pursue are "simply beyond" human capacity. In areas of great achievement, such as erecting skyscrapers, predicting violent weather and performing lifesaving surgery, even experts must humbly concede the limitations of advanced training and years of experience.

> "Much of the world and universe is – and will remain – outside our understanding and control."

Error-based failure happens for two reasons: "ignorance and ineptitude." Ignorance stems from the fact that people still have a lot to learn about the world and how it

works. Ineptitude occurs when knowledge exists but people don't apply it correctly. For example, in medicine, research has illuminated staggering amounts of knowledge about human health, so much so that ineptitude is now as great a problem as ignorance. Furthermore, sometimes the problem is "'eptitude' – making sure [to] apply the knowledge...consistently and correctly."

> "The volume and complexity of what we know has exceeded our individual ability to deliver its benefits correctly, safely or reliably. Knowledge has both saved us and burdened us."

Despite advances in technology, mistakes happen daily in every field that requires "mastery of complexity and of large amounts of knowledge." Think of all the gaffes that make the news: medical blunders, bad software design, legal errors, troubled fiscal systems, botched handling of weather disasters, and more. "Failures of ignorance" are easier to forgive, but most people feel incensed when others don't implement existing knowledge properly and thereby do harm. Trained, hardworking, dedicated professionals in all fields regularly and frequently make avoidable mistakes. The solution may seem "ridiculous in its simplicity": Use a checklist.

The Checklist

A three-year-old girl fell into an icy pond near the Austrian Alps and was underwater for 30 minutes before her parents found her, pulled her ashore and began CPR. When rescuers arrived eight minutes later, her body temperature was 66°F (19°C), and she showed no signs of life. Nonetheless, medics airlifted her to the small local hospital where a surgical team cut into her chest, even though she had been lifeless for 90 minutes. Machines kept her blood flowing, and, when her body temperature rose to normal six hours later, doctors performed a cardiac bypass. Within two days, all organs except her brain returned to normal. She remained in a coma for more than a week. After extensive rehabilitation, she was totally back to normal by her fifth birthday. The lead cardiac surgeon attributed the team's success to his earlier insistence on using a set of simple checklists to remind rescue squads and the hospital phone operator about the detailed steps to take to prepare the surgical team for a patient's arrival.

> Checklists "provide a kind of cognitive net. They catch mental flaws inherent in all of us – flaws of memory and attention and thoroughness."

In October 1935, the US Army Air Corps had aircraft manufacturers compete to build the "next-generation long-range bomber." Boeing's design had the lead; everyone thought the flight trials would be just a formality. But, minutes after its smooth takeoff, the giant four-engine Model 299 stalled and "crashed in a fiery explosion." The veteran aviator who died in the crash had forgotten to release a lock. Rather than call for redesigning the plane or the training, some test pilots developed a checklist for flyers to review during takeoff. Just requiring them to use an index-card-sized checklist saved Boeing from bankruptcy and turned the Model 299 into the B-17 bombers that fought Nazi Germany. In 1.8 million flight miles, B-17s have never had an accident.

> "Expertise is valuable but most certainly not sufficient."

Many professionals, including medics, lawyers, architects, firefighters and police officers, face the same problem as the 1935 test pilots: Their jobs "have become too much airplane for one person to fly." In a complex setting, professionals often face two key challenges: too much information to remember and too many distractions to attend to every detail. Whether building a skyscraper or buying recipe ingredients, if you "miss just one key thing, you might as well not have made the effort." A checklist can make the difference.

"The End of the Master Builder"

From medieval times until the mid-20th century, "Master Builders" designed, engineered and erected great structures. These craftsmen ruled the entire building process from concept to completion. Today, however, advances in every aspect of construction "overwhelmed the abilities of any individual to master them." The building profession split into architects, engineers and contractors, each of which has specialities and subspecialities. Knowing that they have "no margin for error" and that "failure is not an option," these professionals developed a way to work together using a complex system of written checklists for each step of the construction process.

> "You want people to make sure to get the stupid stuff right. Yet you also want to leave room for craft and judgment and the ability to respond to unexpected difficulties that arise along the way."

No one authorizes or performs a task, no matter how small, without checking if preceding tasks are complete. Contractors use large wall-mounted paper charts to track each small step visually as it happens, and they use project-management software and communications systems. That is now the industry standard. A 2003 study cites an average of "just 20 serious [US] building failures per year...an annual avoidable failure rate of less than 0.00002%." Checklists work.

The Idea

One "particularly tantalizing aspect" of construction is that builders push power out to on-the-ground practitioners to make decisions in the face of unanticipated events. Most central authorities, conversely, make checklists for their subordinates but hesitate to let those staffers make big decisions. Checklists work for organizing and overseeing routine tasks, but not for operating in crises, as Hurricane Katrina proved. Federal Emergency Management Agency officials refused to abandon command-and-control management despite worsening conditions; they should have pushed decision making "out of the center as far as possible."

> "The evidence of how slow we've been to adapt is the extraordinarily high rate at which care for patients is duplicated or flawed or completely uncoordinated."

Retail giant Walmart got it right. Immediately after Katrina, the company gave its local store managers full permission to do whatever they could to help. Some gave away entire inventories to people needing emergency supplies. Some gave first responders food, tools and sleeping bags, using just a "crude paper-slip credit system" to keep track. Senior executives focused less on issuing orders and more on communication. The lesson is that complex, uncertain situations – when no one person or central agency can possibly know all that must be known – require a two-pronged mechanism to ensure that no one misses the "stupid but critical stuff" and that people keep talking to each other as they resolve the crisis.

"The First Try"

In 2006, after joining an international World Health Organization (WHO) group to tackle the growing dangers associated with surgeries, author Dr. Atul Gawande, a surgeon, and his research team found that, globally, surgical complications led to at least seven million deaths and one million disabilities each year. WHO wanted a "measurable, inexpensive and substantial reduction in overall complications from surgery." The team rejected unfeasible remedies, but a study on the use of checklists to improve health persuaded them to take that path.

> "A single type of error can affect thousands, but because it usually touches only one person at a time, we tend not to search as hard for explanations."

In one case history, field workers distributed bars of antibacterial soap in poor neighborhoods in Karachi, Pakistan, teaching residents how to use the soap as part of a checklist of six daily routines for personal hygiene, food preparation and child care. During the one-year trial, bouts of diarrhea in children fell 52%, pneumonia fell 48% and the skin disease impetigo fell 35%. Interestingly, participants already used bar soap in their homes, but not correctly or often enough.

> "Just ticking boxes [on a checklist] is not the ultimate goal. Embracing a culture of teamwork and discipline is."

Another example that helped convince the WHO group was a short checklist used just before initial appendectomy incisions at Columbus Children's Hospital where more than a third of patients "failed to get the right antibiotic at the right time." Nurses routinely placed a small metal tent inscribed "Cleared for Takeoff" over the scalpel and were given new authority to stop the surgeon if even one step was omitted, effectively distributing the power. After three months, 89% of patients received the correct antibiotic in a timely way, and, after ten months, 100% did. Checklists also improved the operating-room working environment at the University of Toronto, Johns Hopkins and the California-based Kaiser health system hospitals. Checklists requiring the surgical team to introduce themselves to one another and to discuss and confirm all aspects of the procedure at hand directly led to enhanced levels of teamwork and surgical results.

"The Checklist Factory"

Veteran pilot Daniel Boorman, who spent 20 years creating checklists and flight deck controls for Boeing, warns against bad checklists that are "vague and imprecise, too long, hard to use, impractical, and made by desk jockeys with no awareness of the situations in which they are to be deployed." Conversely, good checklists are "precise, efficient, to the point and easy to use in even the most difficult situations." When compiling a checklist, don't spell out every single step in bureaucratic detail; use simple words in the lingo of your field. Fit your list on one piece of paper and use both upper- and lowercase type (preferably sans serif). Test and refine your checklist in the real world.

> "We are not built for discipline. We are built for novelty and excitement, not for careful attention to detail. Discipline is something we have to work at."

Good checklists focus on the "killer items" – the ones that are "most dangerous to overlook" and that people are most likely to skip. Boeing uses two types of checklists: "DO-CONFIRM" to verify that pilots carry out critical actions and "READ-DO" for specifying the steps pilots take while doing a specific action. But even the best checklist cannot force anyone to use it. Aviators learn that their recollection and judgment are fallible. Good pilots – unlike many surgeons – understand and accept their limitations. When facing a calamity, pilots are "astonishingly willing" to use their checklists.

"The Test"

The WHO group met again in Geneva in spring 2007 to eliminate items that took extra time during the checklist procedure. Some of the proposed cuts might have made a life-or-death difference, depending on the country, the hospital or the surgery. The "final WHO safe surgery checklist" has 19 checks: seven before administering anesthesia, seven before incision, and five after the operation but still in the operating room. WHO gathered data on surgical complications and tested the checklist in eight hospitals worldwide, four in high-income countries – the US, Canada, England and New Zealand – and four in low- and middle-income nations – the Philippines, Jordan, India and Tanzania. In spring 2008, all eight hospitals educated their staff members and implemented the two-minute, 19-item checklist. "Pockets of resistance notwithstanding," the checklist was in use in every study OR within a month of introduction.

> "Checklists must not become ossified mandates that hinder rather than help. Even the simplest requires frequent revisitation and ongoing refinement."

After just three months of using the checklists, major postsurgical complications dropped by 36%; deaths, by 47%; infections, by nearly 50%; and follow-up surgeries to correct problems, by 25%. Of 4,000 patients, only 277 developed serious complications, compared with 435 patients in prechecklist statistics. The WHO checklist "spared more than 150 people from harm – and 27 of them from death." Follow-up surveys of more than 250 OR staffers revealed that 80% found the checklist easy to use and 78% saw it prevent a surgical mistake.

"The Age of Checklists"

By the end of 2009, more than 12 nations committed to using checklists in their hospitals; hospital associations in 20 US states pledged to track the results of checklist usage; 10% of US hospitals either adopted or planned to adopt checklists; and globally, more than 2,000 hospitals were using them. Checklists offer opportunities "not just in medicine but in virtually any endeavor." For example, interviews with three successful investors reveal that each one attributes his success to using checklists based on his experience and that of respected peers; Warren Buffett also uses a "mental checklist process."

> "In the end, a checklist is only an aid. If it doesn't aid, it's not right. But if it does, we must be ready to embrace the possibility."

Yet people aren't very disciplined, so efforts to introduce the discipline of checklists in other fields have been an uphill battle. Little research goes into examining failures "in teaching, in law, in government programs, in the financial industry or elsewhere." When the same mistakes keep happening, it's time to take a different tack: Try a checklist.

About the Author

Atul Gawande is a MacArthur Fellow, a surgeon at Brigham and Women's Hospital in Boston, and an associate professor at Harvard Medical School.