Complications: A Surgeon's Notes on an Imperfect Science Study Guide

Complications: A Surgeon's Notes on an Imperfect Science by Atul Gawande

Contents

Plot Summary

"Complications: A Surgeon's Note on an Imperfect Science" is a collection of stories and personal essays written by Dr. Atul Gawande, a surgical resident. Gawande describes his experiences in the field, in learning and interpreting medical mysteries and facing uncertainties, and the philosophical questions he encounters from these experiences.

In "Complications," Gawande lays out several ways in which medicine is imperfect and will continue to be imperfect. In Part I "How We Learn," Gawande discusses that medicine will always be prone to errors so long as it is performed by humans. Humans are not perfect, but striving to be perfect requires practice and learning. Learning, in turn, demands that mistakes be made. Gawande talks about his first surgical procedure and how his failed attempts improved each time before he was successful. Although Gawande dislikes making mistakes, he knows he will make them and realizes that the difference is what happens after they are made. Mistakes are learning opportunities themselves, as Gawande demonstrates as he retells a botched intubation that is reviewed during a meeting with the doctors to discuss unexpected outcomes. He also notes how doctors learn from each other—whether during a professional conference or from watching a good doctor fall.

Gawande discusses another way in which imperfection occurs—because there is still much that people and science cannot explain. He reviews such medical mysteries related to superstition, chronic pain, nausea, blushing and appetite. Doctors are always looking for a physical, logical, or scientific explanation of a problem. When no such answer explains, doctors are puzzled and sometimes question that the problem exists. Several of the patients he mentions discuss the lack of compassion and belief that existed without corroborating evidence. Through these stories, Gawande explores the connection between mind-body and challenges several popular medical beliefs and theories.

In the last part of the book, Gawande reveals how much of medicine is governed by uncertainties. Though people have tried to reduce the amount of uncertainty through the invention of tests such as autopsy and diagnostic MRIs, X-rays and CAT scans, the rate of misdiagnoses remains the same. Gawande explains that although diagnostic tests may be accurate, they still rely upon a person to order and assess it. Gawande lists several examples of research that demonstrated people are not always the best decision makers. Knowing this, Gawande debates the appropriateness of who should be the ultimate decision-maker in a person's care. He concludes that both patient and doctor should work together in order to ensure that the patient's best interests are in mind. Additionally, he details the case of one young woman, whose skin infection turns out to be caused by aggressive life-threatening bacteria. He discusses how, in this case, the logical course of action would have been the wrong one, and the difficulties doctors face in each decision.

In the end, Gawande realizes that encountering uncertainties in this field are sometimes the only constants. Doctors can equip themselves best by accepting the imperfections of medicine, but never failing to strive for perfection.

Part I - Education of a Knife

Part I - Education of a Knife Summary and Analysis

"Complications: A Surgeon's Notes on an Imperfect Science" is a book about the experience of becoming a surgeon. The author, a surgical resident, uses research, personal experience, and case studies to discuss the various challenges of the field including the fallibility of doctors, medical mysteries, and what to do in the face of uncertainty.

In "Education of a Knife," Gawande discusses the process of how surgeons learn—by practice. He uses the example of his "first real procedure," putting a central line, an intravenous line that would go into the main blood vessel of the heart, in a patient. Although he had watched his supervising chief resident perform the procedure before, he forgets three key steps in the preparation and is unsuccessful with the needle two times before the chief resident intervenes.

Although he corrects several of his mistakes on the next patient, Gawande still fails during his attempt on the next patient, and then the next one. When he finally gets it right, he cannot explain what he did differently to ensure success and chalks it up to practice. Gawande attributes successful surgeons to practice—it is not great hands, but rather the determination to keep practicing even when it is difficult, as in the case of the central line. He cites a Harvard Business School research study in which they studied surgical teams learning a new procedure. The fastest learning team incorporated several differences in how they practiced, including hand selecting the teams, keeping the teams consistent, going through a "dry run" (a walk through of the all elements of the procedure, including the equipment and steps, except for the patient), tracking results, scheduling to allow for repetition, and debriefing after procedures and eliciting feedback.

Gawande notes that surgeons face uncertainties on a day to day basis, but must remain confident holding the scalpel, reinforcing the saying, "Sometimes wrong; never in doubt." Particularly, they must portray confidence when talking to patients and their families, never letting on that it might be the first time they are performing the procedure. This type of on-the-job training is not limited to residents, but a permanent part of being a surgeon in an era of constant advances in technology. Learning, even when it causes harm in the present, is necessary in order to train for the future. One study published in the British Medical Journal found that although one new procedure to correct a severe heart defect initially caused more deaths than the traditional procedure, over time and practice, the new procedure had significantly less deaths as well as a better prognosis for the patient.

Gawande concludes "Education of a Knife" by revisiting the story of the central line. Although he has mastered placing a central line in a patient, his learning is not complete. He must now learn to be the teacher, and he must teach by allowing less

experienced residents to perform the procedure, even in the face of all the uncertainties and possible harm.

Part I - The Computer and the Hernia Factor

Part I - The Computer and the Hernia Factor Summary and Analysis

Gawande believes that medicine in this country strives for machinelike perfection, through routinization and repetition. The rise of specialists is directly related to this quest—specialists perform one set of procedures over and over again.

The best example of this is that of the Shouldice Hospital, which is dedicated to hernia operations and has an exceptionally high rate of success. The surgeons perform only hernia operations and have repeated the procedures so many times that the steps have become automated. Aside from their expertise, the hospital is designed with hernia procedures in mind—no tvs, no bedside room service, all traits intentionally built in to force patients to walk around, thus improving recovery. Gawande questions whether the traditional training (4 years of medical school in all medical fields and additional years of residency) is necessary for this kind of super-specialization that leads to superior outcomes.

However, all doctors are not convinced that this kind of automation is the best direction for medicine, particularly in the case of medical diagnoses. Diagnoses are not just the result of an equation or an algorithm, but also clinical expertise and intuition. Gawande cites two examples where his intuition suspected appendicitis in patients. They had the same inconclusive laboratory findings, although upon surgery, it was discovered that only one was a true case of appendicitis.

One study found that the intuitive approach leads to more errors than a blind algorithm because human judgment might not include or weight multiple factors accurately. In addition, humans can be easily influenced by factors that are irrelevant, such as what the previous diagnosis was.

Due to these human realities, mechanized medicine is inevitable. Computers are making diagnostic decisions and protocols and algorithms to treat are a part of most hospitals. However, Gawande does not believe that computers will replace human care. Instead he suggests that if objective technology and systems take on the technical aspect of medicine, it will allow doctors to focus more on compassion and spending time with patients, something that can never be replaced by machines.

Part I - When Doctors Make Mistakes

Part I - When Doctors Make Mistakes Summary and Analysis

Gawande devotes a chapter to discussing one common consequence of practice—mistakes. Though perfection is expected and demanded of surgical students, medicine practice by humans will inevitably be subject to human flaws and failure as well.

Gawande describes one situation in which he treats a car crash victim because the two senior surgeons were working with another patient. He details several points that could have changed the outcome, such as the decision not to call the senior surgeon for help, the inability to intubate the patient, and the emergency tracheostomy.

Academic hospitals recognize that mistakes such as the one Gawande experienced, will happen. Most institute a weekly Morbidity and Mortality Conference (M&M)—a mandatory meeting to discuss mistakes and poor patient outcomes. During an M&M, the details of a case are reviewed, and questions such as "What would you do differently?" are often asked. Gawande describes the M&M as paradoxical—it reinforces the notion that mistakes are unacceptable, however its regularly scheduled existence acknowledges that errors are inevitable.

Doctors are often blamed when things go wrong—medical malpractice suits are common examples of this. However, punishment is not the best solution to prevent human error from happening again. Increasingly, research is demonstrating that human error is inevitable, however, carefully planned systems that keep human error in mind result in improved outcomes. One such example of this is the field of anesthesia. When a patient undergoes anesthesia, a number of things could go wrong.

One research study conducted in the 1980's found that most mortalities under anesthesia were due to preventable errors such human fatigue on the part of the anesthesiologist, improper placement of the tube, and too much anesthesia or too little anesthesia due to mistakes using the anesthesia machine. Once these problem areas were identified, they were addressed through various solutions. Hours were shortened in order to prevent fatigue and improve vigilance, monitors were used to detect mistakes in tube placements, and anesthesia machines were redesigned with standardized dials and controls.

The example Gawande gave earlier, of the car crash victim, demonstrated that there were several points in which an intervention could have led to a different outcome. Gawande notes that often the doctor is just the final actor in a series of mistakes. As demonstrated from several of the research studies, problems can have simple solutions, but they require the willingness to acknowledge that problems exist in the first place. Although Gawande recognizes that neither he nor any doctor is perfect, perfection is something they must always strive for.

Part I - Nine Thousand Surgeons

Part I - Nine Thousand Surgeons Summary and Analysis

In this chapter, Gawande describes his experience at a professional convention for surgeons. Although initially he is not sure why people attend such events, his experience brings him much insight to the popularity and prestige of medical conventions.

The convention includes approximately 9000 surgeons from across the country. There are 88 pages of scheduled events during the week-long conference. Gawande attends a panel on hernia treatments and watches video of complicated and rare operations. He quickly realizes that the convention is as much an educational gathering as much as it is a marketplace. There are free dinners from drug and medical device companies and more than 5300 salespeople on hand for the "technical exhibit" hall, a large space lined with booths selling surgical devices. Gawande marvels at the ability of six-figure surgeons to covet the free giveaways from the companies in attendance. The booths range from expensive medical instruments to artificial skin for burn patients, additionally they range from the simple booth, to the elaborate surgical setup, including trays of test turkey tissue to mannequins with "gallstone" candies. While Gawande is fascinated by the "toys," it is a booth removed of glitz and showmanship, providing old medical textbooks that strikes Gawande.

Gawande recalls the musings of an anthropologist in likening conferences and conventions to carnivals. Gawande recognizes that the intentions of the various attendees may differ greatly. While some may attend for the free goodies, or as a political play, Gawande is impressed by the collection and sharing of knowledge among like-minded professionals. He describes the awe he feels when hearing about the research in bioengineered liver—that he is a part of a very exciting future.

More than that, he expresses the "hungriness" of the doctors for contact and belonging. At these conventions, they are among their own, and there is an unspoken comfort there, from quietly sitting next to one another on group shuttle buses, to making polite small talk with your dinnermate. The surgeon's life is not easy, but here, at these conventions, are people who understand that just as well.

Part I - When Good Doctors Go Bad

Part I - When Good Doctors Go Bad Summary and Analysis

Although Gawande dedicates several chapters to talking about the humanity of surgery and how mistakes happen, it is also true that some mistakes should never happen. In this part, Gawande outlines what happens "when good doctors go bad." By "bad," Gawande does not mean the media cases of serial killer doctors or physicians practicing without a license—instead, he discusses what happens when a surgeon seemingly loses his "touch" and seemingly stops caring.

Doctors, in some senses, are expected to be super-human, but they are not immune to stresses and maladaptive behaviors such as alcoholism or mental illnesses such as depression. Burn-out is just as common in doctors as in the rest of the population.

Gawande describes the case of Hank Goodman, a once brilliant orthopedic surgeon. Once an attentive skilled surgeon, over the course of several years he begins getting sloppy and making a series of mistakes. Worst of all, he refuses to admit anything is wrong and his colleagues are unable to do anything about it for far too long.

Goodman himself could not explain what happened. He was a nice guy and dedicated surgeon who won a teaching award from his medical students. At some point, he stopped enjoying his job, and starting rushing through as many patients as he could—quantity over quality. Studies have shown that an unacceptable amount of time will lapse between the "fall" of a doctor and a corrective action, such as a license being revoked. Goodman was no exception—his colleagues tried a number of active and passive strategies such as talking to him, reducing his bookings, referring his patients out to other doctors and double-checking his decisions. In the end, he was fired on an administrative technicality—too many absences from the mandatory M&M meetings (which ironically, usually discussed his cases).

Gawande also discusses what can be done. He describes an elaborate, but often effective, program intended to intervene and rehabilitate bad doctors when colleagues cannot. The program involves information-gathering such as interviews with colleagues, interviews with the doctors in question and physical exams to identify the problem. In most cases the diagnosis is often an undetected psychiatric illness—in Goodman's case, it was depression. From the diagnosis, the program writes explicit recommendations and precautions (such as random drug testing or restrictions) for returning doctors. The strength of outside recommendations made it easier for colleagues to follow through and for the problematic doctor to get treatment.

Part I is entitled "The Way We Learn," and indeed, Gawande has outlined several ways in which surgeons learn—by practice, by making mistakes, and sometimes by coming back from the bottom.

Full Moon Friday the Thirteenth

Full Moon Friday the Thirteenth Summary and Analysis

Throughout the book, Gawande talks about the uncertainties that surgeons face. Some of those uncertainties have to do with the doctor's skills, or the patients' conditions, and some are so unknown as to even defy categorization, except for "Mystery."

Gawande discusses the role of superstition in medicine. Most doctors, he argues, are rational and cannot admit to such beliefs and notions. Doctors usually have a plausible explanation for every action.

Yet, Gawande finds himself the only doctor willing to do emergency room duty on a Friday the thirteenth, and other residents tease him about it. In addition to it being an unlucky date, the night also fell on a full moon and lunar eclipse. The one research study he found examining the association between Friday the 13th and unusual events found that hospital admissions for traffic accidents increased, despite a decrease in traffic volume.

Gawande discusses the "Texas-sharpshooter fallacy"—how we imagine a pattern when none exists, similar to a Texas-sharpshooter who fires shots at the side of the barn and then draws the bulls-eye around those shots. Still, superstitions about the 13th as well as the moon remain. The word "lunatic," for example, is thought to be related to abnormal behavior during the lunar cycle.

Though Gawande could find no research to support a relationship between the moon and craziness, as measured by police incidents, emergency room visits, and psychiatrist records, he still experienced a hectic Friday the 13th in the emergency room. From the minute the shift started, the ER was swamped, and it remained that way the remainder of the night.

The Pain Perplex

The Pain Perplex Summary and Analysis

Doctors have long been puzzled by chronic pain in patients. Gawande admits that sometimes doctors are dismissive of pain, or in general, symptoms that cannot be corroborated by a diagnostic test. Indeed there are many aspects of pain that are puzzling—sometimes pain increases when a patient is anxious, conversely sometimes it disappears when a patient is distracted or in a good mood. Doctors are programmed to look for a physical explanation—a lesion, structural abnormality, muscle tear, however, studies have not been able to discern the reason for chronic pain.

Gawande discusses the case of Rowland Scott Quinlan, an architect who suffers from crippling back pain. Diagnostic tests failed to identify a physical explanation of the pain. In fact, the pain started months after he suffered an injury to his shoulder. Gawande talks to Quinlan's wife and doctor to seek additional explanations, but neither has any. Most chronic pain sufferers can find no physical reason for their pain. Even more frustrating than the pain can be the skepticism from surrounding people. Doctors, employers or even loved ones can have a hard time grasping or believing in their condition.

Previous theories on pain, the most widespread being the Gates-Control Theory, predicted that pain signals must go through a "gate" in the spinal cord before reaching the brain and closing the gate can prevent pain. However, this theory does not explain most chronic pain. A newer theory of pain is that it is the brain that generates the pain experience using many different signals in the brain. The example Gawande uses is that of a stubbed toe. The toe sends signals up to the brain and joins signals from memories or mood or distractions, which when combined, may create the experience of pain.

Research continues to elucidate the understanding of pain, including its social coordinates. However, for now, it continues to be a mystery for Gawande and many others.

A Queasy Feeling

A Queasy Feeling Summary and Analysis

In "A Queasy Feeling," Gawande discusses another puzzling condition—nausea. While the act of vomiting is very clear (salivation increases, pupils dilate, heartbeat races, esophagus contracts, the upper small intestine contracts, and then coordinated contractions of the abdomen and diaphragm), nausea, the precursor to vomiting, is seldom discussed in medical school.

Gawande explains that nausea is a typical side effect of drugs, motion sickness and pregnancy. The intensity of nausea may have a functional purpose—the aversive event (vomiting) paired with the stimulus (e.g. poisonous or toxic foods) may prevent the sufferer from seeking out the stimulus again. Pregnancy sickness, may prevent mothers from exposing their vulnerable and sensitive embryos to natural toxins that are safe for the fully developed mother. However these biological purposes do not explain all bouts of vomiting, such as vomiting at the sight of blood or the sight of vomit itself.

One case of unexplained and excessive vomiting is presented in the story of Amy Fitzpatrick, a pregnant woman who suffers from "hyperemesis" (extreme vomiting) throughout her pregnancy. Amy's doctors tried several different kinds of drugs to lessen her symptoms but none were successful. As with the chronic pain sufferers, no physical explanation could be found from diagnostic tests and examinations, and Amy was also accused of faking or having a psychological rather than medical problem.

However, there is some evidence to support a psychological aspect of nausea. Patients with cancer often experience nausea as a direct side effect of chemotherapy. However studies have demonstrated that some of these patients will feel symptoms before the drugs are injected, such as when they see the medical staff, smell the clinic or approach the clinic parking lot. This is an example of classic conditioning like Pavlov's dogs. In these cases, the regular pairings of the unconditioned stimuli (chemotherapy drugs) and conditioned stimuli (hospital surroundings) and the reaction (nausea/vomiting) become so intertwined that the conditioned stimuli will automatically induce the reaction.

Palliative specialists focus on decreasing suffering, such as chronic pain or discomfort from nausea. The best approach, they have discovered is to begin treatment before the symptoms appear, or when they are still mild. However, the role of the palliative specialist goes beyond that—to believe in the patient's pain and provide understanding to the patient.

That type of care was the kind the chronic pain sufferers from the previous chapter appreciated, as well as Amy Fitzgerald during her experience. Amy and her twins survived the rough pregnancy, and once the babies were born, her hyperemesis disappeared as mysteriously as it appeared.

Crimson Tide

Crimson Tide Summary and Analysis

"Crimson Tide" highlights the curious case of Christine Drurer, the blushing anchorwoman. Christine was a young woman with a promising career in television news. However, she had a penchant for blushing during her news segment. The blushing would redden her face, and perhaps worse, make her self-conscious and uncomfortable. The blushing was not new to her, but Christine had worked hard to get past it in her normal activities. While make-up could conceal the redness of her face, it did nothing to cover up her self-consciousness and awkward reaction to it.

Gawande explains blushing as both physiological and psychological. The rush of blood to the face is involuntary and uncontrollable, however, what triggers it involves thought and feeling. Blushing was once thought of as the physical manifestation of shame. Other ideas suggest that blushing results from the possibility of exposure and humiliation, or that blushing serves to show embarrassment, an important moral emotion.

Severe or pathological blushing, such as that Christine Drurer suffered from, has fewer explanations. Typical blushing is expected to decrease with age, however, severe blushing seems to increase over time. In Drurer's case, the blushing was so debilitating that she sought medical treatment. A variety of medications and psychotherapy had no effect, so Drurer sought more drastic measures—severing specific fibers from the sympathetic nervous system, the nervous system that controls involuntary functions such as breathing, sweating and heart rate.

Drurer traveled to Sweden for the surgery, which took twenty minutes and had few side effects. Immediately Drurer felt a difference, managing stressful and embarrassing situations without blushing. When she returned to work, she no longer needed thick cover-up, and she was soon hired as a primetime reporter. Her confidence faltered once her integrity was questioned by a friend she revealed her secret operation to. She felt her self-consciousness return to her, felt like a phony and fell into depression. Coming to terms with her decision and revealing her secret, she began to feel comfortable in her new, non-blushing skin. When talking to Gawande two years after her surgery, she noted that the surgery did not get rid of all of her self-consciousness, but it got rid of most of it, as well as the self-consciousness that the blushing itself caused.

Drurer's situation is the primary example Gawande uses to explore the mystery of blushing.

The Man Who Couldn't Stop Eating

The Man Who Couldn't Stop Eating Summary and Analysis

In "The Man Who Couldn't Stop Eating," Gawande discusses the case of a man who seemingly could not stop eating—to the point of weighing more than 400 pounds and needing gastric bypass surgery. For Vincent Caselli, eating was not inspired by hunger, but out of habit, and because of the immediate gratification that came with it. According to Gawande, Caselli's behavior is not unusual. Research has repeatedly shown that humans are increasingly bad at eating only what they need and resisting the abundance that surrounds us in modern times.

Rarely is an overactive appetite the result of an identifiable genetic disorder, such as in Prader-Willi syndrome, a disease affecting the hypothalamus and causing insatiable hunger. Rather, humans are subject to the "fat paradox," a phenomenon in which fat intake induces two opposite behaviors; when fat reaches the small intestine, signals are sent to the brain to stop eating, however, fat also sends signals to brain receptors instructing the person to eat faster. As a result, people tend to take fewer bites before swallowing in order to eat more before the fat reaches the small intestine and signals the stop command. It also appears as though children are more successful at reading "full" signals than adults, although this disappears over time.

As in the case of pain, nausea and blushing, it is not one factor that leads to eating. Smells, visual cues and social situations all contribute to the experience of eating. For these reasons, there is no magical anti-obesity drug. However, medicine has not stopped trying. Gastric-bypass surgery involves reducing the size of the stomach to a fraction of its normal size and connecting it in such a way as to bypass a critical part of the digestive tract where food is broken down and absorbed. Following a gastric bypass surgery, patients are physically only able to consume small quantities of food or they become ill (typically an unpleasant experience, such as with vomiting).

For some, the physical limitation of their stomach is enough to reinforce a restricted diet. However, gastric-bypass surgery is not always successful. Gawande highlights one case of a man who had the surgery and lost 100 pounds, then put it all on again, resuming his pre-surgery diet and portion sizes. Still, there are many who "get better" after having the surgery, to the extent of the National Institutes of Health endorsing bypass surgery as the only known effective therapy for obesity. Those who are successful credit a change in the way they thought about food and eating.

Gawande brings up the idea of how much of weight is in a person's control and reintroduces the idea of progress with risk. While gastric-bypass surgery is growing in popularity, little is known about long-term side effects. This remains an area rife with uncertainties.

Final Cut

Final Cut Summary and Analysis

In "Final Cut," Gawande discusses a procedure that is only performed when no other treatment was successful—the autopsy. An autopsy, based on Gawande's description, is a vastly different experience compared to surgery— - from the moving and repositioning of the body, the size of the incision, and even the manner in which one wields the scalpel. For doctors, an autopsy sometimes brings the fear that a mistake will be revealed and sometimes brings the relief that the outcome was inevitable rather than human-based.

For much of history, many religions protested autopsies, and those that are accepting of them are usually only for legal reasons. In those times, bodies were sometimes stolen from graves. By the turn of the 20th century, doctors had effectively turned autopsies into tools of discovery—uncovering new diseases such as tuberculosis or Alzheimer's and confirming diagnoses. Currently autopsies are in decline. Gawande credits technological advances such as MRI machines and molecular testing for replacing autopsies. However, one case he discusses changes his mind about autopsies.

Gawande's patient had diseased arteries and a long history of vascular surgeries. Although he had congestive heart failure and fluid in his lungs, he was stable until he died suddenly. Gawande examines all the possible causes of death and concludes that another physician had given an unnecessary dose of medication that caused a blood clot, leading to the pulmonary embolism that killed him. Upon autopsy however, Gawande discovered that a missed aortic aneurysm was to blame—something that none of the doctors had caught during any other examination.

Autopsies reveal that misdiagnoses occur in approximately 40 percent of deaths, a statistic that has not improved over time and with technology. Part of the reason is that although the fancy technology may exist to identify a condition, a human doctor still needs to think to order it.

Gawande notes that humans are neither wholly predictable nor are they unpredictable. Each patient is different, and similar symptoms do not necessary have the same source in both. However, doctors must continue to work as though they will always find the answer.

The Dead Baby Mystery

The Dead Baby Mystery Summary and Analysis

In "The Dead Baby Mystery," Gawande describes a puzzling condition called Sudden Infant Death Syndrome (SIDS). SIDS is the label given to unexplained infant deaths following an inconclusive postmortem investigation. Studies have suggested that sleeping on soft bedding or sleeping facedown increase's an infant's risk for SIDS. However, the cause of such unexplained infant deaths is still unknown and it is difficult to distinguish SIDS from foul play. For many parents of infants who died suddenly, they find themselves at the center of police investigations and accusations.

SIDS parents are not the only ones. Science can often only provide circumstantial evidence in child abuse cases—it is easier for science to determine that a burn or bone break exists rather than how it occurred. In such cases, it is people who can provide the most information.

Gawande recalls an incident in which his young daughter awkwardly breaks her arm. At the hospital, the staff questions him and his wife about the incident to check for inconsistencies and rule out child abuse.

In perhaps one of the most famous cases of sudden infant deaths, Marie Noe gave birth to ten babies who all died. Because these deaths were so frequent and occurred before the classification of SIDS, Marie Noe was suspected of foul play. The deaths were later attributed to SIDS, but in the late 90's, Marie Noe was charged with murder. With these examples, Gawande demonstrates that sometimes people can be more informative than science.

Whose Body Is It, Anyway?

Whose Body Is It, Anyway? Summary and Analysis

Gawnde discusses choices and informed decisions in "Whose Body Is It, Anyway?" First he highlights the case of Joseph Lazaroff, a man with an untreatable cancer. Lazaroff opts for a risky surgery to help delay paralysis, despite doctor's warnings. As a patient, Lazaroff had the right to choose his course of care, however Gawande felt as though Lazaroff did not hear what the doctors told him about the realities of the surgery. Therefore, that information was not factored into his decision.

Gawande clarifies that he did not think that Lazaroff made a bad choice because he did not agree with the doctors, but rather that Lazaroff's choice did not agree with what Lazaroff wanted. Gawande ponders whether the doctors should have even told him about the surgical option and reveals that, because a good physician cannot just stand aside when patients make harmful decisions, more must be done to talk patients through their decisions. In most cases, patients will "choose" what the doctor recommends.

While this may appear manipulative or controversial, research has also demonstrated that, to a certain degree, patients do not want autonomy and responsibility for these decisions, especially when the stakes are life and death. Patients, and other decision-makers such as family, are often in a bad position to make good choices. People might be too emotionally involved to be completely rational—fatigue, mood and pain can often cloud one's judgment.

Some argue that physicians should make the tough decisions because they are not emotionally engaged and have relevant knowledge to the decision-making. Ideally, both would be engaged in the decision-making process. Doctors should be a resource for the patients and patients should decide if they want to relinquish the choice and to whom. Patients are not necessarily seeking autonomy in their care, but rather competence and understanding. Throughout the book, Gawande has shown examples of patients who were most grateful not of the high-tech science of medicine, but for the compassion of doctors.

The line between respecting the patient's decision, no matter how bad, and ensuring that the patient gets the best possible care can be blurry. Gawande concludes by retelling one incident in which a man with a bad infection begins having trouble breathing. He is panicked and insists upon no ventilator, even after doctors explain it will be temporary and he will die without it. His wife is also panicked and having trouble making a decision in a heartbeat. The doctors know the man is making a bad choice but cannot help him. Once the man passes out from lack of oxygen, the chief resident springs into action to put him on a breathing machine. One may question such actions, but not the patient, who as a result, fully recovered and thanked the doctors for saving his life.

The Case of the Red Leg

The Case of the Red Leg Summary and Analysis

In "The Case of the Red Leg," Gawande wraps up his section on uncertainty with a study of a case involving many uncertainties. A 23-year old woman, Eleanore Bratton comes into the ET with a red and swollen leg. The simple diagnosis is cellulitis, a skin infection usually treated with antibiotics, however when the ER physician asks Gawande for a surgical consult, he is concerned it could be necrotizing fasciitis, or the "flesh-eating bacteria." The symptoms of necrotizing fasciitis are very similar to cellulitis (inflamed skin, soreness, fevers, pain and swelling), however necrotizing fasciitis is relatively rare compared to cellulitis. Although Gawande cannot be certain it is necrotizing fasciitis, he cannot be certain it is not either. In obtaining permission for a biopsy, which would determine whether it was necrotizing fasciitis or not, the doctors must explain the various possibilities to the patient and family, who become understandably frightened. They ultimately give their consent and it is discovered that she has the disease. The doctors are hesitant to amputate such a young person's leg and instead try to remove all the infected tissue. Bratton is then given oxygen therapy via a hyperbaric chamber in order to aid her cells in fighting off the bacteria. Ultimately Bratton's life and leg are saved during the course of action.

While a large evidence base exists in medicine and informs best practice guidelines, there are larger gray zones where it is not clear what to do. In those cases, decisions are made using feelings based on experience and judgment.

Gawande uses Bratton as an example of how intuition sometimes succeeds over rationalization. In drawing out a decision tree of Bratton's situation, the logical decision would have been a diagnosis of cellulitis. Asking several doctors what course of treatment they would have followed once the necrotizing fasciitis was discovered would also yield different answers. A thoughtful decision analysis of a case would require two things that are difficult for doctors to come by—appropriate weighting of risks and rewards, and time. In most situations physicians must act quickly and decisively.

One psychologist suggests that what we call intuition is actually an unconscious assessment of facts that fit a known pattern. So perhaps Gawande had unconsciously processed cues in Bratton's case that led him to the correct diagnosis.

In the end, whether it is intuition or logic that will lead doctors to the right conclusion is, like many things, uncertain. However, Gawande notes that there is an inexplicable draw to such an imperfect science, to the possibility of making the right choice and improving someone's life.

Characters

Kent Neff

Kent Neff is a psychiatrist who specializes in professionals with serious behavior problems. Gawande first met him in 1998 at a medical conference where Dr. Neff gave a presentation, "Two Hundred Physicians Reported for Disrupted Behavior." Dr. Neff had a small program, Professional Assessment Program, at Abbot Northwestern Hospital in Minnesota. The purpose of the program was to provide objective evaluation and recommendations for problematic doctors. Hospitals, clinics, even airlines and legal courts sent him their problematic employees. He provided patient consultations to these professionals, which included interviews, physicals and tests, and a formal opinion. In effect, his role was to do what their colleagues were reluctant to do—evaluate the person's problems. With a team, Dr. Neff would research the client, conduct interviews and collect reports from the client's colleagues, perform diagnostic tests and come up with a diagnosis and set of recommendations to give to the client's employer. Most of the diagnoses included mental health issues such as depression or a physical disorder such as Parkinson's. While the employer was not obligated to carry out the recommendations, such as restrictions on practice, regular therapy, and random drug testing, most craved an outside authority to help deal with the problematic employee. Dr. Neff's program was subsidized by Abbott Northwestern Hospital, and while there was a great need for such services, the program struggled financially (each evaluation was approximately $7000) and was canceled. However, his program provided a solution to rehabilitating what were once good doctors, pilots and judges. In the book, it is Dr. Neff who sees and treats Hank Goodman, the case study in Gawande's chapter about good doctors going bad.

Hank Goodman

Hank Goodman (his name was changed to protect his identity) is a former surgeon specializing in orthopedics. Goodman was an accomplished, well-like surgeon, but at some point in his career, he stopped being vigilant about his patients' care and started trying to be "The Producer," the number one booker who could work 80-100 hours a week performing back-to-back surgeries. He got sloppy and was stubborn about admitting any wrongdoing. These mistakes ranged from using the wrong size screw in a joint replacement to ignoring surgical infections and patient complaints of pain. His colleagues noticed his erratic behavior and poor judgment, but were unable to do anything to stop him for several years. Instead, they tried to protect patients from him—referring to other doctors, double-checking his work, clearing his schedule. Stern lectures from senior staff had no effect on him either. He was finally fired for an administrative failure—poor attendance at M&M meetings, which were often to review his cases. After his dismissal from the hospital, his denial continued. He did not tell his family what happened and he continued to get up every morning, get dressed, and go to "work." At one point, he contemplated suicide. He finally sought help from a consultant

(Kent Neff) specializing in professionals with serious behavioral problems. He was diagnosed and treated for depression. Over time he got better and applied to have his license reinstated, with restrictions such as work hour limits, supervision and regular medical and psychiatric treatment. Practices were not willing to hire him and it took him a year to be approved for malpractice insurance. Instead, he began working doing physical exams for an insurance company. He intends to return to surgical practice in the future. In the book, Gawande uses him to illustrate what happens "when good doctors go bad."

Hans Ohlin

Dr. Hans Ohlin was a top cardiologist and the chief of coronary care at a Swedish Hospital. In 1996 he was recruited to participate in a study that compared accuracy between a human and a computer. Both were tasked to read 2240 EKGs, a common diagnostic test to detect heart irregularities, and identify which were normal and which were "suspect" and indicating signs of a possible heart attack. Dr. Ohlin correctly identified 620 "suspect" EKGs, but the computer identified 738 "suspect" EKGs. This study was used as an example during Gawande's discussion of how technology is replacing certain human aspects of medicine.

Rowland Scott Quinlan

Rowland Scott Quinlan was a Boston architect and avid sailor. He had designed buildings for the University of Massachusetts Medical School and the Franklin Park Zoo. He suffered a fall at a construction site, injuring his left shoulder only. After he recovered, he began experiencing agonizing back pain, and as a result, had to give up his successful architecture firm. Laboratory tests such as CT scans and X rays show nothing to explain Quinland's pain. To ease the pain, he infuses high doses of a narcotic through his skin 24 hours a day. His pain leaves him unable to work, carry groceries and even walk up the stairs. Gawande discusses Quinlan's situation in "The Pain Perplex" as an example of mystifying chronic pain.

Edgar Ross

Edgar Ross is an anesthesiologist and director of the chronic-pain treatment center at Brigham and Women's Hospital in Boston. Dr. Ross sees patients with all kinds of pain. Dr. Ross is introduced in the book as Quinlan's doctor. He is different from most doctors in his relationships with chronic pain patients. While many doctors are dismissive of chronic pain or assume the patient needs psychiatric treatment, Dr. Ross's accomplishment is taking the patient seriously and believing in it.

Frederick Lenz

Frederick Lenz is a neurosurgeon at Johns Hopkins Hospital. During a brain surgery to correct a patient's severe hand tremors, Dr. Lenz discovered that stimulating a certain part of the brain with an electric pulse induced an unexplained sensation in the patient similar to a panic attack. He published a report in the journal Nature Medicine to document the unusual response, along with another similar patient case study, and suggest that areas of the brain can become abnormally sensitized and create sensations in the presence of harmless stimuli. Gawande uses Dr. Lenz' findings to demonstrate that perhaps pain is all "in the head," but not in the way previously assumed.

Amy Fitzpatrick

Amy Fitzpatrick is a young woman who, during her first pregnancy, was prone to violent and prolonged vomiting. The episodes started at 8 weeks, but were so severe that she had to leave her job in New York and move in with her parents in Virginia. Doctors could find no explanation for such severe vomiting and no solution that helped. She was nourished through IV fluids and lost weight instead of gaining weight. Not only food made her nauseous, but the slightest motion such as tilting her head. She tried drugs, herbal therapy, Chinese massage, and acupressure wristbands to no avail. The symptoms did not relieve themselves with time, as is typical with pregnancies. As with the chronic pain sufferers, Amy's condition was questioned as a possible mental health issue. The vomiting and nausea finally went away the day after the birth of her twins. Gawande tells Amy's story as another example of a condition that doctors cannot explain.

Christine Drury

Christine Drury is a young woman with aspirations to be a newswoman. She gets her big break as the overnight anchor for the local NBC affiliate. She was pretty, had a good speaking voice and wrote good news scripts, however, when she got in front of the camera she could not stop blushing. In addition to the red flush on her face, Christine would also feel anxious, self-conscious and distressed. Though thick makeup was able to hide her complexion, it would do little to disguise her discomfort. Convinced that the blushing would ruin her career as a newswoman, Christine traveled to Sweden for surgery to stop the blushing by paralyzing specific sympathetic nerves. The surgery was successful and Christine experience no ill side effects. Upon her return, her newfound confidence was quickly noticed and within months she had landed a new job as a prime-time reporter. A negative encounter with a friend whom she told about the surgery deflated her confidence and left her feeling like a phony. After coming out with her secret, she started an organization, the Red Mask Foundation, to help support others with the same affliction. Christine has no regrets about her decision and continues to pursue her on-air reporter dreams.

Vince Caselli

Vincent Caselli (not his real name) is a morbidly obese middle-aged man who undergoes gastric-bypass surgery. He had always had trouble with weight, but when he hit his late twenties, his weight had increased to 300 pounds. Subsequent diets would allow him to lose a significant amount of weight, but he would always gain it back, along with additional weight. His weight caused additional medical problems such as high blood pressure, high cholesterol, diabetes, sleep apnea and skin infections. His quality of life drastically decreased and he was at great risk for death, so at 428 pounds, Caselli underwent gastric-bypass surgery. Gawande is one of the doctors during his surgery and continues to check on his progress over time. Caselli loses much weight over the following year and has drastically changed his eating habits and attitudes. He has no regrets about his surgery, but worries about falling back into old habits. Gawande uses Caselli's case to discuss obesity and appetite research.

Marie Noe

Marie Noe is a woman who gave birth to ten babies who all died. During the years 1949 to 1968, one was a stillborn, one died in the hospital after birth and eight died at home, still infants. Initially no explanation for the deaths could be found and foul play was suspected. However in later years, the deaths would be attributed to a condition identified by the medical community as "Sudden Infant Death Syndrome." In 1999, at the age of seventy, she would plead guilty to eight counts of second-degree murder. Gawande uses Marie Noe as an example of how sometimes people can explain to us what science cannot.

Joseph Lazaroff

Joseph Lazaroff was a man in his early 60's who suffered from an untreatable cancer. Due to the cancer, he loses sensation in his legs. He is offered the option of undoing a risky surgery to delay further paralysis. Although his doctors, Gawande included, believe it is not his best option, Lazaroff chooses to go through with it. Later, it is discovered that perhaps Lazaroff did not understand the purpose of the surgery and was undoing it for the wrong reasons. Lazaroff survives the surgery, but his lungs fail to recover from the operation and he dies two weeks later when his son requests he be taken off the ventilator. Gawande uses him as part of his discussion about who should make decisions for one's health care.

Eleanor Bratton

Eleanor Bratton (not her real name) is a 23-year old who comes into the ER with a red and swollen leg. Gawande intuitively suspects the infection might be life-threatening necrotizing fasciitis, rather than a simple case of cellulitis. His intuition pays off and Eleanor has much of her leg muscle removed and undergoes intensive oxygen therapy

to help stave off the bacteria. She survives and physically recovers. However, emotionally she is haunted by the experience; the "seemingly randomness" of the entire situation causes her to be somewhat distrustful and cautious. However, in addition, she feels stronger and inspired. Gawande uses her experience as an example of the sea of uncertainties doctors must face, and how they must make decisions anyway.

Objects/Places

Hospital

The hospital is where many of the experiences in the book take place. The hospital is where both doctors and patients are present.

House Calls

Gawande makes several visits to patients' homes to see how they are recovering. The house call serves to develop the relationship between doctor and patient.

Residency Program

A residency program is required of doctors who have completed medical school and have picked a speciality to train in for the next several years. The residency program is intended to provide real world experiences and hands-on learning for doctors.

Surgeons

Surgeons, though always learning on the job, typically exude confidence and are intended to represent the closest thing to perfection possible in an uncertain world.

Patients

Patients are those in need of the Doctors' care and attention at the hospital. They are usually characterized by the disease they have.

Shouldice Hospital

The Shouldice Hospital is the medical center referred to as the hernia factory for its super-specialization in hernia operations.

Emergency Room

The emergency room is where trauma victims are taken when they enter the hospital. The nature of the emergency room is that it is teeming with uncertainties.

Morbidity and Mortality Conference (M&M)

A weekly mandatory meeting in which cases from the previous week with unexpected, poor outcomes are reviewed. M&M serves to acknowledge mistakes while trying to prevent similar occurrences.

American College of Surgeons Convention

An annual convention attended by 9000 surgeons. Gawande attends during his residency and realizes the convention is both a marketplace for the newest surgical innovations as well as a social gathering for a sometimes detached community.

Autopsy

Meaning "to see for one self," an autopsy is a postmortem examination to detect or confirm cause of death. Gawande notes the decreasing popularity of the autopsy, but lauds its potential benefits.

Themes

How We Learn

How we learn is a theme that Gawande focuses on to demonstrate the journey of a surgical resident. Gawande dedicates much of the book to discussing how medicine is an imperfect science teeming with uncertainties. One way to reduce uncertainties is to reduce what is unknown through knowledge and learning. Although surgical residents have already gone through four years of medical school, their education is far from complete once they enter residency.

Gawande focuses on several ways in which knowledge is acquired. The most obvious way is through practice. After surgical residents witness a medical procedure, they are expected to do it themselves pretty soon thereafter. Gwande talks about how innately gifted surgeons do not really exist—just determined surgeons who know how to practice. Along with practice they accept another important part of learning—making mistakes. Gawande discusses not just human error, but how human error can be lessened through the use of technology. Often doctors are just the final actor in a series of errors and much time is devoted to discussing how alternative actions could lead to different outcomes. Sometimes, however, doctors are the only actor in a series of errors, and Gawande discusses how sometimes doctors are not good at taking care of themselves, and thus patient care suffers. He includes this example perhaps to demonstrate that not all learning is hands-on, and some can learn this lesson through observing rather than experiencing.

Humans as Flawed Creatures

Gawande repeatedly shows that people, including doctors, are subject to many flaws. Though perfection is always desired, it is unreasonable to expect such a thing knowing the inherent nature of people. Throughout, Gawande details experiences that demonstrates this notion: computer reasoning that outperforms human judgment; emotion interfering with decision-making; cases of self-consciousness; good doctors who go bad; overindulging in the necessity of eating; and weekly Morbidity and Mortality conferences intended to highlight mistakes made.

The medical mysteries he explains in Part II can all be thought of as examples of human flaws—cases in which something, such as pain receptors or a person's appetite, go awry.

Gawande seeks to humanize doctors and bring about realistic expectations and conversation between doctor and patient. This common bond can also be used to explain why doctors could never be replaced by technology, even with all their shortcomings. Throughout the book, the purpose of the doctor is not merely technical, it

is also to commiserate and to provide healing and emotional support—something that only another imperfect being could understand.

The Uncertainties We All Face

Gawande repeatedly notes that the world is full of uncertainties. In an ideal situation, one would have a complete set of information to use to make an educated decision. However, people seldom have that, and doctors almost never have that.

Gawande demonstrates this most pointedly in the third part. He discusses how only autopsies can reveal mistakes or confirm doctors' diagnoses and actions, and how medical conditions such as Sudden Infant Death Syndrome (SIDS) are diagnoses by exclusion, meaning it is given that label because no other disease explains it.

Though he focuses mostly on uncertainties that doctors face, his patients face as much uncertainty as well—wondering which procedures they should allow, whether to get a second opinion, or what kind of end of life care they prefer. It is these moments when they are most vulnerable and need to rely upon doctors who are able to be more objective and less emotional, but face just as many uncertainties.

Gawande's main point is that doctors are not superhuman and do not know all the answers. Though they strive for perfect knowledge, and act confidently as though they do, they face the same uncertainties. Doctors are often troubled by the notion that, in lieu of algorithms and equations, they must make decisions based on experience and judgment—by feel. Gawande notes that doctors are driven by the chance that sometimes the uncertainty will turn in their favor and the acceptance that it is an imperfect science they work within.

Style

Perspective

The book is written mostly in first person. Gawande discusses his feelings and emotions resulting from his actions and mistakes. He poses several thought-provoking questions and his musings are often directed at the reader.

Since it is based on real experiences, the retelling of stories, particularly of patients, the book requires some third person narrative. Since the book is rooted in the uncertainties of medical practice, the third person voice is never completely omniscient—just as knowledgeable as a human being in the situation would be.

Dialogue is infrequently used and the stories are told mostly through description. The characters are typically limited to only one chapter, therefore exposition in the third person narrative is used to create sufficient development and backstory.

The author is a surgical resident writing about his experiences and explains the typical biases of this group of people—the need to collect information and seek a rational explanation. Therefore the book is also written that way and the narration is reliable and describes the facts that are available. When a situation defies logic, Gawande also reports the lack of hard evidence.

Gawande draws upon expansive knowledge from supporting literature and sites the strengths and limitations of the various studies, along with information about the authors to reveal any biases.

Tone

The tone of the book changes throughout based on the subject matter and the perspective. Gawande is fairly impartial during parts written with a third-person narrative. However when he switches to the first person perspective, there is a more humanistic tone.

Throughout the book, he maintains the role of a story-teller. His sentence structure and language are simple and straight-forward. He is clearly concerned with making his concepts and supporting literature accessible to the reader. He is honest and yet matter-of-fact, constantly maintaining a respectful approach. He paints compelling portraits of all the patients, exploring various aspects of their lives. These people are not reduced to extreme caricatures in order to make a point, but rather three-dimensional characters. For example, Gawande does not just describe these people as patients in the hospital, but often makes home visits or depicts their lives outside the hospital.

Although Gawande raises several new ideas about the way that doctors learn and perform, he is never overly critical or argumentative. He mentions frustrations such as

lack of organization to ensure doctors' compliance with best-practice guidelines, but not in an accusatory manner. Instead, he approaches these new perspectives in an exploratory manner—posing questions, presenting scientific evidence from the literature, but ultimately allowing the reader to arrive at his or her own conclusions.

Structure

The book is structured into three parts, each having a central theme, and separated into 4-5 chapters each to explain different examples of the themes. The names of the chapters are descriptive and typically refer to the main focus or theme of the chapter. In Part II, each chapter contains one central character or patient. In addition to detailing their case histories, scientific research is often used to describe the theories and literature around theories and ideas. The research is often summarized into the key points of a peer-reviewed journal article, including background, methodology, results and discussion. Most chapters are self-contained, and not chronological, probably the result of compiling previously published pieces into one book.

The book contains little dialogue and instead opts to explain ideas using a series of case examples as well as scientific research. Medical terminology is used as necessary and all procedures are explained in sufficient detail. Chapters often include patient descriptions, including a medical history and all relevant information about their medical symptoms and condition.

Although the subtitle of the book is "A Surgeon's Notes on an Imperfect Science," the book is not a memoir as much as it is a non-fiction book about medical practice. It is easy to read and the short chapters that are ten to thirty pages long move quickly. The book is thought-provoking and Gawande dedicates a large portion of the book to examining the research and its implications.

Quotes

"This is the uncomfortable truth about teaching. By traditional ethics and public insistence (not to mention court rulings), a patient's right to the best care possible must trump the objective of training novices. We want perfection without practice," p. 24.

"Western medicine is dominated by a single imperative—the quest for machinelike perfection in the delivery of care," p. 37.

"This was not guilt: guilt is what you feel when you have done something wrong. What I felt was shame: I was what was wrong," p. 61.

"People may actually prefer the world of don't ask don't tell. Just ask yourself, could you abide by a system that rehabilitated drug-addicted anesthesiologists, cardiac surgeons with manic psychosis, or pediatricians with a thing for little girls if it meant catching more of them?" p. 103.

"As is often the case, the people who were in the best position to see how dangerous Goodman had become were in the worst position to do anything about it," p. 96.

"From what I've learned looking inside people, I've decided human beings are somewhere between a hurricane and an ice cube: in some respects, permanently mysterious, but in others—with enough science and careful probing—entirely scrutable," p. 201.

"We are a species that evolved to survive starvation, not to resist abundance," p. 170.

"Medicine's ground state is uncertainty. And wisdom—for both patients and doctors is defined by how one copes with it," p. 229.

"[Judgment] is rarely a calculated weighing of all options, which we are not good at anyway, but instead an unconscious form of pattern recognition," p. 248.

"But, as the field grows ever more complex and technological, the real task isn't to banish paternalism; the real task is to preserve kindness," p. 224.

"As a human, you adjust to conditions. You don't think you are. But you are," p. 180.

"No matter what measures are taken, doctors will sometimes falter, and it isn't reasonable to ask that we achieve perfection. What is reasonable is to ask that we never cease to aim for it," p. 74.

"Doctors belong to an insular world—one of hemorrhages and lab rests and people sliced open. We are for the moment the healthy few who live among the sick. And it is easy to become alien to the experiences and sometimes the values of the rest of civilization," p. 86.

"It is hard to contemplate the human appetite without wondering if we have any say over our lives at all," p. 169.

"I am sure I can figure out what's wrong with her, but if you think about it, that's a curious faith," p. 200.

"I had come into residency to learn how to be a surgeon. I had thought that meant simply learning the repertoire of moves and techniques involved in doing an operation or making a diagnosis," p. 217.

"The dishonorable reason is that doing nothing is easy," p. 95.

"Medical care is about our life and death, and we've always needed doctors to help us understand what is happening and why, and what is possible and what is not," p. 46.

"We are all, whatever we do, in the hands of flawed human beings," p. 105.

Topics for Discussion

Gawande reveals that everyday people do not realize that less experienced residents perform complicated procedures on patients in the hospitals on a daily basis. Knowing this, Gawande chose a senior cardiologist to treat his son, over a resident, for a heart condition. He admits that usually only those who are knowledgeable about the medical education system know that this choice exists. Gawande comments, "If choice cannot go to everyone, maybe it is better when it is not allowed at all." Explain why you agree or disagree with his statement.

Gawande notes that Hank Goodman was practicing medicine very poorly for years before he was stopped. There is plenty of research that demonstrates that much time passes before unacceptable behavior is actually stopped. Can you think of an example in which this happened? What happened and what could have been some alternatives for dealing with the problem in a more timely manner?

Part II of Complications describes various mysteries, particularly of the mind-body relationship. In "Crimson Tide," Christine Drury's physical blush is accompanied by mental distress and discomfort. After the surgery, both symptoms disappear. Instead of her problem being just physical or just psychological, it seemed to be a mixture of both. Explain why that might be. Draw on Gawande's examples as well as your own.

Doctors continually strive for progress. In the field of medicine, discuss how progress could be encouraged with minimal risk to the patient. Is progress inherently risky?

In traditional diets, people need to change their eating habits and restrict certain foods. People, after a gastric-bypass procedure, also need to change their eating habits and restrict certain foods. Discuss why you think gastric-bypass has a higher success rate for weight loss. If it is simply the behavior of eating less that is the solution for losing weight, is such a drastic measure such as gastric-surgery necessary?

Vince Caselli says that if he regains the weight after surgery, "that's the cards that God gave me. I can't worry about stuff I can't control." Of the examples Gawande uses in Part II, pain, blushing and obesity, what do you think is within someone's control?

Gawande notes that the number of autopsies performed has decreased over the years, sometimes due to a failure on the doctor's end to ask the deceased's family. Discuss the advantages and disadvantages of performing an autopsy.

Sometimes, as in the case of Eleanor's red leg, intuition is correct. When should one listen to intuition and when should one use rational deduction? What are the dangers of listening to intuition?

In the book, Gawande is open and honest about the practice of medicine, even though at times the truth is not comforting. Why do you suppose he wrote this book? How does this reason relate to Gawande's ideas and themes?