Chapter 7

Political Aspects of Robotic Surgery

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ABSTRACT

The introduction of robotic technology to perform cardiac surgery can be a demanding and laborious task. The successful robotic program director should be able to identify obvious, and not-so-obvious obstacles, within the members of the team, and the hospital administration. The success of the program will depend on the early recognition of objective and subjective roadblocks, ranging from the team's capability and willingness to adapt to new technology, to winning the administration's trust over patient's satisfaction and the hospital's efforts at cost containment.

The purpose of this chapter is to address the most common and therefore most predictable dilemmas: How can a surgeon-leader promote the adaptation of this complex technology while being met by a skeptical crowd? How can the enthusiasm for robotic surgery be preserved throughout all the phases of learning? Is arrested development avoidable?

We propose that a developing robotic program evolves though several discrete phases over time. Recognizing these phases may help the leader to circumvent issues of the team's delayed adaptation, preservation of their morale through the phase of rejection, and avoiding their disenfranchisement from a new surgical model.

KEYWORDS

Program development, adoption of technology, phases of team development, political challenges with innovation

7.1 Introduction

Robotic surgery is a high risk, high profile innovation that evokes an array of complex social dynamics including controversy and opposition. Sustainable success of these programs inevitably depends not just on great patient outcomes, but the ability to implement this program within a culture that is highly conservative and often skeptical of new ideas. Political skills—often discounted as merely backstabbing and manipulation—are undervalued in surgeons compared to the obvious importance of technical skill and knowledge. However, politics also includes constructive activities like the ability to negotiate, influence, engage, convince, and persuade others, which are obviously required to skillfully navigate the challenges of a new robotics program.

A fundamental political problem for robotic programs is a long and potentially hazardous initial phase of on-the-job team learning [1]. Teams get worse before they get better. This is an agonizing and well-known problem with any innovation. Start-up companies in Silicon Valley call it "Death Valley" because of the high frequency of bankruptcies [2]. Surgeons prefer a more euphemistic term: the "learning curve" [1]. Another phenomenon happens at the same time: expectations about the impact of robotics are overly enthusiastic, or hyped, to a degree that vastly overshoot the reality of the learning curve [3]. The flaws of the program are eventually uncovered and the pendulum swings towards negative expectations. This increases the chances of withdrawal of support from important stakeholders and administrative closure of the program. Teams that survive foster a strong learning environment and high team morale in order to actively reinvent the procedure. This strengthens confidence from the organization. (Fig 1)

The premise of this chapter on the politics of robotic surgery is that surgeon-leaders that foresee all the political problems several weeks prior to them happening are likely to improve the chances of success for their robotic program. The ability to predict future swings in expectations about a new program might enable strategies to be employed that mitigate the impact of problems before they result. Since miscommunication has been the

rule rather than the exception, we describe the common communication mistakes and propose tactics to correct those mistakes and meet the intense political demands of a robotic surgery program.

7.2 Three Phases of a Robotic Program

7.2.1 Hype Phase

The term "hype" signifies a large gap between expectations and reality. This gap makes people first underestimate the problems and later overreact to the struggles of a new robotics trying to get off the ground. In itself, that overreaction serves as the fuel to propel those that oppose the idea of robotic surgery (i.e. the late laggards) to go from passive to active resistance. We all appreciate—at least in theory—that a learning curve is inevitable. Unfortunately, the hype about robotic surgery peaks at the exact time that the learning curve is at its steepest and results are at their worst. The paradoxical overlap of hype and team learning soon leads to the impression of a program that has overpromised and underdelivered, even if it is a failure to deliver against totally unrealistic expectations. This feeling sets people towards becoming active resistors [4].

It is an easier task for an established surgery team to take on a new robotic surgery program than for a team with no history of working together. A new team learning a novel procedure forces two learning curves together simultaneously—one for learning the procedure and one for team members to learn how to work together. Teams go through distinct stages of development on their way to gaining expertise. The first, which happens right after everyone on the team is introduced, is known by the Tuckman model as the "forming stage" [5]. In this stage, everyone is overly polite and pleasant and trying to figure out their role. Most are excited to start something new and to be on a new team. However, if they develop concerns about the program, feedback is suppressed, particularly if their viewpoint might be viewed as critical.

The forming stage of team development aggravates the hype cycle in three ways. First, it prolongs the learning process. Robotic surgery is not a one-size-fits-all proposition.

The details of how best to do these cases must be adapted to the strengths and weaknesses of a specific institution. Adopting robotics requires adapting to it and no two hospitals do it the same. A systematic process of trial and error are needed to address the myriad of endpoints that initially get worse—longer case times, higher risk for complications, more bleeding, greater costs/case and problems with team morale. For instance, a case that takes too much operating time would prompt team members to brainstorm on how to make their tasks more efficient and save time on the next case. When a complication happens, new equipment might be purchased or a new protocol developed to avoid repeating the error in the future. These examples show the need for a constant loop between communication and feedback so that the lessons are learned and outcomes improved. This loop is broken in a team in its "forming stage" that is reluctant to provide critical feedback. Without it, learning is delayed, progress with the learning curve stalls, and complications are more common than expected. The overlap of the learning curve and the hype phase makes it inevitable that many of the initial expectations for the program will be unmet, even for teams that learn fast.

Those responsible for the monitoring and oversight of a new robotic program go through their own learning curve. Understanding robotic surgery can be a formidable task, particularly since the outcomes of new robotic programs are far more dynamic over time than the established track record of the mature open operation [6]. Speeding up the learning process of these administrators requires a level of open and honest communication that does not typically occur between groups of people as disparate as those in OR and hospital boardroom. CEOs and other executives often have no clinical background and rarely communicate directly with those on the front lines [7]. Accurate and timely information is needed to avoid succumbing to the hype, make decisions responsive to the needs of program, respond appropriately to dynamic conditions, and correct problems before they escalate. The fact that this information is hard to come by makes it hard to monitor the program in real time and learn from mistakes. [8]

The learning curve for achieving effective oversight leads to a second and more important problem caused by the forming stage of team development. Even in those cases where the CEO is good at communication, team members in their forming stage have not yet acquired the ability to cross-evaluate each other, and shy away from providing constructive criticism on how to improve performance. This poses a major safety problem. Not all surgeons have the aptitude or capacity to succeed in fields that are technically demanding, complex and risky, such as robotic surgery. Teams working with surgeons unable to meet the challenge often have a good idea after only a few cases. Hospitals use a system based on the team's feedback about a surgeon's performance to determine the minimum competency needed to perform robotic surgeries. In light of that consideration, it is natural to observe a vertical suppression of the team's input [9]. This is particularly true if the leaders of an institution are enamored with their own hyped expectations about the new strategic investment in robotics. This lack of feedback impedes the identification of surgeons who lack the necessary skills to lead a successful program, bad programs persist longer than they should and patient harm results.

The third problem with the forming stage is that it suppresses negative feedback even from those that are most opposed to the idea. It is important to note that robotics, like any innovative idea, creates a spectrum of enthusiasm ranging from "early adopters" to "late laggards." A robotic surgery program can be an existential threat to surgeons who are competent only in open techniques and are not sold on the value of this new idea (late laggards). It may seem counterintuitive that late laggards would stand by on idle as the hospital develops an overly optimistic picture about a robotics team that is struggling with its learning curve. One might predict that they would be quick to point out the fallacy of their hyped expectations. However, late laggards go through their own early phase in which their input is self-censored. According to the grief model described by Kübler-Ross [10], people grieve in response to a major threat first by denial. Surgeons in denial about the program may oppose the concept of robotics in theory, but their frame of mind makes them

unavailable to provide critiques to good programs and support the policing of bad programs.

The hype is not helpful but it persists in part because of a natural human bias to believe rather than to question such claims [11]. Overturning an initial assessment that everything is fine requires a critical mass of below expectation events, such as an excessive number of patients with postoperative complications or prolonged OR times. However, these events also occur after traditional surgical cases, so proof is based on ambiguous judgments, and amassed from uncertain, incomplete, and changing evidence. In addition, adverse events trigger unconscious psychological processes in team members such as ego defence, dissonance reductions, self-serving biases and confuse the judgments even further.[12] Bottom line: a long time can pass before teams or hospital administrators recognize a program that in retrospect was clearly off track.

7.2.2 Trough of Disillusionment

Hype never lasts. Eventually the hospital realigns and recalibrates its expectations. This coincides with a team that transitions from its forming stage to a new phase in development known as "storming." [3] In the storming stage, the reality and weight of completing the task at hand have now hit everyone. The initial feelings of excitement and the need to be polite have worn off. Personalities may clash and members disagree over how to complete a task or question group leaders. Simultaneously, late laggards transition in their grief cycle from denial to anger [10]. They exploit the new tendency of the team to overreact to bad outcomes and help promote a continual decline in expectations. The end of this phase is known as the trough of disillusionment, the most common point in which teams give up on robotics.

Surgical programs are integral to the success of hospitals. A decline in confidence might initially apply to the robotic program but can expand into a broad-based crisis of confidence in hospital leadership. There are two common ways that the leaders in charge respond to a crisis: the right way and the wrong way [13]. The right way unfolds as the byproduct of high levels of trust. Organizations that deal effectively with complex and

hazardous crises on a regular basis, known as high reliability organizations, operate around several key principles. One is that their leaders defer to the person with the most knowledge relevant to the problem that is being confronted [14]. Important decisions are deferred to those with the relevant technical expertise, not just those with the most seniority. High reliability cultures are less punitive and use errors as opportunities to learn. Surgical teams are more willing to collaborate and communicate when they don't fear punishment after the crisis is resolved. As a result, administrators are more likely to be given the critical information needed to resolve the crisis in a way that is rational, well informed and best for the institution.

The wrong response is centralized decisions informed by poor collaboration and little communication with those that have the necessary expertise. It reflects what people often do when they are attached to initial expectations and then later confronted with the idea that those expectations were wrong. It can lead to distancing and disgust with robotics, and even anger and resentment for overcommitting to a still immature and functionally limited technology. The best decision-makers recognize that this period of over-negativity is as transient as the earlier phase of excessive hype. Weak decisions tend to be based on overestimating the duration of this turmoil. This promotes panic and drives forward quick solutions like denying that there is a problem (ignoring a bad a program and allowing it to fester) or overreacting (cutting short a good program).

A metaphor of the robotic team that is prone to fail comes from the Buddhist parable of "The Blind Men and an Elephant," in which several blind men asked to describe were feeling what an elephant was, based on touching only one of its parts for the first time. One felt the ear and described the elephant was a fan. One felt the leg and said the elephant was like a tree trunk. Others said whip (tail), sword (tusk), etc. Disagreements over their perceptions became heated arguments. The story concludes that men tend to claim their truth, no matter how limited and subjective it may be, but it is also a partial truth. These blind men are an excellent metaphor for the OR team struggling to adopt robotics. Good

surgical outcomes require the right information to be put together at the right time so that good decisions are made when things suddenly shift course. Bad communication causes poor teamwork and failure of situational awareness, which increases the risk of harm to patients and closure of the program.

7.2.3 Establishing a New Normal

Some robotic programs persist and reach the final stage of team development, the "norming stage," as illustrated by reaching a plateau of higher performance. They weathered the trials and tribulations of this program by developing effective strategies for trial and error. The strategy for most teams is a deliberate effort to change how they view error. Their culture shifts away from one that blames and shames individual clinicians purported to be responsible towards a new norm that views error as an opportunity to learn and improve. This shift opens up communication between leaders in the OR, those in the hospital boardroom and those on the front lines so they start understanding what the whole elephant looks like.

This final phase is when the true value of robotics becomes a reality. For most, the transition is quicker than one might have originally predicted. However, experience is necessary but not sufficient to reach this stage. Not all teams with experience become expert teams. Some teams enter into a state of arrested development where experience no longer leads to improvement [15]. This is usually because the conditions for learning were not optimal, often due to the following problems: 1) the same exact team members were not present to perform the cases, 2) the frequency of cases was too low for the team members to remember the lessons learned (i.e. there is a steep "forgetting curve"), 3) there is no strategy for deliberate practice to accelerate and amplify learning in its early phase (e.g. no routine and formal "debriefing" sessions, surgeon not provided coaching to improve performance), 4) team members become demoralized and disgruntled about the new procedure and 5) systems issues that compromise the safety of this program are not identified and addressed rapidly.

7.3 Using Politics to Make Robotic Surgery Sustainable

7.3.1 Avoid Hype

Hype is created when the focus on a new technology is only on its benefits (e.g. robotics reduces bleeding and infection), while ignoring tradeoffs (e.g. risk of adverse events seen with robotics but not open surgery). It is helpful to provide frequent reminders to the team about adverse events that are unique to robotics and the bailouts that are done in response [16]. During the "time out" prior to skin incision, team members are briefed on what negative outcomes are possible during this case. They are instructed to mentally practice how to manage those possible negative outcomes by imagining how to deploy their strengths. This activity breeds confidence [17]. The team that is confident it can handle the worst-case becomes less anxious about the new program. They start to realize that the worst could happen—the patient is urgently converted to an open procedure—and yet a good outcome is still possible. This illustrates the philosophical power of negative thinking and is the basis for adversity training. On the political front, it mitigates hyped expectations and increases the trust of team members when they are given a more nuanced understanding of pros and cons at the outset.

3.2 Create a High Performing Team

Another way to reduce the gap between hype and reality is to make team learning as fast and effective as possible. The optimal environment for learning happens by promoting better teamwork [18]. High performing teams are created by recruiting, training, and motivating team members that would thrive on this type of a team. Airlines became a high reliability organization once they started hiring pilots for their leadership ability, not just for technical capabilities. Making these selections of who's on your team is what Jim Collins, the author of **Good to Great,** describes as beginning with "who" rather than "what." If you have the wrong people, it doesn't matter whether you've discover the perfect strategy for your hospital to become an HRO [19]. You **still** won't succeed. Great vision without great people is irrelevant.

A second way is to establish the required prerequisites for a high performing team. First, team members must be as assertive and responsible for safety as the person in charge. For instance, if a pilot is having a bad day and doesn't want to go through the safety checklist, the co-pilot and others on the plane are encouraged and even obligated to stop the flight from taking off. Hospitals have no such training. Based on how poorly they have trained clinicians on the use of electronic health records, any advanced type of team training like this is unlikely to be part of any hospital's core competencies for a long time [20]. So, by default, this training becomes the responsibility of the surgical leader. Briefings and debriefings during a case and weekly team meetings provide the right venue for teaching these lessons.

Leaders create high performance and rapid learning by fostering a culture of psychological safety, which is the belief that team members won't be punished when they make a mistake. OR team members fail to speak up and share their perspectives when: 1) they are in some way punished when they do so, 2) their opinion is not acknowledged or is not met by follow-through, and 3) they feel their don't have enough expertise or knowledge or the situation is too ambiguous to warrant speaking up [9]. Without feeling safe, the team does not provide its feedback and the process of learning stalls. A politically savvy leader understands that this creates a problem that extends well beyond slow team learning. When team members don't speak up, they are less committed to the overall goals of the program and unlikely to show strong accountability and collaboration with other team members, particularly during periods of stress [21].

Above all else, a high performing team is accountable to their results. There are established tactics for leaders to enhance team member accountability [22]. The first is to be very clear on the ground rules for how performance is being evaluated. The ultimate measure is the surgical outcomes that the team produces—patient mortality and major morbidity. It is also helpful to evaluate metrics that mediate those outcomes—like the use of behaviours known to help avoid preventable errors. Introducing a new surgical technique

like robotics causes a major change in the team's routine, which increases the risk of a preventable error. Additional risk factors for error are cognitive overload and emotional tension [23]. Team members should be tasked with developing their own tactics for addressing these issues. Ideas that often work include encouraging the use of copilots in order to alleviate cognitive overload and team briefings and debriefings to improve communication and mitigate interpersonal conflict.

7.3.3 Improve Open and Honest Communication

Two-way communication means that surgeons not only speak to their teams, but also find ways to get their teams to speak up. There are tools available to promote more effective communication from the staff to the surgeon. Our team uses a preoperative checklist as outlined by the World Health Organization [24], modified to include pertinent topics for the types of cases performed by our team. During this timeout, separate reports are given by the anesthesiologist and perfusionist so that their concerns are addressed. The circulating nurse confirms whether all the topics that are on the list have been appropriately addressed.

The use of the checklist provides "permission" for team members to speak up during the timeout but is less practical as a guide for communication after the case is started. We train team members to use other techniques for this purpose. A communication tool called SBAR (situation, background, assessment, recommendations) provides a framework for presenting important information clearly and succinctly. The most important aspect of SBAR is for team members to state explicit recommendations for action. This part is often underemphasized, particularly with nurses, but it is the best way to put any interpretations of the patient's status in the proper context and quickly gauge the urgency of the problem.

Every surgical case has critical moments in which patient harm can result unless key information is communicated in an accurate and timely fashion. Critical information in the OR is exchanged using closed loop communication. Accountability is placed on the sender to make sure the message was received. Our mantra is that "if you didn't hear it repeated

back, then you didn't say it". We also receive training in conflict resolution in order to assure that important debates about tasks or processes are not derailed by poor interpersonal relationships [25].

7.3.4 Develop a Strategy for Late Laggards

The foundation of a team that is performance-driven is clear expectations. Regular performance evaluations are invaluable for identifying and removing team members that are not a good fit. As long as the review and development process are transparent and done on a regular basis, those team members given critical feedback will respect and embrace this tactic, particularly those that are worthy of retaining.

A behavior that warrants a poor evaluation is that of a "late laggard"—someone who does not buy-into the new robotic program and tries to sabotage its success. These people spread disruptive criticism rather than helpful feedback. A red flag that identifies the late laggard is when they rarely show up to the team meetings and share their negative opinions face to face with other team members present [26]. If their criticisms contain any value for improving the program, it should be incorporated. This is a potential way to win over the laggard because people don't oppose their own ideas. More often there is nothing helpful in their criticisms and these people must be removed from the team permanently.

It is important not to mistake someone who is outspoken with critical yet helpful feedback about the team's progress. Falsely labeling this person as a laggard and saboteur can have a chilling effect on further feedback from the team. A checklist that discriminates between criticism and feedback can be helpful. Negative feedback is nonjudgmental and descriptive rather than accusatory, focuses on results of the behavior rather than the intent, deals with specifics rather than generalities, does not exaggerate and use hyperbole, assumes that the issue can be changed, is not condescending, is designed to inform rather than attack, and less about winning an argument than resolving a problem. Negative feedback should always be encouraged as the fuel that drives rapid learning.

7.3.5 Mitigate Disillusionment

Stakeholders naturally lose their initial overenthusiasm for robotics, but when it happens too rapidly or the pendulum swings too far, it creates a crisis that presses hospital administration into action. An effective response is more likely when the team that performs robotic surgery and the team responsible for oversight of the program enjoys a high degree of trust prior to the onset of the crisis. Trust is built when the lead surgeon is transparent about the outcomes of the program from the beginning and willing to accept feedback from all sources. Trust happens when administrators provide the support needed to create an optimal learning environment. Regular meetings between the surgeon and the CEO starting at the outset of the program help to create realistic expectations, which go a long way towards mitigating the bad decisions that accompany an overreaction. The results of trust are that resolving problems with the program can be delegated to those as close to the source as possible, which is the only place where optimal solutions are developed.

7.3.6 Choose a Hospital that can Support Innovation

Developing a culture that can support innovations like robotics starts at the top. Not all hospitals have CEO's that are up to the task. Extensive evidence proves that the most effective leaders are those that have expert knowledge of their core business – for hospitals this is medicine and surgery [27]. There are a variety of reasons why this technical expertise is necessary. First, the greater a CEOs expertise, the more credibility he/she will have with medical colleagues. This increases the chance of influencing physicians. They are the lifeblood of hospitals because they control the core business: diagnosis and treatment of patients. Non-clinical administrators may be masters at managerial skill, but this gains them no credibility with physicians. So nonclinical CEOs often give up on physicians and steer their leadership focus onto nurses and other employed staff that respond to command and control. This shift makes a non-expert CEO a more efficient manager but his/her core business is left without leadership. Second, being an expert means that the CEO shares the same values of those he/she is trying to lead. Those that come from the same "in group" have an increased interpersonal attraction and greater odds that they will be able to

influence each other's decisions [28]. As Steve Covey has argued, the best way to influence someone is to be willing to be influenced by them. A third issue important to a CEO's job is the need to set standards. At an HRO these standards are incredibly high—zero preventable harm—which is a feat no hospital has achieved. The mere mention of this as a goal is laughable unless it comes from a technical expert who knows what it takes. A standard bearer must first be able to bear the standards. Finally, a hospital board that hires a true technical expert sends a strong message. They are making it clear that they are willing to step outside their comfort zone of hiring CEOs that are nonclinical. It shows their own willingness to hire someone that is not like them. This willingness to take a risk and think outside the box would be noticed by physicians.

Another issue is to make the financial accounting of innovation more honest. Most financial analysts in healthcare have been reluctant or unable to consider the dynamic changes associated with costs of the learning curve [29] inherent inefficiencies of training and the opportunity costs of sticking with the status quo [30]. CFO's at innovative hospitals know that not everything important is on the balance sheet. They understand that investments in the learning curve are worth their weight in gold because they are the driving force behind culture change. The problem is there is no easy way to quantify the impact of culture change. So it becomes the type of expense that is frowned upon for CFOs that only consider the numbers.

Steve Jobs once said: "stay hungry, stay foolish." Those words encompassed his pursuit of perfecting his vision, while remaining dauntless in mixing it with the "foolishness" of thinking outside the box. Innovation in the healthcare settings can benefit from taking some risk in having a competent clinician be a strong executive as well. That is a welcome message to physicians who accept that, in a hospital led by this type of executive, innovation is bound to thrive.

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FIGURE LEGENDS

Fig. 7.1 This figure illustrates the correlation of the learning curve phenomenon with the hype cycle over a time frame that typically encompasses 2-3 years. Both processes are known to accompany the introduction of novel technological innovations.