

Before the app was created, surgical patients of Jackson Memorial Hospital (JMH) needed preoperative worksheets filled out and scanned to an operating room scheduler. JMH Clinic Buddy digitizes and centralizes this process while providing a digital database for CPT and ICD codes at the user's fingertips, removing the need to search codes manually (Fig. 2). This reduces the overall time it takes to fill out each form by 1 to 2 minutes and increases workflow efficiency of the outpatient clinic. The app also provides users immediate and centralized access to educational and clinical materials such as a plastic surgery photographic standard, Botox administration guide, and breast implant size guides. The app has the ability to function as a research tool because it automatically generates a deidentified database of patients that can be used for future quality improvement projects.

Whereas some EMR systems have similar features related to digitizing surgical booking, our app is EMR agnostic. The effects of using JMH Clinic Buddy have not yet been quantified but the tool is being used routinely by physicians and staff at JMH and University of Miami affiliated hospitals. We hope the app will increase patient satisfaction by improving patient interactions and decreasing wait times and booking errors. Future goals are to quantify the effects of using the app to better understand how technology can be used to better the field of plastic surgery both in and out of the operating room.

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#### DISCLOSURE

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### Five Hazardous Attitudes in the Operating Room: The Role of Aviation Culture and Learning to Fly Safe

Aviation and surgery share many similarities, particularly the need to perform complex tasks with the risk of fatal consequences. To avoid these complications, the field of surgery has adopted many measures initially implemented within aviation, such as checklists. In addition to these interventions, which have demonstrated benefits to perioperative safety, a surgeon's attitude is critical for a successful operative outcome. In 1984, the Federal Aviation Administration identified and subsequently validated five hazardous attitudes that can interfere with the ability to make decisions: antiauthority, machismo, impulsivity, invulnerability, and resignation (Table 1).<sup>1</sup> While pilots are now routinely educated on recognizing and addressing these attitudes (called "antidotes"), no such instruction is provided to surgeons. This article highlights the importance of educating surgeons on hazardous attitudes and emphasizes that a validated measurement scale for surgeons should be developed.

Despite limited literature describing the prevalence of hazardous attitudes in surgery, several studies indicate that they are not uncommon. Bruinsma et al.<sup>2</sup> demonstrated a high level of hazardous attitudes among orthopedic surgeons, with 38% of respondents noted to have dangerous levels of at least one of the attitudes, the most reported being machismo (28%).

Hazardous attitudes are concerning because they may contribute to poor surgeon judgment, particularly in a stressful or emergent situation, which could compromise patient outcomes. In a study by Kadzielski et al.,<sup>3</sup> higher machismo levels within surgeons were associated with a significant increase in readmission and reoperation rates. No study describing whether hazardous attitudes can be corrected in surgeons has been published, but the airline industry has demonstrated that training to recognize hazardous attitudes, as well as their antidotes, has led to a reduction of in-flight errors by up to 50%.<sup>4</sup>

Like pilots, surgeons can be trained to identify hazardous attitudes and their antidotes (Table 2). By incorporating this education early in a surgical career, surgeons can recognize their hazardous attitudes and develop strategies to counteract them.

One of the challenges in investigating these attitudes is the lack of a validated questionnaire for

**Table 1. Definitions of the Hazardous Attitudes<sup>a</sup>**

Hazardous Attitude	Definition
Antiauthority	Believing that rules, regulations, or procedures do not apply to oneself
Impulsivity	Doing something immediately without consideration of the situation or consequences
Invulnerability	Thinking that accidents happen to others but never to oneself and not considering the risks of one's own actions
Machismo	Trying to impress others, which can result in taking unnecessary risks
Resignation	Lacking the confidence that what one does makes a difference in what will happen

<sup>a</sup>Adapted from Nuñez B, López C, Velazquez J, Mora OA, Román K. Hazardous attitudes in US Part 121 airline accidents. *20th International Symposium on Aviation Psychology*. 2019;37–42. Available at: [https://corescholar.libraries.wright.edu/isap\\_2019/7](https://corescholar.libraries.wright.edu/isap_2019/7).

**Table 2. Examples of Hazardous Attitudes and Antidotes in a Surgical Setting<sup>a</sup>**

Hazardous Attitude	Example	Antidote
Antiauthority	"I don't need to participate in the preinduction time out. It's a waste of time."	"Time outs have demonstrated a reduction in patient complications and are implemented for a reason."
Impulsivity	"This is an emergency, and I don't have time."	"I understand this is an emergency, but I must have an operative plan to act efficiently."
Invulnerability	"I've never caused a facial nerve injury, so I'm sure that is not it."	"Every person's anatomy is different and just because I haven't injured a nerve before doesn't mean I couldn't injure it now."
Machismo	"I've never performed this operation before, but I'm a great surgeon, so why not?"	"I should consider a different technique I am more comfortable with."
Resignation	"The patient's likely going to have a bad outcome anyway. I don't even know what I'm doing here."	"My involvement is helping the patient, even if it's only a small improvement."

<sup>a</sup>Adapted from Nuñez B, López C, Velazquez J, Mora OA, Román K. Hazardous attitudes in US Part 121 airline accidents. *20th International Symposium on Aviation Psychology*. 2019;37–42. Available at: [https://corescholar.libraries.wright.edu/isap\\_2019/7](https://corescholar.libraries.wright.edu/isap_2019/7).

surgeons. The studies mentioned above used a modified surgeon Hazardous Attitude Scale, but this may have limitations in its generalizability. Furthermore, given that specific patient complication rates are rare and many times multifactorial, identifying hazardous attitudes as a primary contributing factor is difficult. However, given the implications of these attitudes in aviation, it would be prudent to investigate these principles as they apply to surgery. If these attitudes are prevalent at dangerous levels in the operating room, addressing and increasing training around them could significantly improve patient safety.

In conclusion, as is the case in aviation, surgical complications can have disastrous consequences. Education on hazardous attitudes in surgical training should be implemented given the benefits demonstrated in aviation. Developing a validated tool to measure hazardous attitudes among surgeons could allow for an improved understanding of the effects on patient outcomes and safety.

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