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PATIENT PERSPECTIVES ON SURGEONS' AND SURGICAL ROBOTS' LEVELS OF CONTROL OF SEMI-AUTONOMOUS ROBOT-ASSISTED SURGICAL PROCESSES

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INTRODUCTION

- Semi-autonomous robot-assisted surgery (RAS) is an emerging innovation in patient care
- Advancements in artificial intelligence enable surgical robots to perform pre-operative planning, intra-operative tasks, and decision-making
- Robots may make decisions without a surgeon's direct control
- We need to understand patients' attitudes about semi-autonomous RAS for its potential uptake
- This study assessed patients' hypothetical willingness to undergo surgery involving semi-autonomous robots

METHODS

- Design:** Observational
- Setting:** Large academic medical center
- Participants:** 50 adult (18+) patients who underwent surgery within the past 3 years
- Data Collection:** Semi-structured interviews
- Interview Topic:** Perceptions of and degree of willingness to undergo semi-autonomous RAS by type of surgical process the robot would control
- Analysis:**
 - Qualitative:** Thematic analysis, Kappa >0.80
 - Quantitative:** 5-point Likert scale on level of willingness to undergo surgery, responses were dichotomized for analysis as low ("not at all", "a little bit", and "somewhat") versus high ("quite a bit" and "extremely")

RESULTS

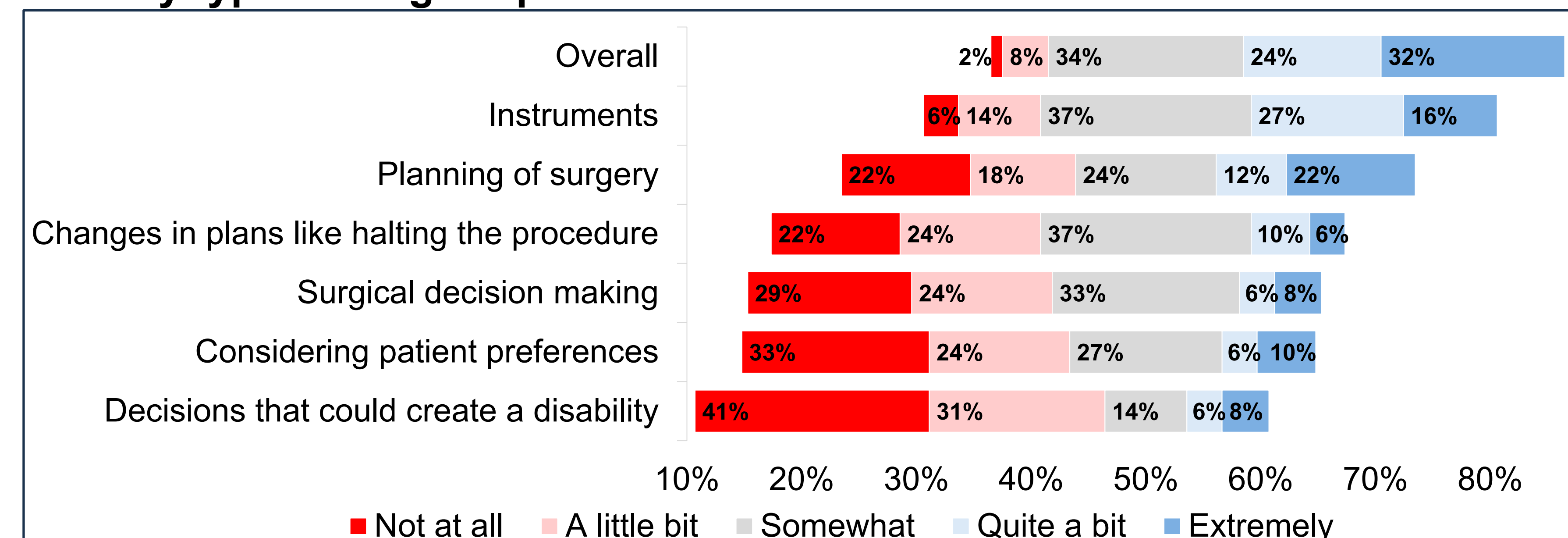
Demographic Characteristics:

- 516 patients emailed
- 50 participated (9.7% participation rate)
- Mean age: 50 years, 62% female, 42% Black
- Prior surgery:
 - Non-robot-assisted (46%)
 - Robot-assisted (38%)
 - Unsure (16%)

Table 1. High level of Willingness to Undergo Semi-Autonomous RAS by Type of Surgical Process the Robot Would Control

Overall	56%
Instrument	43%
Planning of surgery	34%
Changing plans	16%
Decision-making	14%
Considering patient preferences	16%
Decisions that could create a disability	14%

Figure 1. Percent of participants' willingness to undergo semi-autonomous RAS by type of surgical process the robot would control.



Factors Affecting Willingness to Undergo Semi-Autonomous RAS:

- Benefits associated with robot use
- Trust in their surgeon
- Greater comfort with technology

Table 2. Representative Illustrative Quotations

Benefits associated with semi-autonomous robot use	"If it's going to help the doctor in performing your surgery and, you know, making sure everything is done right. If it's gonna help beneficial wise to me—in my speed of recovery and making sure that there's not gonna be any type of infections afterward ... If it's gonna benefit me without any complications, then yeah, I would be willing." (MC91051, male)
Patients' trust in their surgeon	"Especially if I know the surgeon that I presently have is going to be there. I put a lot of trust in her, and she's been my surgeon for a lot of years, so I think the trust factor for something like that is huge. And it all being explained, so I'm willing." (MC91025, female)
Patient's greater comfort with technology	"Yes. Just, you know, growing up with technology, I don't exactly find myself like hesitant to embracing. And you know, I just have seen the advancement made in other areas. So given my previous experience with surgery was pretty straightforward. If it was something along those lines, I think I would be, you know, quite willing to take that route." (MC91045, male)

CONCLUSIONS

- Most patients were willing to undergo semi-autonomous RAS
- Willingness varied by the robot's type of control of the surgical process
- Addressing patients' perceptions about semi-autonomous RAS may facilitate greater integration of surgical robots into clinical practice

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