Table 1. Correlation between mental workload of subject and brain network regional flexibility at each brain area.

Brain area (EEG channel)	Function	Correlation (p-value)
Fp1	Cognition	$0.34(1.54 \times 10^{-12})$
F3	Cognition & Motor	$0.16(8.12 \times 10^{-3})$
Fz	Cognition & Motor	$0.22(4.50 \times 10^{-6})$
F4	Cognition & Motor	$-0.17(4.46 \times 10^{-4})$
F7	Cognition & Motor	$-0.20(9.34 \times 10^{-5})$
F8	Cognition & Motor	$-0.14(5.1 \times 10^{-3})$
T3	Perception	$0.15(1.8 \times 10^{3})$
T4	Perception	$0.11(0.03)$
T5	Perception	$-0.01(0.77)$
T6	Perception	$0.05(0.31)$
C3	Motor	$0.06(0.24)$
Cz	Motor	$0.02(0.65)$
C4	Motor	$0.08(0.08)$
P3	Cognition	$-0.10(0.03)$
Pz	Cognition	$0.17(4.6 \times 10^{-4})$
P4	Cognition	$0.09(0.05)$
Poz	Cognition	$-0.13(8.0 \times 10^{-3})$
O1	Perception	$-0.07(0.13)$
O2	Perception	$-0.16(8.3 \times 10^{-4})$

MP34-20
INFLUENCE OF HIERARCHY IN THE OPERATING ROOM ON RISK COMMUNICATION DURING ROBOT-ASSISTED SURGERY

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INTRODUCTION AND OBJECTIVE: There is paucity of data about the hierarchical culture among the operating room (OR) staff. In this study, we aimed to identify how the surgical team's hierarchical relationships affect the frequency and timing (proactive vs. reactive) of risk utterances and their influence on situational awareness in the OR.

METHODS: Audio-visual recordings and transcriptions of 10 robot-assisted radical prostatectomies were examined for risk utterances between the surgeon, assistant surgeon, bedside assistant, and scrub nurse. Utterances were classified based on the sender-recipient pair (e.g. surgeon to bedside assistant), their timing (proactive vs. reactive), and the NOTECHS situational awareness score. Proactive utterances were produced with the intent to avoid a problem. Reactive utterances were produced with the intent to correct a problem. Utterances made by the surgeon or assistant surgeon were also classified based on their on-console status. Chi-square tests and ANOVAs were used to determine associations between hierarchical status, utterance timing, on-console status, and NOTECHS scores.

RESULTS: Of 4,583 examined utterances, 275 (7%) were risk-related. Of these, 64% risk utterances occurred from individuals of higher hierarchal status to individuals of lower status (Table 1). Utterances were significantly more reactive than proactive $(p < 0.01)$. Proactive utterances $(M = 2.48)$ had significantly higher NOTECHS scores than reactive utterances $(M = 1.76)$ $(p < 0.01)$. 52% of the surgeon and trainee surgeon's utterances were made on-the-console. Utterances were more reactive when on the console and more proactive off the console $(p < 0.05)$. Utterances made by the surgeon or trainee surgeon had significantly higher NOTECHS situational awareness scores when they were off-the-console $(M = 2.42)$ rather than on $(M = 1.78)$.

CONCLUSIONS: On-console status has the greatest influence on frequency, timing, and rating of risk utterances, rather than the assumed hierarchical status based on traditional surgical practice.

Table 1: Hierarchical Classification of Sender-Recipient Pairs

Surgeon-to-Team Hierarchy	Team-to-Surgeon Hierarchy
Surgeon-to-Assistant Surgeon	Assistant Surgeon-to-Surgeon
Surgeon-to-Physician Assistant	Assistant Surgeon-to-Physician Assistant
Surgeon-to-Scrub Nurse	Assistant Surgeon-to-Scrub Nurse
Physician Assistant-to-Assistant Surgeon	Physician Assistant-to-Surgeon
Physician Assistant-to-Scrub Nurse	Scrub Nurse-to-Surgeon
Scrub Nurse-to-Assistant Surgeon	Scrub Nurse-to-Physician Assistant