A QI Project: Using Technology to Improve Communication Between Anesthesia Providers and Technologists

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Introduction

Background: Effective communication is imperative to patient safety and has long been a priority in the perioperative setting. Communication failures were responsible for at least 30% of malpractice claims in the United States, resulting in $1.7 billion in malpractice costs between 2015-2020.

Problem: Inadequate anesthesia equipment distribution. (Delayed responses, missing items, incorrect items distributed etc.)

Purpose: Improve AMC's anesthesia equipment distribution by enhancing provider-technologist communication using EPIC Secure Chat in addition to Vocera and in-person message delivery.

Methodology

Design: Prospective observational study of a quality improvement initiative

Inclusion:
- Anesthesia provider, or technologist, at AMC main campus
- Willing to respond to surveys

Exclusion:
- Anesthesia providers and technologists at satellite locations
- Failure to respond to both surveys

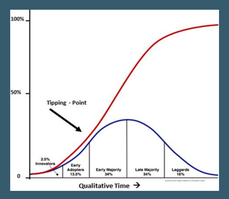
Recruitment: Survey participants recruited via emails with personalized survey links and 3 reminder emails at spaced intervals
- 203 providers and 48 technologist were sent to pre-surveys
- Only data from those who completed both pre- and post-surveys were included

Surveys assessed pre- and post-implementation using 5-point Likert Scale:
- Satisfaction
- Ease of use
- Effectiveness of communication

Intervention: EPIC Secure Chat messaging implemented to supplement the verbal Vocera/in-person equipment requests

Theory

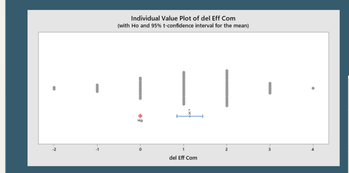
Roger's Theory of Diffusion of Innovation describes the progression of acceptance of a new idea or process by a population

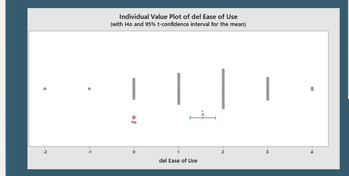


Results

- 70 (34.5%) Anesthesia Providers and 9 (18.8%) Anesthesia Technologists responded to both pre- and post-surveys
- Anesthesia providers reported statistically significantly increased satisfaction ($p < 0.001$), ease of use ($p < 0.001$), & effectiveness of communication ($p < 0.001$)
- Anesthesia technologists' responses did not reach statistical significance in satisfaction ($p = 0.208$), ease of use ($p = 0.855$), or effective communication ($p = 0.418$)

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5





Variable	Provider	N	Mean	Standard Error Mean	Standard Deviation	Minimum	Median
Pre-survey satisfaction	Attending	10	2.900	0.379	1.197	1.000	3.000
	CRNA	29	2.621	0.175	0.942	1.000	3.000
	Resident	2	2.500	0.500	0.707	2.000	2.500
	SRNA	29	2.828	0.205	1.104	1.000	3.000
Post-survey satisfaction	Attending	10	3.800	0.291	0.919	3.000	3.500
	CRNA	29	4.310	0.158	0.850	2.000	5.000
	Resident	2	2.500	0.500	0.707	2.000	2.500
	SRNA	29	3.069	0.152	0.819	2.000	4.000
Pre-survey ease of Use	Attending	10	2.800	0.416	1.317	1.000	3.000
	CRNA	29	2.552	0.154	0.922	1.000	2.000
	Resident	2	3.500	0.500	0.707	3.000	3.500
	SRNA	29	2.931	0.198	1.067	1.000	3.000
Post-survey ease of use	Attending	10	3.800	0.291	0.919	3.000	3.500
	CRNA	29	4.414	0.136	0.733	3.000	5.000
	Resident	2	3.000	0.000	0.000	3.000	3.000
	SRNA	29	4.483	0.137	0.738	3.000	5.000
Pre-survey effective communication	Attending	10	3.100	0.379	1.197	1.000	3.000
	CRNA	29	2.724	0.171	0.922	1.000	3.000
	Resident	2	2.500	0.500	0.707	2.000	2.500
	SRNA	29	3.069	0.210	1.132	1.000	3.000
Post-survey effective communication	Attending	10	3.500	0.307	0.972	3.000	3.500
	CRNA	29	4.276	0.148	0.797	4.000	4.000
	Resident	2	2.500	0.500	0.707	3.000	2.000
	SRNA	29	4.138	0.170	0.915	3.000	4.000
Post-survey use of new tool	Attending	10	3.600	0.306	0.972	3.000	3.500
	CRNA	29	4.103	0.152	0.797	4.000	4.000
	Resident	2	2.000	0.000	0.707	3.000	2.000
	SRNA	29	4.276	0.139	0.915	3.000	4.000
Delta satisfaction	Attending	10	0.900	0.379	1.197	-1.000	1.000
	CRNA	29	1.690	0.228	1.228	-1.000	2.000
	Resident	2	0.000	1.000	1.410	-1.000	0.000
	SRNA	29	1.379	0.260	1.399	-2.000	2.000
Delta ease of use	Attending	10	1.000	0.298	0.943	0.000	1.000
	CRNA	29	1.862	0.226	1.217	0.000	2.000
	Resident	2	-0.500	0.500	0.707	-1.000	-0.500
	SRNA	29	1.552	0.202	1.088	-2.000	2.000
Delta effective communication	Attending	10	0.400	0.340	1.075	-1.000	0.000
	CRNA	29	1.552	0.196	1.055	0.000	2.000
	Resident	2	0.00	1.000	1.410	-1.000	0.000
	SRNA	29	1.069	0.253	1.361	-2.000	1.000

Strengths and Limitations

Strengths
- Appropriate statistical analysis
- Applicable to nearly all surgical centers
- Paired pre- and post-survey data
- Adequate survey response rates

Limitations
- Limited ability to disseminate education about communication tool amongst anesthesia staff through grand rounds and emails
- Limited time allowed for people to start using and adjusting to new communication tool (4 weeks)
- Only 9 survey responses from anesthesia technologists limiting analysis
- Unable to control for the Hawthorne effect

Discussion

Implications:
- The addition of the Epic-chat communication tool increased anesthesia provider satisfaction and ability to communicate effectively with anesthesia technologist
- Anesthesia technologist responses to the new system were positive and negative but overall yielded no statistical significance
- Existing technology can be used to increase satisfaction and effective communication
- Effective communication leads to improved patient safety

Future Research:
- Future research should focus on other ways to use existing technology to further improve communication
- Pre- and post-surveys can be used to determine efficacy of the change
- A longer implementation period allowing for more buy in could yield better results

References