

Appendix 1 Quantitative methods supplement

Generalized vector regression was used to model call urgency (10). In this method, the modeled outcome is not a single value but a vector of observations, including the patient's reason for calling and the subsequent provider response. Using this approach allows for the comparison of average differences based on a specified set of regressors (i.e., days of the week, patient health conditions), as well as the correlation modeled between repeated observations of the outcome. This allows for the identification of whether patients and providers tend to agree on the urgency of the calls, or if there may be a mismatch that requires careful de-escalation by providers. Restricted on a range from 0 (low urgency) to 1 (high urgency), this coding scheme was modeled as a binomial distribution with a logit link (5).

There was an initial, incorrect assumption that

more urgent calls occurred over the weekend. A visual examination of raw patient urgency ratings over the week indicated a “W” pattern, with proportionally more urgent calls occurring not just on the weekend, but also on Wednesday in particular. To address this, a weighted contrast was used, that modeled whether there were significantly more calls at the visually observed high points (i.e., Saturday, Sunday, and Wednesday; scored 2/7) relative to the rest of the week (Monday and Friday scored -2/7; Tuesday and Thursday scored -1/7; or if that was more likely an artifact of weekly variance (31).

References

- Myers JL, Well AD, Lorch Jr RF. Research design and statistical analysis. New York: Routledge; 2013.

Table S1 Call urgency by patient and providers, separated by hematology versus oncology patients with and without metastatic disease. Urgency was further separated by calls placed prior to COVID-19 pandemic and calls after the start of the pandemic (defined as starting March 18, 2020, when state lockdowns began in Rhode Island)

	Weekly trend	Pre COVID		Post COVID	
		Patient	Provider	Patient	Provider
Hematology	PE	3.47	-2.54	-0.75	0.57
	SE	0.75	0.67	1.10	0.98
	Z	4.60	-3.79	-0.68	0.58
	P	<0.0001	0.0001	0.4935	0.5587
Oncology	PE	0.45	-0.53	1.10	0.97
	SE	1.07	0.93	-0.35	0.00
	Z	0.42	-0.58	0.72	1.00
	P	0.6722	0.5649	0.4686	0.3186
Hematology, metastatic	PE	7.26	-2.57	-7.57	6.21
	SE	5.46	4.58	3.12	2.91
	Z	1.33	-0.56	-2.43	2.13
	P	0.1837	0.5744	0.0152	0.0332
Oncology, metastatic	PE	0.95	-0.97	0.84	-0.81
	SE	0.67	0.60	0.63	0.57
	Z	1.41	-1.61	1.32	-1.42
	P	0.1597	0.1066	0.1859	0.1542

Note: PE represents parameter estimate, the extent to which calls were perceived as greater or lower urgency over the weekend and on Wednesday, the observed weekly trend. A positive value indicates greater perceived urgency during these high sensitivity days, and a negative value indicates lower perceived urgency. SE represents standard error, the precision of the estimate under PE. “Z” is a ratio of the parameter estimate divided by the standard error, and “P” represents the probability on a normal distribution of obtaining results at least as extreme, assuming there was no actual association. Probability less than 0.05 was considered significant. Because the model included all main effects and interactions, the linear combination matrix was used to infer and test the strength of weekly trends for each combination of rater, time period, and patient health circumstance.