

Integrating behavioral economic “nudges” into the electronic health record to reduce preoperative testing for patients undergoing cataract surgery: a pilot study of pragmatic randomized trial



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Introduction

Robust randomized trial data have shown that routine preoperative (pre-op) testing for patients undergoing cataract surgery is inappropriate and does not change outcomes. (1,2) While guidelines have discouraged routine testing since 2002, rates of cataract pre-op testing have remained unchanged. (3-5) Recognizing that evidence alone will not lead to a reduction in the delivery of low-value care, research teams are examining the application of behavioral economics to encourage change. (6,7) Behavioral economics theory posits that humans have predictable cognitive biases that can be leveraged to reduce undesired behaviors. One application of behavioral economics is through pop-up alerts embedded within a health system’s electronic health record (EHR). Such alerts can activate at the point of care to influence ordering decisions among physicians to encourage the provision of value-based care.

Methods

- The pilot trial was conducted at UCLA Health between September 2020 to October 2020.
- The UCLA Health physicians who performed pre-op visits were randomized to one of the three nudge arms or usual care (Figure 1).
- The three nudge alerts focused on patient harm (Figure 2), increased out-of-pocket costs for patients (Figure 3), or psychological harm to the patients related to pre-op testing (Figure 4).
- The outcome for this study was the change in the percentage of patients undergoing pre-op testing.

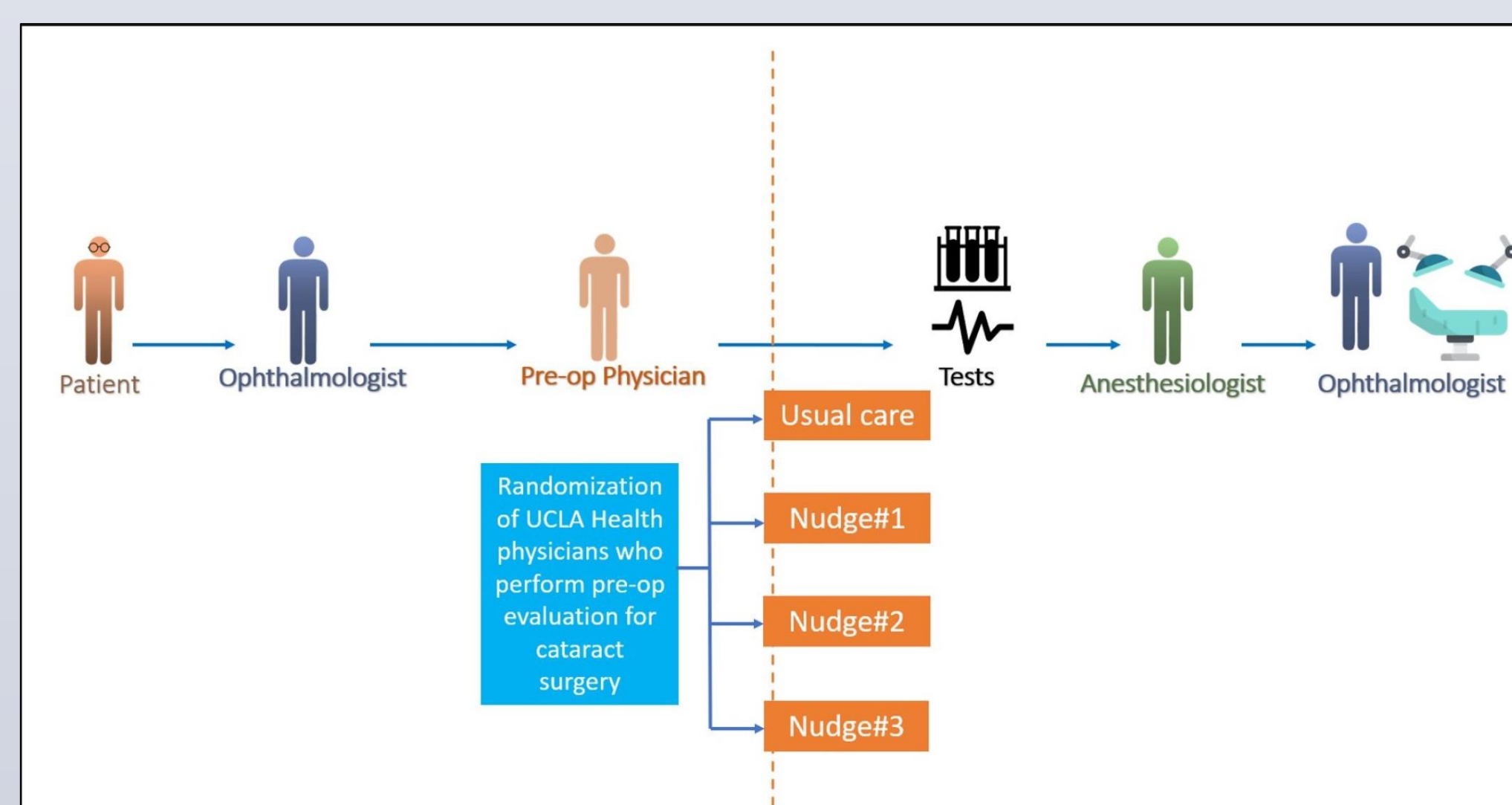


Figure 1: Randomization Strategy

Results

During the pilot study, we did not note any changes in the rates of ordering pre-op testing in the study arms (Figure 5). The most common stated reason by providers for bypassing the nudge and ordering pre-op testing was the belief it was required by the referring surgeon or anesthesiologist.

Figures

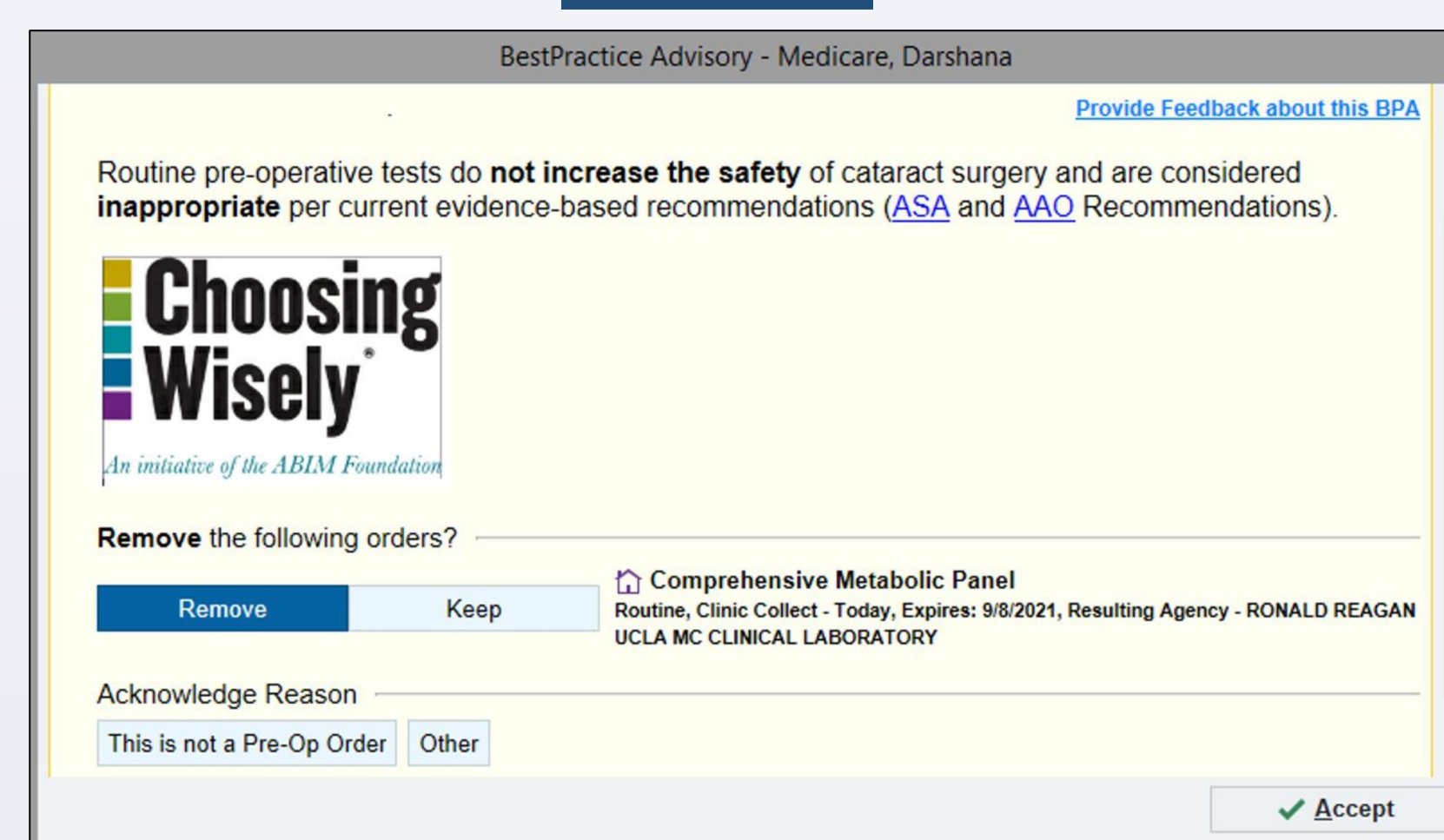


Figure 2: Nudge 1, highlighting safety and liability

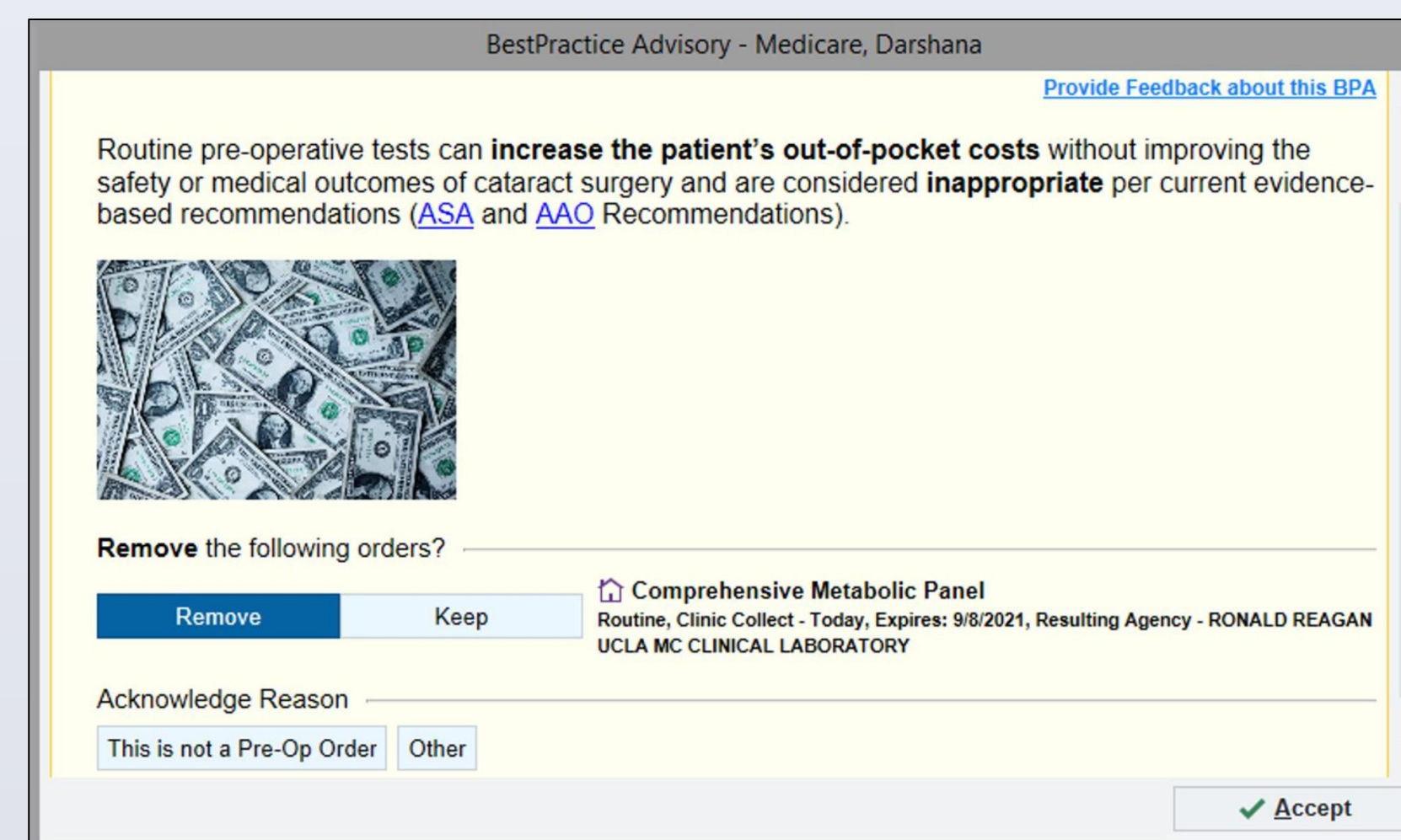


Figure 3: Nudge 2, highlighting financial cost to patients

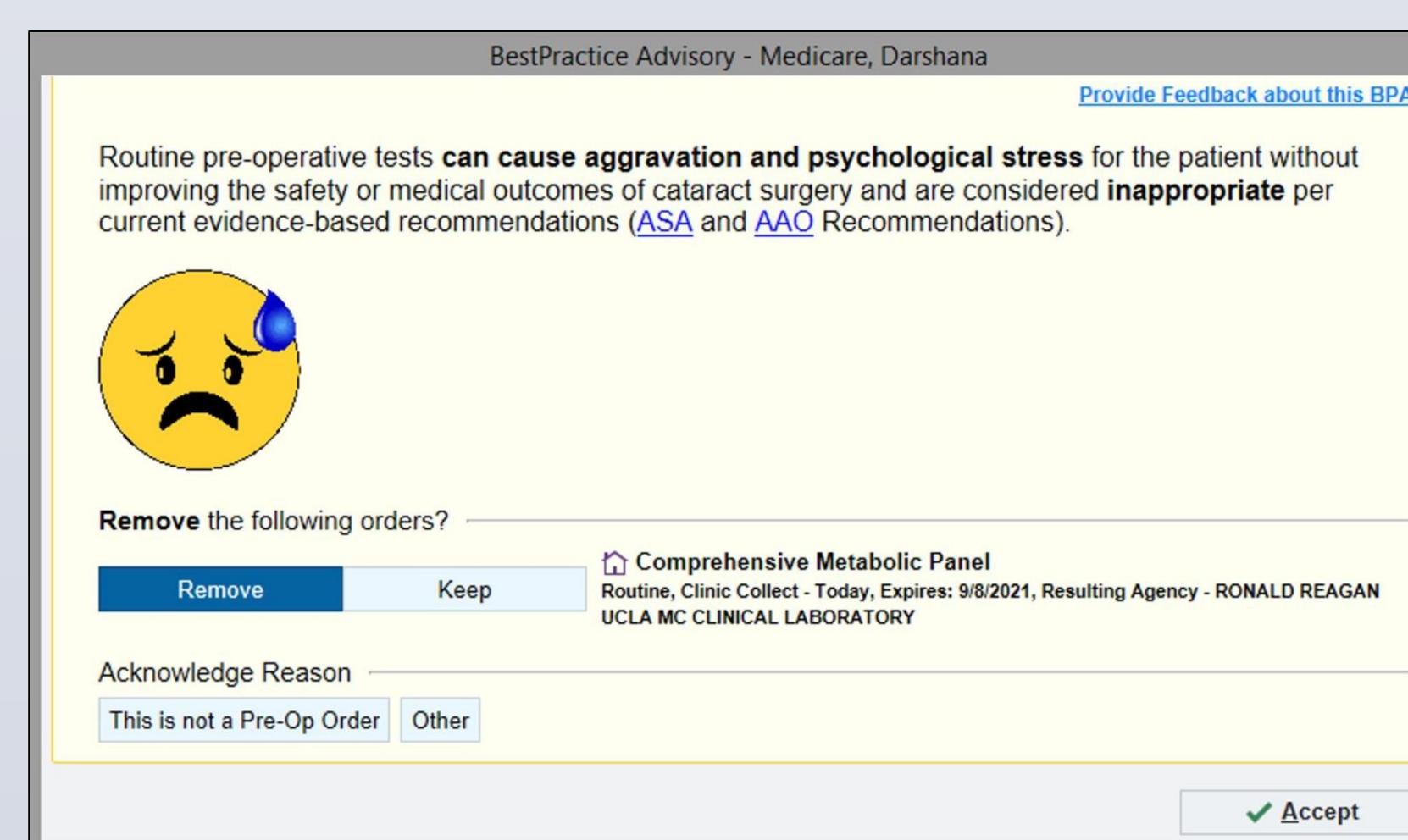


Figure 4: Nudge 3, highlighting the psychological harm

Pre-op visits	n	%
Control arm	13	18.84%
Visits with pre-op tests	11	84.61%
Study arms	56	81.16%
Visits with no tests	3	5.36%
Visits with less tests	7	12.50%
Visits with pre-op tests	46	82.14%

Figure 5: Percentage of pre-op visits in study vs. control

Conclusion

- Institutional culture is one of the main reasons that pre-op tests were ordered even after exposure to the nudge alert.
- There is a widespread belief that pre-op testing is required by other specialists.
- The ease of ignoring the nudge alerts with a single click may have reduced the strength of the intervention.
- We will modify the nudges to include explicit language about UCLA ophthalmologists and anesthesiologists advising against pre-op testing.
- We will modify the nudges so that if a physician decides to bypass the nudge alert, they would be required to explain the reason with a free text.

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References

1. Cavallini GM, Saccarola P, D'Amico R, Gasparin A, Campi L. Impact of preoperative testing on ophthalmologic and systemic outcomes in cataract surgery. *European journal of ophthalmology*. 2004;14(5):369-74.
2. Chen CL, Lin GA, Bardach NS, Clay TH, Boscardin WJ, Gelb AW, et al. Preoperative medical testing in Medicare patients undergoing cataract surgery. *New England Journal of Medicine*. 2015;372(16):1530-8.
3. American Academy of Ophthalmology. Routine Preoperative Laboratory Testing for Patients Scheduled for Cataract Surgery 2014 [Available from: <https://www.aao.org/clinical-statement/routine-preoperative-laboratory-testing-patients->
4. Apfelbaum J, Connis R, Nickinovich D, Pasternak L, Arens J, Caplan R, et al. Practice advisory for preanesthesia evaluation: an updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. *Anesthesiology*. 2012;116(3):522-38.
5. Keay L, Lindsley K, Tielsch J, Katz J, Schein O. Routine preoperative medical testing for cataract surgery. *Cochrane Database of Systematic Reviews*. 2019(1).
6. Nagtegaal R, Tummers L, Noordegraaf M, Bekkers V. Nudging healthcare professionals towards evidence-based medicine: A systematic scoping review. *Journal of Behavioral Public Administration*. 2019;2(2).
7. Wang SY, Groene O. The effectiveness of behavioral economics-informed interventions on physician behavioral change: A systematic literature review. *PLoS one*. 2020;15(6):e0234149.