

### Multimedia Appendix 5: Redesign proposals.

Redesign proposals for the Anesthesiology Control Tower were gathered from the Phase 1 think-aloud and debriefing sessions.

Table 1. Redesign proposals as related to usability problem categories and themes identified in the Phase 1 ACT clinician think-aloud and debriefing sessions.			
Category[1]	Theme	Number of participants reporting	Examples
Navigation	Suggestions for easier way to finding link or information	1	<i>“It would be better if there was a folder with direct hyperlinks rather than a [help] document.”</i> 2102, attending physician
	Any Navigation proposal	1	
Content	Improved meaning or relevance of alerts	7	<i>“[A] more useful alert would be the time period, if there was a high dose of vasopressor given recently rather than cumulatively. Like over the last 20 minutes or something.”</i> 2102, attending physician
	Enhanced prioritization of alerts	5	<i>“But I wish that there was a way that it could prioritize the different alerts so even if you have 10 rooms that have alerts that need to be interrogated, you know these are the top 3 that I need to focus on right now versus the other ones.”</i> 2111, resident physician
	Increased availability of relevant information	3	<i>“Otherwise I would like a legend that tells you everything about what the alert possibly means.”</i> 2105, resident physician
	Suggestions for identifying correct patient or operating room	1	<i>“Wouldn’t it be nice if, when I see the window, the ACTFAST case review, it had the patient’s name right there so I could be sure I was addressing the correct patient?”</i> 2112, resident physician
	Any content proposal	10	
Functionality	Improved interoperability of software programs	4	<i>“Maybe it would be nice if you click on an OR in Alert Watch it would automatically open in [the anesthesia information management system] and [the electronic health record], but I feel like that’s too much to ask for.”</i> 2115, attending physician

	Any Functionality proposal	4	
Layout	Increased visibility of text	3	<i>"[It] would be useful if this could be seen, the whole case [name] somehow."</i> 2102, attending physician
	Improved physical layout (monitors)	1	<i>"I think it would be more efficient if the attending had another screen and then this screen was a separate computer that anyone could pull up – that way if the resident wanted to show me something I could still be doing my work and he could pull up the alert watch on that screen and show everybody."</i> 2102, attending physician
	Any Layout proposal	4	

#### References

1. Zhao T, McDonald S, Edwards HM. The impact of two different think-aloud instructions in a usability test: a case of just following orders? Behaviour & Information Technology. 2014;33(2):163-83. PubMed PMID: 10.1080/0144929X.2012.708786.