

Appendix 2. Summary of TDF domains that are likely to inform whether clinicians would participate in OR Black Box® research

TDF Domain	Specific beliefs	Representative quotations	Frequency out of 17
Knowledge	I am familiar with the concept of the OR Black Box®/how it would work. <i>Enabler</i>	“Well, I think that if there’s an emergency situation or a situation where something goes awry in a case, you can look back at it and see what the contributing factors were to it, and close those holes if there are holes. And you know, if there’s issues with like stocking or whatever, maybe you could follow that up. And I don’t think it’s judgmental in that sense. Like I don’t think you’re looking ‘oh, you did this or you did that’. That’s not the relevant... it’s did it contribute to the issue. That’s what I think.” - Nurse	7
		“Well, from my understanding, you know, the black box incorporates a number of different data sources. So it takes vital signs data, you know, from the monitor. It takes... and then it combines that with biometric data from clinicians, from OR instrument data sources, video feeds and that kind of stuff... So there’s a... it basically acts as a big data sink to collect, you know, a large amount of data on processes and physiologic changes and that kind of stuff in the operating room. Maybe I’m wrong, but that’s my general understanding of it.” – Anesthesiologist	4
	I am not familiar with the concept of the OR Black Box®/how it would work. <i>Barrier</i>	“And then somebody’s going to be in the back now filming us and okay now we got to make sure that this is looking good in the camera too. Now, this may not be accurate but that’s what I’m thinking.” – Anesthesiologist	1
		“In the operating room we’re not dying and so it’s not like after the case you wonder what happened. It... because the surgeons, the anesthesiologists, the staff, are all around still. So I’m not sure of the role.” - Surgeon	4

		<p>“Who’s being recorded or what information is being collected. Like is it just voice recording of... and if so, where’s the microphone? Is it anesthesia, their conversations? Is it just the surgeons? Is it the whole operating room?” - Surgeon</p>	2
		<p>“Because I would say, you know, the processes that we use to check everything and to make sure that everything is going to be working fine for a case are nowhere near what aviation is doing. And I’m not sure about the parallels between the, you know, the cockpit and the surgical team if it really applies in all instances. But certainly there’s probably good, you know, good things that can be transposed from the aviation to surgery. I don’t know if you can just take the model and just put it on the surgery and hope for it to work.” - Surgeon</p>	1
		<p>“One thing that does concern me is who is the gate keeper of this information? Who has access to it and who doesn’t? Would this be used in any way to grade your... how would that affect your position, your job security? And also, the other thing that you think about is the... if something like this starts, is this going to be a MyChart thing where patients are going to then be able to access their own OR recordings and see it? And then what does that do for the patient/physician relationship?” - Surgeon</p>	5
		<p>“Let’s say microphone pick-ups aren’t working or something like that. There may be interruptions during the day from some of the technical team. I don’t know.” – Anesthesiologist</p>	3
		<p>“Well, it would only take one person on the team to say, “I’m not comfortable with this and I don’t want to do it,” and then how do you reconcile that? Do you just say, “Okay, well you can’t be here”, or you need to get somebody else that is? So, I don’t know how that process works because you would need to have... would you need to have individual consent from all participants in the OR that particular day? And if one person who is assigned to your room says no, or the trainee that you’re working with says, “I don’t want to,” then how do</p>	1

		you deal with that? So, I don't know... And how do you consent patient for this type of thing?" - Surgeon	
Optimism	I believe more people will support the OR Black Box® over time. <i>Enabler</i>	"I hope as people learn more about the project... the goals of the black box and just the overall positive things that can come out of it, that people will eventually come on board. That's my sense is that those who are on the fence will soon come off the fence when they see or can understand things a little bit better." - Nurse	6
	The OR Black Box® represents an important opportunity to advance patient care. <i>Enabler</i>	"I think it has the potential to be a game changer in terms of perioperative patient safety." – Anesthesiologist	2
	The OR Black Box® does not represent an important opportunity to advance patient care. <i>Barrier</i>	"... the black box isn't in very many places yet. So being the first in our area to actually take that on board in their hospital as a safety initiative, as a learning opportunity. I just think that's an opportunity to kind of put us on the map a little bit." - Nurse	6
		"I personally doubt that it will lead to such tremendous findings that all of sudden we find an OR black box in every operating room... I guess my expectations aren't that we're going to have a black box in every operating room any time soon, like they do in the airline industry." – Anesthesiologist	5
	Using the OR Black Box® to record surgeries implies a lack of trust in staff. <i>Barrier</i>	"I guess my question would be if something... if there was... I guess the purpose of the black box would be to try to figure out what happened when there was an accident, if there was... not accident, that isn't the right word in health care, adverse event or complication or something. But I... I guess I'm going to... why do you need a recording, why can't you just ask the people who were there? It's implied then that the answers of the people who were there wouldn't be trusted." - Surgeon	1
Beliefs about consequences	The OR Black Box® will positively impact clinical practice. <i>Enabler</i>	"I guess if a recorded surgery went particularly well, then there may be opportunities to kind of learn through positive deviancy analysis and then... and see like what are the things in these surgeries that go well, that went particularly well or maybe, you know, you work with certain specialties and nurses and surgeons where you have good team dynamics and there's	8

		<p>opportunity to learn about what that, you know, what characteristics that good team dynamic has.” – Anesthesiologist</p> <p>“Yeah, I think that, I think that there’s a potential that it would help to identify systematic errors or maybe some human errors that could be rectified or changed. Maybe it could also help us to ‘trim the fat’ a little bit in the OR, all these things that we do, do they make difference or not? Do they actually have an effect? Seems like every week there’s some new thing that we’re doing in the OR that supposed to improve care or not and maybe this would help us to understand that better.” - Surgeon</p> <p>I: Okay. Do you foresee the OR black box having an impact on your own skills?</p> <p>R: I hope so.</p> <p>I: Could you elaborate a little bit?</p> <p>R: Sure. I’ve never been coached.</p> <p>I: In surgery?</p> <p>R: Yeah, in an operating room, since the day I left residency in 1994.</p> <p>-Anesthesiologist</p> <p>“I will do exactly as I do and let it record what it wants to do and then point out my errors or my... or my good things. And I will look at both and improve on the good things to make it excellent and bad things to make sure that I eliminate it.” – Surgeon</p>	<p>6</p> <p>1</p> <p>5</p>
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	<p>The OR Black Box® will negatively impact clinical practice. <i>Barrier</i></p>	<p>“It could increase pressure unnecessarily...” – Surgeon</p> <p>“Well you know, the number one, well, I wouldn’t say the number one thing, but as well as being efficient and getting cases started, it’s nice to have an end to the day, and by that, I mean not running late all the time. So, if there’s going to be, say the... we have a chronic problem in certain services with over booking and so instead of finishing on time, we finish late and I would be concerned that if the black box thing is going to be added as an additional thing, “Oh wait it’s not working properly, stop everything, fix the black box and we’ll...”, you know? Then we’ll start the case with the black box is finished, so all of a sudden, whoa, there’s 30 minutes in the middle of the day lost and I’m not really interested in staying late every time I’m booked on a black box study, so there’s going to have to be some kind of... either less cases scheduled in those rooms or some kind of way to deal with the overruns.” – Anesthesiologist</p>	<p>3</p> <p>3</p>
	<p>The OR Black Box® could be used punitively/have medico-legal consequences. <i>Barrier</i></p>	<p>“The other side of it could be, you know, restricting of privileges, having to retrain, firing, punitive or people maybe would worry about their reputation if that was exposed or, who knows. So you have like opposite ends.” - Surgeon</p> <p>“...patients may want to view their videos and see who’s operating on them, residents or students or staff and I feel like that could lead to medicolegal problems.” - Surgeon</p> <p>“If it went bad and the information could be accessible. But I think that in a lot of cases, that’s... that could be a good and a bad thing because it could show that everything went, you know, we tried to do everything right during the surgery. It’s all recorded and it was a bad outcome. And then there’s really nothing you can do to prevent it.” – Surgeon</p>	<p>4</p> <p>4</p> <p>1</p>

	The OR Black Box® may initially create a Hawthorne effect. <i>Barrier</i>	“I imagine the first day or two most people will be very stilted and circumscribed in terms of how they flow and comment and there will be jokes about the black box, I’m sure, in the first day, that everybody will try to sort of massage and so on. So it will modify behaviour a little bit in the first instance.” – Anesthesiologist	2
	<p>The OR Black Box® will positively change the OR environment. <i>Enabler</i></p> <p>The OR Black Box® will negatively change the OR environment. <i>Barrier</i></p>	<p>“And I’ve been exposed to surgeons that have interesting personalities and I think this might cut off a little bit of that professionalism issue. If they know there’s a black box, they behave better.” - Nurse</p> <p>“Yeah, I just feel it would change the dynamic. It would make you feel like you can’t say anything off the record, you know, if somebody’s listening, you know, instead of... like in the operating room generally it’s a fairly... I wouldn’t... relaxed maybe isn’t the right word because there’s times when it’s not relaxed, you know, that you’re really having to concentrate and it’s quite serious and focused, but other times it’s... it is more relaxed and it just depends on what part you’re in... what part of the case you’re in and I feel like if you’re being recorded the whole time, you would feel like you can’t chat or make jokes or all those things that we do when it’s a tedious part of the operation, because a lot of it is routine and it’s our day-to-day work. So someone on the outside might say, “Oh, I can’t believe that you’re joking in the OR.” Well, you know, there’s a lot of parts of that person’s job where they probably are joking too because it’s just sort of a routine kind of part of the day.”</p> <p>- Surgeon</p> <p>“Well, I don’t think that anybody would really like to have a video camera on them 24 hours a day you know or, like I don’t think anyone likes to work under a video camera. So, I think that, that can be a negative you know. It makes people second guess maybe everything that they say and everything that they do, it makes for a much less relaxed atmosphere in what is an already a very high-pressure environment. So, I think that the black box could make a very high-pressure environment even higher, and that could be negative you know. If you have surgeons that are all of a sudden concerned about how they are behaving because</p>	<p>2</p> <p>4</p> <p>2</p>

		someone is watching them, then they may behave differently. Again, that could be positive or negative.” – Surgeon	
	If the OR Black Box [®] was not implemented, it would impede progress. <i>Enabler</i>	“Well if things continue the same way you’ll get the same results.” – Anesthesiologist	4
Intentions	I would participate in OR Black Box [®] research. <i>Enabler</i>	“Motivated, super motivated...I’m up there. I’m engaged.” - Nurse	12
	I would am unsure about participating in OR Black Box [®] research. <i>Barrier</i>	“I’m probably right now bang in the middle... mainly because I’m not a hundred percent sure what the research goal would be...” – Surgeon	4
	I would not participate in OR Black Box [®] research. <i>Barrier</i>	I: Do you expect you would participate in the research? R: No. - Surgeon	1
Memory, attention and decision processes	The decision to participate in OR Black Box [®] research would be easy. <i>Enabler</i>	“I mean as long... if it just involves me signing a consent form and showing up in the operating room and doing my job anyways, no, that’s pretty easy. And again, you know, the fact that I think it’s important.” – Anesthesiologist	9
	I need to take time to think about my participation. <i>Barrier</i>	“It’s not something I’d say yes to right off the bat, I’d need to see more details about how it was organized. But the concept is good, I think I would be interested, but I need to see more detail.” – Surgeon	5
Environmental context and resources	The resources required by the OR Black Box [®] affects whether or not I would participate. <i>Barrier</i>	“If it meant I had to spend 15-20 minutes which I already don’t have, taking to them [patients] about a study... that would be a barrier.” – Surgeon	4

		“OR time is super expensive and we’re always under the lens of doing things efficiently, cost-effective, and do more in this set time frame. So when another research project comes, often the first question is what’s the impact? What’s the ask?... Is it an extra step?” - Nurse	3
	The alignment of the OR Black Box® with our hospital’s values affects whether or not I would participate. <i>Enabler</i>	“You know, we’re supposed to be a learning organization, we’re supposed to be a teaching organization and that refers not only to our trainees but to ourselves, so I think this kind of work is aligned with what we do.” – Anesthesiologist	3
	Nothing related to my personal circumstances/ the hospital environment would affect my decision to participate. <i>Barrier</i>	“No not really, I can’t think of anything off the top of my head that would affect me.” – Anesthesiologist	7
Social influences	My decision to participate would be influenced by colleagues. <i>Enabler and barrier</i>	“But usually [colleague name] is very thoughtful, and I don’t think that he would be embarking on ideas that were frivolous... things that had already been shown to be of limited value, so I think that I trust that since he’s involved... I trust that it would be a worthwhile enterprise.” – Anesthesiologist	5
		“Everybody has to be willing, otherwise... I would say it’s a no go personally.” – Surgeon	4
	My decision to participate would not be influenced by colleagues. <i>Enabler and barrier</i>	“I work in a team, yes, but my decision is not really influenced by other people because I know what I need to do at all times. I have to be in control of what I’m doing. I can’t be wishy washy on anything.” – Surgeon	6
		“No, no I’ve seen with PSLS [patient safety learning system] that no matter how much you try to convince people that something’s a good thing, if people don’t believe in it, they won’t do it. I’ve made up my mind from that point of view that I report, and it doesn’t really affect me that most other people don’t.” – Anesthesiologist	2
	The specific team I work with in the OR affects whether I would	“Depends on your team. I would say that with my team, absolutely... I don’t feel judged and I feel like they’re there to help me.” – Surgeon	2

	participate. <i>Enabler and Barrier</i>		
Emotion	I have positive feelings regarding the OR Black Box [®] . <i>Enabler</i>	“I’m happy because if I can be one who could help affect good behaviour and safety, then yes... I was excited about it.” – Surgeon	3
	I have mixed feelings regarding the OR Black Box [®] . <i>Barrier</i>	“It’s a mixed reaction because surgery can sometimes be stressful already, and to feel that your every single move is being recorded is... it’s a little bit daunting and it sort of adds another layer of pressure on you when you’re trying to focus on the task at hand. But, when you think about the good of the field and the best outcome for the patient, I think it’s a generally good idea. So on a personal level it kind of adds a little bit of pressure and it maybe has that kind of creepy big brother feel to it...” - Surgeon	1
	I have negative feelings regarding the OR Black Box [®] . <i>Barrier</i>	“I’m worried about the use of the data and the change in the dynamic in the communication in the OR.” – Surgeon	2
		“It’s scary to think that the hospital could be using that because I would be worried about repercussions of how that information would be used.” – Surgeon	5
	I do not have concerns about the OR Black Box [®] . <i>Enabler</i>	I: Do you have any worries or concerns about the OR Black Box [®] ? R: No. - Nurse “I don’t really love the idea of somebody videotaping my every moment in the operating room. At the same time, that doesn’t particularly concern me.” – Anesthesiologist “If it didn’t go well, really in a bad way and there was some concern of patient happiness or, you know, complaints to the College and the extreme lawsuits, would I be real happy that	6 1 3

	<p>I have concerns about the OR Black Box®. <i>Barrier</i></p>	<p>somebody else had additional information that they didn't have to have? No I probably wouldn't be..." – Surgeon</p> <p>"As a clinician researcher with a lot of administrative responsibilities, I'm constantly trying to figure out how to get as much more done in my day as I can. Which means checking email, maybe reading something for the meeting coming up while I'm in the operating room... I recognize that it probably looks bad to others. It doesn't feel good to me but it's the position I find myself in... Having the black box in the corner will make me acutely aware of [this] for the first few times, I'm not sure how I'm going to resolve that personally... but it's something that passed through my mind when we talk about barriers or concerns." – Anesthesiologist</p> <p>"If I was told tomorrow that there's going to be a black box in my room, in my operating room forever more, I think I would have genuine concerns and I think a lot of surgeons and anesthesiologists and nurses would." – Surgeon</p>	<p>1</p> <p>2</p>
	<p>I feel comfortable with the OR Black Box®. <i>Enabler</i></p> <p>I feel threatened by the OR Black Box®. <i>Barrier</i></p>	<p>"I feel quite comfortable with the rigor of the processes surrounding the protection of the individuals who participate." – Anesthesiologist</p> <p>"It wouldn't make me feel anxious to know that it's there. Like... I've heard grumblings of people saying, 'Well, then I won't be able to talk about my weekend,' whatever, and I'm like it's not going to change how I interact with people." – Surgeon</p> <p>"You don't want to have somebody who doesn't understand what you're doing, telling you that you're doing it wrong... I don't know. Maybe that's just more of the paranoid side." – Surgeon</p>	<p>1</p> <p>1</p> <p>2</p> <p>1</p>

		“Well, of course it’s [the OR Black Box [®]] just one more thing to get used to, change is always a little threatening.” – Anesthesiologist	
Behavioural regulation	I would need more information about the OR Black Box [®] in order to participate. <i>Enabler</i>	“I would like to see, you know, like what the purpose, what the objectives are and how they’re planning to, you know, what exactly it entails for the surgeon...” – Surgeon	6
	The impact of the OR Black Box [®] on my clinical practice will affect my decision to participate. <i>Barrier</i>	“As long as it kind of fit into the current OR environment without really impacting, you know, how I provide care every day, or at least without negatively impeding my ability to do my job.” – Anesthesiologist	2