**Web addendum 1**

List of observation categories and codes including examples from this simulator study and from a field study in cardiac anesthesia (14)

<table>
<thead>
<tr>
<th>Category label</th>
<th>Observation categories</th>
<th>Codes</th>
<th>Examples*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>Process information</td>
<td>Information</td>
<td>‘Is the heparin in?’</td>
</tr>
<tr>
<td></td>
<td>information request</td>
<td></td>
<td>‘Do your hear breath sounds?’</td>
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<tr>
<td></td>
<td>transfer</td>
<td></td>
<td>‘Are you guys still having problems with your camera?’</td>
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<td></td>
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<td></td>
<td>‘What do we have in the room in terms of fancy airway stuff?’</td>
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<tr>
<td>Giving</td>
<td></td>
<td></td>
<td>‘I am just about to give heparin.’</td>
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<tr>
<td></td>
<td>information after request</td>
<td></td>
<td>‘Yes, breath sounds are equal.’</td>
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<tr>
<td>Providing</td>
<td></td>
<td></td>
<td>‘Just to let you know, this patient might have a severe reaction to the anaesthetic that is potentially lethal.’</td>
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<tr>
<td></td>
<td>information without request</td>
<td></td>
<td>‘I have turned the nitroglycerin off.’</td>
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<tr>
<td></td>
<td>(e.g. giving an update)</td>
<td></td>
<td>‘They are pretty much done with the LIMA take down.’</td>
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</table>
Situation assessment Review Process

“We did shoot an ACT and everything. I’d say you guys are good to go.’

“We are cooling the patient. We have given more anaesthesia. BP is coming down. What else?’

General situation assessment ‘Sats are 87 now; it looks like things are getting better.’

“This is not surprising. This guy is struggling.’

“There you go, he likes the volume.’

“I can’t get a good view here. He’s got a ton of calcium on his valve.’

“This stuff does not seem to be hitting him as fast as I’d like.’

Team member Request team member information information

‘Are you familiar with this equipment?’

‘Have you done any of these off-pump cases before?’
Give team member information

‘I haven’t done this for a while but I think I can do it.’

‘This day has only started and my patience has already run thin.’

Decision making

Discuss options

‘I am not sure if we can give the Dantrolene if we are not sure that this is MH. What do you think?’

Question a decision

‘Do you really want me to stop surgery?’

‘I don’t think that we should treat her with betablocker at this point in time.’

(Re-) Evaluate a decision

‘I think this was the right thing to do.’

Make / State a decision

‘Let’s forget about this; we have to go to the subclavian.’

‘This patient needs to go to the ICU for observation.’

‘We need to get the crashcart into the room.’
Feedback Acknowledgement ‘Ok.’

‘I didn’t think of that. Thank you.

Good.’

<table>
<thead>
<tr>
<th>Task</th>
<th>Planning</th>
<th>Planning (general)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>‘I will try one more time. If this is not gonna work we are gonna try the subclavian.’</td>
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<tr>
<td></td>
<td>‘If they need it we will slow him down a little bit with esmolol. Let’s get ready in case we need it.’</td>
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<tr>
<td></td>
<td>‘So, how do you want to do this now that you have seen the echo?’</td>
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<tr>
<td>Prioritization</td>
<td>‘I want to change machines and if it takes too long ask them for an O2-tank and I will use an ambubag.’</td>
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<tr>
<td></td>
<td>‘Getting the Dantrolene in is our first priority.’</td>
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</table>
Sequencing

‘Hang on a second, before you go we should get the heating pads on.’

‘Before you get your lines going we need to check out our Aline.’

‘Wait till they have fixed this (bleeding) before you shoot a cardiac output.’

Task Distribution

‘Why don’t you keep working on this while I have a look at the resume to see if there is anything else we need to do.’

‘So if she is gonna put in a foley, what do you want me to do?’

‘Do you mind if I go ahead and put in the PA?’

‘I’ll get it.’

Delegation

‘When you get a chance, get me another vial of epi?’

‘Why don’t you go ahead and squeeze that bag for me.’
Order  
‘Table up. Head down. Tidal volume down.’
‘Start ventilating.’
‘Get the MH cart.’
‘I need you to stop this procedure now.’

Clarification  
‘Do you want ME to do this?’
‘So you are starting the A-line?’

Initiate an action  
‘Let’s take a look at the echo.’
‘Let’s step back and summarize what we have here.’

Assistance  
Verbal request for assistance  
‘Could you turn the oxygen on, please.’
‘I don’t see any needles in here...’

Non-verbal request for assistance  
e.g. looking for equipment

Offering (verbally)  
‘Do you want me to hold this?’
‘What are you looking for?’
‘Let me move this closer for you.’
Offering (non-verbally)  e.g. handing something, closing the gown for someone

| Metacoordination | Defining coordination cues | ‘I will tell you everything as we go along and I’d like you to tell me so that we always know how we are doing.’ |
| Metacoordination | | ‘Let me know when you are ready to intubate and I will come and assist you.’ |

| Coordination via the work environment | Coordination via artifacts (e.g. TEE, monitor, infusion pump, patient chart) | One crew member operates the TEE probe while the other adjusts the settings. |
| Coordination via the work environment | One crew member notices that the other one has not been charting while he/she had left for lunch break and begins catch up on the anaesthesia record. |

| Coordination by listening to communication of others | Surgeon to perfusionist: ‘You can warm up the patient.’ |
Coordination by monitoring other crew member
One crew member observes the other trying to place an IV line.

Coordination by monitoring surgical team
Anaesthesia crew member observing the surgical procedure.

Teaching
‘I prefer to use volatile anaesthetics to reduce the blood pressure in patients with aortic stenosis because they are less likely to produce an excessive and sudden drop of blood pressure than are intravenous vasodilators.’

Other communication
Coordination of the overall work process
‘I doubt that we will be able to do both cases at the same time. We might have to bump one to another day.’

Non-coordination related i.e. chatting

Non-codable i.e. all utterances not codable using the above categories

Composition of Anaesthesia
anaesthesia crew  
attending absent

Anaesthesia

resident absent

* We tried to give non-ambiguous examples for each observation category. However, depending on the context the reader imagines a statement might fall into different categories.