

Interview transcripts were also analysed thematically with a focus on describing the causes of the observed errors using the Yorkshire contributory factors framework^[1]. Participants described multiple potential causes of each error, which related to active failures, latent factors and situational factors.

Active failures

Participants described a number of active failures, especially calculation errors where both slips and mistakes were described:

“...I just got the volume to be infused and the rate just switched the wrong way round.” (IV0)

“...I went totally off-piste with that then, because I diluted it, 20...because I diluted 40, 40 to 1, where did I, hang on... I think I have just taken off the 4 mls to make it 360...but now I can't see how I have made it up to 20 mls because it is...[Interviewer: What were you trying to make?] Well just the 360 from 400 and I have just taken away the 4 mls but I don't, obviously it is not 20 mls the 400 of the medication. I don't even know where I have got that from now. Yeah totally off-piste with that one.” (NW3)

In addition, slips whilst programming infusion pumps were also described:

“...the volume is 100 ml, whoops I just panicked, yes I put the 360, 360 from the drug chart...” (FY7)

Finally, failing to act on relevant information which had been successfully located was also discussed:

“Yes I refer dilution, but I didn't notice the what's it called, the weight I didn't.” (RU0)

Situational factors

Participants described a large range of situational factors which may have contributed to errors, specifically individual factors, task factors and team factors. Many of these related to the effects of taking part in observational research.

Some participants described feeling nervous, anxious or under pressure as a result of being observed and timed whilst giving an unfamiliar drug:

“I was feeling a little bit anxious, I think it was just because when you are put on the spot you feel a bit anxious.” (PU6)

However other participants reported that this was not a problem for them:

"I normally feel pressure with someone watching me but I didn't feel pressure this time." (AU7)

Other individual factors described by participants included lack of day-to-day experience with the required calculations:

"We're very used to having an amount put in front of us, especially in intensive care we've got our own dilution guides and it says put me in 50ml, put me in 100ml, depending on the gram or milligrams so I think just having to be faced with having to work it out it made me sort of go 'oh hang on a minute I don't do this very often' and if you don't do something very often then you haven't always had the skill to hand straight away." (VW3)

Participants also described basing decisions on incorrect assumptions about the medicine:

"I just presumed because it was a lower side of the dose the one hour would be suitable, as opposed to if you were giving a bigger dose of it you would want to slow it down" (NW3)

A task characteristic commonly described as a possible cause of errors was the absence of a double check by a second nurse and not being able to discuss queries about the medicine with a colleague:

"...it was...the matter of double checking with a nurse that I didn't have it here, that really makes a difference" (NW8)

Other participants thought that participation in a simulation may have contributed to the error:

"...it was the fact that I knew it was not a really patient, it was not a real situation that really upsets my mind. I don't know why because I kept saying to myself 'OK just pretend that you have a real patient' but obviously it is not the case." (NW8)

Participants were aware that the simulation was being timed, which some people thought led to them rushing and thus making a mistake:

"But also maybe trying to be speedy, try and be as quick as I can because I was aware there was a time thing on it." (DL5)

The final task characteristic described by participants was the administration of an unfamiliar and complex medicine:

"A little bit anxious because it was a drug that I didn't know or isn't something that I'm familiar with." (DL5)

One team factor was discussed during the interviews, which was being interrupted by colleagues:

"I was called away to check another drug." (PU6)

Latent or organisational factors

The major latent factor identified by participants was policy and procedure, specifically related to the IMG guide. Many participants described difficulty locating the information they needed:

"I didn't see that one so I thought like it is straightforward and I think I missed that bit" (CI8)

One participant suggested that it would have been easier to locate information on a hardcopy of the guide rather than on a screen:

"I think it was because normally you have paper, normally get a paper copy so you can read down the whole of the page and obviously not seen it on a laptop screen... You have just got the whole thing in front of you and you read all the way down. I mean stupidly I didn't take it all the way down, I think if it is in front of you, it's in front of you isn't it?" (PU6)

Other participants described finding the information they needed, but then misunderstanding it:

"...I didn't find that very clear, I was first confused about the dilutant and then afterwards yeah I basically didn't think it was very clear to see that I needed to dilute it further." (MG4)

Finally, participants highlighted contradictory information in the IMG guide:

"...I think because it says on here 'dilute and give over 1-3 hours' it's misleading, so I put it up at 1 hour without doing the maths it looks like you can give it over an hour, so I suppose if you are in a rush, you were in resus situation and doctors are yelling down your neck to get it in and quickly you would read the 'dilute and give over 1-3 hours' and you would automatically presume that over 1 hour is appropriate to give." (AU7)

The other latent factor identified by participants was the physical environment being busy:

“...we’re in a busy environment and often people want to check about patients and surrounding area and stuff like that so yeah there is always interruptions.”
(VW3)

References

1. Lawton R, McEachan RR, Giles SJ, Sirriyeh R, Watt IS, Wright J. Development of an evidence-based framework of factors contributing to patient safety incidents in hospital settings: a systematic review. *BMJ Quality and Safety* 2012;21:369-380.