

### A: APPLICATION OF KNOWLEDGE AND UNDERSTANDING

<p><b>A1: Apply knowledge of underlying concepts and principles associated with area of work.</b></p> <p><i>What we are looking for here is an example of how you apply your knowledge in your day to day work.</i></p>	<p>As the Simulation Technician at [REDACTED] Hospital, my role involves understanding and application of the principles of human factors and Simulation Based Education. We frequently carry out in-situ birth and Post-Partum Haemorrhage (PPH) scenarios in order to improve in-hospital critical patient outcomes. Particularly my role in this frequent scenario is ensuring the CAE Lucina manikin is setup for the simulation scenario. In preparation I have prepared damp blood sheets placed between the legs of the manikin for the authenticity of a PPH by applying a dilution of stage blood onto conti-sheets, ensured delivery forceps are on standby in the simulation room, and the manikin and associated monitoring and recording equipment ready are charged and primed with the appropriate physiological parameters and status to match a patient in this situation. In order to increase reliability of the scenario, the baby foetus is loaded within the manikin in a position for manual delivery via birthing forceps which is trialled prior to the scenario beginning; additionally all monitoring and recording and manikin equipment is charged and tested. These steps are so I can ensure that the scenario is realistic and medically accurate which is absolutely essential. I additionally set up a speaker behind the manikin for the voice output of a facilitator using a radio microphone, and I brief them on the way the patient would act in this scenario i.e. strained and making pushing sounds and screaming, further delivering depth and urgency to the scenario, increasing realism. During the simulation I will alter the parameters of the manikin to match the interventions of the simulation attendees. For the purpose of debriefing candidates I additionally set up a CAE Learning Space portable recording station with 2 portable cameras to record the scenario from multiple angles, for during the scenario I assist in inputting live data on the recording for multiple variables so this information can be fed back to the candidates by the debrief trained</p>
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	<p>Simulation staff. The outcomes of my role in this simulation are: increased fidelity, reassured reliability and flow of the simulation, these lead to improved attendee confidence for future simulations - as some staff suffer from a stigma against being put in a simulation scenario, a part of the aim apart from improving is to make the attendees more comfortable with the simulation environment and improve their competency through a dry run of the stressful scenario of a post-partum haemorrhage.</p>
<p><b>A2: Review and select appropriate scientific techniques, procedures and methods to undertake tasks.</b></p> <p><i>This means that you can explain the underlying reasons for undertaking tasks and why a particular procedure, technique, or process is appropriate.</i></p>	<p>In a day of simulation teaching sessions for our medical students the aim is to provide a platform for introspection and collaborative retrospection. On one of the training courses we provide for them there are two sessions circulated for the whole day for multiple groups of students. These need to be consistent, reliable, and repeatable. Specifically we have simulation sessions for 5th Year Medical Students that consist of a simulation of an upper and low gastrointestinal bleed, and a second simulation of an asthmatic patient. It is my duty to set up the manikins' physiological parameters matching a checklist of starting parameters, these include heart rate, oxygen saturation, blood pressure, level of cyanosis, lung and breathing noises, all parameters that are observed by the medical students to ascertain the level of care and intervention the 'patient' manikin requires. The video and audio monitoring will be setup so that phone calls, video and audio inside the facilitating room can be observed by the educators/debriefers voice actor and manikin controller outside of the room using a specific software and hardware setup with volume setup so that all attendee interactions can be monitored, to provide a more accurate reaction to them via the manikin physiological parameter controls, the voice acting and also for improving accuracy of the debrief by being able to observe as much as possible. The manikin would be physically setup appropriately prior to each scenario by myself, matching the pre-written specification, i.e. pre-soaked bloody sheets would be present and concealed beneath the manikin's groin region and a vomit bowl is filled to 700mL of a dilution of stage blood and put aside and out of sight for the facilitator</p>

inside the room to employ when the 'patient' is about to be sick. The students are re-introduced to the Simulation facilities and capacity for interaction with the manikin, room equipment and facilitators so they may be familiar with the equipment and produce a fairness and reduction of bias for the simulation. For this to come together as a scientific procedure there are a lot of medical facts and factors that need to be observed, followed and set up as I have illustrated, fairly, reducing bias and in a controlled environment in which the dependent variables of the students will be guided by the independent variables of a controlled setup, an acting script, a guidelines for me as a facilitator or manikin controller. For example during the upper and lower GI bleed scenario, as the patient undergoes planned deterioration they will vomit at which point the facilitator, which could be me would fetch the vomit bowl filled with 'blood' and say they have vomited 700mL of blood, and simultaneously point out a horrible smell coming from the patient, at which point the medical students who are examining the patient will uncover the patient's lower end to find soaked bloody sheets. When they move to weight the sheets I will state there is at least 1 litre of blood difference between unsoaked and soaked sheets, at which point this will set off a chain of events, calls to the surgical unit and a call requesting major haemorrhage guidelines. These events may be derailed but as a facilitator and educator I am also obligated to point them to the guidelines for this bleed. Similarly for the asthmatic patient the manikin will be wheezing, they will be blue and cyanosed, the voice actor matching the voice of the patient condition providing information verbally as well as physiologically, with me inside the room as a facilitator or controlling the manikin's parameters appropriately as prior mentioned. I will prompt, guide and aid the students as an acting healthcare assistant in this (and the previous) scenario. In all of this I help create a scientific environment in an authentic medical scenario for the students to react to with their current clinical knowledge and expertise, then from the educator debriefs and participation learn where they need help from guidelines and seniors within a medical setting, furthering their

	education to go on to become more confident, knowledgeable and understanding in their roles.
<p><b>A3: Interpret and evaluate data and make sound judgements in relation to scientific concepts.</b></p> <p><i>This means you can explain how you recognise when your activity appears to have been successfully carried out, or not, and what data, observations, or measurements you are evaluating mean, relating it to the underlying principles. You should also be able describe how you present information in an appropriate manner in order to explain your judgement.</i></p>	With the Post-Partum Haemorrhage scenario discussed in sub section A1, we are providing training to improve staff confidence, awareness, and ultimately improve patient outcomes should there be such medical complications that a major bleed occur. I will discuss my role within the simulation in terms of observations, and measurements which are a mixed variety of output type and input type. The main observable inputs and outputs of the simulation are: urgency in reaction to emergency and calling for help and arrival of said help, team and leadership communication flow, direction and consequent delivery of treatment, reaction and call for the bleed of the patient – activating the major haemorrhage protocol and fetching of blood products. The methodology of recording the simulation for analysis purposed happens via well positioned (via crocodile grips) wide lens portable wireless camera(s) with audio recording, connected to proprietary software on a laptop. As the simulation begins I start recording on the software, manually creating an annotated point on the timeline for each event big or small, this event shows up on the timeline. At the end of the simulation the data results can be collated and analysed by the simulation team. Delving further into this I have a look at the main observable input and note down the initiation time of each corresponding to the beginning of the simulation, and the resolving of each event – how long does it take for a team member to call for and for a team to respond to an emergency call. How many times questions and tasks get thrown out to the team but not to a specific team member, this is a classic talking point in the science of human factors and leads to potential errors and failure of fulfilment of tasks as they are not assigned to anyone specifically. All of these points are

discussed during a post-simulation debrief with the attending members and simulation faculty, this is done by my seniors to whom and with whom I look at and discuss the data prior to the debrief. The data itself is very easily observed on the recording software we utilise, showing: number of instances and time of the instance on the simulation timeline, and duration of an event. The numbers themselves are useful for the above, but without context they hold less strength, the result of knowing these and being able to go back and view each point on the video timeline I can point out good or poor communication – in terms of clarity and direction, quick or slow reaction by an attendee either due to ability to recognise the issue and urgency of the issue and appropriate response and also due to potential training or standard operating procedure quality of care bottlenecks, which are discussed amongst myself and my superiors who then go onto unpack that during a debrief session. Outcomes from the analysis lead to increased awareness and comfort of in good communication techniques (addressing someone when posing questions and delivering responsibilities, asking them to return and to confirm completion of a task). There is an increased response time in terms of sending out an emergency call and a major haemorrhage call due to increased familiarity and ability to recognise the conditions present and their urgency to be treated.

### B: PERSONAL RESPONSIBILITY

**B1: Work consistently and effectively with minimal supervision to appropriate standards and protocols and know when to escalate appropriately.**

*We are looking for an example of how you carry out work with minimal input from your supervisor for certain key*

For the role of Simulation Technician I am responsible for many things including: setup for training courses, the upkeep and maintenance of the simulation manikins, their control hardware and software, setup of the facilitation rooms to match clinical areas in appearance, cleanliness and equipment amongst many other relevant duties. For example upon checking the up to date course timetable on my Outlook calendar a few weeks ago, I knew that the same course was operating 3 days in a row. This mean that at the start of the week I checked all the Simulation equipment is functioning and clean as I do as part of my responsibilities. I audited

*tasks, experiments or procedures associated with your role and completing them to the appropriate standards and time frame. We are also looking for evidence that you know when to escalate appropriately and that you are able to make a judgement on when to escalate.*

the equipment trolleys and drawers according to checklists to ensure equipment was present and correctly placed to not interfere with scenario fidelity. Firstly I check for damage or wear and tear of manikins, if there are any marks I use the relevant adhesive remover or make-up remover to remove them. I recharge the manikins and their control and monitor units. For the course I checked the relevant calendar attachment and physical file folder to examine the course requirements and setup. This made me aware that we have 6 scenarios per day, one facilitating room was required and 1 large debrief room. I (with the help of a colleague and following safe lifting procedure) proceeded to load up the adult male Gaumard HAL manikin on the patient trolley used in the A&E department as that is appropriate to the medical field and course scenarios. I then launch the manikin via the control tablets, checking the function and battery levels, and that the monitor tablet connects to an external HDMI cable leading to a monitor within the facilitating room, acting as a patient monitor screen. This is followed by launching the observational and recording software on our hardware (PC, external speakers, and sound mixer) to test the audio and video stream, that the microphone into the room works and that the two-way closed system telephone is functional and audible to an audience - by observing on the software stream this is played back live. This was all done at the start of the day so that the next day of the course would be near ready and troubleshooting has happened to make sure all equipment is present, setup and works. On the course day, I setup the stream in the observation and debriefing room for attendees to observe a live video and audio stream of the facilitating room, have the manikin on and connected to the control and monitor tablets with the physiological parameters setup on the software for the manikin, apply the moulage and medical equipment described for the first scenario, this is all done autonomously. I then check the final setup with the course leader(s) to see if the parameters, setup, quality of audio and video streams are to their liking. At the end of each course day I repeated the pre-setup process of clean down, facilitating room and manikin reset and clean, software and hardware resets and checks. These are the standards expected of me, consistently, and are delivered. On

	<p>occasion things might not go to plan, in the transport of the monitor tablet for the HAL manikin, a colleague had disconnected and reconnected the USB Wi-Fi point from the monitor tablet unintentionally. Although the reason for the fault was unknown to me at the time, this disconnection and reconnection led to the control tablet not being able to connect to the monitor tablet meaning the patient monitor inside the room did not have a life feed of the 'patient's physiological parameters. I managed to quickly and within the scenario connect the monitor via the alternative Bluetooth connection ability of the two tablets. This issue obviously coming as unexpected caught me off guard as there had been no such issues since acquiring the manikin. I solved it reliably, but the solution was insufficient as the Bluetooth range is lower than the Wi-Fi range and is required for at least one of our courses. So being out of my depth on proprietary and new to me software, with the user manual being insufficient in depth to answer this, I contacted the official local support representative and we talked about the troubleshooting and solution for this, upon which we solved the issue in which a specific set of steps had to be taken to ensure a reconnection via Wi-Fi for the monitor tablet, improving the range to fit our course requirements again.</p>
<p><b>B2: Demonstrate how you apply safe working practices.</b></p> <p><i>This means that you can explain the safe working practices applicable to your area of work and describe how you follow them.</i></p>	<p>An essential part of my role involves transporting and loading and unloading of manikins. Each time this needs to happen I have to follow the Trust's Moving &amp; Handling (version 7) policy and also ensure others are as well, the adult manikins all exceed 50kg, so a colleague or even total of three of us may be needed to lift up or safely put down a manikin, or slide it across to a trolley as is the case on courses very often. For example on one of our courses we have used three different manikins, this requires checking colleagues are free and physically able to perform the lifting manoeuvre, I ask my colleagues to help with the movement of the pregnancy manikin Lucina to a different bed to fit the course needs, at the same time we also need to unload the Gaumard Hal Manikin and put him on a different trolley for a different scenario. This means we (not something I can safely and legally do myself thus using 'we') had</p>

to load up the Lucina manikin onto a transportation trolley following the appropriate heavy objects lifting manoeuvre, and do many other manoeuvres to perform the swap. This could be done by a single person in theory but it would not be following safe working practices so I must and do check for able personnel and ask them for assistance with these. The manikins ended up being in the right trolley, patient bed and facilitation room for each scenario. We use sharps for the same course for one scenario (a car-related catastrophe patient required a chest drain), the sharps in the form of a scalpel must be packaged and present when they are expected and not before, I keep them in a location known to the faculty for the purpose of the training and watchfully ensure sharps are disposed in a clinical yellow sharps bin when we are finished with them, following the trust's Safe Use and Disposal of Sharps Procedure (Version 7.4). If the sharps bin is filled to the 'fill' line, I seal up the bin, signing and dating it on the container, and dispose of it in the main sharps disposal container outside the building which requires secure key access, ensuring safety of staff and visitors. The manikins being mains and battery powered, it is best to follow the manufacturers' guidelines for operation and as a technician I have to ensure full safety of participants interacting with our equipment, and ensure the equipment is being maintained and operated properly. There is obviously a high danger risk of combining liquids with electrical products, to elaborate, one of our manikins Lucina can be configured to bleed with a pump and pre-filled blood like solution. Unfortunately if the manikin is incorrectly angled the liquid can come back into the manikin and be within proximity or even contact with the inside electrical components. When transported to an environment with less control i.e. an in-situ simulation, I must advise that this extra feature is not used due to the potential fire dangers and damage to personnel and expensive equipment as attendees who are not trained with the manikin may open it to risk.

### B3: Take responsibility for the quality of your work and the impact on others.

*This means that you can describe how you take responsibility for the quality of the work that you undertake and its impact on others within defined parameters and timelines – including if an activity does not work in the way that you expect.*

I take full responsibility for simulation equipment physical maintenance, operation of the equipment and my role as a facilitator in my work as a Simulation Technician. I have ownership over those tasks and domains, that is to say I am held accountable and expected to deliver a certain standard of presentation, performance and quality. For example for one of our courses we run a full day of obstetrics and gynaecology as well as paediatric scenarios. The course leaders on this occasion all came in with varying requirements and expectations for the course on which manikins will be used. In preparation for the course I will have wiped and cleansed the manikins of all marks and checked for damage or imperfections - which could interfere with the fidelity of the simulations if present marks are identified as a medical condition this could derail a part of the scenario and has happened previously with damage marks on a manikin leg, which was consequently identified and replaced by myself to remove this potential error. As the course carried on I was expected to produce blood soaked sheets, and the baby manikin to be ready to go for the next scenario after which the larger paediatric manikin will be used. I was expected to turn the room around, reset used equipment and wipe down contact points with Clinell wipes for disease control due to COVID-19, and wheel the current manikin trolley out, to be replaced with the baby manikin on another bed, turned on, monitor setup and physiological parameters input on the control panel. All within 15 minutes between scenarios with enough time to double check the accuracy of the setup for the next scenario in accordance with the pre-written setup and scenario requirements. As I was also facilitating (acting) as a healthcare assistant within the room I would have to have everything setup within this time frame and be able to carry that whole process out multiple times in one day. The issue came when I was expected to swap the baby for the junior paediatric manikins with different physiological parameters as a last minute change by the external course runners. This happened in no more than 3 minutes: I shut down the baby manikin and launched the software of the junior manikin as that takes 1-2 minutes to launch, then I rolled the baby manikin and its bed out of the room into our storage room and rolled the now expected junior manikin into

position, queried the course runner on the expected inputs for the physiological parameters and set this up. Then I enabled the audio/video live stream for the course attendees to spectate and assisted in the simulation as a facilitator, wearing a radio ear-piece with which I could receive input from the course runners on which direction to take the scenario to fit their learning objectives, which I must reflect in my actions and speed naturally to not break the immersion and flow of the scenario for each candidate. At the end of the day the course ran to the evolving needs and expectations of the course runners, due to flexibility, preparation and efficiency from myself, finishing the course on time and with the learning objectives reached, with pleasant feedback on the fidelity of the simulation from the candidates. It could be demanding at times but it is very rewarding to deliver that quality, efficiency and professionalism consistently.

### C: INTERPERSONAL SKILLS

#### C1: Demonstrate effective and appropriate communication skills.

*What we are looking for here is an example that you are an effective communicator. The example can be through appropriate oral, written or electronic means.*

During courses it is of utmost importance to be an effective communicator to maintain professionalism and respectfully represent our organisation. Communication can build but it can also destroy or derail, during a simulation when the attendee may be stressed to be under so much observation they could be in a fragile state or even just feel in an alien environment. We hold communications courses for international anaesthetic doctors who have joined our NHS Trust. These simulations are not focused on the ability of a doctor to perform clinical tasks but it focuses on their communication skills, and confidence and building those up. My role for the duration of the scenarios in this case was to be acting as an additional facilitator within the course. The attendees all had very communication skills even for our difficult scenarios, yet to remove bias and to make them more comfortable as they came into our facilities, I concisely and simply walked them through what our facilities and manikins are capable of, what

equipment we have, and how we operate, mirroring their body language and tone of voice, speaking softly yet firmly and clearly enunciating avoiding use of dialect terms or language that may distract or confuse but not simplifying language as to offend or condescend. This is the manner in which I followed my communication on the day as an in-room facilitator and actor as a Healthcare Assistant/Nurse. I think this is one of the harder skills to demonstrate certainly with people of various cultures and backgrounds and differing familiarities with the English language. At the end of the day, I recall the feedback of the candidates explicitly stated that they were made comfortable with and found the facilitating staff (myself included) warm, welcoming and that they made them comfortable within the rather unnatural environment of a whole day of communication exercises. Another example is a case of breaching of COVID rules by course attendees en masse. The issue had to be resolved because the repercussions of continuing are obviously undesirable – breaking the rules and risking contagion, so as this was a difficult situation, difficult because of the staff being doctors and therefore far more senior and deserving respect. The layout was an end of a corridor with the attendees shoulder to shoulder, having drinks and eating, there was a high volume of chatter. This meant that I could not quietly and subtly ask the gathering to disperse, instead I loudly and with assertiveness but not aggression projected my voice asking each of the attendees to go to their pre-ordained break rooms with masks on so we can all keep to the rules and enjoy being together safely and also so we can all see our families for Christmas (this was very close to the holidays). This intervention worked with no one retorting or feeling attacked, they all split into smaller groups and the rules were kept to. My colleagues stated that I handled that well.

### C2: Demonstrate effective interpersonal and behavioural skills.

*This means that you can demonstrate skills that you use to interact with colleagues in a constructive way within the work setting. In these situations it may be appropriate to discuss these with your supervisor, as an external perspective is often very useful in this regard.*

Within simulations as a facilitator I have to interact with colleagues and attendees in a helpful and constructive way to produce the desired learning environment and navigate or direct the candidates through the pre-planned scenario. Whilst acting as a facilitator I wear a radio ear-piece so that my colleagues can communicate with me and provide input where it is required, for example a difficult to make observation due to simulation limitations i.e. a smell that is not present but I can pretend is there, the movements/appearance or otherwise muscular response that a patient in the form of a manikin is capable of. These are then rephrased and delivered that information in a helpful and fluid way through reacting appropriately to the 'smell' or movement and appearance of the patient, and passing that information on to the candidates. In other such simulation situations I may simply communicate via body language to my colleagues who are observing outside of the room by shaking my head, nodding, beckoning and what other actions might be correct at the time without pulling the candidates out of their immersion in the scenario. This in turn means my colleagues' trust in me increases, delivery of a quality service continues and we grow in our work relationships

In our control room (which is behind our two way glass of our simulation rooms) we observe and control the manikin as well as pick up the associated with room simulation telephone and control the manikin inside. During a course we had recently, Simulated Trauma Training, we ran multiple scenarios of major trauma in patients for our candidates of ranging trauma experience. Whilst in the control room we as colleagues discuss things picked up on, and excelled on or missed out on during courses. My input as someone who was not controlling the manikin for a simulation meant I had more of a free capacity to pay attention to details within the simulation. Thanks to this when my colleagues asked me how the candidates did for additional input I was able to confidently and in privacy share with my colleagues how a candidate had not carried out a necessary cannulation and lacked in providing the appropriate amount of oxygen as they were not operating the bag valve mask as per guidelines, yet during

	<p>the stressful situation of they had followed the expected guidelines. The reason this information had to be shared to improve the knowledge of what happened in the simulation for our debriefing staff and be able to improve the learning outcomes for the attendees. The in turn instils confidence and improves constructive working relationships between myself and colleagues.</p>
<p><b>C3: Demonstrate an ability to work effectively with others.</b></p> <p><i>This means 'team work', which can be in a large team or on a 1:1 basis. Your example should illustrate how you worked collectively with others, what your specific role was within the team, and what the outcome was.</i></p>	<p>Recently we had a course which happened to repeat itself within a fortnight, for the second instance of this course I had just come back from sick leave with some remaining difficulty. Within an hour of the course starting our faculty team was down by an extra person who came in early to setup for the course but who had to leave work. Another colleague is on summer holidays, meaning that the main team faculty was down by 2 people on a course, leaving the team a bit shorthanded. Thankfully, these are scenarios and a course we are familiar with. I had to take on extra workload within the setup and re-setting for each simulation scenario in the form of increased moving and handling, setting up of physiological parameters, troubleshooting. During cleaning down the manikin from the first scenario I noticed there was an unexpected adhesive wound dressing on its abdomen (from a previous course in my absence) and had to communicate to my colleague that I will need assistance with this so we can keep to the program's tight schedule. They came and observed the problem, as I was wiping down adhesive from just used stickers upon the manikin. The issue is that the dressing may derail the scenario if the patient is physically examined, which was an important aspect of this scenario. I asked for their help to remove this rather tricky dressing, due to the dressing being left on the manikin for a prolonged amount of time the adhesive was very difficult to remove and we had to collaborate to remove the adhesive with specialised products, thankfully I was already carrying adhesive removal wipes in my pocket and began to use them to remove the artefacts of adhesive. The wipes proved lacking in effectiveness for this strong an adhesive in the time we had, I relayed this to my colleague that we will need to change to a</p>

more aggressive method, I relayed to my colleague that we will need to change to a more aggressive method, sourcing a solution of adhesive remover. In quick succession we came together to prepare the manikin and be in a condition that is fit and ready to be used for high fidelity simulation. To finish preparation I had to tackle the tidying of the room and coordinate with my colleague on which aspects of the preparation for the next scenario needed to happen – I carried out restocking of the resus trolley quickly whilst they began changing the chest drain pads on our separate torso training manikin for the upcoming scenario, and I setup the physiological parameters of the manikin specific to the scenario. Finishing just in time for the next scenario, we came together as a team for the duration of the day to efficiently and collaboratively have everything ready for each educational scenario, delivering the course fully and receiving good feedback from the candidates on the fidelity of the training provided.

When there is downtime throughout the work day I try and make myself available to support others as is key for my role. Frequently a demonstrator or extra faculty is required to demonstrate or participate in CPR chest compressions in an Intermediate Life Support course, or for a Simulation Course. When there is such an opportunity to help a colleague with this to take the physical strain away from them but also potentially benefits the educational experience by showing correct pacing of the technique, different body types carrying out compressions and how a person may ask someone else for assistance. When a colleague called me up to do the same a few minutes ago I had made myself available for their educational needs by notifying them earlier on that I can support them and not to worry about this as other staff were unavailable and they should not have to do everything by themselves. Indeed my colleague called for me and I responded immediately. I was invited into the session and quietly instructed by my colleague on how we will perform this demo for the candidates who were about to be educated then tested on the same thing, so the demo has to be performed at the 'golden standard' – good depth, good pace, good safety and procedure. Indeed I followed my

colleague's lead and proceeded to confirm his request to pretend 'alert' the cardiac arrest team and bring the resus trolley to the exercise. When I completed this he proceeded to count me in for chest compressions and I took over seamlessly, with him continuing to teach and demonstrate the rest of the material for this scenario, he setup the defibrillator pads around my hands on the manikin's body whilst I was carrying out compressions. As he was leading this scenario I waited for his instructions to move away for the defibrillator shock and for his command to resume chest compressions. In effect we worked together to show the golden standard of Intermediate Life Support CPR for the candidates who proceeded to have more confidence for their group scenarios.

### D: PROFESSIONAL PRACTICE

#### D1: Recognise problems and apply appropriate scientific methods to identify causes and achieve solutions.

*What we are looking for here is an example of where you have problem solved or attempted to problem solve.*

Some of the equipment and facilities we have are still new to us and we as a team are still getting acquainted with them – new manikins, and a new audio and video system. The new a/v system is delivered as part of a learning package and had been installed whilst members of staff were away, meaning even after training, familiarity with the system was poor, its capabilities and limitations had not been explored. We as a team found that when using the new system's software based audio setup that there was a noticeable delay between microphone output, and audio output. The reason this is an issue is because if the manikin operator/voice actor and facilitators in a separate room do not hear what is going in the room exactly when it happens, their possible response(s) and voice input action will be delayed, then there was also a delay between sound going into the microphone – and sound coming out of the speaker inside the room, leading to unnatural breaks or pauses in conversation inside the simulation room, sometimes with candidates asking a following question when the first had not been answered. I decided to investigate this as we as a collective found this problematic and

the delays added up to a clunky-slow simulation experience. First I measured the delay from sound in the selected observed room to output of the sound on the computer system in the observing room. This was done with the help of a colleague talking and a stopwatch, repeated 5 times and an average taken. The delay was around 1.0 seconds, I restarted the software by refreshing the software page, the delay came down to 0.8 seconds. I proceeded to reboot the servers for this system, the delay was still 0.8 seconds when repeated and an average drawn out. This newly discovered delay was considerate when taking into account the additional delay for the microphone input – speaker output for the ‘behind the manikin’ speaker. I measured this too using the same methodology, this was a more sizeable delay of 1.0 seconds until there was a sound output in the room. Adding up to a total delay of at least 1.8 seconds, this delay increased slowly if the software had not been restarted for a few hours. This was chased up on with the service provider of the A/V system and was told it is an inherent part of the system and any limitations of speed were parts of the way the system operates. I inquired as to workarounds with the existing equipment, the only one which I had already figured out was to plug the observing room’s audio directly into the audio mixer meaning an immediate delivery of the audio in the room - timed to 0 seconds. No workaround for the microphone input delay due to the speaker being a specialised one that is connected to the server rather than a local connection. My solution was to source a radio audio transmitter and receiver and to test that with colleagues. There was an immediate response – timed to 0 seconds. Now our system runs with no audio delays, input/output, microphone input and speaker output or otherwise. This is a much smoother experience and is more consistent too, eliminating the previous issues and now our ability to deliver a more fluid system has increased.

### D2: Demonstrate how you use resources effectively.

*This means that you can give examples of work that you have undertaken where the method, procedure, programme, equipment, or materials used was chosen as the best (or most relevant) to use. Your example should describe how you planned and organised these to complete the task, and also how you reviewed choices – why the one you selected was the best compared to others that are available.*

In our department we have a selection of simulation manikins from various manufacturers. We have three manikins that are of the same manufacturer, all manufactured at different times, one which was brand new and two which were made within the last decade. They all have different purposes as an adult, paediatric and natal manikins they serve to train different areas of Medicine. Their controlling hardware was dated, had very poor battery life and was also slow, I noticed that the more recent of the older controllers had been setup to control both of the older manikins. It came to me that even though we use these manikins very frequently the older manikins use the less than favourable older hardware, which has lower performance and is less easy to transport too due to being heavier and less compact, versus the brand new manikin with its brand new controlling and monitoring hardware. I contacted the company hardware support representative and with his help and with reading the manual I was able to register the control codes and keys for the older manikins on the newest control hardware, successfully. The newer setup was tested, it ran very smoothly as expected. Since then we only need the newest control and tablet machines to be setup, as we use one of those manikins (of that same make) one at a time due to our course needs. This has made that part of the process of operating and setting up manikins easier, using better equipment as explained and my colleagues and guest faculty feeling more comfortable and confident with this newer hardware.

During an instance of our Advanced Life Support course, which I assist with by invigilating and marking I was tasked with marking exam papers with a colleague. This is a time sensitive task, we want to have all the papers of attendees marked and scores recorder prior to them leaving the testing centre as they have a practical exam after this multiple choice exam. At the time the employed method of marking was by using highlighters to highlight the correct answers on a marking grid. The pass requirement for the exam is high and that means far more often the numbers of correct answers outweigh the incorrect answers, the correct answers were all

	<p>counted up and totalled, with 20 questions per column you would have to count up to 20 and recheck that (at least once) for reliability. I simply flipped the process in reverse so that I would count all the blank spaces (incorrect answers) and mentally take that number away from 20. This process at least halved the time required to mark a paper. I was then able to relay the scores via a radio communicator in advance to when each final exam had finished. I completed the task so quickly compared to previous instances carried out by two people, my colleague was freed up to usher the candidates to where they needed to go, and my other colleagues received the exam scores in advance of the candidates finishing the final practical exam, thus removing the potential bottleneck of exam paper marking.</p>
<p><b>D3: Participate in continuous process improvement.</b></p> <p><i>What we are looking for is an example of how you have improved the efficiency of a way of working, for example this could include maintenance of stock levels, improved methods, new ways to increase throughput, health and safety or ways to increase cost-effectiveness.</i></p>	<p>Sometimes the methodology in a simulation cannot be easily or obviously improved but on the other hand the work required could be reduced. In our back to back simulations for student courses we carry out two simulations per group for up to 4 groups in a day. This can lead to multiple scenario and post-simulation exercise clean-ups and set-ups, which are necessary to be controlled and consistent and accurate. You can run the scenarios in an A-B, A-B, A-B, A-B format, carrying out a total clean-up and changeover of the parameters and physical materials required in a scenario. Instead I proposed to colleagues that we operate the scenarios in an A-B, B-A, A-B, B-A format, meaning that I as a Simulation Technician have less of a reset to do in between changeover of groups, that our facilitators (including myself) run the same scenario at the end of a group as the start of the following group and we feel less fatigued by that. Not only that but this means I have more free time to support the rest of my colleagues and am as a human resource more available to support the service. We implemented this and to a great success and have not looked back since, my colleagues have also been able to be more at ease and help each other more through this methodology where we could employ it.</p>

An already used example for above D2 criteria as it not only the best methodology to use the equipment was - Previously I mentioned that we utilise chest drain pads on a Chest Drain & Needle Decompression Trainer, this is used for chest drain training exercises, and to treat tension pneumothorax in our simulations. It is great equipment, and very beneficial for increasing competency and confidence of the staff who receive it. So for example on our recent Emergency Department course, I have queried the course runners on whether they will need to use a chest drain and instead of rushing to prepare the manikin and accompanying equipment at the last minute, these are setup in advance of the course by myself, a time saving and proactive approach. Additionally the chest drain pads are the main consumable used on this torso trainer, the drain pads are not cheap and can cost upwards of £30 for a pair of pads, which would be an acceptable cost yet for an internal training course we do not generate income, and may have to use multiple pads. So I gently persuaded the faculty to use each pad 3-4 times in the different areas of the pads to maximise usage, minimising operation cost, frequency and time to swap the pads, and this does not negatively impact the training either. Previously, pads would have been replaced after a single puncture, being inefficient and wasteful.

#### **E1: Comply with relevant codes of conduct and practice.**

*This means that you can give examples of how you comply with a code of conduct (e.g. of your professional Body) or how you work within all relevant legislative, regulatory and local requirements.*

Within our organisation and specifically in Simulation, we aim to adhere to the ASPiH standards framework - The Association for Simulated Practice in Healthcare. The 21 simulation standards listed provide the foundation and guide for an enhanced level of Simulation Based Education delivery. Of the standards listed I personally have to follow and where not appropriate to my position, help enable adherence to the remaining standards as well. As a frequent facilitator within a simulation I have to act out a specific role, and follow "Standard 13 - Local processes and procedures are carefully reviewed to deliver ISS (In Situ Simulation) activity authentically.". In work I am surrounded by medical professionals with decades of experience in being a healthcare assistant, nursing, being a consultant doctor, and many other medical professions and specialisations. From this exposure I specifically focus on trying to perform as the required specialist i.e. on our recent Royal College of Anaesthetists course I facilitated in multiple scenarios as a nurse and others as an ODP (operating department practitioner) acting those roles out competently and convincingly only because of pre-emptively asking for input on procedures I have to be able to perform and initiate and in general asking to be (if I am not) informed on the hierarchy and mode of operation in a medical setting as that specific role. This is to deliver an authentic simulation experience and I succeeded in doing so by being able to say "Yes I can cannulate" "I can assist with this intubation by applying cricoid pressure" - and carrying that out, because it has been explained and demonstrated to me; or "No, I am not comfortable with doing that" because that would be beyond that role's normal professional ability and not in line with the scenario script. So for the duration of the scenario I am aware of and following our Trust's policies and procedures for the said role I am acting out, and in addition I am adhering to the ASPiH standards framework, being instrumental in providing a high standard of simulation-based education. Additionally "Section 2 Technical Personnel – Standard 4. Simulation technicians and technologists, whose primary responsibility is to

support delivery of SBE, have gained or are working towards professional registration with the Science Council." - this is something I am currently striving and working towards in this application, with the support of my colleagues and managers. The reason for wanting to achieve an accredited status is so that I can be a part of representing, maintaining and further developing high standards of education in our centre; and through this increase the confidence, ability and competency of all of our faculty and course attendees and as an end result improve patient care and outcomes.

Examples used in a previous section: an essential part of my role involves transporting and loading and unloading of manikins. Each time this needs to happen I have to follow the Trust's Moving & Handling (version 7) policy and also ensure others are as well, the adult manikins all exceed 50kg, so a colleague or even total of three of us may be needed to lift up or safely put down a manikin, or slide it across to a trolley as is the case on courses very often. For example on one of our courses we have used three different manikins, this requires checking colleagues are free and physically able to perform the lifting manoeuvre, I ask my colleagues to help with the movement of the pregnancy manikin Lucina to a different bed to fit the course needs, at the same time we also need to unload the Gaumard Hal Manikin and put him on a different trolley for a different scenario. This means we (not something I can safely and legally do myself thus using 'we') had to load up the Lucina manikin onto a transportation trolley following the appropriate heavy objects lifting manoeuvre, and do many other manoeuvres to perform the swap. This could be done by a single person in theory but it would not be following safe working practices so I must and do check for able personnel and ask them for assistance with these. The manikins ended up being in the right trolley, patient bed and facilitation room for each scenario. We use sharps for the same course for one scenario (a car-related catastrophe patient required a chest drain), the sharps in the form of a scalpel must be packaged and present when they are expected and not before, I keep them in a location known to the faculty

	<p>for the purpose of the training and watchfully ensure sharps are disposed in a clinical yellow sharps bin when we are finished with them, following the trust's Safe Use and Disposal of Sharps Procedure (Version 7.4). If the sharps bin is filled to the 'fill' line, I seal up the bin, signing and dating it on the container, and dispose of it in the main sharps disposal container outside the building which requires secure key access, ensuring safety of staff and visitors. The manikins being mains and battery powered, it is best to follow the manufacturers' guidelines for operation and as a technician I have to ensure full safety of participants interacting with our equipment, and ensure the equipment is being maintained and operated properly. There is obviously a high danger risk of combining liquids with electrical products, to elaborate, one of our manikins Lucina can be configured to bleed with a pump and pre-filled blood like solution. Unfortunately if the manikin is incorrectly angled the liquid can come back into the manikin and be within proximity or even contact with the inside electrical components. When transported to an environment with less control i.e. an in-situ simulation, I must advise that this extra feature is not used due to the potential fire dangers and damage to personnel and expensive equipment as attendees who are not trained with the manikin may open it to risk.</p>
<p><b>E2: Maintain and enhance competence in own area of practice through professional development activity.</b></p> <p><i>This means that you can give an example of an activity you have undertaken to enhance your competence in your own area of practice i.e. Continuing Professional Development (CPD) and reflect on its impact on you and others. We are not looking for a list of courses here but evidence of how your CPD benefits your practice and</i></p>	<p>In order for me to perform my role competently and confidently I personally seek further training and competencies, and I am encouraged by colleagues to develop my skills and confidence in those skills too. Prior to this role I had not been exposed to manikins or how the healthcare sector operates, so there is so much scope for me to continue development. One of the first points which were identified that I desired to work on was how to operate the highly in-depth and multi-functional CAE manikin Lucina, this was training that I requested from a colleague who had previously had been educated by the manufacturer's representative. Myself and another colleague were trained on operation and troubleshooting of the manikin for a day, learning the depths of the technical functions of the manikin, and alongside the manual became much more familiar with operation, usability, applications, maintenance and set-up of</p>



## Registered Science Technician



benefits others. Your CPD may include work-based learning, professional activity, formal/educational, self-directed learning.

*(Note registrants will need to comply with the Science Council CPD Standards)*

the manikin. I was asked to demonstrate various forms of lubrication, manikin birthing mechanism delivery and software usage. After this high fidelity manikin training our team (myself included) was more confident that I can be relied upon and trusted to work with this manikin and keep it in operation. This brings me back to the first example used in the competency report of the post-partum scenario and how I am able to be a boon to my team because of all this additional training and exposure to the manikin's capabilities and how to utilise them where required and appropriately. Additionally I have been eagerly volunteering to help demonstrate techniques and facilitate in teaching sessions to gain exposure to different healthcare situations and skills. I have stated before that I am called to demonstrate basic and intermediate life support, so for this as I am only qualified at my grade to apply for the Basic Life Support course. I studied the extent of the e-Learning myself and signed up to a teacher's course so that I am able to perform the manoeuvres and procedures in line with our current Resuscitation and COVID trust policies, but to also be able to deliver the teaching and assess others, this is recorded and kept a record of. With this skill I help I am trusted to and capable of delivering authentic basic life support in our teaching sessions and simulations. To further enrich this skill I also volunteered to sit in on the more advanced Intermediate Life Support course and Paediatric Intermediate Life Support courses so that I am aware of, understand and able to emulate the teachings from those courses so I can support the service needs of my department in terms of education. As I show increasing competency and positive attitude towards Continual Professional Development, more opportunities to assist in education and familiarity in troubleshooting and operating manikins come along, as well as increased experience. Again fitting in with the need to professionally and personally continue professional development recently I showed interest in and made notes of Intermediate Life Support educational level Electrocardiogram (ECG). I asked an experienced colleague with a vast degree of medical experience to tutor me on the various ECGs, their causes, reasons for why they happen and how to read an ECG from a 3-Lead cable attached to a defibrillator which

is extremely relevant as that is the situation where we most frequently see them in our educational setting as a facilitator and faculty. If a student were to ask me what the ECG shows or queries it, or is confused by it I can now dive deeper and explain what it is and what they should take notice of on an ECG. On the other hand if a faculty member requires a certain heart rhythm to show on a manikin's monitor for a teaching scenario, I am able to understand the medical jargon and input that on the control software, performing my function more competently.

Looking towards the future 12 months I have already mentioned this application as a key part of my progression, and focus on improving my skills to support the team in their functions too, another instance is that just recently I was asked about training that would benefit us by my superior, we came to the conclusion that we would benefit from an professional moulage course for all of our team's staff members, and I was tasked with finding the suitable one. This course would benefit myself and the team and equip us with the ability to create authentic appearing mock injuries in the form of make and make up prosthetics upon manikins and people, thus increasing fidelity and immersion in teaching sessions with trauma patients in. I carried out research and shortlisted a few potential Educator candidates that would and could deliver our needs of an in-house 1-3 day course and delivered the details and costings to my superior. This course is now being tailor by us for us, for the educator to deliver. Additionally there is now further enhanced Basic Life Support training with Defibrillator Awareness attached and I will attend this as it is highly relevant to our delivered courses even though it is not mandatory to myself, I will attend this. I am very excited as we just received a new high fidelity and modern newborn patient simulator and I have organised training on that manikin for myself and my fellow colleagues. Thank you for reading through this application.