Emergency Medical Education: 20 Questions

20 Questions is a monthly educational resource developed for HCMC EMS paramedics and authored by their medical directors and other subject matter experts. This content is intended for educational purposes only and not intended to be a substitute for professional medical advice, diagnosis, or treatment.

20 Questions about Crew Resource Management and other (job-related) performance issues

Q1: What is crew resource management?
A1: CRM is a set of techniques designed to reduce performance errors under stress. Some of the key aspects are: structured team behaviors (e.g. checklists, SOPs), focus on common goals, practicing together, two-challenge rule (no crew member should have to ask about a safety issue more than twice before it's addressed and all crew members should be free to raise concerns), practice closed loop communications, mutual support / assistance, and a shared plan.

Q2: Where did CRM come from?
A2: United Airlines started CRM in 1980 after a crash in 1978 where the crew became fixated on a landing gear trouble indicator light and failed to recognize they were nearly out of fuel and crashed, killing 10 aboard. This followed 6 years after an Eastern flight crashed under near-identical circumstances killing 101 people. UA understood that without a new paradigm, these crashes would continue to happen. The 'pilot in command' that traditionally had all the answers and shouldn't be questioned was an unsafe concept, and a team approach was needed. (For a healthcare-oriented version see: http://www.teamsteppsportal.org/)

Q3: I think well under stress and do it all the time, so why should I apply these principles?
A3: A mild amount of stress can improve decision-making but the more stress, the worse your cognitive performance, and the more decisions, the worse your performance. Think of your decision making plotted on a bell curve. At low stress (left side of the curve), you are barely engaged and don't make good decisions. At just the right amount of stress (top of the curve), you make excellent decisions. Under too much stress (right side of the curve) your decision quality declines rapidly. You also tend, under stress, to activate your 'reflex' decisions rather than think about (cognitive) all the factors – so you tend to jump to conclusions rapidly that may or may not be correct. Finally, we are often faced with unfamiliar information points during a crisis and the brain has problems analyzing and prioritizing under stress.
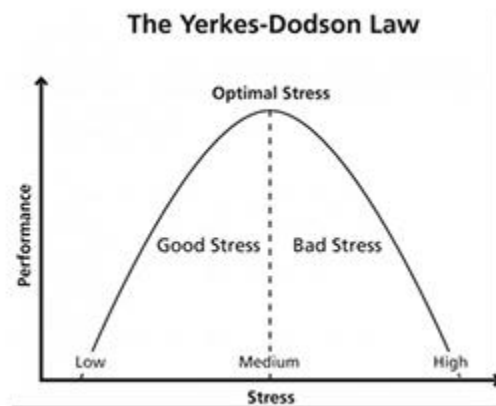
Q4: I also catch my mistakes and my partner's pretty well, so that's good
A4: That *is* good – for every major error that occurs that causes harm, the same staff has likely had a 'close call' 50-100 times. If we don't find a system issue that we can learn from and correct, at some point we'll have a bad outcome. Think of a block of Swiss cheese with holes in it. Mistakes get through a few holes every time, but don't go all the way through. The goal is to put enough system, equipment, and training checks in place so that there's never a chance for them to get through to a major error.

Q5: Is it good to make some mistakes and learn from them?
A5: Of course. But a common situation is that we make a mistake or take a risk but it doesn't result in consequences that time. Interestingly, we tend in future situations to take the same risks rather than being safer. This is called the 'close call paradox' – examples would include not wearing eye protection during an intubation and then making that a habit. Prior to the space shuttle Columbia being doomed by a briefcase-sized piece of insulation falling off the fuel tank and damaging the insulating tiles on the shuttle *79*prior launches had recorded insulation debris falling from the fuel tank and because there were no consequences, no correction was made.

Q6: Why can't I remember certain things that I know when I'm stressed?
A6: The more stressed you are, the more limited your access to information – under extremely stressful circumstances, you may lose 80% of your ability to truly 'think' about a situation – so it's good to have easy access to algorithms and references to help you out. The military tries to checklist anything that requires more than 4 steps because of this.

Q7: Does stress have the same effect on procedures? Intubations, for example?
A7: Yes, the same bell-shaped curve applies to procedural skill including both gross and fine motor skills. 'Muscle memory' tends to help us through common procedures. However, when things don't go as planned with those procedures, we often just try to keep doing the same thing over again, and keep failing – this 'tunnel vision' leads to the majority of deaths in the anesthesia world

Q8: How can I avoid getting stuck?
A8: The number one first thing to do is to ask for help. Asking for help is a sign of maturity, not weakness! Getting somebody else to look at the problem can be tremendously helpful. During the Three Mile Island near-meltdown, the reactor was within hours of completely imploding when an outside expert arrived and within minutes (and with a fresh perspective) identified that a faulty gauge was providing wrong information that the team had been acting on (and every action they took was making the problem worse).

Q9: What if I'm the only one available?
A9: Make a conscious effort to change something you're doing – if it's airway, figure out if it's equipment, patient position, or something else you can change – and if you can't think of anything, then move to a back up plan (King airway, etc.) It has been said that the definition of insanity is doing the same thing over and over and expecting a different result.

Q10: What if I see my partner making a mistake?
A10: First, decide if the mistake will have any consequence – pointing out minor issues in front of the patient and care team can have negative impacts, and should wait for a 'debrief'. However, if the mistake could involve a safety issue try to ask your partner directly and diplomatically (and perhaps quietly?) – 'What do you think about…?' or 'I was wondering if we should…'. Make sure to get their attention, state the problem, propose a solution, and get buy-in or negotiate an alternative. If you don't get a response, or if the safety issue is significant and needs immediate correction be as dramatic as 'STOP' when you need to. All of us should understand that even if we discuss the challenge / question it's far better to have the team on the same page and avoid errors while learning together. Team trust involves the confidence to question, and not just blind trust that things will work out.

Q11: As a junior medic, I feel like even when I should be leading a case that my partner is actually controlling too much – what can I do?
A11: Leading patient care doesn't mean you have all the answers – it means you are the

communicator of the plan. So your partner and the other responders should be asking questions or making suggestions, which is fine as long as they are relevant to a practical or safety issue that requires they be brought up during the course of care. It's the leader's job to process those ideas and get the team on the same page and keep them headed in the right direction – assigning tasks and making sure the team shares the 'mental model' or picture of what is happening and the next steps ('OK, after you get that IV in, then Ken will give the drugs he has drawn up and let's all be ready to roll the patient onto the board and we'll get moving – I need somebody to make sure our cot is in the entryway head end pointing out the door and the straps unbuckled').

Q12: If I noticed something we can do better, what should I do?
A12: If it doesn't present a safety issue at the time, make sure to raise the issue with your partner and discuss it as soon as possible – ideally right after the call – these 'debriefs' are critical to team success and team building as well as should be the time to share ideas about whether there's a system or process issue to solve (e.g. Do other crews face the same issues? Can they be fixed through education or equipment changes?) Though every case doesn't require a debrief, make sure to do one on every complex case (cardiac arrest, airway, rescues, etc.) It's a good chance to review the things that went well too!

Q13: OK, we got the patient to the hospital, so now it's their problem, right?
A13: Wrong (saw that coming, didn't you?) – the handoff is a critical failure point – during transport, think about the key points that need to be communicated – the ABCDs and then also any critical interventions, allergies, PMH and meds they are on (e.g. anticoagulants) – make sure you have the attention of the RN and MD and close the loop on anything critical 'Just to make sure, I told you his pressure was 60 at the scene, right?' – it's easy to lose information, and often critical information, in the handoff process

Q14: Are there any things that I can do *before* things start to go bad that can help when they do?
A14: All of us can do a better job of thinking about 'the next thing' that can happen – we're in the business of worst case scenarios, but often they still catch us by surprise, even though it's an 'expected surprise'. For example, you're transporting a patient with chest pain and a possible inferior MI – better be ready for hypotension, bradycardia, and VF. Or a patient who got narcan that may become more hypoxic or, more combative. Once you have thought about what might be next, and what you would do, when it happens you will not waste time or effort trying to process it – you'll be able to just react.

Q15: What is 'swarm intelligence'?
A15: Swarm intelligence may be a new term, but it's something we do every day – it's team members not waiting for direction to do something they know how to do that needs to be done – it's the firefighter setting up the oxygen without being asked, or your partner getting you the airway supplies you need as you assess a patient you're going to intubate. Swarm intelligence, like a pit crew at NASCAR, can help accomplish in a very short period of time tasks that otherwise would take much longer (but in a pit crew, responsibilities are pre-assigned, which is great when possible, swarm intelligence relies more on understanding what needs to be done and doing it without being asked to, contributing to overall care – the combination of the two is optimal)

Q16: As an experienced medic, do I make less errors than a new medic?
A16: Certainly, though the overall rate of errors is actually least in the medics with moderate (5-10 years) experience, and on average increases again a little after that. Inexperienced medics tend to make errors because they don't recognize the 'pattern' the patient falls into and follow the treatment algorithm, very experienced medics often reflexively categorize based on their experience without

gathering enough data to make sure the conclusion is correct. And everyone is subject to bias based on cases they have recently seen.

Q17: What are 'human factors'?
A17: Human factors are the combination of the workplace (environment), people (fatigue, emotional state, demographics), and management (workload, policies) that combine to affect how we actually perform our work. They are independent of the actual tasks that we do but affect tremendously how we do them. We can control all of them to a degree, but often acknowledging how they may influence us is the biggest step.

Q18: What are some common human factors that have effects on our patient care?
A18: Fatigue is perhaps the number one problem that we face – it affects ALL our decisions (usually resulting in errors of omission, where we leave things out or don't think of things we should). Second to that is our emotions – emotional reactions to patients or the situation have substantial impact on the quality of our decisions and the care we provide – usually resulting in less care/interventions when we experience negative emotions, (positive emotions can result in mixed outcomes – sometimes more 'caring' but less care as we don't want to inflict pain on that cute 3 year old by placing an IV). These can be very difficult to detect sometimes – maybe it's the chemically dependent that push your buttons, maybe it's perpetrators, but you have to think twice about whether or not you're providing the care that you should and if not, why not?

Q19: Any other things I should watch out for?
A19: The most dangerous intervention is usually the one you DON'T do – since most patients do fine in the end it's easy to adopt a 'nah, they don't need it' attitude to interventions and workups and to try to assure yourself that things AREN'T that bad – this is normal and natural, but also dangerous. If you are trying to decide between a more aggressive course of action and less aggressive, (e.g. should I give epi to this allergic reaction) you should always consciously weight the aggressive course of action higher to start with and have really good reasons if you decide not to. Your default in emergency services should be treat for the worst and hope for the best.

Q20: All of this is stressing me out! How can I be less stressed knowing all this?
A20: You'll actually find that thinking a step ahead, looking for human factors influences, and thinking about how to lead effectively will help reduce the stress of your job as it will often help you adjust rapidly to changing conditions, use your team members more effectively, and have better insight into your emotions. When in doubt, take a deep breath (literally) and let it out slowly, then think about the next step. Good luck! When the going gets tough, you know that you are well-trained to handle it.