Use Checklists to Minimize Mistakes in the Field

In Washington State, I worked on a committee that developed a statewide system for cardiac and stroke care. We drilled down to very key items we should never miss on these patients—specifically key interventions and legal requirements every provider should know on every call for every patient.

The process begged the question: How could we ensure EMS personnel applied these critically important interventions every time?

My medical director, Richard Campbell, MD, and I were coincidentally reading Atul Gawande's book The Checklist Manifesto at the same time.1 Gawande, a Harvard professor and surgeon, was appointed by the World Health Organization to reduce errors and avoidable death in operating rooms (ORs) and improve surgical safety worldwide.

One of the first concepts he presented was using simple checklists in the OR to ensure simple key steps weren't missed. These checklists were developed and piloted in eight hospitals around the world. The results were expected to be modest, but these checklists reduced surgery complications by one third and lowered the incidence of surgery-related deaths by nearly half.

Similar to surgery, the field of EMS is expanding and increasing in complexity. The parallels in what both healthcare fields seek—consistently safe, effective care for patients—are striking. Campbell and I felt that if hospitals and surgeons were finding ways to deliver safer, more effective care, EMS might be able to utilize some of the same principles.

I've worked in fire and EMS for 25 years, and have always used checklists to ensure fire apparatus and ambulances were ready for the next response. During my tenure as a flight medic and wildland firefighter, we lived by checklists. During initial wildland firefighter training, each firefighter was given a checklist for 10 standard firefighting orders and 18 watchout situations, each developed by the United States Forest Service in the 1950s following 16 tragic fires.2

It would be unthinkable to arrive on scene and have a medication or piece of equipment missing. It would be equally catastrophic to run out of fuel on an emergency incident. When evaluation of vehicle checks uncovers problems, it's often tracked back to someone not checking the equipment or supplies.

Gawande's book inspired us. If checklists could leverage high-consequence industries like surgical medicine, air travel and nuclear power to a higher level of success, certainly we could take them beyond vehicle checks.

Checklist Development
Even with thousands of hours of training and thousands of calls, EMTs and paramedics can still forget simple, key things. Who hasn't arrived on the ramp at the hospital and realized they forgot to put oxygen on the patient or administer aspirin to a chest pain patient?

Campbell and I set out to develop checklists for our high acuity 9-1-1 calls. To start our list, we used a consensus paper published in Prehospital Emergency Care titled, "Evidence-based performance measures for emergency medical services systems: A model for expanded EMS benchmarking."3

The paper studied the best available evidence to determine which conditions are most influenced by EMS interventions. The review also evaluated which interventions had the highest potential to impact outcomes.

One specific way to measure the impact of a procedure that stood out to us was the NNT, or number needed to treat. According to its website, www.thennt.com, "The NNT offers a measurement of the impact of a medicine or therapy by estimating the number of patients that need to be treated in order to have an impact on one person. The concept is statistical, but intuitive, for we know that not everyone is helped by a medicine or intervention—some benefit, some are harmed, and some are unaffected. The NNT tells us how many of each."4

Our initial list of conditions that needed a checklist included trauma, congestive heart failure, chronic obstructive pulmonary disease, stroke, chest pain/ST-segment elevated myocardial infarction, seizures, asthma, anaphylaxis and cardiac arrest. Although these represent only 20% of our calls, they're some of our most critical interventions.

We then determined other emerging conditions where studies or complexity indicated checklists could enhance EMS performance. Sepsis and post-resuscitation care are two examples. For example: ACLS has simplified the resuscitation process. However, post-resuscitation care has increased in complexity. So we developed a checklist for return of spontaneous circulation (ROSC).

We tested this checklist in our ACLS courses. Starting in the classroom setting, Campbell asked our paramedics to write down every action that should be performed after ROSC. Very few people could quickly list all 11 action items on our ROSC checklist.

"If this were my family member, I would expect the paramedics to remember 100% of the actions that would contribute to the best possible outcome, right?" Campbell asked the students. We then gave the class the ROSC checklist and found it created an effective, organized approach for the team and provided instant confidence for the team leader.

Checklists for high-acuity EMS situations were sent to our crews, and we later had the opportunity to share some of our success with Gawande. He was incredibly encouraging and connected me with other experts in his field to support our efforts. I felt like I was walking among giants.

We were also able to review Gawande's checklists developed for use in OR crisis situations, and his results showed that checklists not only enhanced teamwork in medical crisis situations, but also reduced errors and/or missed steps by 75%. We were convinced that this must become an EMS best practice.

Confident that we were on the right path, Campbell and our team of medical services officers spent hours developing and publishing a checklist each month. This may not seem very fast, but with some checklists requiring up to 50 revisions, I realized the enormity of our mission. Good checklists require extensive knowledge, persistence and focus to develop.

Conclusion
Utilizing checklists is a huge paradigm shift; I describe it as giving someone the answers during the most important test: saving a life.

A few years ago, I and many colleagues were called to a once-in-a-career event. It involved an explosion, two structure fires, a wildland fire and a 50-person mass casualty incident (MCI). As soon as I arrived, I was assigned to serve as the medical group supervisor and was handed the MCI board, called "the MCI checklist." That day, everything went right and I'll always be confident that I remembered everything—because I used a checklist.

Not every call is a once-in-career event. However, for the patient it's potentially a once-in-a-lifetime event. The patient requires the very best care. Even if seems routine to us, checklists make sure we don't miss anything.

Don't get discouraged; it's important to realize that checklists will take time to become an EMS best practice. They're still gaining acceptance in ORs so it may take time to have EMS and fire crews accept and adopt them. It's easy to get discouraged trying to implement something new, especially when it's something that makes you have to accept that your memory is fallible. Professional EMS providers pride themselves in having all their information in their heads. However, I believe that, in the future, we'll look back and won't be able to imagine running even a routine EMS call without one.

Finally, remember that cognitive aids like checklists are a strength, not a weakness. We endeavor to support others who aspire to increase the performance capability of their organization.

-Shaughn Maxwell, EMT-P

References
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2. Fire and Aviation Management. (n.d.) Standard firefighting orders and 18 watchout situations. Retrieved April 9, 2014, from www.fs.fed.us/fire/safety/10_18/10_18.html.
3. Myers J, Clovis C, Eckstein M, et al. Evidence-based performance measures for emergency medical services systems: A model for expanded EMS benchmarking. Prehosp Emerg Care. 2008;12(2):141–151.
4. The NNT explained. (n.d.) The NNT. Retrieved April 21, 2014, from www.thennt.com/thennt-explained.

Resources

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Reference Links

- Cape Cod Healthcare
- Centers for Disease Control
- Fire Engineering
- IAFF
- Korey Stringer Institute UCONN
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- PFFM
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Checklists are a great method to generalize the overall steps needed and gives a good idea of what all should be done. This helps you to minimize errors in the overall process and make it easier for you to review the final work. This is necessary if you are a multitasker who has to get lots of things done. 4. Constant review Try to use templates and examples and learn from them on how to do a task ideally and meet the requirements of the supervisors. 15. Communicate and coordinate with the team: If you are working within a team, try to coordinate your work with other team members and try to see if everybody is doing work with a constant standard. Checklist are lists that aids a person in a job or task that he or she needs to accomplish as well as help check and verify if tasks are already accomplished. Checklists can be used as an aid for any type of field such us building surveys and medical treatments. Creating a printable checklist helps ensure nothing is missed. How to Create a Checklist. So how can one prevent from making mistakes in making an audit checklist? Ways to Avoid Mistakes. Nothing is perfect in this world but that doesn't mean that nothing can be improved. In making a checklist, it is our smart goal to make it perfect. Although it can't always be perfect, there are ways to prevent making a mistake when making the list. Here are a few points to remember in order to avoid those mistakes High quality example sentences with "minimize mistakes" in context from reliable sources - Ludwig is the linguistic search engine that helps you to write better in English. So they employed a conservative offensive style to minimize mistakes and, in essence, let their defense win the game. The New York Times - Sports. 5. It was perceived as a useful checklist which, when systematically followed, helps to minimize mistakes and ensures that all important objectives are covered. BMC Public Health. 15. To minimize mistakes potentially leading to overuse injuries, physical therapists and physical trainers may benefit from a consensus about the correct technical execution of the exercise by utilizing an assessment tool. BioMed Research International. 16.