Emergency Manual Uses During Perioperative Critical Events

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Think back to...
Session Objectives

The Forest

What are Emergency Manuals?

Why are they important?

Review study methods & figures

Comments & Questions

http://sherimackey.com/2010/03/04/global-leadership-do-you-see-the-forest-the-trees/
http://www.clker.com/clipart-13125.html
Emergency Manuals: Definition

= context-relevant sets of cognitive aids, such as crisis checklists, for critical events
Why?
Why?
Why?
Emergency Manual: Integrated in Flight Simulation Training
Why? Human factors

• Memory under stress
• Prospective memory error
• Latent knowledge; ?deployable
MEMORY
MEMORY
Crossover-design:
Each of 17 teams had 4 scenarios with & 4 scenarios without crisis checklists

- 75% reduction in “failure to adhere to critical steps”
400,000+ downloads globally
In multiple languages of EMIC-linked tools
EMIC = Emergency Manuals Implementation Collaborative
Project: Specific Aim

“Do emergency manuals get used clinically and how do they help or hurt during real OR crises?”

• Obtained FAER grant (2-years)
• Specific Aim: To examine a large series of clinical uses and non-uses of emergency manuals at two early-adopting institutions.
Early Evidence: Use of an Emergency Manual During an Intraoperative Cardiac Arrest by an Interprofessional Team: A Positive-Exemplar Case Study of a New Patient Safety Tool


Figure 1: This figure depicts the results conceptually in terms of the three interacting domains. How Emergency Manual (EM) Use Enabled Clinical Team Functioning, Delivery of Patient Care, and Future EM Use.
Project: Methods

Convergent mixed methods using interview data to collect:

- Quantitative counts of crises, EM uses (or non-uses), and EM impacts during crises
- Qualitative account of clinical context and *how* EM was useful during crises

Identification of applicable crises included

- QA events
- Informal emergency calls to OR leaders
- Critical events in EPIC
- Project-specific reporting system for providers to self-identify additional events

Participants:

- Anesthesia providers
- *Surgery and nursing providers also interviewed but not part of this manuscript*
Project: Methods

Data Collection:

• Semi-structured interview guide, expert-developed, pilot-tested

• Elicited:
  • Medical context
  • EM used:
    • Negative/positive impacts of use
    • Facilitators/barriers to use
    • Distractions
  • EM not used:
    • Factors inhibiting use
    • Participant exercise on “would have been” helpful or harmful
Data Analysis:

• Numeric counts
• Inductively-developed codebook, with high inter-rater reliability (0.8 pooled Cohen’s kappa)
• Team-based thematic analysis to identify themes and relate to prior findings from Exemplar study
Project: Results

Fig 1

Summary of participants and events across two institutions

- MGH
  - 23 participants with applicable critical events
  - 34 applicable critical events
  - 28 unique events
  - 6 events with perspectives from multiple participants

- Stanford
  - 30 participants with applicable critical events
  - 46 applicable critical events
  - 41 unique events
  - 5 events with perspectives from multiple participants

TOTAL: 53 participants with 80 applicable critical events
69 unique critical events
The EM was used in 37 of the total 69 unique critical events (53.6%)
Project: Results

Two overarching domains:
• Impact of EM on clinician team members
• Impact of EM on delivery of patient care

Additional findings:
• Circumstances of EM non-use
• Intended future use
**Impact of Emergency Manual Uses on CLINICIANS**

**Individual Clinician**

**Decreased Stress During an Event**
- Under stress, I think something like this [EM] really helps you organize your mind and collect your thoughts (Anes Attg)
- First pulse you should check when you run into a code is your own. You don’t think as clearly when you’re stressed out and anxious and you’re not as quick. So I think calming your own nerves and having this [EM] here allows you to use your brain and other functions as you work through this. (Anes Res)

**Confidence/Reassurance**
- It was so highly effective. It was one of the only things that we talked about when we debriefed, how grateful we were to have it, because it instilled our confidence that we were doing the right thing because it was such an unexpected scenario for this patient. [The EM] makes everybody feel a bit more secure that they’re taking good care of the patient. ‘I didn’t forget anything’ and this is how we have to go forward.” (CRNA)

**Teamwork/Communication**

**Communication**
- I think it [the EM] was extremely helpful to bring us all together and make sure that we were all on the same page, and that we each had a specific role as well which is important to close that communication loop. (Anes Res)
- I think it opened up the line of communication between all the providers that were in there because it gave an extra set of ideas, that we were throwing out there and bouncing ideas off of each other. (Anes Attg)

**Organization of Team or Process**
- It’s always unifying when you can agree as a medical providing team on a diagnosis, a treatment plan and plans for monitoring and through implementation of that plan, everybody feels better that you’re doing the right thing basically. So in my mind, it helps to unify the providers. (Anes Res)
- One of the side benefits of using the emergency manual is that we didn’t have six people in the room saying, ‘You want to get bicarb?’ That didn’t happen, because we were going through systematically. It kept everybody else quiet and we focused on the principle questions and actions that were important, in a very organized way. As I mentioned, my concern about [usually] running a circus show. That didn’t happen here. . . Afterwards, people were talking about the event in the hallway, in the locker room, and even at the end of the day, saying, ‘Wow! that was really smooth.’ I think that it would not have seemed so smooth were it not for the emergency manual. (Anes Attg)

**Event Atmosphere**
- The manual brought more organization to the room. . . there was no chaos with it. Event went so smoothly and flawlessly. I’ve been in quite a few chaotic situations and this was the polar opposite from it, and I do believe that it was because the manual just brought the anxiety of the room down. (CRNA)
- I found that with the manual we were looking up, “What’s my next direction? What’s this? What’s that?” We all had a task and I think that is probably what brought the communication together and the chaos down as we were waiting for the next bullet, the next instruction and we were able to circle back and reflect as we care for the patient. (CRNA)
Use of Emergency Manual Helped for Differential Diagnosis: Preventing Fixation and Catching Omissions
• We excluded all the stuff that was high on our list. And then started dropping down into, into other stuff that for a
twentysomething-year-old who’s otherwise healthy wouldn’t be a common occurrence. Those can kind of tuck away and
you don’t necessarily readily recall those, especially in the heat of the moment. There were two things that just didn’t even
occur to us. That’s sort of what solidified it for me, it was very nice to have a resource to make sure that we hit all the bases.
Instead of thinking “oh, we probably hit most of them.” (Anes Res)
• The manual in this particular case was good for us to check the initial script that we had for that patient particularly
whether the patient had malignant hyperthermia...It helped us to exclude MH and in the thought process, we used the
differential diagnosis list and also used the other physicians in the room to think about what else it could be, and then came
to a conclusion that it was serotonin crisis. (Anes Attg)

Use of Emergency Manual Helped to for Treatment Actions: Key details
• It was useful in confirming the appropriate preparation and dosing of dantrolene [for treating malignant hyperthermia]. It
was also a useful reminder for other steps to consider for managing the patient in that situation. And it left room for the
exercise of reasoned clinical judgment. (Anes Attg)
• So the emergency manual was very helpful in terms of confirming the things that we were doing and avoiding missing
things that we should have been doing that we hadn’t. (Anes Attg)
• We got the emergency manual out towards the end, once everything was settling down... and we realized the thing we had
not done yet was to get the defibrillator in the room. People who have myocardial ischemia are at high risk to just do bad
things, and we weren’t ready for that, so that was what the manual reminded us. In this case, we hadn’t caused any harm,
but it was an error of omission [that the EM helped us correct]. (Anes Attg)

Use of Emergency Manual Enabled Getting Appropriate Help
• We didn’t have a cardiologist here and we didn’t know where to call [had spent time searching for right phone
number]...until someone said “Let’s take a look at the emergency manual.” And sure enough, there was a STEMI emergency
phone number. We called the number and the team came and evaluated the patient. (Anes Attg)

Clinician Perspective of Impact on Patient Outcome
• I think it saved this woman’s life. Because had we not been prompted to have the defibrillator right there, it would’ve been
way down the hall...it was an incredibly quick defibrillation... and we had started CPR right away. So I think it saved her life.
Just having that prompt. (Anes Attg)
• I think that patient was very lucky that she was where she was that day, and we had the manual...the event happened and
minutes later help was in the room and the manual was opened right away and helped to guide our care. (CRNA)
Examining Emergency Manual Non-Uses

Event Progressed Too Fast for Emergency Manual Use (10 events)
- Resolved in < 1-2 minutes
- All clinicians needed for immediate actions
- Resolved before help arrived

Identified Missed Management Steps, in retrospect (18 events)
- Reminding myself about the epi would've been very useful. (Anes Res)
- Nobody talked about it, even afterwards... And actually after, I looked up myocardial ischemia to see what the different steps are and we did miss some things that could have been helpful, especially while we were waiting after activating the STEMI team. It took awhile and it would have been much faster if we'd gone straight to the manual. (Anes Attg)
- The TEE, again we did not do that, it probably would have been useful information. The exercise we did made me realize that I missed one or two of the things that are critical to myocardial ischemia and so it would have been helpful. (Anes Res)
- I would've prepared epi in retrospect, just in case. Even though she was stable, she could've decompensated of course. And then things to rule out. This would've been helpful certainly to have thought about. (Anes Res)

Identified No Omissions or Delays in Care, in retrospect (4 events)
- With the exception of epinephrine, which I’d chosen not to do, we did everything that was in the manual, including verifying the position of the endotracheal tube and all that. I don’t think a first-year resident could have done that without the manual, but with the manual, I think they would have had the same outcome that we had. (Anes Attg >40 years experience and expert in managing bronchospasm = this event)
Impact on Intended Future Use

• Everyone who used EM during a crisis said that they plan to use during future crises
  • “use begets use”

• Those who were conceptually against EMs in general changed their perception due to clinical use, and would be interested in using EM in the future
Project: Limitations

- Memory decay
- Social acceptability bias
- Not generalizable
  - Two academic centers
  - Implementation-friendly sites
Project: Discussion

- Emergency Manual was used in clinical setting, in over half of applicable events
  - Despite clinical and logistics challenges
- Emergency manuals are relatively new in healthcare, and had a positive impact on clinical teams and delivery of patient care
- Built upon framework for *how* EM was helpful
Thoughts/Questions

• Figures, is this the right presentation of the information?

• Manuscript review, thoughts&questions?

• Target journal: *Anesthesiology*, top specialty journal, but would there be interest in broader journals?

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