



Cognitive aids with roles defined (CARD) for crisis management in the OR: a mixed methods study.

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Background

- information on managing intraoperative cardiac arrests is **scarce**
- challenging for health care professionals to manage these situations because:
 - infrequent occurrences
 - critical nature
 - lack of **guidelines**
- Patient survival** depends upon rapid organized delivery of life-saving treatments by all members of the interprofessional OR team¹⁻⁴
- currently, a "code blue" button is activated by the circulating nurse when an intraoperative cardiac arrest occurs in order to summon help leading to:
 - adjacent operating staff attend the code, which only adds **disorder** to the already **chaotic situation**
 - instructions** are **missed** and needlessly **repeated**
- barriers** to effective treatment and better patient outcome is **effective teamwork**⁵⁻⁷
- use of **cognitive aids** to improve team performance in intra-operative cardiac arrests has been proposed

Objectives

- Compare the efficacy of team management of a simulated multi-disciplinary intra-operative cardiac arrest using the CARD protocol to standard management with no cards
- Evaluate the amount of teaching required prior to implementation of the CARD protocol
- Explore the perception of the CARD protocol by teams using qualitative analysis from focus groups

Results

Qualitative findings reveal thematic dimensions including: role definition in crisis management, logistical issues, and the "real life" applicability of CARD.

Role Definition in Crisis Management

Scenario	Feelings	Quotes
Scenario 1	disorganized, chaos, feelings of "not doing anything", communication breakdown	"...we don't want everyone doing the same thing. Everyone is experienced enough to be able to do it but it was like you didn't know whose role was what... It wasn't as organized."
	confusion early on, empowered to carry out assigned tasks, more organized, confidence	"...it actually turns out being more efficient if you have just a few things to worry about instead of trying to be Mr. Everyone for everything."
Scenario 2	enhanced efficiency, improved team focus and concentration, more comfort, less chaos	"I find once the roles are defined, it definitely runs smoother. You don't feel so pulled in so many directions." "It empowers you to do, and you feel better because it's all more efficient and it's faster this way."

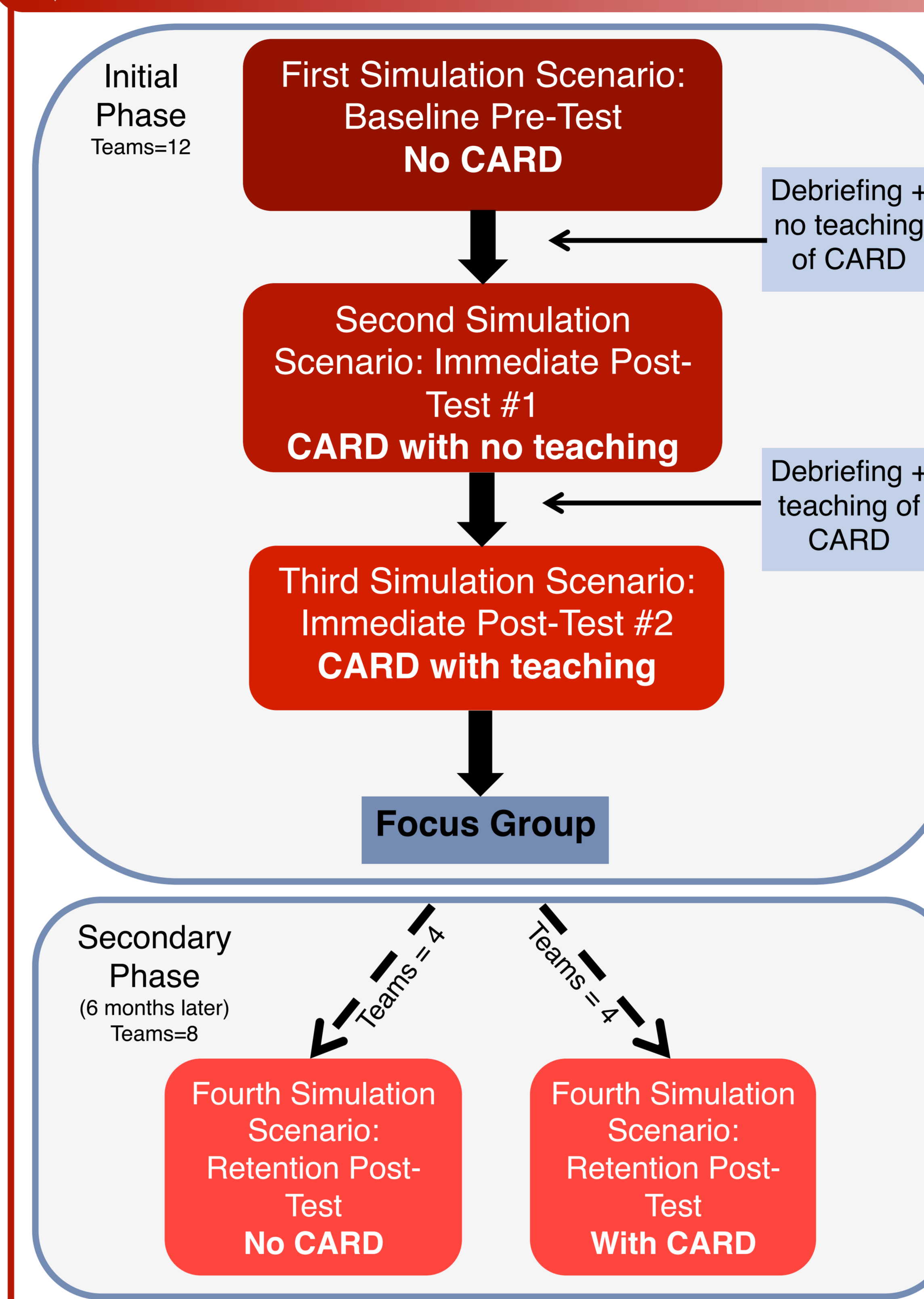
Logistical Issues

- Presentation of CARDS
 - PROS: colour coding by professional groups, size, font choice
 - CONS: descriptions lengthy – limit to keywords
- Access and Distribution
 - good place to store the CARDS is on top of the crash cart, mixed feelings about having a distributor or not: "...if you see it then you'll be able to hand it out. If it's tucked under in the back, no one is going to do it in an emergency situation."

Real Life Applicability

- Resources: implement ongoing training "...for this system to work, you have to do it often enough so people know the roles"
- Suggested Modifications: task distribution among the roles led to some being more complex than others, "Do the cards have a different skill level on them? Like for a new nurse be not capable of doing certain tasks or they're not as proficient at it?"

Methods



Subjects:

- typical participants in a perioperative cardiac arrest were invited to participate on a volunteer basis via email
- subjects were blinded to study content

Study Design:

- 12 interprofessional teams took part in 3 simulated crisis scenarios involving perioperative cardiac arrest
- Scenarios created by simulation experts were based on main causes: haemorrhage, local anaesthetic toxicity, and spinal anaesthesia
- CARD protocol: participants given I.D. cards that are worn around their neck which help the code director quickly recognize the individuals' purpose at the code
- expert led team debriefing for performance rating
- 6 months after completion, a retention test follow up simulation was conducted
- Sample size determined based on convenience: there are only 12 anaesthesia assistants at the Ottawa Hospital so only 12 groups can be blinded

Outcome Measures and Analysis:

- scenarios and debriefings were videotaped for review and analysis
- quantitative data: primary outcome = % hands-on CPR time, secondary outcomes = time to start CPR and clinical skills
- qualitative data: thematic qualitative analysis⁸

Participant Perspectives:

- Benefits at a personal level – feeling more assertive/confident: "...people find it in themselves easier to stay put when they look at the card and say, yeah, I'm supposed to stay put."
- Benefits at the team level – improved organization, communication, efficacy: "You have to have some semblance of order and who you listen to and what your job is."
- Leaders and code directors reported mixed reactions: "...for me I always know what my role is so I don't need the card to tell me what my role is. But to know what roles I have to assist me is a quantum leap forward from before."
- Nurses had positive reactions: "...we could probably start things much sooner if you just go and grab your role and you know you can start doing that immediately, rather than waiting for direction from somebody."

Quantitative findings

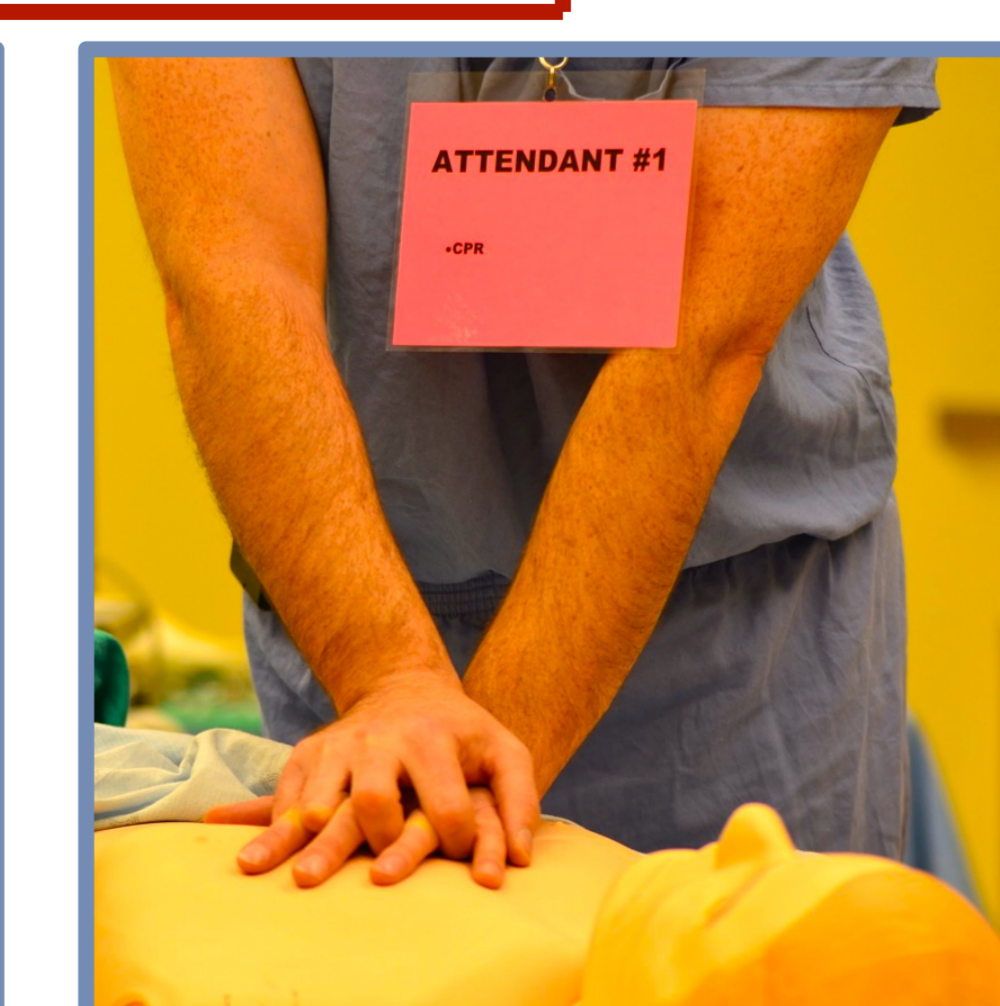
		Scenario 1 no CARD	Scenario 2 CARD no teaching	Scenario 3 CARD with teaching	Scenario 4 Retention no CARD	Scenario 4 Retention with CARD
Global Rating 1-10	Minimum	2.5	3.0	1.0	3.5	3.5
	Median	6.0	6.0	7.3	5.5	5.3
	Maximum	8.5	8.5	9.0	6.5	7.5
TEAM Rating	Minimum	19.5	17.0	16.0	29.0	29.5
	Median	34.3	34.0	37.5	34.0	33.8
	Maximum	42.0	41.0	41.0	36.0	38.5
Delay to start CPR (min:sec)	Minimum	0:07	0:11	0:02	0:09	0:12
	Median	0:30	0:38	0:40	0:15	0:14
	Maximum	1:09	1:19	0:57	1:45	0:44
% Handsoff CPR	Minimum	6.9	12.9	6.6	10.6	7.8
	Median	19.9	21.0	21.6	18.8	15.8
	Maximum	40.0	41.4	41.0	64.0	30.1



"Scribe" roles are to monitor defibrillator and shock, and hand drug tray to nurse



"Med Nurse" roles include preparing medications, and relay drugs given to scribe



"Attendant #1" only role is to perform CPR

Conclusions

- CARD approach to cardiac arrest management is relevant to a broad number of disciplines and profession
- protocol well-received by participants
- Easily exportable to any critical situation including in-hospital arrest, trauma, obstetric or critical care patients
- concept of a self-organizing team with defined roles may be infinitely valuable for patient safety
- CARD system has since been implemented in the OR at the Ottawa Hospital

References

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