

Date 9/27/2011

Title: Efficacy of Disaster Exercises to Augment Hospital Staff Education in Disaster Preparedness

Clinical Question

P (population)	Among hospital clinical staff
I (intervention)	does didactic disaster education in conjunction with disaster exercises*
C (comparison)	as compared to didactic disaster education alone
O (outcome)	increase perception of knowledge, satisfaction and comfort/confidence regarding disaster preparedness?

***Definitions:**

Disaster exercises are used to provide organizations the opportunity to demonstrate, evaluate, and improve the elements of an emergency preparedness plan (FEMA, 2010).

Exercise: Disaster exercises test multiple portions of a disaster preparedness plan including policies, plans and training (FEMA, 2010). Types of exercises include tabletop, functional and full scale exercises.

Target Population Hospital clinical staff

Recommendation

It is strongly recommended that didactic education with the addition of disaster exercises be used to increase clinician's perceived knowledge, satisfaction and comfort/confidence regarding disaster preparedness (*Harder, 2010, [1b]; Hsu, Jenckes, Catlett, Robinson, Feuerstein, Cosgrove, Green, & Bass, 2004, [1b]; Cicero, Blake, Gallant, Chen, Esposito, Guerrero, & Baum, 2009, [2a]; Behar, Upperman, Ramirez, Dorey, & Nager, 2008, [2a]; Franc-Law, Ingrassia, Ragazzoni, & Della Corte, 2008, [3b]; Fung, Loke & Lai, 2008, [4a]; Idrose, Adnan, Villa, & Abdullah, 2007, [4a]; Chi, Chao, Chuang, Tsai, & Tsai, 2001, [4a]; Eriksson, 2009, [5a]; Powers, 2007, [5a]*).

Discussion/Summary of Evidence related to the recommendation(s)

The literature search identified ten relevant articles. According to research evidence utilizing disaster drills/exercises in conjunction with didactic disaster preparedness information increases the learner's perception of knowledge, satisfaction and comfort/confidence regarding disaster preparedness (*Harder, 2010, [1b]; Hsu et al., 2004, [1b]; Cicero, 2009, [2a]; Behar et al., 2008, [2a]; Franc-Law et al., 2008, [3b]; Chi et al., 2001, [4a]; Idrose et al., 2007, [4a]; Fung et al., 2008, [4a]; Eriksson, 2009, [5a]; Powers, 2007, [5a]*).

Perception of Knowledge:

Disaster exercises have been shown to increase the perception of knowledge for exercise participants. In a prospective randomized controlled longitudinal study, Behar et al. found that lecture only as well as lecture along with tabletop exercise (TTX) raised participants' test scores significantly above baseline with scores remaining high up to six months post intervention (*2008 [2a]*). However those who participated in the lecture

augmented by TTX showed a statistically significant increase in test scores ($p=0.016$) over the lecture only group (Behar et al., 2011 [2a]). In a systematic review, Hsu, et al. discovered that staff who participated in exercises demonstrated an increase in understanding of disaster plans and equipment and additionally demonstrated improved patient flow and tracking (2004 [1b]). In addition, those who utilized technology-based education (IE. computer simulation, Internet-based audiographic teleconferencing, video conferencing, and audiovisual instruments) displayed increased knowledge of clinical treatments and had longer retention of knowledge retention (Hsu et al., 2004 [1b]). Franc-Law et al. noted that those who participated in disaster preparedness training simulations had higher scores compared to the control group related to knowledge of and adherence to a structured incident command system ($p<0.001$) (2010 [3b]). Additionally, the authors reported that the increase in disaster triage knowledge was associated with statistically significant decreases in time to triage patients (95%, CI 12 – 75 seconds, $p <0.01$) as compared to the control group (Franc-Law et al., 2010 [3b]). Idrose et al. found in a longitudinal study that the use of exercises among medical responders led to a statistically significant increase in mean test scores among all respondents ($p <0.05$) (2004 [4a]).

Perception of Satisfaction:

Studies of disaster exercises reveal that participants (72%) requested disaster exercises to further their disaster medicine education and likewise expressed a preference for experiential learning to augment didactic education (Cicero et al., 2009, [2a]). Franc-Law et al. found that 100% of their participants reported exercises were valuable and preferential when compared to didactic information alone (2004 [3b]). Disaster exercises were found to be well received by all study participants (MD, RN, EMT-P, assistant nurses and paramedics, ambulance drivers and health attendants) (Idrose et al., 2004 [4a]).

Perception of Comfort/Confidence:

Information from the simulation body of evidence reveals that 91% of those who participated in and evaluated their simulation experiences, expressed an increase in their confidence levels and perceived competence when compared to those who did not participate in simulation training (Harder, 2010 [1b]). On a five point scale, self-reported levels of comfort showed a mean increase from 2.41 to 2.88 ($p = 0.004$) for the lecture along with TTX participants (Behar, et al., 2008 [2a]). Additionally, Hsu et al. demonstrated that disaster exercises lead to increased familiarity (comfort) with disaster plans and equipment, which has a direct effect on patient tracking and flow (2004 [1b]).

Incidental findings reveal that TTX exercises are effective means of providing disaster preparedness education (Behar et al, 2008 [2a]; Chi et al., 2001 [4a]). This information is fortunate, as TTXs are more cost efficient ways to educate staff regarding emergency preparedness than either full scale or functional exercises (Idrose et al., 2007 [4a]).

Physicians scored higher than nurses on all tests (Behar et al., 2008 [2a]; Idrose et al., 2007 [4a]). Hypothetically, this finding may be due to the inclusion of disaster medicine during physician education. Previously, this type of education was not offered to nurses (Fung et al., 2008 [4a]). This finding presents a challenge to hospitals as nurses are commonly the most numerous health care workers employed and likely comprise the largest group of direct responders in disaster scenarios.

References

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Supporting Information

Background / Purpose of BEST Development

As the number of natural and manmade disasters grows, healthcare workers are increasingly called upon to be ready to effectively respond to emergency situations (Cicero et al., 2009 [2a]; Fung et al., 2008 [4a]). The Joint Commission (TJC) and other regulatory bodies require hospitals to perform emergency preparedness exercises on a regular basis in order to ensure hospital and clinician preparedness. The use of disaster exercises are commonly believed to “provide the best method[s] of establishing disaster/major incident plans” (Chi et al., 2001, p. 433 [4a]) and increase healthcare providers preparedness. This initial BEST

statement looks at available evidence and provides a recommendation for the use of disaster exercises in conjunction with didactic disaster preparedness information to increase clinician's perceived knowledge, satisfaction and comfort/confidence with disaster response.

Outcome or Process Measures

1. Pre and post test measurements (knowledge)
2. Survey (satisfaction, comfort/confidence)

Search Strategy

The search strategy was comprehensive and included the following databases:

Medline, Cinahl, Google Scholar, Cochran Library

Search terms included:

Disaster, disaster drill, disaster drill exercise, disaster preparedness, disaster education, emergency education, experiential learning, situated learning, mass casualty incident, simulation, drills, disaster exercise, table top drill, functional drill, full scale drill.

References from the articles retrieved through the above search terms were hand-searched.

Limits on the search include

English language only,

Date range of 2000 -2011, peer reviewed and references available.

The date of the last search was April 19, 2011.

Relevant CCHMC Evidence-Based Documents

CCHMC Policies: EOC-700 CCHMC Emergency Preparedness Program Plan
EOC-708 CCHMC Evacuation Drill Program Plan

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Conflicts of Interest were declared for each team member and:

No financial conflicts of interest were found.

The following financial conflicts of interest were disclosed:

Note: Full tables of evidence grading system available in separate document:

- [Table of Evidence Levels of Individual Studies by Domain, Study Design, & Quality](#) (abbreviated table below)
- [Grading a Body of Evidence to Answer a Clinical Question](#)
- [Judging the Strength of a Recommendation](#) (abbreviated table below)

Table of Evidence Levels (see note above)

Quality level	Definition
1a ⁺ or 1b ⁺	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5a or 5b	General review, expert opinion, case report, consensus report, or guideline
5	Local Consensus

†a = good quality study; b = lesser quality study

Table of Recommendation Strength (see note above)

Strength	Definition
It is strongly recommended that... It is strongly recommended that... not...	There is consensus that benefits clearly outweigh risks and burdens (or visa-versa for negative recommendations).
It is recommended that... It is recommended that... not...	There is consensus that benefits are closely balanced with risks and burdens.
There is insufficient evidence and a lack of consensus to make a recommendation...	

Dimensions for Judging the Strength of the Recommendation

Reflecting on your answers to the dimensions below and given that more answers to the left of the scales indicates support for a stronger recommendation, complete one of the sentences above to judge the strength of this recommendation. (Note that for negative recommendations, the left/right logic may be reversed for one or more dimensions.)

1. Grade of the Body of Evidence*	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low
2. Safety / Harm* (Side Effects and Risks)	<input checked="" type="checkbox"/> Minimal	<input type="checkbox"/> Moderate	<input type="checkbox"/> Serious
3. Health benefit to patient*	<input checked="" type="checkbox"/> Significant	<input type="checkbox"/> Moderate	<input type="checkbox"/> Minimal
4. Burden on patient to adhere to recommendation	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Unable to determine	<input type="checkbox"/> High
5. Cost-effectiveness to healthcare system	<input checked="" type="checkbox"/> Cost-effective	<input type="checkbox"/> Inconclusive	<input type="checkbox"/> Not cost-effective
6. Directness of the evidence for this target population	<input checked="" type="checkbox"/> Directly relates	<input type="checkbox"/> Some concern of directness	<input type="checkbox"/> Indirectly relates
7. Impact on morbidity/mortality or quality of life	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low

Comments on Dimensions (optional):

Copies of this Best Evidence Statement (BEST) and related tools (if applicable, e.g., screening tools, algorithms, etc.) are available online and may be distributed by any organization for the global purpose of improving child health outcomes.

Website address: <http://www.cincinnatichildrens.org/svc/alpha/h/health-policy/best.htm>

Examples of approved uses of the BEST include the following:

- copies may be provided to anyone involved in the organization's process for developing and implementing evidence based care;
- hyperlinks to the CCHMC website may be placed on the organization's website;
- the BEST may be adopted or adapted for use within the organization, provided that CCHMC receives appropriate attribution on all written or electronic documents; and
- copies may be provided to patients and the clinicians who manage their care.

Notification of CCHMC at EBDMinfo@cchmc.org for any BEST adopted, adapted, implemented, or hyperlinked by the organization is appreciated.

Please cite as: Cincinnati Children's Hospital Medical Center: Efficacy of Disaster Exercises to Augment Hospital Staff Education in Disaster Preparedness , <http://www.cincinnatichildrens.org/svc/alpha/h/health-policy/best.htm>, BEST 112, pages 1-6, 9/27/11.

This Best Evidence Statement has been reviewed against quality criteria by 2 independent reviewers from the CCHMC Evidence Collaboration.

For more information about CCHMC Best Evidence Statements and the development process, contact the Evidence Collaboration at EBDMinfo@cchmc.org.

Note

This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.