Appendix A: Expert Reviewers

Organization	Last Name	First Name	Location and Position
Internal Reviewers - Johns Hopkins University			
Johns Hopkins University	VanRooyen	Michael	Johns Hopkins University Center for International Emergency, Disaster and Refugee Studies Baltimore, MD
Johns Hopkins University	O'Toole	Tara	JHU Center for Civilian Biodefense Strategies Baltimore, MD
Johns Hopkins University	Inglesby	Thomas	JHU Center for Civilian Biodefense Strategies Baltimore, MD
Government			
Health Resources and Services Administration (HRSA)	Bossler	Sumner	Commander, United States Public Health Service Health Resources and Services Administration's Bioterrorism Preparedness Program Rockville, MD
Agency for Health Care Research and Quality (AHRQ)	Phillips	Sally	Agency for Healthcare Research and Quality's Center for Primary Care Research Rockville, MD
University			
Vanderbilt School of Nursing	Conway-Welch	Colleen	Dean, Vanderbilt School of Nursing Nashville, TN
University of Alabama at Birmingham	Terndrup	Thomas	Professor and Chair, Department of Emergency Medicine Director, Center for Disaster Preparedness University of Alabama at Birmingham Birmingham, AL
Philadelphia Veterans Administration Medical Center	Henning	Kelly	Philadelphia Veterans Administration Medical Center Division of Infectious Diseases, University of Pennsylvania Philadelphia, PA
St. Louis University School of Public Health	Evans	Greg	Director, Center for Study of Bioterrorism and Emerging Infection, School of Public Health, St. Louis University St. Louis, MO

Appendix A: Expert Reviewers (continued)

Harbor-UCLA Medical Center	Kaji	Amy	Department of Emergency Medicine Harbor-UCLA Medical Center Torrance, CA
Professional Organizations			
Joint Commission for Accreditation of Health Organizations (JCAHO)	Smith	Marc	Chair, Joint Commission for Accreditation of Health Organizations roundtable on emergency preparedness Washington, DC
Society for Medical Decision Making (SMDM)	Bravata	Dena	Center for Primary Care and Outcomes Research Stanford University School of Medicine Stanford, CA

Appendix B: Priority Journals[a]

Academic Emergency Medicine
Annals of Emergency Medicine
Clinical Infectious Diseases
Disasters
ED Management
Emergency Medicine Clinics of North America
Emerging Infectious Diseases
Hospital Security and Emergency Management (formerly Hospital Security and Safety Management)
Journal of Emergency Nursing
Military Medicine
Morbidity and Mortality Weekly Report (MMWR)
Prehospital and Disaster Medicine
Prehospital Emergency Care

[a] All volumes of the journals listed were searched during the month of January 2003.

Appendix C: Methodological Approach to Searching Literature Sources

Search Strategy for PubMed®

(disaster planning[mh] OR disaster*[tiab] OR mass casualt*[tiab] OR mass-casualt*[tiab]) AND (drill*[tiab] OR simulation[tiab] OR exercise*[tiab]) AND eng[la] NOT (animal[mh] NOT human[mh]) NOT (review[pt] OR meta-analysis[pt])

Search Strategy for the Cochrane CENTRAL Register of Controlled Trials

(((DISASTER* or CATASTROPH*) or BIOTERRORISM) or CASUALT*)

((((EXERCISE* or TABLETOP) or SIMULAT*) or DRILL*) or TRAIN*)

(#1 and #2)

Search Strategy for the Excerpta Medica Database

#1Disaster Planning/
#2disaster$.tw
#3mass casualt$.tw
#4hospital$.tw
#5Emergency Health Service/
#6drill$.tw
#7simulation.tw
#8exercise$.tw
#91 or 2 or 3
#104 or 5
#116 or 7 or 8
#129 and 10 and 11

Search Strategy for the Specialized Register of Effective Practice and Organization of Care Cochrane Review Group

(disaster* OR catastroph* OR bioterrorism OR "biological weapon" OR casualt*) AND (exercise OR tabletop OR simulat* OR drill* OR train*)

Search Strategy for the Educational Research Information Clearinghouse

(poison,poisoning,"communicable disease","disease control",bioterrorism,"biological warfare",disaster,catastroph*) + ("health personnel","allied health personnel","health services") + ("program evaluation","course evaluation")

Search Strategy for the Research and Development Resource Base in Continuing Medical Education

'disaster' in indexed and non-indexed fields.

Appendix D: Coding Forms—Abstract Review Form

EPC Bioterrorism Update Project (BT2)Reviewer: _____
Abstract Review Form
Data Entry: _____

Delete article because (check one):

☐ not in English

☐ does not include human data

☐ no original data

☐ meeting abstract (no full article for review)

☐ does not include hospital staff

☐ does not include response to MCI or a disaster

☐ does not include training or education

☐ has no evaluation

☐ other: (specify)

_____

☐ **Unclear: get article to decide**

Do not go on if any item above is checked.

Article addresses following questions (check all that apply):

Effective methods to train hospital staff to respond to MCI**:**

☐ the effectiveness of *hospital disaster drills* (#1a)

☐ the effectiveness of *computer simulation* (#1b)

☐ the effectiveness of *"tabletop" or other exercises* (#1c)

☐ *methods or tools* that have been used to evaluate the effectiveness of training (#2)

☐ This article does not apply to any of the questions

☐ Get article for reference regarding:_____

Johns Hopkins University Evidence-based Practice Center
Hospital Disaster Drill Article *Quality* Review Form

Article ID: _____ Reviewer 1:_____ Reviewer 2:._____

Section I: Article Eligibility

Article is not eligible for review because (Check one):

- ○ Not in English
- ○ Does not include human data
- ○ No original data
- ○ Meeting abstract (No full article to review)
- ○ Does not include hospital staff
- ○ Does not include response to mass casualty incident (MCI) or a disaster
- ○ Does not include training or education
- ○ No evaluation
- ○ Article does not apply to any of the research questions
- ○ Other (Specify): _____

IF ANY OF THE ABOVE ITEMS IS CHECKED, STOP: DO NOT COMPLETE FORM

Section II: **Focus of Article**

Article provides information to address the following questions (Check all that apply):

- ☐ What is the effectiveness of *hospital disaster* drills in training hospital staff to respond to an MCI?
- ☐ What is the effectiveness of *computer simulations* in training hospital staff to respond to an MCI?
- ☐ What is the effectiveness of *"tabletop" or other exercises* in training hospital staff to responded to an MCI?
- ☐ What *methods or tools* have been used to evaluate the effectiveness of hospital disaster drills, computer simulations, tabletop, or other exercises in training hospital staff to respond to an MCI?

Section III: Representativeness of Targeted Hospital Staff

For each question, circle one response.

1. Were detailed descriptions of subjects provided?

a.	Adequate	(Detailed description, e.g., number of doctors, number of nurses, etc.)	2
b.	Fair	(Some general description, e.g., professionals involved)	1
c.	Inadequate	(Minimal description or none at all, e.g., disaster team)	0

2. Were the setting and department(s) described?

a.	Adequate	(Setting and departments described in sufficient detail to replicate)	2
b.	Fair	(Setting OR departments NOT reported OR poor descriptions)	1
c.	Inadequate	(Neither specified)	0

Section IV: Bias and Confounding

For each question, circle one response.

3. Was there a comparison group?

a.	Adequate	(Concurrent and similar group)	2
b.	Fair	(Non-concurrent OR non-similar)	1
c.	Inadequate	(Non-concurrent and non-similar)	0
d.	None	⇨Skip to item **7**	

4. Was assignment of study groups randomized?

a.	Yes	2
b.	No	0
c.	Unclear	0

5. Did the education intervention groups have any important differences on key factors at baseline?

   Key Factors:
   Profession (e.g., Nurses, Emergency Medical Technicians, Doctors)
   Specialty (e.g., Emergency Medicine, Internal Medicine, Pediatrics)

a.	Groups equivalent in all key factors	2
b.	Groups have minor difference in 1 factor	1.5
c.	Groups have major difference in 1 factor or minor differences in more than 1 factor	1
d.	No information about groups' characteristics or inadequate to compare	0

6. Was there any intervention other than the educational intervention of interest that differed between groups?

a.	Yes	0
b.	No	2
c.	Unclear	0

Section V: Description of Intervention

For each question, circle one response.

7. Are the objectives of the intervention clearly stated in specific measurable terms?

a.	Adequate	(Objectives clearly stated in measurable terms)	2
b.	Fair	(Objectives stated but not stated in specific measurable terms)	1
c.	Inadequate	(Objectives not stated)	0

8. Did the objectives of the intervention specifically take into consideration knowledge, beliefs/attitudes, skills, behaviors, or clinical outcomes?

a.	Adequate	(Considers any 3 of 5)	2
b.	Fair	(Considers 1 or 2 of 5)	1
c.	Inadequate	(Considers none of the above)	0

9. Was there a complete description of the educational methods, content, resources, and organization of the educational intervention?

a.	Adequate	(Intervention could be replicated given the completeness of description)	2
b.	Fair	(Some detail but insufficient to ensure replication)	1
c.	Inadequate	(No detail)	0

10. Were the key people measuring the educational outcomes appropriately masked to intervention?

a.	Yes	2
b.	No	0
c.	Unclear	0

Section VI: Outcomes of the Educational Intervention

For each question, circle one response.

11. Outcomes of the educational intervention were based upon:

a.	Pre- and post-intervention evaluation	2
b.	Post-intervention evaluation	1
c.	Neither pre- nor post-intervention evaluation	0

12. Are the evaluation methods described in sufficient detail to replicate?

a.	Adequate	(Evaluation methods could be replicated)	2
b.	Fair	(Evaluation methods described but could not be replicated)	1
c.	Inadequate	(Evaluation methods not described)	0

13. Were objective methods used to evaluate outcomes?

a.	Adequate	(Evaluation methods were objective)	2
b.	Fair	(Objectivity of evaluation is questionable)	1
c.	Inadequate	(Evaluation methods not objective)	0

14. Was there any evaluation of long-term retention of information related to training hospital staff in case of an MCI event?

a.	Yes	(At least one month after completion of the intervention)	2
b.	No		0

Section VII: Statistical Quality and Interpretation

For each question, circle one response.

15. Was there quantitative data analysis?

a.	Yes	⇨ Continue on with questions 16 - 18 below
b.	No	⇨ Thank you, your form is complete

16. For primary endpoints of the evaluation, does the study report the magnitude of difference between groups AND an index of variability (e.g., test statistic, p value, standard error, confidence interval)?

a.	Adequate	(Both reported with index of variability using standard error or confidence intervals)	2
b.	Fair	(Both reported with index of variability using only test statistic or p value)	1
c.	Inadequate	(One or both not reported)	0
d.	No comparison group		

17. Were the appropriate analyses and statistical tests performed?

a.	Adequate	(Yes for all analyses)	2
b.	Fair	(Yes for only some of the analyses)	1
c.	Inadequate	(Not for any of the analyses or can’t tell)	0

18. If groups were not comparable at study onset, was there adjustment of potential confounders with multi-variate or stratified analyses AND were confounders coded in a way to make such control adequate?

a.	Adequate	(Adjustment done AND confounders appropriately coded)	2
b.	Fair	(Adjustment done BUT confounders not coded appropriately OR coding unclear OR can't tell)	1
c.	Inadequate	(Adjustment not done OR comparability not previously reported)	0
d.	No comparison group		

THANK YOU! For completing this form. Please return it to Mollie.

Johns Hopkins University Evidence-based Practice Center
Hospital Disaster Drill Article *Content* Review Form

Article ID: _____ Reviewer 1: _____ Reviewer 2: _____

1. Funding agency (Check all that apply):
   - ☐ Federal government agency (Specify): _____ ☐ Other (Specify):_____
   - ☐ State/local government agency (Specify): _____ ☐ Not specified
   - ☐ Hospital

2. What group or organization requested this drill? (Check all that apply):
   - ☐ State/local government agency (Specify): _____
   - ☐ Hospital
   - ☐ Other (Specify): _____

3. Type of mass casualty event addressed (Check all that apply):
   - ☐ Biological
   - ☐ Nuclear
   - ☐ Radiational
   - ☐ Chemical
   - ☐ Incendiary device
   - ☐ Natural disaster (e.g. fire, earthquake)
   - ☐ Structural collapse
   - ☐ Transportation accident
   - ☐ Other (Specify): _____
   - ☐ Not stated

4. Type of training intervention (Check all that apply):
   - ☐ Disaster drill
   - ☐ Computer simulation
   - ☐ Tabletop exercise
   - ☐ Other (Specify): _____

5. Type of hospital staff targeted (Check all that apply):
   - ☐ Administrator
   - ☐ Nurse
   - ☐ Physician
   - ☐ First responder (e.g., Emergency Medical Technician)
   - ☐ Other (specify): _____
   - ☐ Not specified

Appendix D: Coding Forms—Content Review Form (continued)

6. Total number of targeted hospital staff: | Total N: | | ☐ Not stated

7. Hospital departments or units involved:

☐ Emergency Medicine	☐ Pediatrics	☐ Social work
☐ Intensive Care Unit	☐ Pharmacy	☐ Central supply
☐ Radiology	☐ Nursing	☐ All hospital
☐ Surgery	☐ Public affairs	☐ Other (Specify): _____
☐ Medicine	☐ Security	☐ Not specified

8. Number of hospitals participating in training intervention: _____

9. Other entities participating in training intervention:

☐ Emergency Medical System	☐ Federal agency
☐ Fire	☐ State agency
☐ Police	☐ None
☐ Local health department	☐ Not specified

10. In what part of the world was the intervention mainly performed? (Check all that apply)

☐ Africa	☐ Mexico, South or Central America
☐ Asia	☐ U.S.
☐ Australia	☐ Other (Specify): _____
☐ Canada	☐ Not specified
☐ Europe	

11. What was the length of the drill or exercise?

☐ < 1 day	☐ 8 - 30 days	☐ Not specified
☐ 1 - 7 days	☐ > 30 days	

12. How long after the close of the drill or exercise was the assessment completed? (i.e., post-testing)

☐ < 1 day	☐ 8 - 30 days	☐ > 365 days
☐ 1 - 7 days	☐ 31 - 365 days	☐ Not specified

13. Was retention of knowledge assessed (greater than one day post-intervention)?

☐ Yes ☐ No ☐ Can’t tell

14. Training evaluation methods (check all that apply):

- ☐ Group interviews/debriefings
- ☐ Individual interviews/debriefings
- ☐ Written exam or questionnaire
- ☐ Self-assessment forms
- ☐ Trained casualties
- ☐ Trained "smart" casualties[1]
- ☐ Trained observers
- ☐ Trained "smart" observers[1]
- ☐ Other observers
- ☐ Computer interactive tests
- ☐ Other (Specify): _____
- ☐ Not specified

15. Measurable Objectives? ☐ Yes ☐ No

Objectives ✔ **all that apply**	Record any stated objective(s) according to the type of objectives for targeted learners. (e.g., Knowledge objective: hospital staff will be able to describe their roles in the hospital command and control scheme)
Knowledge ☐	
Attitudes/beliefs ☐	
Skills ☐	
Behaviors ☐	
Clinical outcomes ☐	

[1] "Smart" casualties and observers are people with medical training.

Comments: _____

_____

_____

16. Results: record *qualitative* and *quantitative* measures of outcomes (e.g., External communications: completed within one hour timeline OR Security: noted to be present)

Incident control system (ICS)	
Triage	
Internal communications	
External communications	
Patient care	
Patient flow	
Security	
Materials/resources	
Decontamination	
Patient tracking	
Other (Specify):_____ _____	
Other (Specify):_____ _____	

Comments: _____

_____

_____

17. Main conclusion (Please limit to one sentence):

_____

_____

_____

18. Any other comments?

_____

_____

_____

_____

_____

THANK YOU! For completing this form. Please return it to Mollie.

Appendix E: Evidence Tables

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a]

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Hospital disaster drills						
Baughman, 1990 U.S.	Disaster drill; hospital fire and explosion in the emergency department	1	Emergency medicine; intensive care unit; nursing; security; other departments.	Nurses; physicians. (N=NS[a])	K: To assess what resources would be available if 1) the usual triage team was unable to perform because of injuries, 2) usual treatment area was not available because of a disaster in that location. S: To assess intensive care unit nurses' ability to triage victims.	Not specified.
Chobin, 1989 U.S.	Disaster drill; chemical	1	Administration; emergency medicine; nursing; security.	Administrator (CEO[a]); nurses; physicians; first responders; telephone operator; security office; nursing administration; admitting; maintenance. (N=NS[a])	K: To test the preparedness of the necessary resources (hospital employees, hospital fire brigade, emergency room staff, local fire department) in the event of an ethylene oxide spill.	Not specified.
Classic, 2000 U.S.	Disaster drill; radiational	1	Emergency medicine; security; hospital communications; facilities; operations; radiational safety.	Nurses; physicians; radiation safety staff. (N=NS[a])	S: To assess the function of intercom and security systems in radiation emergency. B: To assess the time to contact radiation safety staff and set up portable decontamination area; appropriateness of setup of triage area.	Group interviews/debriefings.

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] "Smart" casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Cook, 1990 U.S.	Disaster drill; transportation accident	1	All hospital.	Not specified. (N=NS[a])	K: To understand overall implementation of hospital disaster plan and how their departments interact. S: To move disaster victims through the hospital system as appropriately and efficiently as possible. C/O: To minimize patient time spent in each area waiting for disposition.	Group interviews/debriefings; "smart" observers[c]; observer checklists.
Eisner, 1985 U.S.	Disaster drill; transportation accident	>1 (but only data on 1)	Emergency medicine.	First responders; physicians; triage team. (N=NS[a])	K: To gain knowledge of time needed to initiate care of patients from an airplane disaster at the local airport. S: To initiate care to patients with varying degrees of injury severity in a timely manner. C/O: To evaluate triage of victims and severity of injuries by arrival time at trauma center.	Mock disaster patient charts.
Fishel, 1974 U.S.	Disaster drill; transportation accident	18	Central supply; emergency medicine; nursing; security;	Nurses; physicians, first responders. (N=NS[a])	K: To evaluate the effectiveness of the total exercise operation. S: To assess the transportation of 300 victims to 18 hospitals by ambulance and bus.	Group interviews/debriefings; "smart" observers[c].

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] "Smart" casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Gofrit, 1997 Middle East	Disaster drill; NS[a]	8	Emergency medicine; nursing; radiology; surgery.	First responders; nurses; physicians. (N=NS[a])	C/O: To assess the feasibility of integrating physicians among the simulated casualties of a hospital disaster drill.	Group interviews/debriefings; written exam or questionnaire; "smart" casualties[c].
Gretenkort, 2002 Europe	Disaster drill; hospital fire	1	Nursing; central supplies; inpatient units.	Administrators; first responders; nurses; physicians. (N=500)	K: To educate the coordinating physician of the hospital in communication procedures during an MCI[a]. S: To evacuate immobile patients quickly and effectively to designated collection points. C/O: Comparison of patient evacuation time with group using *carry sheet* versus single person using *Jaerven Rescue Drag Sheet.*	Group interviews/debriefings; "smart" observers[c]; other observers; patient impersonators.
Halstead, 1993 U.S.	Disaster drill; hospital fire in operating room	1	Nursing; security; surgery; operating room staff.	Nurses; physicians. (N=48)	K: To list the three elements of fire; know how to initiate the procedure for notifying hospital personnel of fire; know the location of the fire extinguishers. S: To know how to use fire extinguishers. S: To evacuate patients safely.	Group interviews/debriefings; "smart" observers[c].

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] "Smart" casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Lau, 1997 Asia	Disaster drill; transportation accident	1	Emergency medicine; nursing; radiology; security; central supplies; emergency mobile team.	Administrators; nurses; physicians; security; transport staff. (N=60)	K: To familiarize hospital staff with the disaster plan and with their roles in disaster management. S: To handle patient flow in an orderly and timely manner; to appropriately triage patients. B: To test the efficiency of the plan and coordinate among hospital departments during disaster management.	Group interviews/debriefings.
Maxwell, 1987 U.S.	Disaster drill; transportation accident	1	Not specified.	Physicians; first responders. (N=NS[a])	K: To assess the value of using victim- tracking cards in a hospital disaster drill. C/O: To appropriately triage and transport casualties to the correct treatment areas.	Group interviews/debriefings; trained casualties; victim-tracking cards.
Menczer, 1968 U.S.	Disaster drill; incendiary device and boiler explosion	4	Emergency medicine	Physicians, first responders. (N=NS[a])	S: To assess handling and transportation of victims; to assess first aid at the scene of a disaster; to assess medical care at the hospital after a disaster.	Written exam or questionnaire, trained casualties, videotape.
Paris, 1985 U.S.	Disaster drill; transportation accident	NS[a]	Not specified.	Not specified. (N=NS[a])	S: To analyze the care provided to victims in a community airport disaster drill.	"Smart" casualties[c]; triage cards.

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] "Smart" casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Saxena, 1986 U.S.	Disaster drill; chemical	1	Emergency medicine.	Physicians, first responders. (N=NS[a])	B: To demonstrate the capability to make a coordinated response to a hazardous materials incident by dispatching appropriate local and state response vehicles and teams; to exercise chemical disaster emergency plans within political guidelines; to meet the information needs of federal, state, and local government agencies by establishing on-site communications from an incident site; to demonstrate the ability to notify and assemble emergency response personnel at the scene of a chemical disaster and at Emergency Operating Center; to demonstrate the ability to cooperatively and effectively manage hazardous material accidents; to demonstrate the capabilities of a major hospital emergency room to handle the chemical disaster.	Not specified.

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] "Smart" casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Tur-Kaspa, 1999 Middle East	Disaster drill; chemical	21	All hospital.	Not specified. (N=NS[a])	S: To evaluate the quality of patient care in response to a chemical disaster. C/O: To evaluate the ability to provide continuity of patient care in response to a chemical disaster.	"Smart" casualties[c]; "smart" observers[c]; other observers (administrative personnel); Army physicians with experience in managing chemical casualties.
Weston, 1988 Europe	Disaster drill; hospital fire in operating room	1	Nursing; security; surgery.	Administrators; nurses; physicians. (N=NS[a])	S: To assess time to evacuation.	Group interviews/debriefings; "smart" observers[c]; other observers.
Computer simulations						
Levi, 1998 Middle East	Computer simulation; NS[a]	1	Senior management.	Administrators. (N=NS[a])	B: To evaluate hospital disaster plan without activating whole system (to carry out a limited scale drill); to train decision makers. C/O: To assist in managing real situations by identifying bottlenecks and evaluating solutions.	Group interviews/debriefings; other observers; constructing a detailed computerized scenario.

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] "Smart" casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Tabletop and other exercises						
Burns, 1984 Not specified	Tabletop exercise (competitive simulation); incendiary device	1	Emergency medicine; nursing.	Nurses; emergency management team. (N=NS[a])	K: To evaluate nursing care for persons with burn injuries. B: To assess 5 performance objectives, each requiring 4 to 5 activities (these were not specified further).	Written exam or questionnaire; self assessment forms; other observers.
Gray, 1996 Middle East (Saudi Arabia)	Other exercise (video simulation); transportation accident	1	All hospital.	First responders; nurses. (N=500+ viewed video within 2 weeks)	K: To evaluate information recall in a group of hospital employees who had seen the video versus a group who had read the disaster plan.	Written exam or questionnaire.
Inglesby, 2001 U.S.	Other exercise; biological	3	Emergency medicine; intensive care unit; medicine; pharmacy; security.	Not specified. (N=NS[a])	K: To test readiness of top government and other officials to respond to terrorist attacks directed at multiple geographic locations.	Group interviews/debriefings; individual interviews/debriefings.

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] "Smart" casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 1. Characteristics of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year location	Type(s) of training intervention, type(s) of event addressed	Hospitals involved (N)	Hospital department(s) involved	Type(s) of hospital staff targeted, total staff involved (N)	Training objective(s)[b]	Training evaluation method(s)
Levy, 2000 Eastern Europe (Russian Federation, Armenia, Estonia, Georgia, Moldova, Ukraine)	Other exercise (audio-graphic teleconferencing); radiational	NS[a]	Emergency medicine.	Emergency department staff. (N=NS[a])	K: To recognize accidental exposure to radiation. B: To perform medical assessment of exposed victims; to estimate radiation exposure; to report to national authorities; to establish communication between participating counties. C/O: To achieve coordination and consultation regarding victims.	Group interviews/debriefings.

[a] Abbreviations: CEO = chief executive officer, MCI = mass casualty incident, NS = not stated
[b] Key: K = Knowledge, S = Skills, B = Behavior, C/O = Clinical outcome
[c] “Smart” casualties and observers have medical training

Appendix E: Evidence Tables (continued)

Evidence Table 2. Quality of studies evaluating training programs for hospital staff to respond to an MCI[a]

Author, year	Representativeness[b]	Bias[c]	Description[d]	Outcomes[e]	Statistics[f]	Total score[g]
Hospital disaster drills						
Baughman, 1990	0	N/A	38	25	N/A	21
Chobin, 1989	75	N/A	63	13	N/A	50
Classic, 2000	75	N/A	25	25	N/A	42
Cook, 1990	25	N/A	63	63	N/A	50
Eisner, 1985	25	N/A	38	50	N/A	38
Fishel, 1974	75	N/A	38	13	N/A	42
Gofrit, 1997	50	N/A	25	38	N/A	38
Gretenkort, 2002	50	N/A	50	50	0	38
Halstead, 1993	100	N/A	75	50	N/A	75
Lau, 1997	75	N/A	38	38	N/A	50
Maxwell, 1987	50	N/A	63	63	100	69
Menczer, 1968	75	N/A	50	38	N/A	54
Paris, 1985	25	N/A	25	38	N/A	29
Saxena, 1986	50	N/A	63	13	N/A	42
Tur-Kaspa, 1999	50	N/A	38	25	N/A	38
Weston, 1988	25	N/A	25	25	N/A	25
Computer simulations						
Levi, 1998	0	N/A	38	13	N/A	17

Appendix E: Evidence Tables (continued)

Evidence Table 2. Quality of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year	Representativeness[b]	Bias[c]	Description[d]	Outcomes[e]	Statistics[f]	Total score[g]
Tabletop and other exercises						
Burns, 1984	50	N/A	50	75	50	56
Gray, 1996	50	69	38	50	100	61
Inglesby, 2001	50	N/A	38	25	N/A	38
Levy, 2000	50	N/A	38	25	N/A	38

[a] Abbreviations: MCI = mass casualty incident, N/A = not applicable.
[b] Representativeness: The total maximum for this section was 4 points. This included detailed descriptions of subjects provided (maximum 2 points) and the setting and department(s) described (maximum 2 points).
[c] Bias (and confounding): The total maximum for this section was 8 points. This included presence of a comparison group (maximum 2 points), assignment of study groups (maximum of 2 points), whether the education intervention groups had important differences on key factors at baseline (maximum 2 points), and intervention other than the educational intervention of interest that differed between groups (maximum 2 points).
[d] Description (of intervention): The total maximum score for this section was 8 points. This included the objectives of the intervention clearly stated in specific measurable terms (maximum 2 points), whether the objectives of the intervention specifically took into consideration knowledge, beliefs/attitudes, skills, behaviors, or clinical outcomes (maximum 2 points), complete description of the educational methods, content, resources and organization of the educational intervention (maximum 2 points), and the key people measuring the educational outcomes appropriately masked to intervention (maximum 2 points).
[e] Outcomes (of the educational intervention): The total maximum for this section was 8 points. This included outcomes of the educational intervention based on pre- and post-intervention evaluation (maximum 2 points), the evaluation methods described in sufficient detail to replicate (maximum 2 points), objective methods used to evaluate outcomes (maximum 2 points), and evaluation of long-term retention of information relating to training hospital staff in case of a MCI (maximum 2 points).
[f] Statistics (quality and interpretation): The total maximum for this section was 6 points. This included the magnitude of difference between groups and an index of variability for primary endpoints (maximum 2 points), the appropriate analyses and statistical tests performed (maximum 2 points), and adjustment of potential confounders with multi-variate or stratified analyses and confounders coded (maximum 2 points).
[g] Total score: Mean of the percent scores from the previous four categories.

Appendix E: Evidence Tables (continued)

Evidence Table 3. Results of studies evaluating training programs for hospital staff to respond to an MCI[a]

Author, year	Type(s) of event addressed	Results	Summary/conclusion
Hospital disaster drills			
Baughman, 1990	Hospital fire and explosion in the emergency department	**Incident control:** Confusion resulted because no single person was designated as incident commander. **Triage:** Usual triage area was not available causing confusion. Secondary staff was inexperienced in triage. **Internal communications:** Considerable time delay because ED[a] was immobilized. **Patient care:** Treatment began in triage areas before patients were sent to treatment areas. **Patient flow:** No triage area. **Security:** Security informed fire department of situation. **Resources:** Disaster charts not available because stored in ED[a].	Disaster located in the ED[a] immobilized procedures, revealing deficiencies in the internal chain of command, distribution of disaster charts, and training of nurses in triage.
Chobin, 1989	Chemical	**Internal communications:** Hospital operator was called using established hotline. Hospital fire brigade alerted by code. Hospital operator notified nursing administration. **External communications:** Requested assistance from local fire department. Requested hospital Chief Executive Officer to call a disaster code. **Patient flow:** Victims evacuated to ED[a]. **Resources:** Fire department arrives on scene in full gear: material safety data sheet and breathing apparatus used. **Patient tracking:** Admitting personnel present in ED[a] making charts and identification bracelets.	Enactment of a disaster drill involving both external and internal response, and involving multiple departments with simulated patients, enables the departments, hospital and local agencies to test Occupational Safety and Health Agency-required disaster plans before an emergency arises.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Evidence Table 3. Results of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year	Type(s) of event addressed	Results	Summary/conclusion
Classic, 2000	Radiational	**Triage:** Physical barriers to identify "hot", "warm", and "cold" zones for ambulatory victims not used correctly. **Internal communications:** Intercom system inadequate, as message could not be clearly understood. Fire alarms worked well. Radiation call staff contacted successfully. **External communications:** Contact of radiation safety immediate, but message incomplete (significant deficiency). **Patient care:** Plan to use building exits as "choke points" for screening works well. **Patient flow:** 30 victims transported to ED[a]. **Security:** Security of building and perimeter exceeded the standards. **Decon[a]:** County Hazardous Materials Response Team required an hour to set-up the portable decon[a] facility. Only one nurse had been released to prepare the hospital decon[a] facility, an activity that requires at least two people. Victims found dead on the scene are not released to local funeral homes until they have first gone to the autopsy laboratory, allowing hospital control of the body in the event it is contaminated. **Other:** Disaster response personnel needed special identification. Bioassay specimen collection needed for those with radiation exposure. Access to facilities may not be able to occur within regulatory time frames.	Drill provided education to spill team members and identified areas for improvement in response. Drill was not only educational but also built responder confidence in abilities.
Cook, 1990	Transportation accident	**Incident control:** Less confusion. **Internal communications:** Overhead announcement not heard. Some vital personnel had not received new disaster plan. **Patient flow:** Less congestion in triage and ED[a] since personnel reported directly to assigned areas rather than to the ED[a] to ask for guidance. **Other:** At least one person in each department now has an in-depth understanding post drill. Staff stress levels more manageable with game approach.	Use of a game approach in disaster planning produced benefits in increased understanding of disaster plans, identification of disaster plan flaws, and increased coordination regarding thoughtfully planned disaster care.
Eisner, 1985	Transportation accident	**Triage:** 53% of the group that needed immediate care arrived at care location greater than 1.5 hours post-disaster. 15% of patients triaged were discharged home compared to 85% of patients requiring hospital admission.	Simulation of an airplane crash at a local airport revealed a long delay in patient care for seriously or critically injured people.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Evidence Table 3. Results of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year	Type(s) of event addressed	Results	Summary/conclusion
Fishel, 1974	Transportation accident	**Triage:** Teams of doctors and nurses were not experienced or knowledgeable in triage. A course to develop triage personnel is needed. The triage tags were not easily identifiable, color coded tags may address this problem. **Internal Communications:** The emergency call-up system was inadequate because names and telephone numbers were not correct. **External Communications:** Radio communications developed several technical and operational problems. **Patient Flow:** Ambulance crews became exhausted moving the victims.	An 18 hospital city-wide disaster drill was able to locate deficiencies in patient transport, internal and external communications, and triage even though only 175 of the expected 300 simulated casualties participated.
Gofrit, 1997	Not stated	**Triage:** 9% of patients were over-triaged. 4 % of patients were under-triaged. **Patient care:** Simulated casualties were not examined head-to-toe. Patients with post-traumatic stress disorder were not examined fully and referred directly to psychology. **Patient flow:** Delays were encountered in treatment due to lack of leadership and shortage of personnel. Patients transferred from one area to another without appropriate medical escort and without properly controlled ventilation. **Resources:** There was a shortage of ventilators and other trauma care equipment resulting from failure to report from in-hospital storage to ED[a]. **Patient tracking:** Medical documentation was inadequate.	Integrating physicians ("smart" casualties) among the simulated casualties in a hospital disaster drill may contribute to achieving the objectives of hospital disaster drills and add to disaster management education of the simulated casualty physicians. The "smart" casualty also can identify faults in the medical organization and in the medical care provided.
Gretenkort, 2002	Hospital fire	**Incident control:** The leadership concept of the Coordinating Physician of the Hospital working together with other hospital executives and the incident commander proved effective. **External communications:** Went smoothly and provided true interface between authorities and hospital administration. **Patient flow:** Patient flow and staff allocation greatly aided by *Jaerven Rescue Drag Sheet.* **Resources:** For 120 patients, *Jaerven Rescue Drag Sheet* took 601 minutes for complete evacuation, compared to 799 minutes for carrying teams. **Other:** Preparation of patient collection points did not meet the needs for the actual number of patients.	Reorganization of leadership for hospital disaster incidents, complemented by the use of predefined checklists and *Jaerven Rescue Drag Sheets*, greatly streamlined elevator-independent evacuation of immobile patients.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Evidence Table 3. Results of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year	Type(s) of event addressed	Results	Summary/conclusion
Halstead, 1993	Hospital fire in operating room	**Internal communications:** Could not hear overhead announcement of fire in operating room. Needed printed protocol for fighting fire. Operating room representatives to be added to hospital committee. **Patient care:** Operating room beds too heavy to maneuver for evacuation. **Patient flow:** Corridors, exits, and evacuation routes were blocked with equipment. More storage space needed for extra equipment. **Resources:** Gas levers were difficult to find. Fire door in back corridor did not close. Need second water hose. **Other:** A secondary program taught the operating room staff how to use fire extinguishers.	Operating room specific drills and programs should be developed and tested to teach operating room staff about fire prevention and responding to fire disasters.
Lau, 1997	Transportation accident	**Incident control:** Disaster plan activated successfully. **Triage:** 19 patients triaged and discharged. Patients' particulars were inadequately up-dated on the Accident and Emergency clinical record sheets. **Internal communications:** Better radio training needed. **External communications:** Telephone operator preferred native language under stressful conditions. **Patient care:** Charting and filling out forms detracted from patient care. Staff summoned from other units were not familiar with ED[a]. **Patient flow:** 45 minutes from first patient in to last patient out. Porters did not know role in drill. **Resources:** Nurse wasted time to summon back staff. Not enough wheelchairs, extra chairs in waiting room, or poles and ropes to maintain order. **Patient tracking:** Patients given bracelets and record sheet with identification. All patients accounted for.	Organizing practice drills provided clinicians with the opportunity to anticipate possible operational difficulties and find remedies to track them, as well as develop effective coordination and cooperation around various departments of the hospital in disaster management.
Maxwell, 1987	Transportation accident	**Triage:** 6 victims were not assigned any hospital triage category. **Patientcare:** 13 of the 14 victims were judged to have received appropriate treatment. **Patient flow:** The median time to triage was 3 minutes with a range of 0 to 10. The median time to treatment area was 10 minutes with a range from 0 to 39. **Patient tracking:** 4 victims slipped through hospital triage without being tagged.	Victim tracking cards contribute to the process of post drill analysis.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Evidence Table 3. Results of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year	Type(s) of event addressed	Results	Summary/conclusion
Menczer, 1968	Incendiary device and boiler explosion	**Incident control:** No overall recognized leader to coordinate services and agencies. No medical authority at the scene. **Triage:** No selection of victims for removal from the scene. Immediate establishment of an area for victim safety and treatment was an unfulfilled need. One observer found no evidence of effective triage and no follow-up. **Patient care:** Training of police and fire department personnel in first aid was deficient. Victims need more thorough and adequate first aid after being removed from the disaster site. **Patient flow:** Transportation of victims from the disaster scene was done with little regard to the type or site of injury. A great deal of unnecessary handling of victims occurred. Several victims were laid on cold ground uncovered for as long as 20 to 30 minutes. Ambulance services generally provided proper handling and transpiration. **Resources:** First aid equipment and supplies in quantity must be taken to site as soon as the type of disaster is ascertained. **Other:** Out-of-town ambulance drivers did not know hospital locations as the state highway signs were inadequate.	The disaster exercise identified a number of important deficiencies in disaster management.
Paris, 1985	Not stated	**Triage:** 5% of victims never assigned to a triage category. 44% of victims assigned to proper triage category. **Patient care:** All 133 patient-tracking cards collected. 3% of victims with correctable injuries “died” as a result of necessary treatment not provided in timely manner. 6% of victims had deterioration attributed to lack of timely intervention.	Victim-tracking cards useful in evaluating the patient management aspect of a disaster drill.
Saxena, 1986	Chemical	**External communications:** Notification for the activation of Emergency Operating Centers among participating agencies was not effectivity accomplished. The list of chemicals involved was not correctly reported to the state Emergency Operating Center. Exercise communications between the Emergency Operating Center were inefffective and in come cases nonexistent.	The chemical disaster drill will help the state to be in a state of readiness for hazardous material accidents.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Evidence Table 3. Results of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

Author, year	Type(s) of event addressed	Results	Summary/conclusion
Tur-Kaspa, 1999	Chemical	**External communications:** An effective communication system between different sites and the control center is essential. **Patient care:** Continuous care and repeated re-evaluation of patients are essential during transfer and treatment. Clinicians must know dosages and side affects of antidotes. Training should occur in full protective equipment and include "intubation dolls", ventilation, and decon[a] procedures. At each treatment site, medical personnel must be ready to handle casualties with injuries other than those of the specific type and severity for which they have been prepared. **Decon[a]:** Full protective equipment must be worn in the "contaminated area." Decon[a] must be directed by personnel with loudspeakers. **Patient tracking:** Clear labeling, identification, and record keeping are vital for efficient reception and treatment of casualties. **Other:** Adequate pre-drill instruction and training are vital for the drill's success. **Note:** The above statements were presented as the "results" of the drill.	Lessons learned from hospital disaster drills can be incorporated into the current hospital deployment plan. The described hospital deployment plan for management of chemical casualties and the preparation process that accompanies it can serve as a basis for hospital planning. This has implications for the handling of large-scale disasters, with maximum efficiency and minimum loss of life.
Weston, 1988	Hospital fire in operating room	**Incident control:** Absence of senior hospital nursing officer led to command confusion. Incident flow charts needed. **Internal communications:** Poor communication because of low number of alarm bells and low level of buzzers. **Patient care:** Patient casualty occurred due to surgical evacuation. **Patient flow:** Patients were incorrectly moved outside instead of to opposite side of first fire door. **Patient tracking:** All patients and staff were accounted for at the end of the 28 minute evacuation.	Simulation of a small fire in the surgical theaters revealed deficiencies in command, communication, and execution of evacuation during the disaster drill.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Evidence Table 3. Results of studies evaluating training programs for hospital staff to respond to an MCI[a] (continued)

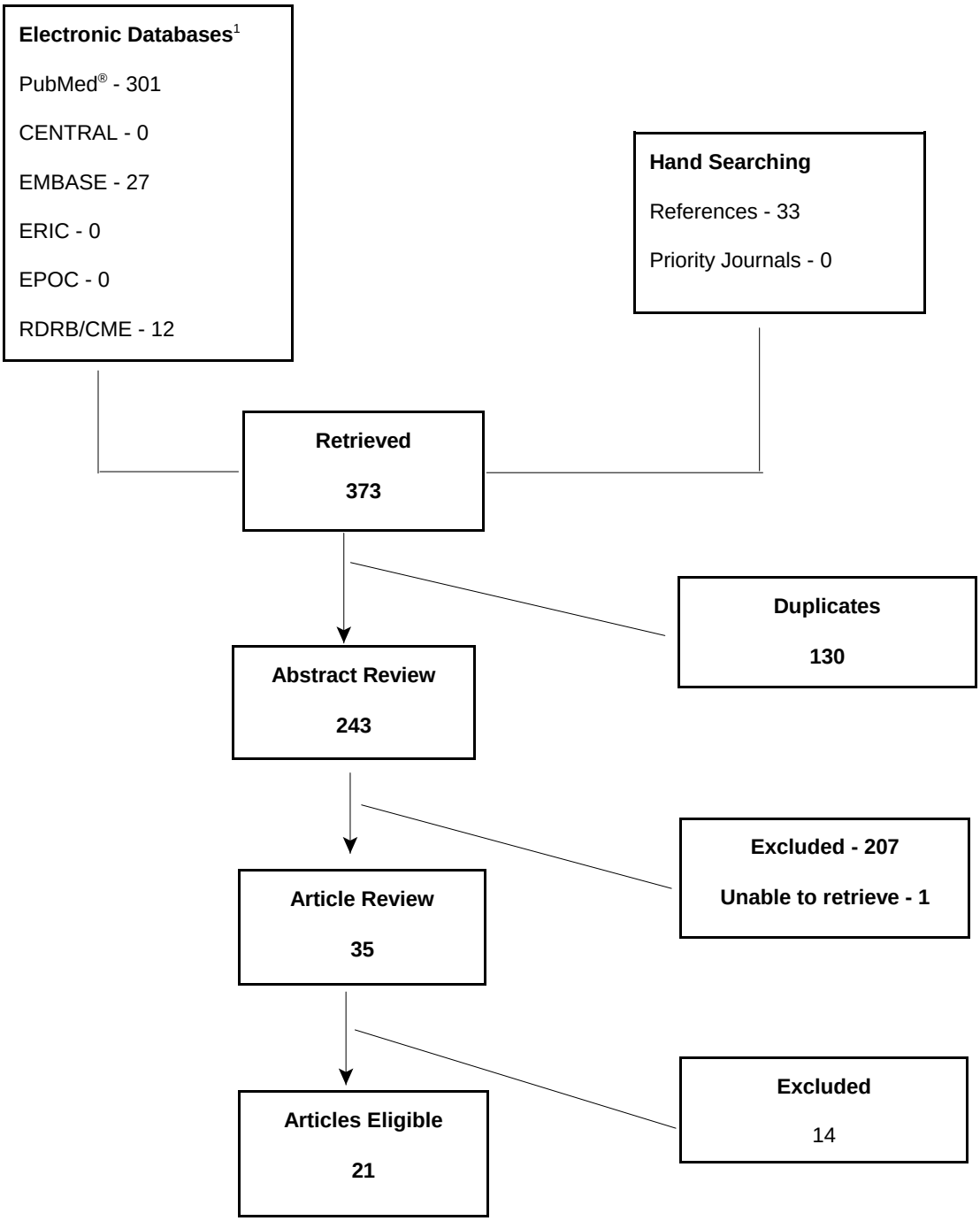
Author, year	Type(s) of event addressed	Results	Summary/conclusion
Computer simulation			
Levi, 1998	Not stated	**Patient flow:** Able to identify bottlenecks and predict ability to care for more casualties. **Security:** Able to identify crowd control issues and other security problems. **Resources:** Able to identify specific medical equipment/medication needs and electro-mechanical failures.	The described simulation techniques used in preparatory limited scale drill had advantages in evaluating and improving preparedness of hospitals for managing an MCI[a] before a full-scale drill is done.
Tabletop and other exercises			
Burns, 1984	Incendiary device (competitive simulation exercise)	**Patient care:** Participants' burn care knowledge increased 6 to 7 points from pre-test to post exercise (total score = 200). The median outcome of self-scoring was 87% with a range from 60-96%. Leadership personnel from the ED[a] working with members of the burn unit scored the highest. A team consisting of an ED[a] technician and a staff nurse scored the lowest.	The competitive simulation used to test and educate nurses on the treatment of burn victims was found to have advantages in motivation of the participants, utilization of new concepts prior to actual practice, realism, relevance, and the simplification of complex nursing problems.
Gray, 1996	Transportation accident (video simulation)	**Other:** In a video describing the use of a control room, a staff reporting station, field equipment, and protective clothing in a transportation accident, video viewers retained information significantly better than those who had read the disaster plan (72% versus 45%, $p<0.01$).	Use of video has three advantages: 1) video allows staff to see equipment and how to use it, 2) video gives staff insight into facing mass casualties, and 3) video viewing is easy to plan and supervise. Overall this was an efficient, convenient, and enjoyable way for hospital staff to learn about the disaster plan.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Author, year	Type(s) of event addressed	Results	Summary/conclusion
Inglesby, 2001	Biological	**Incident control:** Unclear how to coordinate different operation centers set up by a variety of state and federal emergency management offices. Not familiar with language used in disaster control. Leadership roles and authorities in the crisis were uncertain; not clear who was in charge. **Triage:** Concern over ability to distinguish between "worried well" and those harboring early signs of plague. **Internal communications:** A significant amount of time spent exchanging phone, beeper, and FAX numbers; exchange should have been done prior to exercise. **External communications:** Process of decision making by conference call was highly inefficient and led to indecision and significant delays in taking action. 800 MHz radios had efficient communication where regular phone lines were not answered or otherwise dysfunctional. **Patient care:** Hospitals were beyond capacity for patients in less than 24 hours. **Patient flow:** Inadequate plans for disposition of patients before and after triage, and for the deceased. **Security:** Concerns about security's ability to create an effective "security lock-down". **Resources:** Antibiotic supplies were exhausted early in the exercise and antibiotic distribution was logistically difficult. Other resources were scarce. **Other:** Serious disagreements about antibiotic distribution. Not clear which health care workers should be wearing protective equipment or what level of protection was appropriate.	Clear, scientifically and politically sound principles for containment of highly infectious disease in large, urban communities are needed. Public health resources now in place would not be sufficient to respond to the demand created by a bioterrorism epidemic.
Levy, 2000	Radiational (audio-graphic teleconferencing)	**Triage:** Correlations made between clinical symptoms in ED[a] and common source of exposure. Names of those exposed were identified and sent to the Departments of Public Health in participating countries. **External communications:** Extensive live communication among sites in 5 time zones. All sites participated in 7 live conferences within 74 hours. Proper authorities notified in each country.	Practice with the technological component of a training activity is an effective means to familiarize emergency responders with policies and procedures regarding radiation accidents.

[a] Abbreviations: decon = decontamination, ED = emergency department, MCI = mass casualty incident

Appendix F: Literature Search Summary



[1]CENTRAL - the Cochrane Central Register of Controlled Trials; EMBASE - the Excerpta Medica database; ERIC the Educational Research Information Clearinghouse; EPOC - the Specialized Register of Effective Practice and Organization of Care Cochrane Review Group; RDRB/CME - the Research and Development Resource Base in Continuing Medical Education.

Appendix G: Bibliography

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Appendix H: Excluded Articles

Citation	Reason for exclusion
Balch DC, West VL. Telemedicine used in a simulated disaster response. Stud Health Technol Inform. 2001; 81:41-5.	Does not include hospital staff
Bragdon RL, Gousse GC, Piwarzyk P, et al. Regional disaster planning for hospital pharmacies. Am J Hosp Pharm. 1982; 39(11): 1913-5.	Does not include training or education
Chi CH, Chao WH, Chuang CC, et al. Emergency medical technicians' disaster training by tabletop exercise. Am J Emerg Med. 2001; 19(5): 433-6.	Does not include hospital staff
DeMars ML, Buss RM, Cleland LC. Victim-tracking cards in a community disaster drill. Ann Emerg Med. 1980; 9(4): pp 207-209.	No information about hospital component of drill
ED managers react to threat against hospitals: here are security strategies. ED Management. 2003; 15(1): 1-5.	Does not include training or education
Fawcett W, Oliveira CS. Casualty treatment after earthquake disasters: development of a regional simulation model. Disasters. 2000; 24(3): 271-87.	No original data
Freeman KM, Thompson SF, Allely EB, et al. A virtual reality patient simulation system for teaching emergency response skills to U.S. Navy medical providers. Prehospital and Disaster Med. 2001 Jan-2001; 16(1): 3-8.	No original data
Klein JS, Weigelt JA. Disaster management. Lessons learned. Surg Clin North Am. 1991; 71(2): 257-66.	Article does not apply to any of the research questions
Lafreniere F. A mock evacuation is an exercise in saving lives. Dimens Health Serv 1988; 65(5): 35-7.	Results of evaluation not presented
Nigro CM. Economical citywide tabletop disaster preparedness drill. J Emerg Nurs. 1995; 21(2): 137-9.	No results of evaluation provided
Ochsner MG, Harviel JD, Stafford PW, et al. Development and organization for casualty management on a 1,000-bed hospital ship in the Persian Gulf. J Trauma. 1992; 32(4): 501-12; discussion 512-3.	No evaluation
Rutherford WH. The place of exercises in disaster management. Injury. 1990; 21(1): 58-60; discussion 63-4.	Does not include hospital staff
Vardi A, Levin I, Berkenstadt H, et al. Simulation-based training of medical teams to manage chemical warfare casualties. Isr Med Assoc J. 2002; 4(7): 540-4.	No original data
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