

Seeking Disasters' Best Practices

Creating Expectations of Care in Alternative Environments

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Unconventional Concepts

Rules of Engagement (ROE)

“... directives ... under which military forces initiate engagement with belligerent forces...”

1. Presentations developed from domestic and foreign open source information (OSINF)
2. The study of disasters and mega-casualty events can be problematic
 - a. Lack of alternative expectations and standards of care
 - b. Lack of data standards, definitions, analyses, reporting on which to base alternative standards
 - c. Prone to misinformation, propaganda, urban legends
 - d. Faux praise for the influential but uninvolved
 - e. Disaster A-B-C's – Accuse – Blame - Criticize

Rules of Engagement (ROE)

“... directives ... under which military forces initiate engagement with belligerent forces...”

3. The opinions are those of the authors, contributors, and cited sources.

There is no implied endorsement, approval, fondness, acknowledgement, or mere tolerance by any entity, agency, organization, or university.

Viewer Discretion Advised

Overview

1. Background
2. Paradigm Shift in Standards of Care (SoC)
3. Apply the ACS/AHA guidelines
4. Proposed Disaster SoC Care Matrix
 - Applied Principles to solo-casualty
 - Applied Principles to mega-casualty events

Alternative Expectations of Care

- Standard of care (SoC)

 - “the level at which the average, prudent provider in a given community would practice ... under the same or similar circumstances.” (Bolam Test)
 - “A diagnostic and treatment process that a clinician should follow for a certain type of patient, illness, or clinical circumstance” ...

Alternative Expectations of Care

■ Standard of care (SoC)

- “the level at which the average, prudent provider in a given community would practice ... under the same or similar circumstances.” ('Bolam Test')
- “A diagnostic and treatment process that a clinician should follow for a certain type of patient, illness, or clinical circumstance” ... can be “a new standard of care, but not necessarily the only standard of care.” (NEJM, 2004)

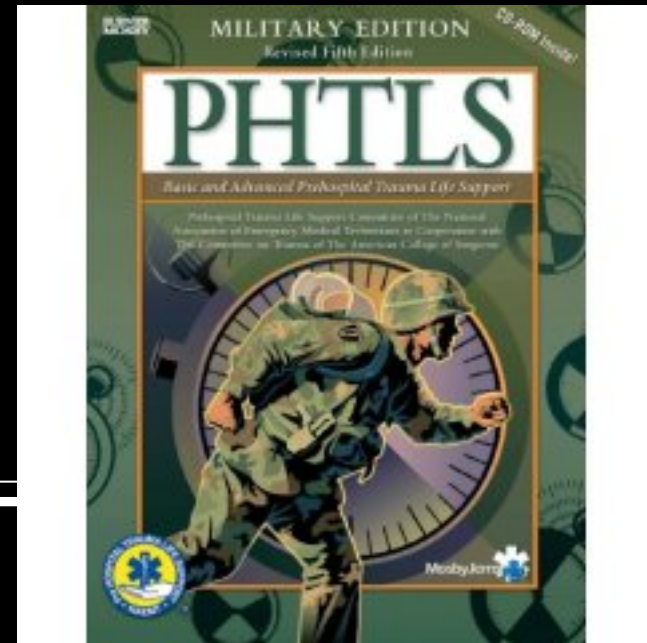
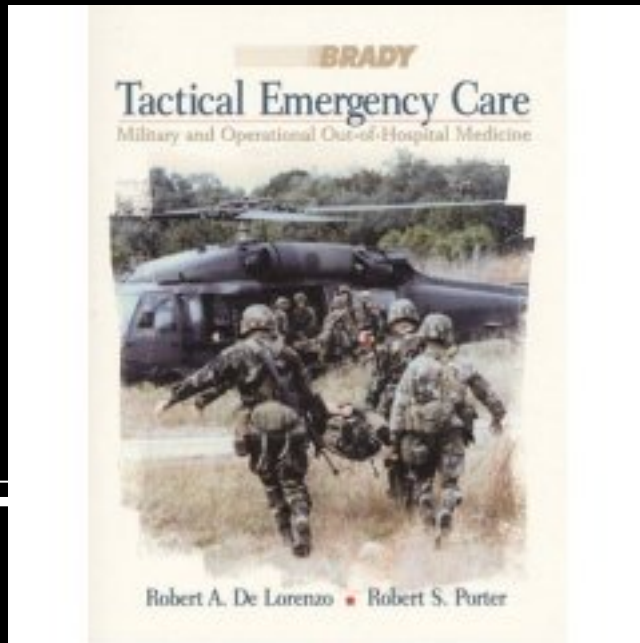
Best Practices and SoC for the prudent disaster provider are

- at best ill-defined, and
- typically retrospective-applied

ALS Paradigm Shift

Tactical Combat Casualty Care (TC³)

- Alternative Expectation and Standard of Care supported by
 - American College of Surgeons *“You can’t take Walter Reed south.”*
 - National Registry of EMTs (NREMT)



Historical Basis for alternative expectations and alternative standards of care

CARE UNDER FIRE:

Care rendered at the scene of the injury while both the medic and the casualty are under hostile fire.

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Rendered once the casualty is no longer under hostile fire. Medical equipment is still limited to that carried into the field. Time to evacuation may range from minutes to many hours.

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CASUALTY EVACUATION CARE (CASEVAC):

Rendered while the casualty is evacuated to a higher echelon of care. Any additional personnel and medical equipment pre-staged in these assets will be available during this phase.

Proposed Civilian Mega-Casualty Standards

Care in Unstable Environment (Care under Fire):

Care rendered at the scene of the injury while both the medic and the casualty are in immediate danger.

Logistics-limited Care (Tactical Field care):

Care given once the casualty and medic are not in imminent danger. Medical assets are still limited. Time to med-evac or transfer may range from minutes to hours.

Medical Evacuation Care (CAS-EVAC):

Care given during transport to an uncompromised MTF. Care enroute can be provided by field makeshift clinics.

Disaster Expectations of Care Matrix

Alternative Expectations of Care

	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	?	?	?	?
Refill request	?	?	?	?
Med supply request	?	?	?	?

Alternative Expectations of Care

- Where to begin?
 - Recognized Best Practices and Clinical Guidelines for U.S. clinical practice
 - E.g., ATLS, ACLS, PALS
 - Harriet Lane Pediatric care
 - Published extreme austere clinical guides
 - Wilderness Medicine
 - Special Operation Forces Medical Guides

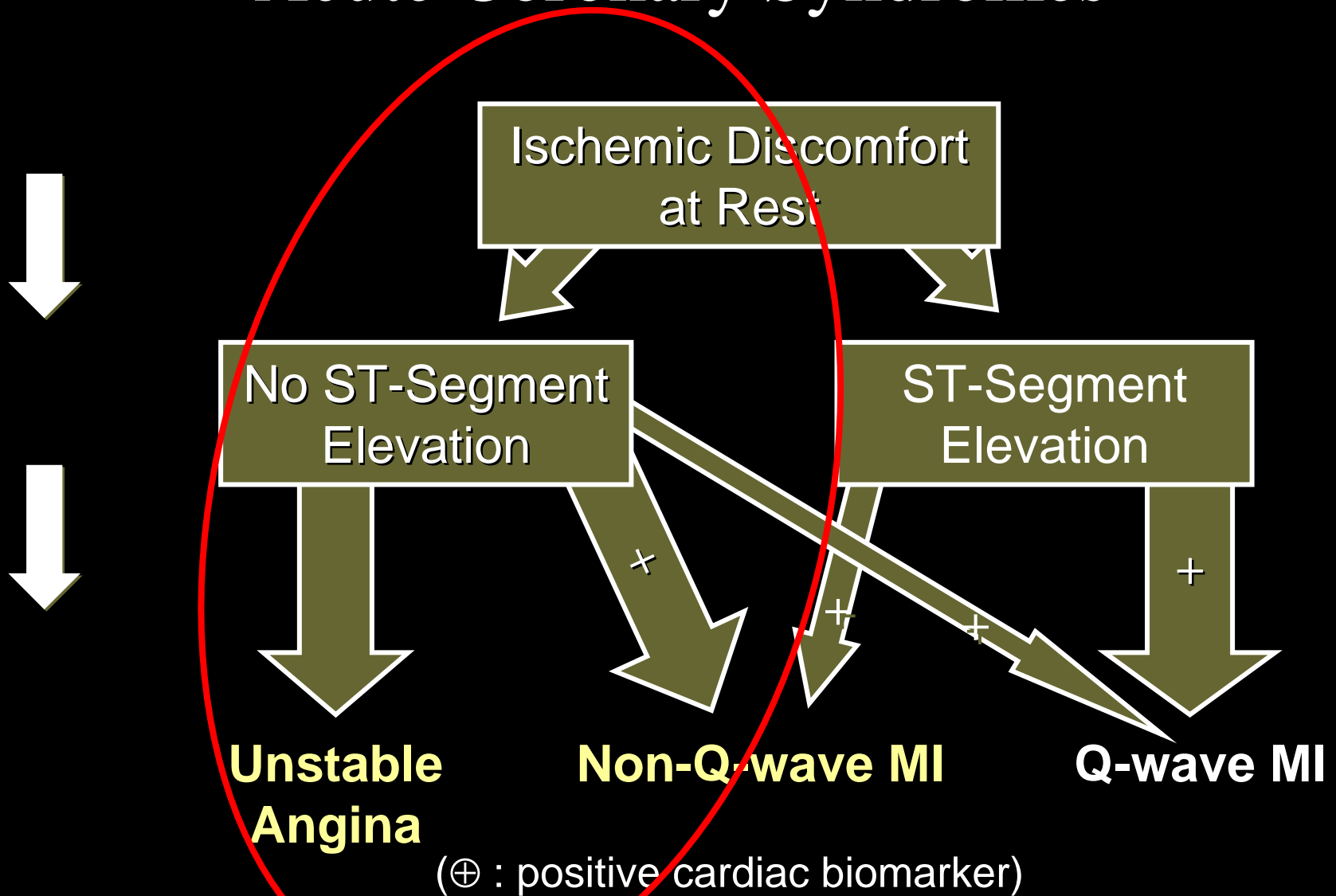
Alternative Expectations of Care

- Characteristics of benchmark practice
 1. U.S.-based
 2. Authoritative
 3. Best practice for peer group
 4. Widely accepted – widely quoted
 5. Transportable – readily adaptable for a range of alternative environments
 1. Single casualty in HAZMT, CBRNE / WMD
 2. Mega-casualty

Alternative Expectations of Care

- Candidate Best Practices / Clinical Guidelines
 - *“Management of Patients with Unstable Angina and Non-ST Segment Elevation Myocardial Infarction”* (non-STEMI)
 - A Report from the American College of Cardiology / American Heart Association Task Force on Practice Guidelines
 - Journal of the American College of Cardiology
August 6, 2007: 50; e1 – e157
<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Acute Coronary Syndromes



A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

- Class I Recommendations
- Class IIa Recommendations
- Class IIb Recommendations
- Class III Recommendations

A Report from the ACC / AHA Task Force

Management of Unstable Angina and non-STEMI

■ Class I Recommendations

- Conditions of which there are **evidence** and / or **general agreement** that a given procedure or therapy is useful and effective

(For those who are impatient: Ideally, all Class I recommendations should be followed, all the more-so if Level A.)

A Report from the ACC / AHA Task Force

Management of Unstable Angina and non-STEMI

■ Class II Recommendations

- Conditions of which there is **conflicting evidence** and/or a divergence of opinion about the usefulness/effectiveness procedure or treatment
 - Class II a – Weight of **evidence is in favor** of usefulness / effectiveness
 - Class II b – Weight of **evidence is less well** established for usefulness / effectiveness
- Class II recommendation are less binding

(For the impatient: Class II are “nice to’s” in the field)

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

■ **Class III Recommendations**

- Conditions of which there is evidence and / or general agreement that the procedure or treatment is **not useful / effective** and in some cases **may be harmful**

For the impatient: DO NOT USE

SIZE OF TREATMENT EFFECT →

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT

	CLASS I <i>Benefit >>> Risk</i> Procedure/Treatment SHOULD be performed/administered	CLASS IIa <i>Benefit >> Risk</i> Additional studies with <i>focused objectives</i> needed IT IS REASONABLE to perform procedure/administer treatment	CLASS IIb <i>Benefit ≥ Risk</i> Additional studies with <i>broad objectives</i> needed; additional registry data would be helpful Procedure/Treatment MAY BE CONSIDERED	CLASS III <i>Risk ≥ Benefit</i> <i>No additional studies needed</i> Procedure/Treatment should NOT be performed/administered SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL
LEVEL A Multiple (3-5) population risk strata evaluated* General consistency of direction and magnitude of effect	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Sufficient evidence from multiple randomized trials or meta-analyses 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established 	<ul style="list-style-type: none"> Recommendation that procedure or treatment is not useful/effective and may be harmful Sufficient evidence from multiple randomized trials or meta-analyses
LEVEL B Limited (2-3) population risk strata evaluated*	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Limited evidence from single randomized trial or nonrandomized studies 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established 	<ul style="list-style-type: none"> Recommendation that procedure or treatment is not useful/effective and may be harmful Limited evidence from single randomized trial or nonrandomized studies
LEVEL C Very limited (1-2) population risk strata evaluated*	<ul style="list-style-type: none"> Recommendation that procedure or treatment is useful/effective Only expert opinion, case studies, or standard-of-care 	<ul style="list-style-type: none"> Recommendation in favor of treatment or procedure being useful/effective Only diverging expert opinion, case studies, or standard-of-care 	<ul style="list-style-type: none"> Recommendation's usefulness/efficacy less well established Only diverging expert opinion, case studies, or standard-of-care 	<ul style="list-style-type: none"> Recommendation that procedure or treatment is not useful/effective and may be harmful Only expert opinion, case studies, or standard-of-care

Quality of evidence further ranked
 Level A – best
 Level B – limited
 Level C – poorest

Suggested phrases for writing recommendations*

should
 is recommended
 is indicated
 is useful/effective/beneficial

is reasonable
 can be useful/effective/beneficial
 is probably recommended or indicated

may/might be considered
 may/might be reasonable
 usefulness/effectiveness is unknown/unclear/uncertain or not well established

is not recommended
 is not indicated
 should not
 is not useful/effective/beneficial
 may be harmful

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class I Recommendation pilot guideline

1. Bed/chair rest with continuous ECG monitoring for all UA/N-STEMI during early hospital phase (Level C)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – O₂, stretcher / chair if available.
Self-ambulation tolerated.

Few Logs limits – O₂, stretcher / chair

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<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class I Recommendation pilot guideline

2. O₂ for all patients with SaO₂ < 90%, respiratory distress, or other high-risk features for hypoxia (Level B)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – O₂ for all CP > 40 years if available

Few Logs limits – O₂, for all CP > 40 years

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class I Recommendation pilot guideline

3. Ongoing ischemic discomfort receive SL NTG 0.4 mg q 5 x 3, then assess for NTG drip (Level C)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – SL NTG and NTG paste if available

Few Logs limits – SL NTG and NTG drip, however NTG paste is acceptable if monitoring not assured

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class I Recommendation pilot guideline

4. Intravenous NTG indicated for the first 48 hours for persistent ischemia, heart failure, or hypertension. Does not preclude beta blockers and ACE inhibitors. (Level B)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited –NTG paste, B-blockers, ACE if available

**Few Logs limits –NTG drip, B-blockers, ACE inhibitors.
However NTG paste is acceptable if monitoring not assured**

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Class I Recommendation pilot guideline

5. Oral beta-blocker indicated within first 24 hours for patients w/o a) sign of CHF, b) sign of low output state, c) risk of cardiogenic shock. Relative contra-indications – PR interval > 0.24 sec, 2nd or 3rd degree heart block, or active asthma. (Level B)

HAZMAT – C-B-A / Force protection. TC - YELLOW

**Logistics limited – oral B-blocker if available
unless pulse < 60**

**Few Logs limits – oral B-blocker within 24 hours unless
pulse < 60**

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

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Class I Recommendation pilot guideline

6. For ongoing ischemic where B-blockers are contraindicated, a non-dihydropyridine Ca⁺² channel blocker (e.g., verapamil, diltiazem) indicated unless clinical left ventricular dysfunction or other contraindication (Level B).

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – oral or IV Ca⁺² blocker if available

Few Logs limits – oral or IV Ca⁺² blocker

A Report from the ACC / AHA Task Force *Management of Unstable Angina and non-STEMI*

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class I Recommendation pilot guideline

7. ACE inhibitor should be administered orally within the first 24 hours in all patients with pulmonary congestion or LVEF \leq 40%, in absence of hypotension (systolic $>$ 100, or $30 <$ baseline) or known contraindication.
(Level A)

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – oral ACE if available & systolic $>$ 100

Few Logs limits – oral ACE in first 24 hours if suggestion of CHF & systolic $>$ 100. Base on ejection fraction (LVEF) if available.

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

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Class I Recommendation pilot guideline

8. An angiotensin receptor blocker (ARB) should be administered within the first 24 hours who are intolerant of ACE inhibitors, yet otherwise meet ACE indications. (Level A)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – angiotensin receptor blocker if available

**Few Logs limits – angiotensin receptor blocker if available.
ARB - valsartan, losartan, or similar.**

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Class I Recommendation pilot guideline

9. Except for aspirin, withhold all NSAID (non-selective and COX-2) because of increased risks of mortality, re-infarction, HTN, heart failure, and myocardial rupture. (Level C)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – No NSAID except aspirin

Few Logs limits – No NSAID except aspirin

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Class II a Recommendation pilot guideline

1. O₂ is reasonable for all patients with UA/NSTEMI during the first 6 hours (Level C)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – O₂ for all CP > 40 years if available

Few Logs limits – O₂, for all CP > 40 years

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class II a Recommendation pilot guideline

2. IV morphine is reasonable for uncontrolled ischemic chest pain despite NTG providing that MS is being used to manage the underlying ischemia. (Level B)

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – Morphine for CP > 40 years if available but acceptable to prioritize limited supplies

Few Logs limits – Morphine for CP if suspicion of ischemia and no suspected history of narcotic abuse

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Management of Unstable Angina and non-STEMI

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Class II a Recommendation pilot guideline

3. IV beta blockers at presentation is reasonable for hypertension without a) sign of CHF, b) sign of low output state, c) risk of cardiogenic shock. Relative contra-indications – PR interval > 0.24 sec, 2nd or 3rd degree heart block, or active asthma. (Level B)

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – B-blocker only if drug and monitoring assured. Acceptable to prioritize assets.

Few Logs limits – B-blocker if drug and monitoring available

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Management of Unstable Angina and non-STEMI

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Class II a Recommendation pilot guideline

4. An oral long-acting non-dihydropyridine Ca²⁺ channel blocker (e.g., verapamil, diltiazem) is reasonable for recurrent ischemic after B-blockers and nitrates have been maximized or are otherwise contraindicated (Level C).

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – Ca Blocker only if drug and staff assured. Acceptable to prioritize assets.

Few Logs limits – Ca Blocker if drug and staff available

A Report from the ACC / AHA Task Force *Management of Unstable Angina and non-STEMI*

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class II a Recommendation pilot guideline

5. ACE inhibitor administered orally within the first 24 hours can be useful in patients without pulmonary congestion or LVEF $\leq 40\%$, in absence of hypotension (systolic > 100 , or $30 <$ baseline) or known contraindication. (Level B)

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – oral ACE if available & systolic > 100 . Acceptable to prioritize assets.

Few Logs limits – oral ACE in first 24 hours if suggestion of CHF & systolic > 100 . Base on ejection fraction (LVEF) if available.

A Report from the ACC / AHA Task Force
Management of Unstable Angina and non-STEMI

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Class II a Recommendation pilot guideline

6. Intra-aortic balloon pump (IABP) counter pulsation is reasonable for severe ischemia that is continuing or recurs despite intensive medical therapy ... (Level C)

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – forget-about-it

Few Logs limits – Weigh against capabilities and capacity of MTF to absorb further casualties.

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Management of Unstable Angina and non-STEMI

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Class II b Recommendation pilot guideline

1. Use of extended-release non-dihydropyridine Ca²⁺ channel blocker (e.g., verapamil, diltiazem) instead of B-blockers can be considered (Level C).

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – Substitute for B-blocker is okay, but not expected.

Few Logs limits – Substitute for B-blocker is okay

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Management of Unstable Angina and non-STEMI

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Class III Recommendation pilot guideline

1. Nitrates should **not** be administered if hypotensive (systolic < 90 mm Hg), bradycardia (< 50), tachycardia (> 100) in absence of heart failure, or RV infarct. (Level C).

HAZMAT – C-B-A / Force protection. TC – YELLOW

Logistics limited – No nitrates for above

Few Logs limits – No nitrates for above

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Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class III Recommendation pilot guideline

2. NTG and other nitrates should not be used if phosphodiesterase inhibitor for erectile dysfunction (ED) has been used – e.g., sildenafil (24 h), tadalafil (48 h), and unknown for vardenafil and miwenniferil. (Level C).

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – Screen. Document. Don't use NTG if ED drug used

Few Logs limits – Screen. Document. Don't use NTG if ED drug used

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Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class III Recommendation pilot guideline

3. Immediate-release non-dihydropyridine Ca²⁺ channel blockers **should not be used** without a beta-blocker. (Level A).

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – Do use quick-release non-dihydropyridine Ca²⁺ blockers without B-blockers

Few Logs limits – Do use quick-release non-dihydropyridine Ca²⁺ blockers without B-blockers

A Report from the ACC / AHA Task Force

Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class III Recommendation pilot guideline

4. IV ACE inhibitors are **NOT** given during first 24 hours because of increased risk of hypotension. Possible exception for refractory hypertension. (Level B)

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – No IV ACE inhibitors with CP patients during the first 24 hours

Few Logs limits – No IV ACE inhibitors for CP patients in first 24 hours except for refractory hypertension

A Report from the ACC / AHA Task Force

Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class III Recommendation pilot guideline

5. It may be harmful to use IV B-blockers if contraindications to B-blockade, signs of heart failure or low output state, or other risk factors for cardiogenic shock. (Level A)

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – No IV B-blockers in CP patients with hypotension, CHF, or peripheral edema.

Few Logs limits – No IV B-blockers in CP patients as defined above

A Report from the ACC / AHA Task Force

Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Class III Recommendation pilot guideline

6. NSAID (except aspirin) should **NOT** be used during hospitalization, whether selective COX-2 or non-selective agents, because of increased risk of mortality, reinfarction, HTN, heart failure, and myocardial rupture (Level C)

HAZMAT – C-B-A / Force protection. TC - YELLOW

Logistics limited – No NSAID except ASA in CP patients.

Few Logs limits – No NSAID except ASA in CP patients.

A Report from the ACC / AHA Task Force

Management of Unstable Angina and non-STEMI

<http://content.onlinejacc.org/cgi/content/full/50/7/e1>

Recommendations for Antiplatelet and Anticoagulation

1. Treatment depends on intended intervention – conservative medical management or invasive PCI or surgery. (Level C)

HAZMAT – C-B-A / Force protection. **TC - YELLOW**

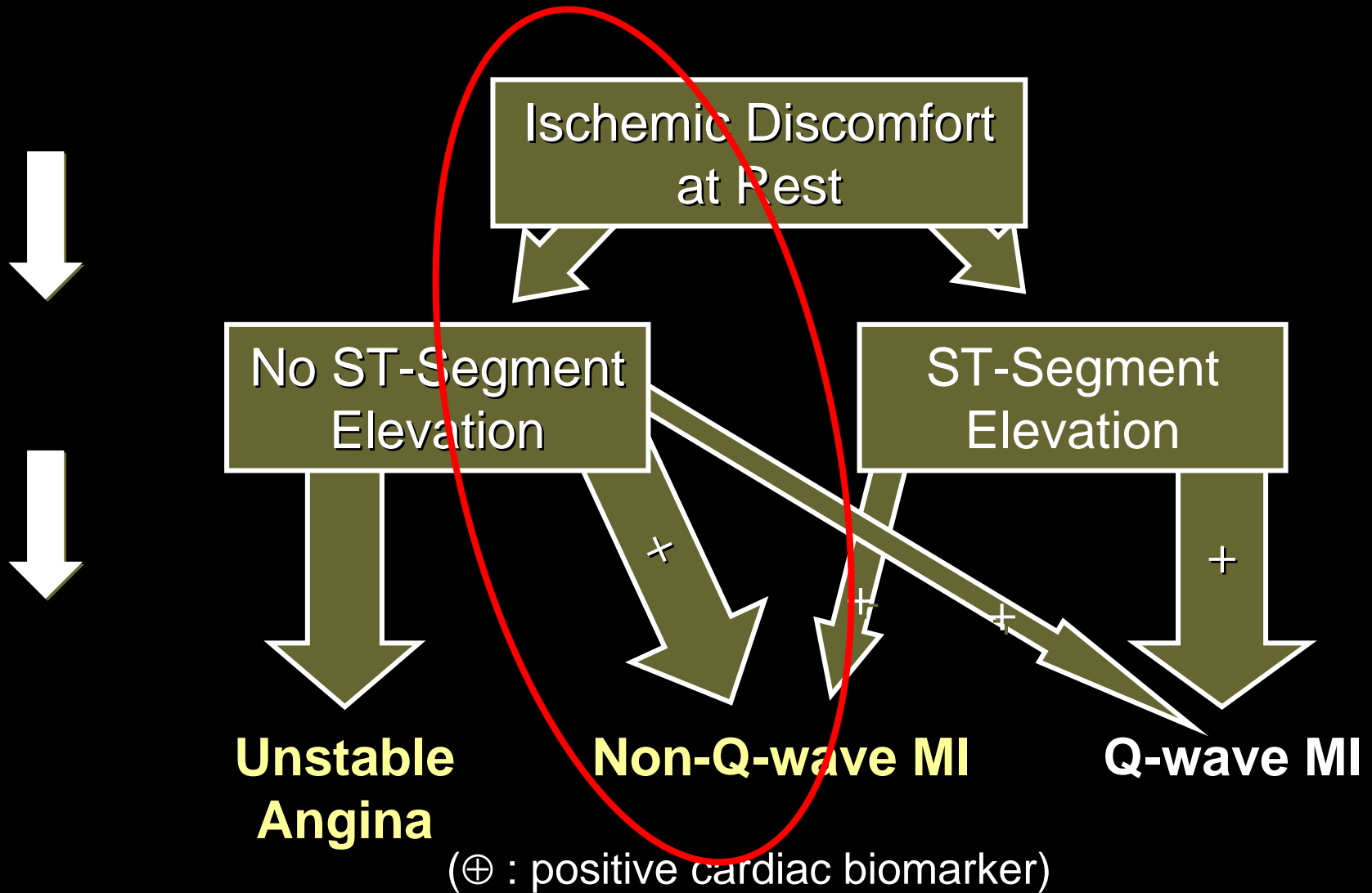
Logistics limited – Medical management only – ASA (Class 1, Level A) or clopidogel (C 1, L A). Anti-coag not encouraged

Few Logs limits – Assume medical management unless cardiology, cath lab, and OR is immediately available.

ASA / clopidogrel (Plavix), add anticoagulation (C 1, L A)

- e.g., Enoxaparin (Lovenox), Fondaparinux (Arixtra), UFH

Acute Coronary Syndromes



High-risk for Near-term Death or non-fatal MI in patients with Unstable Angina

- History – Accelerated tempo over preceding 48 hours
- Character – ongoing rest pain > 20 minutes
- Findings – PE/CHF due to ischemia, presumed new MR murmur, S3 or new rales, low BP, bradycardia, tachycardia, age > 75 years
- ECG – Rest angina with transient ST > 0.05 mm, presumed new Bundle-branch block, sustained V-tach
- Lab – Tn-T or Tn-I > 0.1 ng/ml, elevated CPK-MB

High-risk for Near-term Death or non-fatal MI in patients with Unstable Angina

Expectations / Standards of Care in Compromised Environment

- HAZMAT – C-B-A / Force protection. **TC – YELLOW**
- Logistics limited – All Class I Level A medical management, telemetry, treatment, and laboratory if available. Self-ambulation, self-care, buddy-care accepted under circumstances. **MedEvac is TC – YELLOW.**
- Few Logistic limits – JACC recommendations expected: All Class I (A, B, C) medical management. All Class IIa (A, B) as prioritized. Invasive management is not expected. **MedEvac is TC – YELLOW.**

Disaster Expectations of Care (EoC) Matrix

Expectations of Care vs Standard of Care

	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	?	?	?	?
Shot / Refill request	?	?	?	?
Med supply request	?	?	?	?

Disaster EoC Care Matrix

Solo-Casualty Alternative Expectations of Care

Single Patient	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	Rapid exit C-B-A No CSI	ALS / CSI Triage by survivability Name / cc / Tx	Flexible Alternate betw survive – worst ED-like record	Routine SoC ALS worst – first SoC record
Shot / Refill request				
Med supply request				

Disaster EoC Care Matrix

Solo-Casualty Alternative Expectations of Care

Single Patient	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	Rapid exit C-B-A No CSI	ALS / CSI Triage by survivability Name / cc / Tx	Flexible Alternate betw survive – worst ED-like record	Routine SoC ALS worst – first SoC record
Shot / Refill request	Not applicable	1. Name 2. Request 3. Dispensed	1. Demographics 2. Request, VS 3. Dispensed	1. Demographics 2. Request, VS 3. Dispensed 4. Referral
Med supply request				

Disaster EoC Care Matrix

Solo-Casualty Alternative Expectations of Care

Single Patient	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	Rapid exit C-B-A No CSI	ALS / CSI Triage by survivability Name / cc / Tx	Flexible Alternate betw survive – worst ED-like record	Routine SoC ALS worst – first SoC record
Shot / Refill request	Not applicable	1. Name 2. Request 3. Dispensed	1. Demographics 2. Request, VS 3. Dispensed	1. Demographics 2. Request, VS 3. Dispensed 4. Referral
Med supply request	Not applicable	1. Name 2. Request 3. Dispensed “CRO” carded for record only	1. Demographics 2. Request 3. Dispensed	1. Demographics 2. Request 3. Dispensed 4. Referral

Disaster EoC Care Matrix

Mega-Casualty Alternative Expectations of Care

Mega-casualty	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	?	?	?	?
Shot / Refill request	?	?	?	?
Med supply request	?	?	?	?

Disaster EoC Care Matrix

Mega-Casualty Alternative Expectations of Care

Mega-casualty	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	Rapid exit C-B-A No CSI Buddy-transport	ALS / CSI Triage by Survivability Buddy-care/tran name / cc / Tx	Flexible ALS Alternate betw survive vs. worst Buddy-care/ trans name / cc / Tx	Routine SoC ALS worst – first full record
Shot / Refill request				
Med supply request				

Disaster EoC Care Matrix

Mega-Casualty Alternative Expectations of Care

Mega-casualty	HAZMAT unstable environment	Logistics limited care, Mobile Team	MedEvac & MTF with logistic issues	MTF (hospital) with no logistic issues
Complaint Problem Injury	Rapid exit C-B-A No CSI Buddy- transport	ALS / CSI Triage by Survivability Buddy-care/tran name / cc / Tx	Flexible ALS Alternate betw survive vs. worst Buddy-care/ trans name / cc / Tx	Routine SoC ALS worst – first full record
Shot / Refill request	Not applicable	Not applicable	1. Name 2. Request 3. Dispensed (no referral)	1. Demographics 2. Request, VS 3. Dispensed 4. Referral
Med supply request				

Disaster EoC Care Matrix

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Paradigm Shift in Mega-Casualty Events.

There are at least FIVE Paradigm Shifts

1. **Duty**
2. **Priorities – triage**
3. **Authority**
4. **ALS resuscitation.**
5. **Trust and Risk**

Not business as usual

Creating Alternative Standards of Care.

1. **Duty** (ethics) Paradigm Shift

Routine

– to serve and protect our patient
to the greatest extent possible

A provider-patient relationship is established
with clear legal and ethical responsibilities.

Do everything possible for the benefit of that one patient.

Creating Alternative Standards of Care.

1. Duty (ethics) Paradigm Shift

Disaster / Mega-Casualty Event Task

- simultaneously serve unknown numbers
- serve the community and the casualty

Legal and ethical relationships are less clear.

Duty to the brief-contact casualty is ill-defined

- you are a mere link in the chain of care
- limited information, names, unknown f/u care, receiving facility, outcome.

Duty to the community is unpracticed – unchartered.

Logistical issue – finite resources, perceived infinite demand.

Creating Alternative Standards of Care.

2. Priorities (Triage) Paradigm Shift

b. Disaster / MCE – NOT worst-first **Survivability is now an issue**

Priority = Most critical with survivable conditions

Lower priority = Non-salvageable injuries – poor prognosis

YELLOW > - - - **RED** - - - > **GREEN**

Survivability

as discussed in the Trauma literature

1. **Non-Salvageable** – mortal wounds regardless of resources
2. **Resource Limits** – low probability, but potential survivor in an unlimited resource environment
3. **Time & Distance** to care effects survival
 - if time to ER < 15 minutes
 - if time to OR < 60 minutes
 - **Standard of Care ATLS[©] benchmarks**
 - e.g., Trauma's “golden hour” (Trunkey, OR-1)

Non-Survivable Injuries regardless of resources

Cardiac Arrest from CBRNE

- ACLS and PALS protocols not designed for WMD.
No evidence-base for effectiveness in CBRNE
- Uncomplicated routine Cardiac Arrest is “6.8% or less”
(ACLS Provider Manual, 2006)

- Risk contaminating scarce medical resources
(real target?) and destroying evidence

Mega Casualty Care

ALS Paradigm Shift

Routine: Physiological basis for priority and resuscitation

- A-B-C-D – ensure adequate oxygenation and some circulation on the chance of a correctable cause
- animal models – consensus-based – limited E-B
- dismal success – 6.8% “or less” (ACLS Provider Manual 2006)

MCE: “Epidemiologic basis”* for priority and resuscitation

- Evidence-based military literature
- Human population studies.
- C-B-A versus A-B-C

* C Lee – T Davis

ALS Paradigm Shift – an epidemiological approach

Military E-B fatalities with survivable injuries

- 60% - hemorrhage from extremity wound
- 33% - tension pneumothorax
- 6% - airway obstruction
- <<<< 1% - C-spine injury
- C – B – A Epidemiologic (evidence based)
versus A – B – C Physiologic

Alternative Expectations in a Hostile Environment

ALS Paradigm Shift

Toohey's Axiom:

"I also expect the casualties to continue to return fire as long as they are able to do so."

- CDR Pat Toohey

Hadley-Davis Axiom:

Injured survivors, bystanders, and responders must be prepared to aid and buddy-rescue others until they are exhausted.

- Col Hadley – CDR Davis

Martinez Phenomenon

Tendency of persons to name some sign, disease, or event after themselves in a pathetic scheme to gain a morsel of immortality.

- Ric Martinez, NHTSA Admin.

ALS Paradigm Shift

Establishing Consensus

Adaptation to civilian mega-casualty events

- Care under Fire
- Tactical Field Care
- Casualty Evacuation
- ill-defined paradigm shift of
 - Standards and expectations
 - Circumstances, environment, and resources
 - Casualty volume, limited staff
 - Retrospective review

Disaster ABCs – Accuse, Blame, and Criticize

Care in the Hot Zone

C-spine Immobilization (CSI)

- Only 1.4% of Vietnam casualties with penetrating neck injuries helped by C-spine Immobilization (CSI)
- Rare cervical spine injury bomb survivor in Israel
- CSI by experienced EMTs = 5.5 minutes
- Risk to casualty and providers in Hot Zone outweighs the potential benefit CSI (most GSW neck were medics)
- Outside Hot Zone: CSI applied ASAP for Falls with neck pain or unconscious
- In Hot Zone: Collar-drag out of Hot Zone may be most practical and safest means for survival of casualty and medic
- Majority of GSW neck casualties in Vietnam were Medical Sergeants

Tactical Field Care

- “CPR should not be attempted on the battlefield for victims of blast or penetrating trauma who have no pulse, respirations, or other signs of life.”
 - Capt. Frank Butler
- Traumatic cardiac arrest has horrible prognosis under best of circumstances; blunt = “0”, penetrating << 1%
- No E-B to justify CPR in domestic mass-cal
- No E-B to support CPR in CBRNE incident
- ACLS was designed for otherwise “healthy” cardiac arrest victims and still has survival rate <<< 6.8% in most EDs

Prevent PTSD – Avoid Helplessness

Have a basic plan at all times

Instructions to healthcare staff

1. *If you've been to one bombing (disaster),
you've been to one bombing (disaster).*
– modern Israeli proverb
2. You will make mistakes – each disaster is different
3. Your decisions can cause increased pain,
suffering, even death
4. Your goal is to never make the same mistake twice

Summary

Expectations of Care should replace ill-defined Standards of Care if mega-casualty or dynamic disaster environment based initially on threat to participants

- HAZMAT – immanent risk to patient and provider
– priority is force protection and patient safety
- Logistics Challenges – Only Class 1 Level A desirable
– non-invasive management expected as available
- Some Logistics limits – healthcare assets in flux
– invasive management desirable if continuity of care assured

Alternative Expectations of Care

Caveats

- Don't try this alone.
- Must pass Bolam Test.
 - "...average, prudent provider in a given community."
- But flexibility is already discussed
 - "a new standard of care, but not necessarily the only standard of care."
- In the interim, document care, limitations, and decision-making.
 - Write Letters to editors of peer-reviewed journals
 - Repeat common themes
 - Contribute to new standards
 - "NDMS Electronic Medical Record".

Avoid Words that create suspicion

1. "I am in charge."
2. "You've got nothing to worry about."
3. "Don't worry, I've got everything under control."
4. "Check's in the mail."
5. "First thing in the morning."
6. "Now relax, you may feel a little pinch"



Public Health's Fundamental Responsibilities

1. Access Needs

- Rapid needs assessments
- Underserved populations

*NDMS EMR gives
unprecedented ability
to Assess,
Assure,
and Inform*

2. Assure Access

- To vital services and quality healthcare
- Underserved populations

3. Collect, analyze, and inform

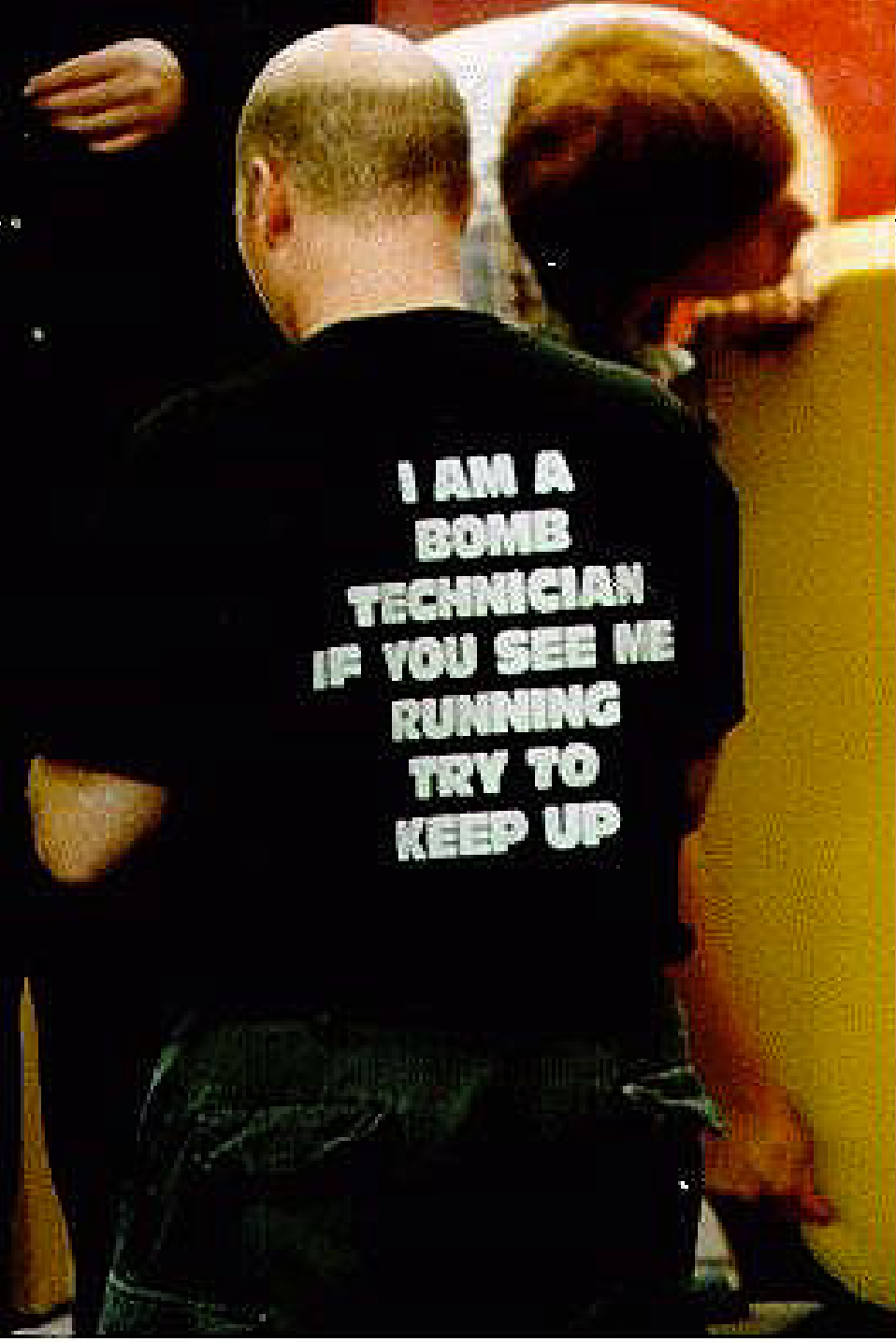
- Decision-makers, policy-makers, emergency managers
- media and the public

Alternative Expectations of Care

■ Standard of care (SoC)

- “the level at which the average, prudent provider in a given community would practice ... under the same or similar circumstances.” (Bolam Test)
- “A diagnostic and treatment process that a clinician should follow for a certain type of patient, illness, or clinical circumstance” ... can be “a new standard of care, but not necessarily the only standard of care.” (NEJM, 2004)

Best Practices for the prudent disaster provider are ill-defined, and dependent on data, reports, and peer- and public-review to establish alternative new standards and Expectations of Care.



Questions Comments



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