ORTHOPAEDICS IN MOTION
Motion Orthopaedics
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Sandy Rescues: "That is Why I Joined the National Guard"

The following article was written from a soldier's perspective in reaction to the aid given after Hurricane Sandy hit the East Coast. It was originally published by the National Guard on their online news page (www.nationalguard.mil/news/).

By Staff Sgt. Jerry Saslav
Massachusetts National Guard

NEW YORK (11/9/12) — "When we saw it coming down, we couldn't believe it," said Rose Miller, 85, recalling how Hurricane Sandy battered the Rockaway section of Queens.

Rose and her husband Leonard Miller, 95, lived in a house one block from the roiling Atlantic Ocean. "It was scary," she said.

"Well, you better get out today," said 2nd Lt. Michael Nuttall, platoon leader, 2nd platoon, 772nd Military Police Company, Massachusetts Army National Guard, as he stood in the family's second-floor apartment. "When it rains again there's going to be a little more flooding."

Nuttall and some of his men had been stationed at a nearby Catholic church that was being used as a distribution point for residents to receive aid. Spc. James Maltais, a military police officer in Nutall's platoon, was helping to distribute some of the aid when a woman approached him.

"She said she had two elderly … in-laws stuck in their upstairs apartment and couldn't get out down the street," said Maltais. "The street was all blocked with trash and debris; they weren't going to be able to walk out of there."

Spc. Joseph Pollini assists Leonard Miller down the steps of his boyhood home to a waiting vehicle in the Rockaway section of Queens, Nov. 6, 2012. (U.S. Army Photo by Staff Sgt. Jerry Saslav)

The woman was Alice Miller, Rose and Leonard's daughter-in-law. She and her husband Jeff lived in the downstairs apartment.

> *"...they weren't going to be able to walk out of there."*

When the warning went out that residents should leave before Hurricane Sandy reached shore, Leonard Miller refused to leave. He had grown up in his house. So Leonard, Rose, Alice and her husband

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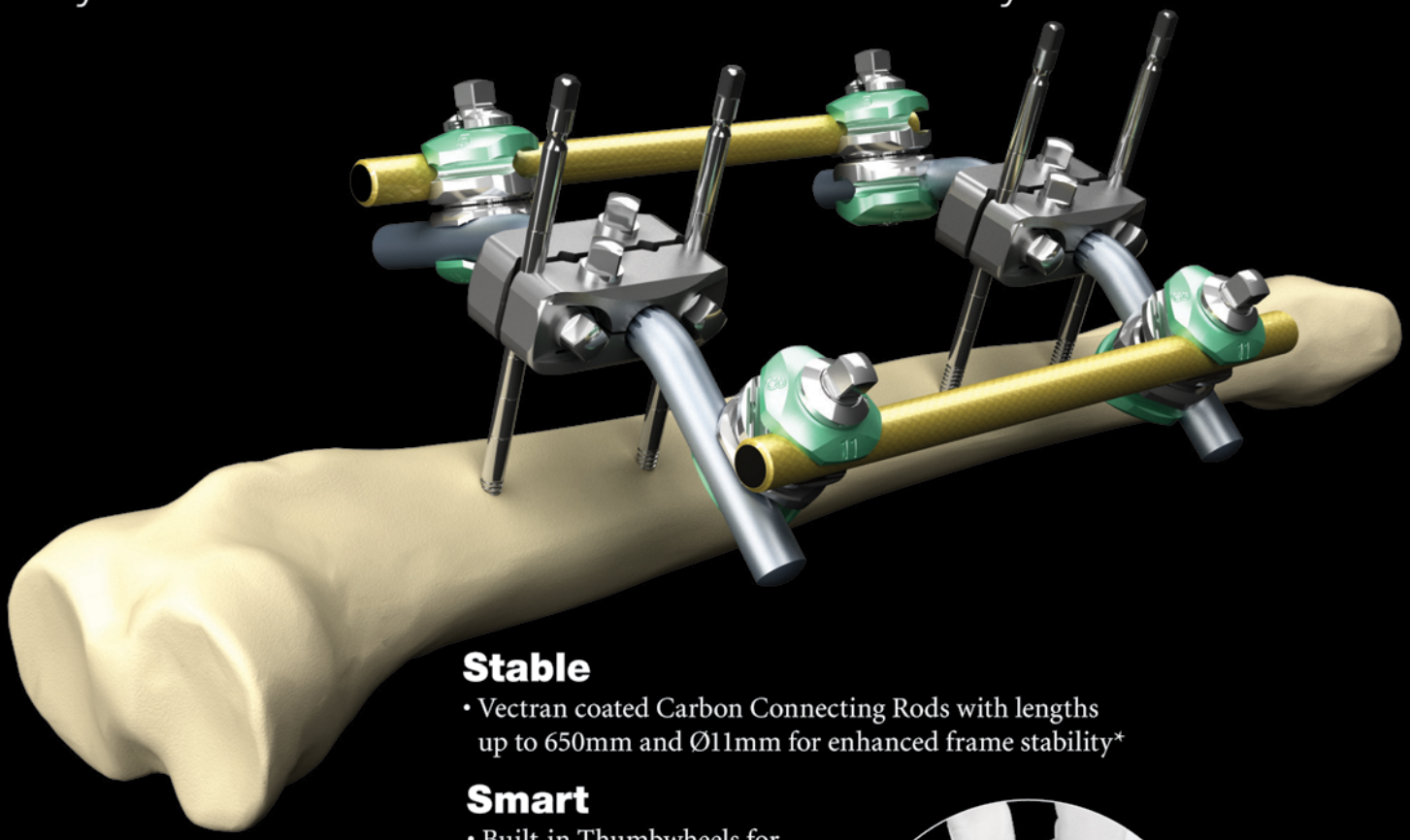

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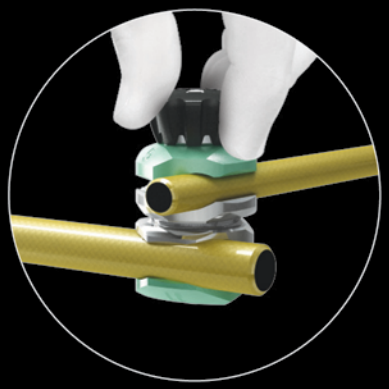

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*White Paper (NL11-NA-TR-2465): Comparison between the Hoffmann II MRI and the Hoffmann 3 Systems: The mechanical behavior of the connecting rods and a monoplanar bilateral frame. E. Wobmann, MSc; M. A. Behrens, MSc; S. Brianza, PhD; T. Matsushita, MD, DMSc; D. Seligson, MD. Based upon Biomechanical Test Reports from Stryker Trauma AG, Selzach; BML 11-072 and BML 11-059.

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Sandy Rescues *continued from page 1*

Jeff rode out the storm in the house.

"We lost our cars," said Jeff, who walks with a cane, "we were basically stranded."

For over a week they lived in their home, with no heat or electricity and survived on what supplies they had and what they could receive from the local distribution centers. When they heard that a storm was supposed to hit the area late Tuesday or early Wednesday, Alice went to look for help.

Maltais found Nuttall and briefed him on the situation. They quickly went into the church and asked to borrow some shovels. Alice gave the Guardsmen directions to the house and went to find her vehicle. After gathering another military police officer, Spc. Joseph Pollini, the three set out to the house.

The street was filled with debris and the sand from the beach had been piled over four feet high in some places. A large front-end loader from the city's sanitation department was slowly making its way down the street, piling the sand on the sides of the street.

Nuttall approached the driver, explained what they were trying to do and asked if he could clear part of the Miller's driveway so the residents could evacuate. As the truck driver began the slow process, Nuttall and his men waited for Alice before entering the house to evacuate Rose and Leonard.

"Her eyes lit up when we walked into the room," said Nuttall, "she was so happy to see us."

After a brief conversation, Pollini and Nuttall took Rose and Leonard's bags downstairs while Maltais stayed with them in their apartment.

"These folks really needed our help. It was cold in there," Maltais said. "They were bundled up. They definitely needed our help. Both of them told me that they thought that they were going to die there, that they were going to freeze to death there. So getting them out of there, keeping their spirits up… telling them that 'you know what, this may be bad but it will get cleaned up and that things will get back to normal; just give it time.' It made me feel good to see them smile and realize that this isn't the end of days for them."

Alice entered her own home to gather her husband and their belongings. While they were inside, the front-end loader cleared enough of the area in front of the home that the Miller's vehicle was able to enter the sand-filled driveway.

> *"...they thought that they were going to die there..."*

After seeing how difficult the piled sand made walking the short distance from the front steps of the Miller's house for anyone, let alone an elderly couple who both needed canes to walk — Pollini grabbed discarded cabinet doors and other pieces of wood that had been damaged and began to construct a walkway.

When everything was in place, Pollini helped Leonard down the steps and toward the vehicle.

Together he and Nuttall carefully helped Leonard into the vehicle across the back seat. Maltais helped Rose toward the vehicle and together he and Pollini gently helped her in.

"This is too much work," said Rose, "maybe I should stay."

No, said the Soldiers, you are two-thirds of the way in.

Eventually Rose made it into the vehicle, but before the door closed she insisted on taking each one by the hand and thanking them.

"Stay well," said Rose, "be safe."

After the Millers had left; Nuttall, Maltais and Pollini headed back to distribute more relief supplies.

"You know what?" Nuttall said to Maltais and Pollini, "That right there is why I joined the National Guard."

Hurricane Sandy

Relief by the Numbers

The New York National Guard compiled a quantifiable list to highlight the relief efforts made after Hurricane Sandy hit the night of Oct. 29, 2012. From then until November 13, 2012, these logistics were calculated in the areas most affected on Long Island and in New York City. The numbers really do tell the story.

According to the New York National Guard article, a team of **400** National Guard Soldiers and Airmen used every item in the logistics tool kit to feed, fuel, and house almost **4,000** troops. More than **1,300** trucks and Humvees were utilized to provide **2.5 million** emergency meals and **150,000** blankets to victims of the hurricane. The New York National Guard fueled more than **13,000** city vehicles, visited more than **12,000** apartments and homes, and moved **210** specifically designed geriatric hospital beds. More than **11,000** cubic yards of debris had been removed and carted away. Supplies were moved on **27** long-haul tractor-trailers, **2** Ch-47 Chinook heavy lift helicopters, and **2** C-17s.

Only two weeks into the recovery, the New York National Guard had committed more than **$3 million** to supply purchases… and expected to spend more. In comparison to 2011 storm response, the New York National Guard spent just **$500,000** on supplies for Hurricane Irene and Lee relief.

This information and much more can be found on the National Guard's website: www.nationalguard.mil/news/archives/2012/11/111312-Hurricane.aspx

Refresh Your Trauma Skills (part one of a series)

As a civilian orthopaedic surgeon you may never need to manage more than one level-one trauma situation at a time or may never face a natural or man-made disaster. If, however, such a situation did occur, would you know how to most efficiently and effectively save lives with the limited resources at hand?

The Disaster Preparedness and Trauma Care Toolbox, comprised of published, peer-reviewed articles, course materials, newsletters, and an interactive, case-sharing blog, is a valuable resource that brings together the combined experience and knowledge of the Society of Military Orthopaedic Surgeons (SOMOS) membership. These surgeons are well-versed in the care of the combat wounded as it applies to humanitarian assistance and disaster relief. The SOMOS Core Curriculum and Critical Skills List, key components of the Toolbox, are derived from the objectives of the Combat Extremity Surgical Course, a program taught to military surgeons prior to deployment, and are presented in conjunction with the Wheeless' Online Textbook of Orthopaedics (www.wheelessonline.com/ortho/12821).

The following excerpt comes from the SOMOS Core Curriculum Combat/Disaster Injuries section which details the management of high energy, blast, and crushing injuries.

I. Combat/Disaster Injuries

Spectrum of injury

- Mechanisms – high energy, blast, crushing
- Injury patterns
  - Nature of conflict/disaster impacts types of wounds expected
    - Urban area earthquake – crush injuries
    - Rural conflict – gunshot/knife wounds
    - Terrorist – blast injuries
- Early evaluation
  - Save life first, then treat limb-threatening injuries

Fundamental principles of wound management

- Debridement – probably most important service performed by orthopaedic surgeon (Fig 6)
  - Determine tissue viability
  - Don't close primarily (tissue viability/hidden foreign debris)
- Foreign material
  - Indications for fragment removal
- Irrigation – normal saline without additives
- Wound vacuum-assisted closure (VAC) – preferred wound dressing

Indications for emergent ortho interventions (Fig 5)

- Tourniquets
- Fractures/dislocations – external fixation (Fig 14)
- Internal fixation – generally contraindicated (risk of infection)
- Fasciotomy and compartment syndrome
  - Compartment syndrome usually in lower extremity crush/blast/high energy injury

To review the section in its entirety, visit: www.wheelessonline.com/ortho/12802.

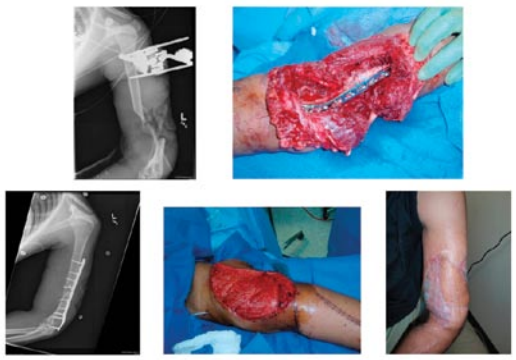

Figure 5. Open humerus fracture requiring serial debridements and initial external fixation, eventually converted to an open reduction with internal fixation (ORIF) when wound clean and covered at same setting with lateral flap.

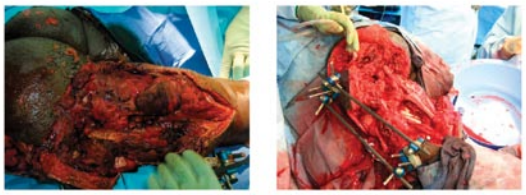

Figure 6. Wound debridement before and after. Wide, extensive, and aggressive wound debridement is critical.

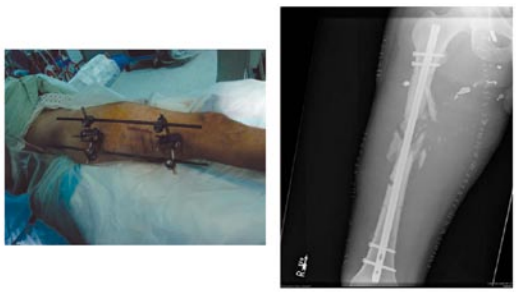

Figure 14. External fixation used to stabilize fracture and soft tissues until wounds clean, closable, or coverable, at which time conversion to internal fixation can judiciously be performed where adequate equipment and facilities are present.

Ski Resorts for Non-Skiers

Winter is the season for skiing, but often there is an odd man (or woman) out who just doesn't ski in a group of family or friends. Shermans Travel (www.shermanstravel.com) has compiled a list of the top ski resorts that have plenty to offer both the skier and non-skier.

1. **Mont Tremblant, Canada** – With wide runs dotted with moguls, Mont Tremblant has been a skier's paradise for years. But the pedestrian-friendly village with international restaurants and a vibrant après-ski scene provides plenty to occupy the non-skier. Nearby Domaine Saint-Bernard park offers some of the best cross-country skiing for those who like to ski without the downhill rush.
2. **Park City, Utah** – Park City encompasses 3 bustling ski areas with as many terrain options as there are skiers. The bustling town also offers a cultural scene that includes the Kimball Art Center, classes and workshops in photography and ceramics, the historic Egyptian Theatre, and in January, it is the home to the Sundance Film Festival.
3. **Stowe, Vermont** – Long popular for its Front Four pistes, this laid-back town with its preserved historic structures offers wellness centers, spas, and yoga and Pilates studios, as well as family oriented tours such as the local cider mills and the nearby Ben & Jerry's ice cream factory. The Nordic Center at the Trapp Family Lodge offered 100 miles of scenic, groomed cross country trails.
4. **Sun Valley, Idaho** – Skiers love swishing their way down sun topped slopes of Mount Baldy, while non-skiers can take a step back in time, visiting the grave of Ernest Hemmingway and sipping hot buttered rum in the favorite lodges of Clark Gable and Ingrid Berman in this charmingly Western resort.
5. **Taos, New Mexico** – With sunny days, champagne powder and some of the US's steepest slopes, skiers have no complaints about Taos. For the non-skier, the town may well boast more artists per capita than anywhere else in the world, with over 80 galleries and 7 museums in this town of only 5,000 residents.

For additional top picks outside North America and tips on the greatest values at each of these destinations, visit Shermans' website.

Park City, Utah. Photo courtesy of Park City Chamber/Bureau.

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Did You Know?

Nearly half of all flash flood deaths occur in automobiles as they are swept downstream. Anyone in a vehicle needs a TADD of advice... Turn Around, Don't Drown. A car can easily be carried away by just two feet of floodwater.

weather.about.com

Disaster Apps: Be Prepared Before Disaster Strikes

With growing technology comes easier accessibility to information. These smart phone applications offer pertinent information right at your fingertips. You can find these apps and much more on Android, Blackberry, and iPhone systems.

HURRICANE TRACKER

Some of this app's features include NHC advisories & maps, quick sliding icons, audio/video updates, breaking storm news via Twitter, animated satellites, Atlantic/E. Pacific coverage, tropical outlooks, push notifications, portrait & full screen landscape support, storm name lists, Saffir-Simpson Scale, and much more…!

FEMA

The FEMA App contains disaster safety tips, interactive lists for storing your emergency kit and emergency meeting location information, and a map with open shelters and open FEMA Disaster Recovery Centers (DRCs). The app is free to download through your smartphone provider's app store.

MY MEDICATIONS

Whether you're keeping track of multiple medications, recording allergy information or storing emergency contacts, the My Medications app from the American Medical Association is your solution. Developed specifically for patients by health care professionals, My Medications lets you store, carry and share your critical medical information in one secure place. With My Medications, you can share up-to-date medical information with your primary care physician, specialists, pharmacist, or family members and friends quickly and easily.

POCKET FIRST AID & CPR

This app includes the latest up-to-date emergency information from the American Heart Association. With it you are able to review first aid procedures anytime, anywhere- from your home, to your car, to the wilderness. Manage your first aid kit checklist, to be sure you have what you need in an emergency.

THE WEATHER CHANNEL

The Weather Channel provides the most accurate and relevant weather information whenever weather matters to you. With 200+ meteorologists and ultra-local forecasting technology, the app provides you with the weather tools you need to plan your day, week, or even the next hour. This app provides weather information for any US zip code, severe weather alerts for your area, and updates as soon as they become available. It creates a convenient outlet to track natural disasters with a simple click.

DAILY SURVIVAL TIP

The SURVIVAL TIP OF DAY Mobile App is the first survival app of its kind. It is a user community developed database of survival tips from survivalists all over the globe. Anyone can submit survival related tips to be included in the application database. Each day, users of the app will be notified of a random daily survival tip on their cell phone.

Product Recalls: How Do You Protect Yourself and Your Practice?

By Theresa Ford

It is crazy out there. The DePuy ASR recall is in full bloom, metal on metal generally is causing concern in the medical device community (with several manufacturers having metal on metal offerings), and the Sulzer Inter-Op® recall, though nearly a decade old, is still being discussed in the media coverage of the current ASR/metal on metal situation. I am hearing from my physician clients that they are more nervous than ever about being pulled into the fray; more specifically, worried about being sued for negligence even though the problem is a product defect. As you might imagine, some of my clients have seen this worry turn into a reality, making it, sadly, a very legitimate concern for all physicians. An even bigger worry for the physician community is how any product defect will affect their patients and what will need to be done medically to correct the situation.

It would be impossible to outline in this article all of the potential circumstances that could arise and how best to handle them when working with products that are or could be the subject of a recall. The issues are many – patient safety at the top of the list – and the myriad ways in which each issue can be mishandled are limitless. The goal of this article is to point out some of the biggest and most common hurdles that you will face and some best practices for getting over those hurdles.

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In a now famous open letter to the American Association of Hip and Knee Surgeons, Dr. Larry Dorr made it clear that companies that blame product defects on surgeon technique and skill (or, arguably, the lack thereof) are missing the point in a big way. And while Dr. Dorr has had some personal history with that issue which he outlined in the letter, the bigger general point is this: when a physician notifies a company that he or she is having problems with a particular product, the immediate response, very often, is that the physician is doing something that is affecting the outcome, not that the product is in any way defective. Having been in-house counsel at a medical device manufacturer, I understand the corporate response. However, as an attorney to literally hundreds of physicians through the years, I am infuriated by the response, as are most of my clients. (None of the actions outlined in this article are being specifically ascribed to DePuy or any other company that has gone through a recall, recently or otherwise. They are simply anecdotal examples I am aware of concerning what surgeons have encountered when dealing with product issues directly with the manufacturer.)

Want to find out what the next steps should be if you see a negative pattern occurring with a product you use? Visit www.orthopreneurpub.com. Or, scan this Quick Code with your smart phone to take you directly to the article.

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EMPOWERING TODAY'S ORTHOPAEDIC SURGEON

Editorial

THIS ARTICLE BEGINS ON THE BACK PAGE

or no experience with expectant care in which simple palliation or no-care is an option.

Simple triage and rapid treatment, or S.T.A.R.T., can be used in the field and was designed for community emergency response teams. The system rapidly separates injuries into four groups: (1) expectant (beyond help); (2) injuries requiring immediate transportation and medical care to obtain a reliably improved outcome; (3) "injured, but stable" in whom transport may be delayed; and (4) "minor injuries" in which help is much less urgent and for whom emergency transportation is not necessary. Such a system facilitates the rapid transport to the receiving medical facility. However, in some instances there may be too many casualties to transport, and advanced triage, generally done at a medical facility by physicians, may need to be applied in the field.

Advanced triage is utilized in medical facilities by physicians. Patients are further characterized into three groups: (1) expectant-likely death regardless of care; (2) likely to survive regardless of care; and (3) immediate care will positively impact outcomes. An example of a group 3 patient is one in whom a fasciotomy may save one or more limbs. *Advanced triage* is improved by the utilization of predetermined severity scales — e.g., *Glasgow Coma Scale and the Injury Severity Score*. Other scales and trauma scores are valuable. The use of these trauma scores is helpful, especially if there are hundreds or even thousands of injuries. In large-scale disasters, priorities may change and definitions may be altered as resources are depleted. This scenario includes the depletion of blood products, IV fluids, drugs, and the absence of additional physicians. Therefore, in large scale events, a continuous triage process is crucial.

This editorial contends that "medical rules of engagement" would be beneficial in the event of large-scale disasters with multiple injuries. Four medical circumstances are suggested and these would require parallel legal action at a state and/or federal level.

Rules of Engagement Medical Care - Levels:

1. **Current standard-of-care (SOC):** The way physicians practice medicine today.
2. **Minimally modified standard-of-care:** All patients are transported and cared for, but the prioritization is determined by a triage process in the field and medical facility. No one is denied care, but care may be delayed. Legally this requires modifications of the definition of standard-of-care.
3. **Severely modified standard-of-care:** Prioritization is based upon triage principles with the intent to support all patients optimally, but patients who otherwise are expectant, are delayed significantly, may receive palliation–IV fluids, blood products, etc. Legal action is required at a state or local level.
4. **Disaster standard of care:** Algorithmic triage is used and decisions are based upon societal benefit. This requires strict criteria to identify expectant cases who receive palliation; treatment of minor injuries is by allied personnel and maximal resources are utilized for patients in whom a probable positive impact is predictable.

For levels 2 to 4, legislation is required and optimally would be triggered by state or federal declarations of "disaster," or for level 4, the implementation of Martial law.

Currently, orthopaedic surgeons in the U.S. are ill-prepared for mass casualty events. If faced with five or ten thousand casualties, a triage system is crucial and treating first-come as first-served is inappropriate. Failure to have a standardized system with training, pre-credentialing, algorithm-based resource allocation, and appropriate laws will increase suffering as well as loss of limb and life. Training needs to include basic and advanced triage as well as how to cope with moral, ethical, and legal implications of an advanced triage process. Disaster algorithms are necessary, preplaced or mobilizable resources must be available, and health care providers and facilities require pre-credentialing. State and federal laws need to be amended in order to allow for modification of traditional standard-of-care by declaration of medical emergency or Martial law.

— L. Andrew Koman, MD

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Editorial: Preparing for Disaster: Medical "Rules of Engagement"—Triage, Education, and Legislation

In order for the orthopaedic community to prepare for a significant disaster and provide orderly optimal management of multiple trauma victims, it is necessary to establish mechanisms to initiate an algorithmically-driven process within a planned infrastructure. This requires pre-credentialed providers, dedicated and available resources, and a dependable infrastructure. Even with appropriate providers and resources, optimum care requires a defined code of conduct and a clear definition of the "rules." This care will require training, which is not available in residency and fellowship, and new laws to govern treatment in emergent situations. The concept of "rules of engagement" applicable to medical care has not been well-articulated or codified; physicians and healthcare providers must understand the applicable standards in order to function in a disaster with mass casualties.

For the purposes of this discussion, a disaster is a natural or man-made event resulting in multiple injuries of varying severity and in which traditional medical services are unable to provide "usual and customary care." This situation is a significant concern in a litigious society. Without preplaced guidelines and legislative support, a disaster will precipitate suboptimal management in mass casualties, which will increase the magnitude of loss of life and limb. U.S. orthopaedic surgeons are trained in management of injuries using standard-of-care, however, we are poorly emotionally equipped, sub-optimally trained, and physiologically ill-prepared to deny care. The analogy of crowd control during a riot by the military versus the police provides an excellent corollary. Police are trained in crowd control; the military is not. U.S. surgeons are trained to provide total and optimal care and are uneasy rationing services.

Standard-of-care is the degree of prudence and caution required of an individual who is under a "duty of care." That standard is well-defined for orthopaedic surgeons, who by definition have similar or "like" training if they practice in a similar or "like" environment. Standard-of-care may be altered significantly by circumstance such as a disaster with mass casualties. If the number of casualties exceeds the available resources within the geographic confines or medical environment in which care is provided, there is a profoundly negative impact on standard-of-care. Unfortunately, current guidelines and training are inadequate, legal precedent is ill-defined, and significant moral, ethical, and legal challenges persist. The concept of **expectant** care–in which the task and duty of medical providers is to determine "which patients are beyond help" and set them aside to die–is particularly difficult. Triage-including expectant care is an alien and difficult concept for most practicing physicians in the U.S. While orthopaedic surgeons are familiar with "simple triage," in which the order and priority of treatment is determined, orthopaedic surgeons, in general, have limited

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