2008 Presidential Address

Philip S. Barie, MD, MBA, FCCM

I'm a trauma surgeon from New York, educated in management as well as medicine, an avid amateur historian and a lover of music and all things canine. All of the interests will intersect in my remarks today. I stand before you humbled and honored, but well prepared to be your president.

Welcome to paradise. Some of you are fortunate to be returning to Hawaii this week, but many of you are making your first visit. How did you prepare for your trip? What created your expectations and assisted your planning? Beliefs can be based on the concrete or the fanciful, but our expectations, because we seek to confirm them, can get in the way. There's real value in considering what seems unreal because someday, it may become very real indeed.

Preparation is a basic part of life that is ingrained into us as children. We prepare for our day with a stimulating beverage. We cannot survive if we do not prepare our food. An education prepares us for life. For many of us, including probably everyone in this room today, education is a lifelong endeavor. And so preparation is ubiquitous in life, so much so that we might be tempted to take it for granted. To do so, in my opinion, is shortsighted and indeed dangerous. It would be foolhardy to believe that we can foresee any eventuality, and we certainly cannot prepare for what we cannot envision. However, we can prepare ourselves and our teams to be ready to function in a crisis. Let's consider some historical crises in the context of our present surroundings, my personal experience, and our wonderful organization, the Society of Critical Care Medicine (SCCM).

Hawaii hasn't always been paradise. Sixty-seven years ago, the United States Naval Base at Pearl Harbor, headquarters of the Pacific Fleet, was attacked. The attack – a complete surprise – probably should not have been. On the left, you see Pearl Harbor today with the battleship USS Missouri, the Mighty MO, in the foreground, and the USS Arizona Memorial beyond. On the right, the anchorage of the fleet on the morning of December 7, 1941, is depicted. The position of the Arizona is shown along Battleship Row. The Arizona had a New York connection. Her keel was laid in the Brooklyn Navy Yard. She served with distinction as a training vessel during World War I in the Atlantic fleet. After a major refitting in the 1930s, she joined the Pacific Fleet for the first time in 1940, and she moored on the morning of December 5 at Ford Island for provisioning and minor refitting. Two days later she was destroyed by a direct hit on her ammunition magazine by an aerial bomb; One thousand one hundred lives were lost, more than 40% of American casualties, that disastrous day. More than 900 American servicemen are entombed in the wreckage. The attack was planned by Admiral Yamamoto who, having been education at Harvard, understood better than many in the Japanese high command, the likely response of their new American adversary. Yamamoto was a pacifist , opposed personally to the attack, but he did a professional job and did his duty. Meticulous preparations began a year beforehand, aided by excellent free-flowing intelligence. But despite all preparations, the plan

was flawed fundamentally. The strategic goal was not to annihilate the Pacific fleet, but to cripple it, driving it back to the West Coast where it would be powerless to challenge Japanese hegemony in the eastern Pacific. The emphasis of the battle plan was placed on the destruction of the battleships; the American aircraft carriers were not their targets. At the time of the attack, the three carriers of the Pacific Fleet – the Enterprise, "Lady Lex," and the Saratoga – were steaming west of Hawaii and escaped destruction. This turned out to be crucial but only in retrospect.

Well, what went wrong? The flawed Japanese battle plan also included the failure to target fuel stores and ship repair facilities; the Pacific Fleet was able to recover sooner. A demobilized isolationist America was unprepared for war, arguably as unprepared as at any time in history. The Hawaiian naval base, its mere existence, along with the curtailed exports to Japan of oil and scrap metal, were provocations to the Japanese, but America didn't realize it. Other obvious signals that were missed included misinterpreting the radar signatures of the attacking aircraft for those of a routine inbound flight of American aircraft, costing about an hour and a half. The Japanese, for their part (Yamamoto excepted), underestimated American resolve and its ability to mobilize for war.

What went right? The rehabilitated Pacific Fleet bolstered by the addition of warships, such as the carriers Yorktown and Hornet, led to major tactical successes. Colonel Jimmy Doolittle led an audacious air raid of land-based bombers on Tokyo from the deck of the USS Hornet in early 1942. The raids caused little damage except to the Japanese psyche. Six weeks later, at the battle of Midway, the first naval battle in history to be fought between aircraft carriers, saw the pivotal sinking of four of those Japanese carriers.

There may come a time in your career when you are challenged professionally beyond your capacity to imagine and personally to the limits of your capacity to endure. For me, for us in New York City and Washington, DC, that day was September 11, 2001. That Tuesday morning started routinely enough but soon became a chaotic mix of emotion, communications failure, and extraordinary acts of heroism. As a trauma surgeon, my response on 9/11 was a blend of excitement and revulsion. On the one hand, I had prepared my entire career to take care of mass casualties, and I was about to find out if I was up to the challenge. On the other hand, I could never have prepared for the emotions I experienced watching the towers collapse on live television while trying to stay focused on triage and resuscitation. That day, and the clinical decisions I made, were the most difficult of my career.

The litany of failure on 9/11 is well documented. Most prominent among many was the utter failure of communications. Cellular and land-line telephone communications were impossible. We did not know whether to expect more casualties, when or what their injuries might be. First responders were crippled by communications failures. Police and fire radios were incompatible, and neither worked in tall buildings. Crucial intelligence was relayed to on-scene commanders only by fireboat crews observing from offshore. Commands issued to occupants of the two towers differed; some occupants were directed not only to stay inside the buildings, but to

proceed to the roof to await evacuation by helicopter, an impossibility that resulted in the deaths of everyone who did. That the towers were not perceived to be a target and that the structural failure of the buildings was inconceivable is highlighted by the fact that Incident Command was still housed in the towers despite the prior 1993 attack. The tragic toll included more than 340 firefighters of the Fire Department of New York among the 2700 fatalities that day.

Well, what went right? The medical triage system worked well. Thousands of casualties, albeit mostly minor, were handled with great efficiency. Acts of heroism became everyday events. Firefighters and volunteer search-and-rescue teams spent months afterward in recovery efforts, imperiling their own health. In the aftermath, emergency response systems were examined and improved; for example, satellite telephones and global positioning units were acquired for ambulances to improve communications.

But what has really changed? Memory fades and so does the perceived threat. Complacency sets in. Assets are redeployed. Accumulated experience is lost. Human remains are still being found at the site, which is one of many reasons why reconstruction has yet to begin.

Hurricane Katrina struck the US Gulf coast in late August 2005 on a Labor Day weekend. The damage was incalculable, and the region may never recover. The toll in human suffering and that of our beloved animal companions was enormous. Almost everything went wrong during Hurricane Katrina. Landfall at New Orleans was predicted 24 hours in advance, but little was done to evacuate people. Many had nowhere to go or means to get there. No meaningful plan existed for mass evacuation. The levies failed, and when the electricity failed, the pumps failed as well. Hospitals were flooded, and the healthcare system collapsed. The collapse of municipal services degenerated into lawlessness. Bickering over jurisdiction between local and state governments delayed aid, and the disjointed local response was exacerbated by the feeble federal response.

What was right about Katrina was the humanism of the response. The resilience of spirit of the displaced citizenry was awe-inspiring. Volunteer medical teams from esteemed centers, electrical line crews from electric utilities, and volunteers from animal shelters descended on New Orleans in a remarkable outpouring of generosity. Many SCCM members participated in the medical relief efforts, about which more will follow below.

Three disasters, three crises. Disparate causes – war, terrorism, nature – yet there are commons themes. Central to all is the failure of communications, which is a central theme in many disasters. Also central was the failure to foresee the improbable as probable, the unlikely as likely. Human beings are hardwired to see the expected, not the unexpected. We react rather than anticipate, and we take ill-considered risks because we underestimate probabilities. Taleb, in a modern classic entitled *The Black Swan* (1), notes that human beings invest a lot of energy to find explanations in hindsight of events that cannot be predicted. Even conventional history, as I have been recounting this morning, can fall into this trap. Each of the historical events we

have discussed are black swan events; they have momentous impact. Black swan events are rare, beyond normal expectations, and perhaps difficult to predict in consequence, except in hindsight.

So why can't we see? From a behavioral perspective, our emotions and our fears override our ability to reason in a crisis; to promote artificial harmony, rather than the diversity and conflict that is a sign of a healthy team, we seek consensus – despite the aphorism that it is possible to fool all of the people some of the time. Moreover, even the brightest people, as another saying goes, don't know what they don't know. We also seek intellectual satisfaction by devising the simple answer, sometimes overlooking inconvenient facts to compartmentalize our reasoning. The inductive fallacy is a pervasive logic flaw.

In another of Taleb's works, *Fooled by Randomness* (2), the substantial human talent for seeing patterns where none exist, or to underestimate the odds of an occurrence, are explored in detail. And as I implied earlier, hindsight is always 20/20.

Now let's consider how we might overcome these limitations. In their management classic, *Managing the Unexpected* (3), Weick and Sutcliffe from the University of Michigan, describe the concept of the high-reliability organization (HRO). The salient characteristics of HROs are five: 1) a preoccupation with failure; 2) a reluctance to simplify; 3) sensitivity to operations; 4) a commitment to resilience; and 5) deference to expertise. Close attention to failure increases the chance that detection of a weak or early signal of failure may prevent later catastrophic failure. Greater attention to detail, anticipation in the forms of a reluctance to simplify, and attention to operations management mean that more can be seen and more adjustments can be made. Deference to expertise means that more decision making is invested in those in the best position to decide, those with their fingers on the pulse. Commitment to resilience merits particular mention. All members of HROs must have situational awareness; knowledge of systems and technology is crucial to keep small errors from compounding into large ones. Crucial also, particularly for leaders, is to know one's self and one's team members, so as to know how people learn, what skills they have, and how they will react, especially under stress. Many tools are available to facilitate such introspection, such as the Myers-Briggs Personality Type Index; I have found it useful personally.

Effective leaders must have expertise in several domains and must often balance competing priorities. Those denoted by an asterisk are considered especially important. For example, the motivation leader must also be able to use discipline when necessary. The effective leader delegates responsibility, but must also be ready to take charge, especially in a crisis; a crisis is not the time to identify or develop leaders but rather to have them step forward.

HROs also act mindfully. By that I mean they pay close attention. Thinking continuously about the implausible makes it possible to envision problems that might arise and their solutions. They are organized to recognize early the unexpected in the making, so as to halt or contain their development. Should the problem escape containment, resilience in the form of flexibility and

innovation allows the swift restoration of functionality. Examples of high-reliability organizations include nuclear power plants, hostage negotiation teams, aircraft carriers, and people like us – medical emergency response teams. What these ostensibly different teams share is the realization, as one famous movie put it, “failure is not an option.” The environments in which HROs operate also share several characteristics; they are high-risk environments where on-the-job training and trial-and-error learning are just impermissible. Situations are fluid and can change rapidly; small errors can propagate or compound quickly. Of course, every person in this room today is accustomed to making momentous clinical decisions based on incomplete information that is the stock-in-trade of critical care practice.

The flight deck of a Nimitz class aircraft carrier has been called the most dangerous 4.5 acres anywhere, yet it is one of the safest places imaginable. A naval officer quoted by Weick and Sutcliffe put it thus: “Imagine that you shrink San Francisco Airport to one short runway, one ramp, and one gate. Make planes land and take off at the same time. Have the preset time interval and rock the runway from side to side. Make sure the equipment is so close to the edge of the envelope that it’s fragile, then turn off the radios and radar to avoid detection. Fuel the aircraft with their engines running, and scatter live bombs and rockets around. Now wet the whole thing down with seawater and oil, and man it with 20-year-olds, some of whom have never seen an aircraft before. And oh, by the way, try not to kill anyone” (3).

With tongue only slightly in cheek, it takes little imagination to liken carrier flight operations to a typical trauma activation. Think about it for just a moment. What makes this catapult officer stand over a steaming catapult in front of a powerful fighter? A culture of safety and empowerment. The carrier flight deck is the epitome of high-reliability organization. Preoccupation with failure? Every landing is not only graded but televised; everyone on board can see failure. Sensitivity to operations? Communication is continuous and unambiguous in a noisy environment through the use of hand signals. Deference to expertise? There’s no rank during flight operations; anyone can intervene to rectify a dangerous situation.

Now let’s consider SCCM’s part in the story of Katrina. SCCM was scheduled to hold its 35th Annual Critical Care Congress in the Morial Convention Center, which sustained heavy damage and was no longer available. Our annual Congress was coming up in 4 months, and we had no venue. If SCCM had cancelled unilaterally, we faced multimillion dollar cancellation penalties. How did SCCM respond to its crisis?

The Chinese pictogram for crisis is comprised of danger and opportunity. According to Mitroff (4), in crisis we react but how we react is defined by how we have prepared. Preparing in anticipation of crisis represents the opportunity inherent.

Crisis may become manifest in many forms: economic, informational, or physical, among others. And in several forms simultaneously. In SCCM’s Katrina crisis, a natural disaster precipitated physical, the loss of the Congress venue, and economic crises, the financial penalties we faced. When I led SCCM’s strategic planning process several years ago, I encouraged the organization

to adopt a long-range planning horizon and to think about improbable events and their impact. Scenario planning is one tool to facilitate thinking about what lies over the horizon, beyond what can be envisioned. Scenario planning prepares an organization to manage complexity in its operating environment, disruptive change, or genuine uncertainty. For example, a recent article in the *Harvard Business Review* describes how Fortune 500 companies are already beginning to envision the effects of climate change on healthcare: more heat-related deaths, more tropical diseases, and more flood-related illnesses need to be envisioned and planned for. Are you thinking about this yet?

Katrina struck over the Labor Day weekend. Several of our dedicated staff members surrendered their holidays and swung into action. Hundreds of calls were fielded from SCCM volunteers eager to contribute to the medical relief effort and the information was supplied to coordinating organizations. The New Orleans Convention and Visitors Bureau was contacted; we learned that we would be in competition with more than 40 other organizations for scarce convention venues and that we would not be released from our financial commitment, at least not yet. Senior volunteer leadership monitored the situation closely to provide support, and amazingly – but really not so – our superlative staff had already planned for this unlikely catastrophic loss of our convention venue. Alternative venues were contacted quickly and when we were finally released from our New Orleans commitments, we contracted within hours to meet in San Francisco. SCCM had become a high-reliability organization and remains so today. In my opinion, SCCM's response to Katrina represented our finest hour. Attendance in San Francisco reached an all-time high – that is, until yesterday, at this meeting.

I am pleased to be a leader in a high-reliability organization, the acute care surgical service of New York-Presbyterian/Weill Cornell Medical Center. One of our marketing slogans is "Amazing Things Are Happening Here," except that its not just hype. If you plan and prepare and transform yourselves into a high-reliability organization, there may come a time when you too will accomplish something amazing.

But even success brings its hazards. We can't let it go to our heads. High-performance organizations can be distracted by the hoopla and lose their heads. Our job at Cornell will be to maintain our focus and maintain our performance.

Tragedy can strike anywhere. Urban areas hold no monopoly on crisis. We stand in solidarity with Virginia Tech and morn their losses. We honor the first responders and the medical emergency teams of the Blue Ridge Mountain region for responding effectively in the face of crisis and grief. We are all helpless.

You cannot anticipate every eventuality, but you can prepare. Even if you are not a team leader, you can prepare. Do you know your facility's disaster plan? Do you know your role within it? Have you ever participated in a disaster drill? Are your skills up to date? Is your team well rehearsed? Ask these questions of yourselves. Hopefully the answers will be affirming, but if not, SCCM can help you prepare. By attending SCCM's Annual Critical Care Congress, you have

already confirmed your commitment to lifelong learning. The *Fundamental Critical Care Support* (FCCS) manual has just be published in its fourth edition and the *Fundamentals of Disaster Management* manual will soon appear in its third. Our superb journals bring you the latest information and editorial commentary to help you place the information in perspective. Our flagship journal, *Critical Care Medicine*, has just received its highest impact factor ever, nearly 6.6, placing it in the top 3.4% of all journals worldwide.

SCCM has also invested several years and several million dollars to keep its technology at the forefront of customer service and support. Enhanced technology and security are the core of the effort, but members and visitors to our website, www.sccm.org, will enjoy enhanced navigability and functionality. Log on if you haven't already. You can customize your own online experience at www.MySCCM.org, find topical educational content collated for you at www.LearnICU.org, listen to our award-winning iCritical Care podcasts (we've just published the 100th in the series), register for meetings, order books and other merchandise, and so much more. And should you call, customer service representatives will have your profile literally at their fingertips to be able to serve your promptly and efficiently.

And now I ask you to please help SCCM. The Society's goal for the Critical Care Education and Research Foundation calls for 100% participation from all Congress attendees. In your chair or in your registration packet is an envelope for the Foundation. Please join me and your colleagues to reach this goal. The Society's educational, clinical, and research initiatives provide an important public service; they help ensure positive outcomes for patients in our ICUs. Make a difference with your donation, large or small. Your envelope may be deposited in the boxes located outside this room, at registration, or at SCCM Central in the Exhibit Hall.

And as we conclude, please take a private moment to remember the fallen. Please also remember our colleagues who provide healthcare in the Armed Forces; no matter your opinions about global geopolitics, these are our colleagues and friends. They have volunteered to serve, and they too are doing some amazing things.

I have two partners, Soumi and Jian, both of whom are SCCM members. We make a great team because we are as alike as we are different, and I am grateful to them both for the care they provide and the support they give me. Jian is in the audience today, and I am pleased to thank him personally in your presence. Special thanks and my undying admiration and gratitude go to Lynn Hydo, who's been my colleague and friend for more than 20 years; she manages our clinical research enterprise, maintains our database, has collaborated on more than 120 publications, and has a steadying influence when things start getting a little crazy. Words hardly express my admiration for her.

Crisis is inevitable and rarely foreseen, but you can think differently about your environment and your practice. If you prepare, you can have the skills and tools to manage adversity. Things are going to change.

Mahalo, and thank you so much for the opportunity to be your president.

References

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2. Taleb NN. *Fooled by Randomness: the Hidden Role of Chance in Life and in the Markets*. New York, NY: Random House; 2008.

3. Weick KE, Sutcliffe KM. *Managing the Unexpected: Resilient Performance in an Age of Uncertainty*. San Francisco, CA: Jossey-Bass; 2007

4. Mitroff I. *Crisis Leadership: Planning for the Unthinkable.* Hoboken, NJ: Wiley; 2003.

5. Lash J, Wellington F. Competitive advantage on a warming planet. *Harvard Business Rev*iew. March 2007.