

Executive Summary: The Science of Surge Conference

The *Academic Emergency Medicine* 2006 Consensus Conference, "The Science of Surge," was held on May 17, 2006, in San Francisco. The conference was developed by a committee under the direction of the Editor-in-Chief of *Academic Emergency Medicine* and was our seventh annual multidisciplinary conference dealing with health care policy issues of importance to the delivery of emergency health care. The conference was joined by the Association of Academic Chairs of Emergency Medicine as part of their formal offering at their yearly national conference. In addition, the conference was attended by members of the Society for Academic Emergency Medicine (SAEM) and key SAEM committees, as well as invited national and regional observers and experts.

The conference was funded by *Academic Emergency Medicine*, the National Center for the Study of Preparedness and Catastrophic Response (PACER, a U.S. Department of Homeland Security University Center of Excellence), and the Johns Hopkins Office of Critical Event Preparedness and Response. SAEM also supported this meeting. The former U.S. Surgeon General, Vice Admiral Richard H. Carmona, MD, MPH, delivered the conference keynote address the following evening, at the conclusion of the opening reception of the SAEM annual meeting.

The goals of the *Academic Emergency Medicine* 2006 Consensus Conference were to 1) determine the scientific underpinnings for the study of surge; 2) explore the interrelationships between two main concepts, daily surge and catastrophic surge; and 3) establish priorities for study. The major objective of the conference was to set the surge research agenda for emergency medicine and determine a means to communicate the importance of such research to related disciplines, policy makers, and funding agencies. The specific conference objectives were to reach consensus on 1) definitions of primary concepts of surge capacity, 2) how the concepts of daily surge and disaster surge overlap, 3) determining important areas of discovery, 4) determining potential methodological approaches, and 5) determining appropriate metrics. The main product of the conference is the publication of these proceedings along with other peer-reviewed original articles on the same topic in this issue of *Academic Emergency Medicine*.

CONFERENCE PROCEEDINGS

Overview of the Topic

After opening remarks by Dr. Michelle Biros, Editor-in-Chief of *Academic Emergency Medicine*, and Dr. Gabe

Kelen, chair of the conference, a session entitled "The Big Picture" was moderated by Dr. Kristi L. Koenig, co-chair of the conference. A panel of experts focused on setting the tone for the day's discussions by providing an overview of the conceptual definitions of surge and the current state of research. Donna Barbisch, DrHA, MPH, director of the Institute for Global and Regional Readiness in Washington, DC, presented the components of a surge system: staff, stuff, and structure (physical and management). Sally Phillips, RN, PhD, director of the Bioterrorism Preparedness Research Program at the Agency for Healthcare Research and Quality, described the current status of surge research, noting that evidence-based research on emergency preparedness and surge capacity is sparse, with a preponderance of literature on concepts and case study approaches. Brent Asplin, MD, MPH, of the University of Minnesota then focused on the state of research in daily surge. Frank Shih, MD, director of emergency medicine at the National Taiwan University Hospital, provided his perspectives on biothreat surge issues based on his work in Taiwan, including his experiences in managing the outbreak of severe acute respiratory syndrome. Finally, Skip Burkle Jr., MD, MPH, director of the Asia-Pacific Center for Biosecurity in Hawaii, discussed health system surge, including triage methodologies for large populations of patients.

Breakout Group Discussions

Breakout sessions including audience participants were facilitated by experts identified by the planning committee. Three simultaneous morning sessions followed the "Big Picture" panel.

The breakout group "Defining Concepts" was facilitated by Amy Kaji, MD, MPH, and Tareg Bey, MD, PhD, and sought to delineate the components and key issues that comprise surge capacity, distinguish daily and disaster surge capacity, and outline the challenges in standardizing and quantifying surge capacity.

The session on "Priorities for Research" was facilitated by Richard Rothman, MD, PhD, and Christopher Kahn, MD. Using a quasi-Delphi technique, members of this session developed a prioritized list of areas considered important to investigate. Key discussion topics were criteria and methods for decision making regarding allocation of scarce resources, best practice guidelines for triage protocols, methods to test the efficacy of decision-making processes, best practice communications strategies for information sharing and situational awareness, and methods and alternatives for meeting workforce needs.

The breakout session on “Differentiating Large Scale Surge versus Daily Surge” was facilitated by Robert O’Connor, MD, MPH. The group concentrated on defining resource requirements, factors responsible for and measurements of daily surge, how surge capacity can be increased to manage a large-scale event, and the science of triage techniques during times of surge needs.

Boaz Tadmor, MD, Senior Consultant for Emergency and Disaster Preparedness and former head of the Medical Department of the Israeli Defense Forces Home Front Command, shared his insights and experiences from Israel in a lunch session entitled “The Art and Science of Surge.”

Panel Discussion on Methodologies and Process

The afternoon panel was moderated by Dr. Arthur Sanders and focused on specific operational issues regarding methodologies and processes as a complement to the morning session on the global strategic overview of concepts and current state of research. Peter Estacio, MD, PhD, MPH, Senior Medical Advisor, U.S. Department of Homeland Security, discussed the use of detection as a methodology and process to address surge capacity needs for an emerging event and early warning programs that are under development that offer countermeasures for large-scale infectious disease events. Melissa McCarthy, ScD, from Johns Hopkins University addressed research methods in daily surge. Joshua Epstein, PhD, Senior Fellow, Center for Social and Economic Dynamics, The Brookings Institution, shared information on simulations. Robert Wise, MD, Vice-President, Division of Standards and Survey Methods, Joint Commission on Accreditation for Healthcare Organizations, spoke on the role of regulatory agencies in the creation of emergency health care standards for catastrophic events. Carl Schultz, MD, from the University of California at Irvine discussed the state of research in high consequence surge.

Breakout Group Discussions

Three afternoon breakout sessions followed the methodologies and process panel. The group discussing “Metrics” was facilitated by Jonathan Handler, MD, and Thomas Kirsch, MD. They sought to define the metrics that identify capacity and surge, how these affect patient outcomes, the priorities for research, and ways to communicate metrics between providers and institutions.

The breakout session on “Detection” was facilitated by Lieutenant Colonel John McManus, MD. This group explored the role of the emergency department in developing community hazard vulnerability analyses and situational awareness of community dangers, what detection methods have been scientifically validated, and what types of decision support tools and programs are needed to collect and analyze information.

The group examining “Methods of Research Inquiry” was facilitated by Thomas Terndrup, MD, and Joel Rogers, MA. This group examined currently available research methods pre-event and postevent, including their limitations and methods that need further development. They also discussed methodologies for studying triage decision making and resource identification.

The final session of the day was led by Lieutenant Colonel John McManus, MD, and James Scheulen, PA-C, MBA, and consisted of summary reports from the breakout sessions.

Original Research

A call for original papers related to research concepts on the science of surge was issued by *Academic Emergency Medicine* in 2005. The articles that were received underwent the journal’s standard peer review process, and accepted articles were edited by David Cone, MD. The articles are published in this issue of *Academic Emergency Medicine*.

SUMMARY

The proceedings of the conference are presented in this issue of *Academic Emergency Medicine*. The conference brought together emergency physicians, policy makers, economists, hospital administrators, experts in mathematical modeling, and others to begin laying the academic groundwork for the science of surge. A morning panel session covering definitions of surge and the current state of research was followed by working groups that discussed a conceptual framework, research priorities, and differentiating daily from catastrophic surge. The lunch speaker shared knowledge from the Israeli experience with surge. An afternoon panel focused on research methodologies and processes and was followed by workgroups that discussed metrics, detection, and methods of research inquiry.

This conference lays the academic foundation for further research into the science of surge. The challenge ahead is to continue to refine surge capacity concepts, scientifically study and test the theories, and communicate the results to the appropriate funding agencies and policy makers.

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