CHEST

Introduction and Executive Summary

Care of the Critically Ill and Injured During Pandemics and Disasters: CHEST Consensus Statement

Michael D. Christian, MD, FRCPC, FCCP; Asha V. Devereaux, MD, MPH, FCCP; Jeffrey R. Dichter, MD; Lewis Rubinson, MD, PhD; and Niranjan Kissoon, MBBS, FRCPC; on behalf of the Task Force for Mass Critical Care

PODCAST

Natural disasters, industrial accidents, terrorism attacks, and pandemics all have the capacity to result in large numbers of critically ill or injured patients. This supplement provides suggestions for all of those involved in a disaster or pandemic with multiple critically ill patients, including front-line clinicians, hospital administrators, professional societies, and public health or government officials. The current Task Force included a total of 100 participants from nine countries, comprised of clinicians and experts from a wide variety of disciplines. Comprehensive literature searches were conducted to identify studies upon which evidence-based recommendations could be made. No studies of sufficient quality were identified. Therefore, the panel developed expert-opinion-based suggestions that are presented in this supplement using a modified Delphi process. The ultimate aim of the supplement is to expand the focus beyond the walls of ICUs to provide recommendations for the management of all critically ill or injured adults and children resulting from a pandemic or disaster wherever that care may be provided. Considerations for the management of critically ill patients include clinical priorities and logistics (supplies, evacuation, and triage) as well as the key enablers (systems planning, business continuity, legal framework, and ethical considerations) that facilitate the provision of this care. The supplement also aims to illustrate how the concepts of mass critical care are integrated across the spectrum of surge events from conventional through contingency to crisis standards of care.

CHEST 2014; 146(4_Suppl):8S-34S

ABBREVIATIONS: CCTL = Critical Care Team Leader; CHEST = American College of Chest Physicians; HC/RHA = health-care coalition/regional health authority; IT = information technology; MCC = mass critical care; NGO = nongovernmental organization; Spo_2 = oxygen saturation by pulse oximetry; WHO = World Health Organization

Accepted May 1, 2014; originally published Online First August 21, 2014.

AFFILIATIONS: From Royal Canadian Medical Service (Dr Christian), Canadian Armed Forces and Mount Sinai Hospital, Toronto, ON, Canada; Sharp Hospital (Dr Devereaux), Coronado, CA; Allina Health (Dr Dichter), Minneapolis, MN; Aurora Healthcare (Dr Dichter), Milwaukee, WI; R. Adams Cowley Shock Trauma Center (Dr Rubinson), University of Maryland School of Medicine, Baltimore, MD; and BC Children's Hospital and Sunny Hill Health Centre (Dr Kissoon), University of British Columbia, Vancouver, BC, Canada.

FUNDING/SUPPORT: This publication was supported by the Cooperative Agreement Number 1U90TP00591-01 from the Centers of Disease Control and Prevention, and through a research sub award agreement through the Department of Health and Human Services grant Number 1 - HFPEP070013-01-00 from the Office of Preparedness of Emergency Operations. In addition, this publication was supported by a grant from the University of California–Davis.

COI grids reflecting the conflicts of interest that were current as of the date of the conference and voting are posted in the online supplementary materials.

CORRESPONDENCE TO: Michael D. Christian, MD, FRCPC, FCCP, Royal Canadian Medical Service, Canadian Armed Forces, Mount Sinai Hospital, 600 University Ave, Rm 18-232-1, Toronto, ON, M5G 1X5, Canada; e-mail: michael.christian@utoronto.ca

DOI: 10.1378/chest.14-0732

Natural disasters, industrial accidents, terrorism attacks, and pandemics all have the capacity to result in large numbers of critically ill or injured patients.[1] Depending on their magnitude, the response to these surges may vary from a conventional response, where critically ill patients are managed with no significant alterations in standards or process of care, to a crisis response, where resource limitations dictate significant alterations in both standards and process of care to provide minimal basic critical care to the maximum number of patients (Fig 1).[2-6] This supplement provides suggestions for all of those involved in a disaster or pandemic with multiple critically ill patients, including front-line clinicians, hospital administrators, professional societies, and public health or government officials. Although it is important for all providers to be familiar with the aspects of critical care disaster/pandemic management, Table 1 provides an overview of the suggestions of most interest to each of the groups.

In 2008, the American College of Chest Physicians (CHEST) Task Force on Mass Critical Care published its first series of disaster critical care suggestions.[1,5,7-9] Their published document reflected their consensus deliberations and proposed suggestions regarding the care of critically ill and injured patients from disasters. The supplement was received enthusiastically by both the medical and broader public health communities, becoming the second most frequently downloaded supplement from CHEST's website, and papers from the supplement have been cited in 157 publications indexed on the Web of Science (http://thomsonreuters.com/web-of-science). The effort was timely, as many hospitals applied the suggestions to respond to regional crises related to the 2009 influenza A(H1N1) pandemic.[10-16] Several recent disasters have brought new learning since the original documents were published. Also, the 2008 documents had minimal direction for the management of pediatrics, trauma, subspecialty ICU populations, or critical care outside of developed countries. Consequently, the Task Force for Mass Critical Care was reconvened with an expanded scope and expertise to provide a rigorously developed set of usable guidelines to critical care providers responding to disasters or pandemics throughout the world.

The assumptions[1] upon which the first Task Force suggestions were based remain largely unchanged. Since 2008, the world has coped with the 2009 A(H1N1) pandemic as well as a myriad of other events that have either resulted in or have had the potential to create large numbers of critically ill patients or disrupt existing regional critical care infrastructure: Japan earthquake/tsunami 2011,[17] Buenos Aires train crash 2012, Brazil night club fire 2013, Boston marathon bombing 2013,[18,19] Spanish train crash 2013, super-storm Sandy,[20,21] and the Westgate mall attack 2013 Nairobi. The horizon is studded with potential pandemics, such as H7N9[22] and MERS CoV[23]; in addition, conflicts and regional instability increase the risk of conventional and chemical weapons attacks.[24-26] Clearly, hospitals and clinicians still need to be prepared to manage large numbers of critically ill or injured patients.

Cognizant of the burgeoning experience since the 2008 supplement, the Task Force for Mass Critical Care reconvened in 2012 and 2013 to review, update, and expand the suggestions presented in the 2008

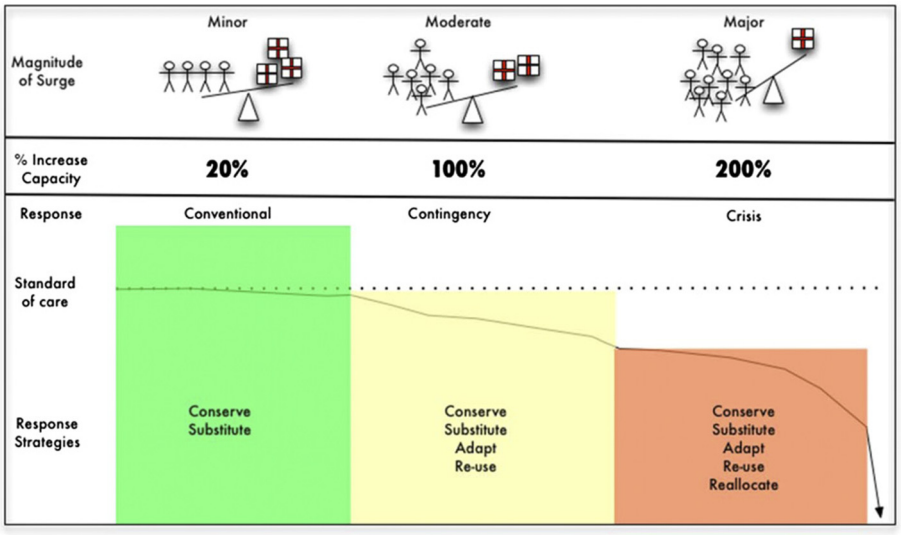

Figure 1 – *This figure depicts the spectrum of surge from minor through major. The magnitude of surge is illustrated by the alterations in the balance between demand (stick people) and supply (medication boxes). As surge increases, the demand-supply imbalance worsens. Conventional, contingency, and crisis responses are used to respond to the varying magnitude of surge. Varying response strategies are associated with each level of response. As the magnitude of the surge increases, the strategies used to cope with the response gradually depart from the usual standard of care (default defining the standards of disaster care) until such point that even with crisis care, critical care is no longer able to be provided.*