CHEST Online Supplement

Mass Critical Care Surge Response During COVID-19

Implementation of Contingency Strategies – A Preliminary Report of Findings From the Task Force for Mass Critical Care

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e-Appendix 1. Methodology

Methodology Overview:

In the Fall of 2020, the Task Force for Mass Critical Care (The Task Force) embarked on a project to develop rapid guidelines for managing the COVID-19 pandemic surge given its persistence globally, an urgent need for dissemination of best practices, and the diverse composition of The Task Force with disaster professionals experienced in the management of critically ill COVID-19 patients during surges. Given the novelty of COVID-19, high quality evidence was limited. To maintain methodologic rigor, reduce the time to development, and maintain flexibility to adapt to evolving trends, the Task Force adopted a modified version of established rapid guidelines molding methodologies from the World Health Organization rapid advice guideline principles[1] and the Guidelines International Network-McMaster Guideline Development Checklist for rapid guidelines[2] (Morgan 2018). With a consensus development process incorporating high-caliber expert opinion to define important questions and extract evidence, The Task Force set out to develop relevant pandemic surge suggestions in a structured and timely manner.

Three distinct areas of surge preparedness and management related to the COVID-19 pandemic were prioritized for the rapid guidelines. These areas focused on hospital, health system, and state/regional *system level strategies* as having the greatest opportunity for clinical impact and for which there was very limited published data. These three areas were 1) communication and coordination during surge, 2) staffing and resilience challenges during surge, and 3) novel surge strategies based on COVID-19 experience. Task Force members were distributed across these three subcommittees based on relevant levels of experience and expertise. Each of the three groups worked in parallel to develop questions, search the literature, extract key statements, provide expert opinions, and synthesize suggestions. Members from all three groups met at least weekly to discuss findings, updates, and overall project progress.

Literature Review:

Each subcommittee conducted a rapid literature review to compile and consolidate published evidence relevant to each subcommittee's topic. Working with a medical librarian, a search strategy for relevant literature was developed, with criteria for inclusion limited to studies

that were *most* applicable to COVID-19. There were no restrictions on publication dates, but studies published in 2020 were prioritized for inclusion due to *direct evidence* addressing COVID-19. Studies published prior to 2020 were assessed for *indirect evidence* applicable to COVID-19 with applicability and inclusion determined by consensus amongst subcommittee members.

Data Extraction:

Once articles were selected for inclusion for each subcommittee, at least two members screened the titles and abstracts for those most relevant to each topic. Each subcommittee then disseminated the selected articles for review and subcommittee members extracted key narrative statements deemed important for management guidance during a surge relevant to their topic. The extracted statements were consolidated for each subcommittee and then arranged into overarching themes, with duplicate concepts combined or deleted and wording streamlined or improved when appropriate. All subcommittee members were then asked to vote on their top 20 priority statements for incorporation into suggestions. An 80% response rate within each subcommittee was required before finalization of the top statements extracted from the literature. Final statements had at least 25% of the respondents choose them.

In tandem with the extraction of statements from articles deemed most relevant to each subcommittee's area of focus, Task Force members convened weekly to share anecdotal evidence from their own expertise and experiences managing the COVID-19 surge at their institutions and regions. These anecdotal statements, along with any additional deemed applicable by members of each subcommittee, were then incorporated alongside the statements obtained from the literature review into a tabular format under the appropriate overarching themes.

Evidence Synthesis:

The statements extracted from the literature review were combined with anecdotal evidence for each overarching theme, when applicable, to arrive at initial suggestions for each subcommittee. Subcommittee members then engaged in an iterative multi-round survey process in order to arrive at best-practice suggestions, using a modified Delphi approach[3] previously used by the Task Force in an earlier CHEST Consensus Statement[4].

Subcommittee members voted on their level of agreement for each initial suggestion, using a five-point Likert scale derived from the Grading of Recommendations Assessment, Development and Evaluation (GRADE) grid[5,6] [strongly disagree - 1; disagree - 2; neutral - 3; agree - 4; strongly agree - 5]. The suggestions were accepted if their average score received ≥ 3.5 points. For cases in which the average was <3.5 points, revisions were considered or the suggestion was omitted from further consideration. If revised, the suggestions were re-rated by the subcommittee and suggestions receiving average score of ≥ 3.5 points were accepted. At least 80% participation with average Likert Scores ≥ 3.5 was required for each suggestion to be finalized within each subcommittee.

The GRADE Evidence-to-Decision framework was used to determine the strength of finalized suggestions. Quality of evidence, values, benefits, harms, and feasibility for each finalized suggestion was assessed using a Likert scale where a median score > 4 was deemed as a strong suggestion, and anything less a weak suggestion. A high threshold for determining a strong suggestion was established due to the overall absence of high-quality evidence.

Next Steps: Finalized Suggestions

The next step for each subcommittee is to present the finalized suggestions to the entire Task Force for discussion and approval, similar to the process within each subcommittee. The entire Task Force participants will include all members of each of the three project groups, and any "at large" members who must formally "opt in" to participate. The suggestions will either be accepted by the Task Force or sent back for further revision. The suggestions will be finalized once there is 80% consensus reached (average Likert score ≥ 4.0) with a response rate of at least 80%. Once accepted by The Task Force, the final suggestions will be considered ready to be shared publicly, in both written and virtual presentation formats with frequent updates based on evolution of the evidence and expert opinion as they relate to management for the COVID-19 pandemic surge.