



PRAGMATIC DISEASE- FOCUSED CHECKLIST FOR USE DURING ROUNDING ON CRITICALLY ILL PATIENTS WITH COVID-19

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The sudden surge in cases of COVID-19 has presented unprecedented challenges in the care of critically ill patients with the disease. A disease-focused checklist was developed to supplement and streamline the existing structure of rounds during a time of significant resource constraint. A total of 51 critical care consultants across multiple specialties at a tertiary academic medical center were surveyed regarding their preference for a structured checklist. Among the respondents, 82% were in favor of a disease-focused checklist. Mechanical ventilation parameters, rescue ventilation strategies, sedation regimens, inflammatory markers specific to COVID-19, and family communication were the elements most commonly identified as being important for inclusion in such a checklist. (*American Journal of Critical Care*. 2021;30:238-241)

The COVID-19 pandemic has presented significant challenges to health care systems worldwide, as approximately 14.4% to 16% of those hospitalized require admission to an intensive care unit (ICU).^{1,2} The rapid evolution of this pandemic has strained ICU capacities to unprecedented levels.^{3,4} Uncommon circumstances such as need for surge ICU space, reallocation of nursing staff, and the accompanying multiple care transitions continue to present unique challenges to well-established ICU workflows.³

These issues have been compounded by uncertainties about the natural history of the disease and a lack of established treatment guidelines.⁵ Such uncertainties notwithstanding, certain clinical patterns have emerged among critically ill patients with COVID-19 who have been admitted to ICUs.⁶ Most of these patients arrive in the ICU in a hyperinflammatory, prothrombotic state, with acute respiratory distress syndrome (ARDS) as the key manifestation.

The main problems associated with the care of these patients in the ICU that are distinct from the problems that arise during usual care include difficulties with mechanical ventilation with frequent need for rescue strategies, challenges with management of sedatives and anticoagulants, selection of therapeutics for off-label use, and restrictions on family visitation, which hinder communication. Recognizing these clinical patterns, we sought to ascertain whether intensivists would be interested and perceive utility in the development of a disease-focused checklist that would streamline and supplement the existing structure of rounds, and we aimed to identify appropriate components of such a checklist. Checklists by themselves may have limited utility in improving quality of care,⁷ but their role in the management of a relatively new disease when major logistical challenges abound has not been explored.

Methods

On the basis of initial positive feedback, we designed a needs assessment survey. After pilot testing, we forwarded it to intensivists within the Anesthesia, Critical Care, and Pain Medicine; Pulmonary,

Critical Care, and Sleep Medicine; and Acute Care Surgery, Trauma, and Surgical Critical Care departments at Beth Israel Deaconess Medical Center (BIDMC) in Boston. As a tertiary academic medical center, BIDMC has 77 designated ICU beds.

This number had been expanded to 134 beds at the peak of the COVID-19 pandemic. During this pandemic, critical care services at BIDMC transitioned to geographic rounding, with ICU teams caring for patients admitted to the units irrespective of their primary critical care diagnosis, whether medical or surgical. Intensivists were thus exposed to similar case mixes, predominantly comprising patients with COVID-19 during the pandemic.

The survey comprised 4 questions focused on (1) understanding the cumulative experience of intensivists performing rounds for patients with COVID-19; (2) identifying any perceived need for a structured disease-focused checklist; (3) evaluating the use of any existing intuitive aids; and (4) querying interest in a structured checklist embedded within the electronic medical record. A fifth item asked respondents to identify the most important components of such a structured checklist; respondents noted responses as free text. (The survey is presented in the Supplement, available online only at www.ajconline.org.)

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Results

We sent the survey to 51 intensivists from the aforementioned departments at BIDMC between April 27 and May 9, 2020; 23 of the intensivists (45%) responded. Among them, 82% were in favor of an automated tool embedded within the electronic medical record that would facilitate daily structured rounds. Our survey identified various components that could be incorporated into a COVID-19-specific checklist. The most important components included

Surges in COVID-19 cases have posed unique challenges to established ICU workflows that can be partially mitigated by structured rounding aids.

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Table

Common themes identified for incorporation in a rounding checklist specific for COVID-19

Themes	Respondents, No. (%)
Ventilation parameters	18 (78)
Rescue strategies for ventilation: prone positioning, paralysis, inhaled epoprostenol, inhaled nitric oxide, extracorporeal membrane oxygenation	11 (48)
Sedation regimen	9 (39)
Inflammatory markers specific to COVID-19	9 (39)
Family communication	7 (30)
Anticoagulation	5 (22)
Fluid balance and renal function	5 (22)
Trial eligibility	4 (17)
Antimicrobials	3 (13)

ventilation parameters, rescue ventilation strategies, sedation regimens, COVID-19-specific inflammatory markers, and family communication (see Table).

Discussion

Our pilot work highlights the potential need for a structured, focused checklist that may help streamline

the process of rounds among critically ill patients with COVID-19 at a time of severe constraint. We aimed our survey at a pool of experienced intensivists across multiple specialties at a tertiary academic medical center at the height of the pandemic. The collective responses reflect experiences across traditional and surge spaces and could therefore be extrapolated to large centers across the United States that are facing similar disease burden. We are in the process of incorporating this checklist into our electronic medical record and are currently pilot testing a hard-copy version to facilitate rounds in select locations (see Figure).

Our results are a consistent reflection of the common problems associated with management of severe acute respiratory distress syndrome compounded by challenges in optimizing sedation because of drug shortages. Although understanding of the progression of COVID-19 remains incomplete, preliminary data suggest the utility of trends in levels of inflammatory markers (D-dimer, fibrinogen, and ferritin), which may have prognostic value and may therefore justify relevant testing.⁸ The importance of daily family communication was borne out in our checklist. Although

COVID-19 disease-focused checklist

Medical Record Number:
Critical Care Unit: Traditional/Surge ICU

Parameters	Date						
Ventilation parameters	Mode						
	P/f						
	PEEP						
	Driving pressure						
Rescue strategies	Nitric oxide						
	Inhaled epoprostenol						
	Prone						
	Paralysis						
Sedation regimen							
Inflammatory markers	D-dimer						
	Fibrinogen						
	Ferritin						
	C-reactive protein						
Anticoagulation	Therapeutic						
	Prophylactic						
Fluid balance and renal function	Creatinine						
	24-hour fluid balance						
Family communication	Update (yes/no)						
	Mode of communication						
Trial eligibility	Enrolled						
	Eligible						
Antivirals/immunomodulators	Antiviral						
	Immunodulator						

Figure Checklist focused on COVID-19 for use during rounds in the intensive care unit (ICU).

Abbreviations: PEEP, positive end-expiratory pressure; P/f, ratio of partial pressure of arterial oxygen to fraction of inspired oxygen.

this element figured lower in the list, perhaps because intensivists did not perceive the issue as being unique to COVID-19, we cannot overemphasize its importance in the context of limitations on family visitation. The role of the extent of anticoagulation, whether prophylactic or therapeutic, remains unclear in this population, although most patients demonstrate a thrombotic form of disseminated intravascular coagulation.⁹ This finding explains the need for a daily reassessment of anticoagulation strategies.

With multiple interventional trials ongoing, judicious flagging of patients as candidates for such trials is appropriate in order to generate an evidence base that will inform future treatment strategies, although this may be more relevant at large centers. Currently, no strong recommendations favor any specific antivirals for COVID-19, although the evidence is evolving rapidly.⁵ This observation may explain why few respondents favored inclusion of this element on the checklist.

Despite a modest response rate of 45%, which could be attributed to the enhanced clinical load on the group surveyed, it was evident from the results that respondents were overwhelmingly in favor of a structured aid for rounds among this population. Limitations of response bias and institutional preferences notwithstanding, use of this lean checklist could aid in the development of a focused approach to addressing the most common COVID-19–related issues in the ICU. Although data collection could be simplified further by automatically populating most fields from the electronic medical record and thereby minimizing transcription errors, such automation is not essential, as evident from our current practice.

We do not claim to capture *all* key elements necessary for efficient, focused rounds, but we provide a pragmatic disease-focused framework that institutions could modify according to unique local needs and priorities. The effects of this checklist on the overall utility and efficiency of processes of care remain to be determined.

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FINANCIAL DISCLOSURES

None reported.

SEE ALSO

For more about adjustments during COVID-19, visit the *Critical Care Nurse* website, www.ccnonline.org, and read the guest editorial by Goforth, “Our New Normal: Back to the Basics and Creating Our Future” (February 2021).

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