



Multisociety Task Force for Critical Care Research: Key Issues and Recommendations

Executive Summary

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In 2009 the four largest professional societies involved in critical care in the United States – the American Association of Critical-Care Nurses (AACN), the American College of Chest Physicians (ACCP), the American Thoracic Society (ATS), and the Society of Critical Care Medicine (SCCM) – formally established the Critical Care Societies Collaborative (CCSC) to explore common issues. At that time, in spite of the importance of critical care, there was no consensus on the agenda for critical care research in the United States. To overcome deficiencies in the conduct and expansion of critical care research, experts from each of the four CCSC com-

ponent societies joined with a successful clinical research collaborative, the US Critical Illness and Injury Trials Group (USCIITG), and formed the Multisociety Strategic Planning Task Force for Critical Care Research. The task force was charged with defining a comprehensive agenda for critical care research based upon input from a broad range of participants and relevant stakeholders.

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METHODS AND PROCESS

Each of the five organizations identified a key leader to serve as a member of the task force steering committee, which initially convened via conference calls and a face-to-face meeting to develop an approach. After careful deliberation and iterative input from the leadership of the five organizations, the steering committee identified several key characteristics to providing a framework within which critical care research and practice could be defined.

Through an iterative process that focused on broad representation across the grid spectrum, 20 additional individuals with expertise within multiple areas were invited to participate. They were divided into five subgroups (basic/cellular, translational, clinical, health systems and delivery, education), each chaired by a member of the steering committee. Each subgroup was charged with defining its research priorities while considering the time course of critical illness. The subgroups and steering committee met both by conference calls and by a 2-day face-to-face meeting.

Outcomes

In the course of the discussions, the task force identified key overarching themes and challenges to research:

1. The insular “silo-ed” approach to critical care and research must be altered.
2. Diverse areas of research must be more effectively linked.
3. Human research must account for the complexity of critical illness and injury and patient phenotypic heterogeneity.
4. An enhanced infrastructure for clinical research is required.

Through an extensive iterative process, the task force also identified **general principles for the research priorities in critical care**:

- Unpack critical illness: classify and separate clinical entities.
- Identify and test novel biomarkers including protein markers, metabolites, RNA, and DNA.
- Develop better models of critical illness and incorporate novel approaches in bench research to account for variations in patients, care strategies, and therapeutic interventions.
- Enhance access to clinical research data.
- Integrate new areas of research, scientific disciplines, and technology into the study of critical illness.
- Develop and apply rigorous methodology to basic, clinical, health services, and translational research experimental design and to the evaluation of evidence.

Based on the work of the five subgroups, the task force also identified **key research priorities in critical care** in the areas defined a priori:

Basic Science/Cellular Research

- Seek to define factors that transform a normal stress response into critical illness.
- Investigate the role of the host response in initiation, transition, and resolution of critical illness.
- Define the microbiome in normal individuals and investigate its role and transitions in critical illness.
- Integrate research into the biology of tissue repair with investigation into mechanisms that underlie critical illness.

Translational Research

- Integrate studies of mechanism and intervention.
- Apply rigorous, standardized methodology to study design.
- Account for the effects of treatment/management on disease progression.

Clinical Research

- Develop methods for the rapid, early recognition of acute, severe disease in patients at high risk for imminent deterioration.
- Develop minimally invasive, biocompatible organ support.
- Focus on therapeutic manipulation of the neuro-inflammatory state.
- Explore new approaches to enhance patient comfort while reducing the need to manipulate consciousness.
- Develop clinically accessible approaches to accelerate global system and organ recovery/reanimation.
- Identify the best process and outcome measurements for critical illness research and palliative and end-of-life care.

Health Service and Delivery Research

- Identify variables that affect outcomes and develop meaningful and reproducible performance metrics and improvement processes.
- Identify strategies to improve communication and coordination of care delivery.
- Determine which tools, processes, and programs (eg, checklists and multidisciplinary rounds) most effectively promote knowledge transfer and implementation.
- Examine factors related to establishing a positive learning environment (eg, technological advances, reduction in cognitive overload, and avoidance of burnout).
- Examine strategies for preventing errors and facilitating error reporting, and assess the effects on patient outcomes.
- Examine the effectiveness of interventions to measure and treat prevalent/distressing patient symptoms (eg, pain, fatigue, confusion/delirium) and family symptoms (eg, anxiety, depression, stress disorders).

Education Research

- Incorporate cognitive psychology, systems engineering, and social science into critical care education and training.
- Determine the relative importance of key elements such as team interactions, deliberate practice, assessment, and de-briefing in simulation.
- Refine team-based learning, including examining differences between high- performing and low-performing units, and determining in which scenarios team-based learning has the greatest value.

In addition to the specific research priorities identified, the task force recognized that critical care

research could be substantially enhanced by process improvements in specific areas, including:

- Research environment
- Preclinical modeling
- Patient characteristics
- Regulatory challenges
- Research networks
- Standardization of approach
- Funding
- Flexibility

The increasing demand for resources to address outcome challenges mandates enhanced investment in critical care research and a dynamic, broad-based strategic planning process. The Multisociety Strategic Planning Task Force for Critical Care Research

was convened to meet those challenges. The recommendations for research priorities and process improvements outlined here are the result of a collaborative, multidisciplinary approach.

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