



**Submitted By:** Dale Needham, MD, PhD      **Phone:** 410-215-3031  
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**Session**

**Title:** ICU-Acquired Weakness: New Insights and Novel Therapies  
**Target Audience:** critical care physicians, pulmonologists, pulmonary rehabilitation providers, nurses, respiratory therapists, physical and occupational therapists

**Session Summary**

Include a brief summary of session content that runs no longer than 75 words.  
Muscle weakness in ICU patients is an important clinical problem with long-term consequences for patients' functional status. This session will address new insights regarding clinical manifestations and pathophysiology of skeletal and respiratory muscle weakness in ICU patients, and describe novel methods for physical rehabilitation in the ICU setting. The session will conclude with a synthesis of state-of-the-art science in this field and its implications for design of future ICU therapies.

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**Assemblies**

**Primary Assembly**

Which Assembly do you want to submit this proposal to for review?

Critical Care

**Secondary Assemblies**

Which of the following Assemblies may be considered for co-sponsorship of this session? Select all that apply. (The proposal will not be sent to these Assemblies for review.)

- Allergy, Immunology and Inflammation
- Behavioral Science
- Clinical Problems
- Critical Care
- Environmental and Occupational Health
- Microbiology, Tuberculosis and Pulmonary Infections
- Nursing
- Pediatrics
- Pulmonary Circulation
- Pulmonary Rehabilitation
- Respiratory Cell and Molecular Biology
- Respiratory Structure and Function
- Sleep and Respiratory Neurobiology

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**Statement of Educational Need**

Please state in 250 words or less the educational need for this session to be presented to the ATS International Conference attendees. Please include 2 or 3 resources that could be reviewed by the Program Committee as evidence of need (e.g. specific article, survey, etc.). Please identify the methods you used in determining this need by checking appropriate boxes below, rather than stating them in narrative.

Many ATS members are not knowledgeable regarding muscle dysfunction among persons with chronic disease, nor of the prevalence, severity and prolonged nature of weakness after critical illness. Muscle weakness and associated functional impairment is underemphasized in PCCM clinical training. Very recent data (including "in press" articles) suggest that early rehabilitation, in ICU, is safe and feasible, and can improve patient outcomes. However, early rehabilitation is not conducted in most ICUs since clinicians are not familiar with these methods. Implementation of rehabilitation requires a paradigm shift in the ICU. Increased knowledge regarding weakness, rehabilitation therapies and ICU culture change are needed for a successful paradigm shift (ESICM Statement Int Car Med July 2008; Crit Care Clin 2007;23:81-96). At ATS 2008, a symposium on ICU-acquired weakness was held which focused on diagnosis and associated long-term outcomes. The proposed session builds on this foundation and will: (1) delve further into pathophysiological mechanisms and novel pharmacological therapies, (2) focus heavily on various methods to provide early rehabilitation and ICU culture change, and (3) discuss future directions for improving recovery after ICU. The high level of interest for this new proposal is clear based on 2 recent half-day meetings (International Meeting of Physical Rehabilitation in the Critically Ill, Toronto, May 17 2008, organizer: Dale Needham; and International Meeting of Neurological Complications of Critical Care, London, UK, May 23, 2008, organizer: Nick Hart)

How were the educational needs of this proposed session assessed? Check all that apply.

- Advice from authorities in the field
- Faculty perception
- Formal/Informal requests from members
- New medical findings/techniques
- Previous participant evaluation
- Review of literature
- Self-assessment tests
- Survey of target audience
- Other:

## Objectives

At the conclusion of this session, the participant will be able to

1. Recognize the clinical patterns and detrimental impact of muscle weakness among critically ill patients
2. Understand pathophysiological mechanisms that underlie muscle dysfunction in ICU patients
3. Learn specific methods for rehabilitating critically ill patients in the ICU in an effort to improve physical recovery

## Initial Disclosure of Faculty Conflicts of Interest

The **ATS Policy on Management of Conflict of Interest** requires the following (among other things): (a) all ATS International Conference session organizers, chairs and presenters must submit written disclosures of all relationships with commercial or non-profit entities (that exist now, may exist or existed during the past three years and through the 2009 International Conference) that may cause a conflict of interest (COI) for them in carrying out an official ATS activity; (b) appropriate ATS oversight committees must review the disclosures of those submitting proposals for conference sessions as part of their vetting of proposals. **Please note that disclosure of a real or potential COI will not automatically invalidate a session proposal.**

Many individuals have competing interests that may cause conflicts of interest. A COI depends on the situation and not on the character or actions of the individual. Examples of potential relevant conflicts include personal financial

relationships with commercial entities, or government or foundation funders, that are relevant to the activity, including employment by a commercial entity; consultancy(ies); Board or Advisory Board; lecture fees; service as an expert witness; industry-sponsored grants; patents received or pending; royalties; stock ownership or options excluding mutual funds unless a sector fund concentrated in an industry(ies) relevant to the activity.

In addition, the ATS "**Policy on Tobacco Relationships**" requires disclosure of relationships with tobacco entities (companies) that exist or existed within the past ten years. In regard to the ATS International Conference, it also states that individuals with such a relationship that exists now, may exist or existed during the past 12 months and through the 2009 International Conference will not serve as a session planner (organizer), chair or presenter. If the relationship consists of personal holdings of tobacco stocks or options, the policy allows the individual to participate if he/she divests such holdings a minimum of 30 days before the conference.

**For the purposes of this session proposal, please complete the following questions as an initial disclosure.** (At a later date ATS will ask session chairs and presenters to complete a full disclosure form. More information on the above ATS policies and acceptable methods of resolving conflicts will be provided, and are available at any time on the ATS website.)

Do you, as the proposer, have a real or potential conflict of interest (COI) relevant to the subject matter of this proposal? If you check "yes", please provide below a brief description of the real or potential COI by providing the company's name and the type of relationship, (as above.)

NO

Do you, as the proposer, have a relationship with a tobacco entity at present, or may within the twelve months prior to the conference? If you check "yes", please provide below a brief description of the relationship (as above.)

NO

To your knowledge, does any other member of the proposed faculty (presenters) have a real or potential conflict of interest relevant to his/her presentation? If you check "yes", please provide below the speaker's name and a brief description of the real or potential COI by providing the company's name and the type of relationship, (as above.)

NO

To your knowledge, does any other member of the proposed faculty (presenters) have a relationship with a tobacco entity at present, or may within the twelve months prior to the conference? If you check "yes", please provide below the speaker's name and a brief description of the relationship (as above.)

NO

## Proposed Chairpersons

1. Dale Needham, MD, PhD - dale.needham@jhmi.edu  
*Johns Hopkins University*
2. Stefano Nava, MD - stefano.nava@fsm.it  
*Respiratory Intensive Care Unit, Fondazione S.Maugeri, Pavia, Italy*
3. Carolyn L. Rochester, MD - Carolyn.Rochester@va.gov  
*PCCM, Yale University School of Medicine; Medical Director, Pulmonary Rehabilitation, VA Connecticut Healthcare Center*

Click here to confirm that the proposed chairperson(s) has knowledge of the submission of this proposal and has agreed to serve as chair if the session is approved for presentation.

## Proposed Presenters and Topics

Presenter	Topic	Length of Time
Carolyn L. Rochester, MD Carolyn.Rochester@va.gov <i>PCCM, Yale University School of Medicine; Medical Director, Pulmonary Rehabilitation, VA Connecticut Healthcare Center</i>	Clinical aspects of Skeletal Muscle Dysfunction in the Critically Ill Patient  <i>This presentation will describe ICU-acquired and pre-existing skeletal muscle dysfunction among ICU</i>	25 min.

Presenter	Topic	Length of Time
<p>Ronald D Cohn, MD rcohn2@jhmi.edu <i>Pediatrics, Neuology, Genetic Medicine; Johns Hopkins Center for Hypotonia and School of Medicine</i></p>	<p><i>patients (including critical illness neuromyopathy) and patients with advanced chronic disease (including respiratory disease and heart failure). This session will provide the context for the subsequent sessions and pose the rationale for ICU-based rehabilitation to improve recovery.</i></p> <hr/> <p>Understanding mechanisms of critical illness muscle dysfunction</p> <p><i>This presentation will describe an approach to study the pathological mechanisms of critical illness myopathy in a variety of animal models. Characterization of critical pathways will be presented and strategies of pharmacological manipulation will be discussed.</i></p>	25 min.
<p>Theodoros Vassilakopoulos, MD tvassil@med.uoa.gr <i>National &amp; Kapodistrian University of Athens, Greece</i></p>	<p>Respiratory Muscle Dysfunction and Inspiratory Muscle Training</p> <p><i>This presentation will describe respiratory muscle dysfunction in the ICU, highlighting ventilator-induced diaphragm dysfunction, and discuss use of inspiratory muscle training in mechanically ventilated ICU patients</i></p>	25 min.
<p>Rik Gosselink, PT, PhD rik.gosselink@faber.kuleuven.be <i>Professor and Dean of Faculty of Kinesiology and Rehabilitation Sciences, Universitaire Ziekenhuizen Leuven Katholieke Universiteit Leuven, Belgium</i></p>	<p>Modalities for early exercise training in critically ill patients</p> <p><i>This presentation will focus on modalities of exercise and muscle training to improve physical function before patients can be mobilized, including lower limb bed cycle ergometry and electrical muscle stimulation.</i></p>	25 min.
<p>Dale Needham, MD, PhD dale.needham@jhmi.edu <i>Johns Hopkins University</i></p>	<p>Early Ambulation in the ICU: Synthesizing Experience from Multiple Sites</p> <p><i>This presentation will focus on existing evidence for, and experience with, early ambulation in the ICU, including data on safety, feasibility and benefit. In addition, it will outline the culture change necessary to introduce an early mobility program in the ICU setting.</i></p>	25 min.

<b>Presenter</b>	<b>Topic</b>	<b>Length of Time</b>
Margaret Herridge, MD, MPH Margaret.Herridge@uhn.on.ca <i>University of Toronto</i>	Future Directions for Improving Physical Recovery after Critical Illness  <i>The presentation will focus on both basic and clinical science aspects of future research directed at discovering and implementing new treatments for improving patients' physical recovery after critical illness</i>	25 min.

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