

# Actioning our understanding of respiratory compromise

Roger Correia, RRT, HBSc, MHS<sup>1</sup>, Andrea Wnuk, RRT, BSc, MHA<sup>2</sup>,  
Marco Zaccagnini, RRT, CCAA, BHSc, MSc(c)<sup>3</sup>, Andrew West, MAppSc, EdD, FCSRT<sup>4</sup>

---

R Correia, A Wnuk, M Zaccagnini, A West. Actioning our understanding of respiratory compromise. *Can J Respir Ther* 2019;55:28–29.  
doi: 10.29390/cjrt-2018-026.

---

The following is a response to a recent editorial published in the *Canadian Journal of Respiratory Therapy* on the need for clarification of the definition of respiratory compromise (RC) [1]. We thank the author for his frank and insightful comments regarding the need for a useful definition of RC in the current literature. We see this as a timely discussion that helps to articulate what many of us are thinking—how best to take action on RC into both research and clinical practice.

## HOW TO DEFINE RC?

We contend that Morris and his colleagues [2] have done something quite right—they have provided a broad, comprehensive definition that stimulates further discussion and prompts a call to action for clinicians to explore the wide range of avenues that RC can take in a preclinical setting. Furthermore, we are not convinced that RC will ever fit into a “perfect definition.”

Respiratory therapy practice is in constant refinement, prompting the need for interpretation of practice issues across a range of clinical contexts. Take the acute respiratory distress syndrome (ARDS) definition, for example—a definition that is well studied and that can be concisely explained to the intensive care resident in a few key bullet points. The definition for ARDS was first put forth in 1994 from the American-European Consensus Conference and has since been refined to the Berlin definition in 2012 [3]. Even after refinement of the ARDS definition 18 years later, there remains room for clinical interpretation. There may be instances in which we do not use the ARDS definition to the most literal terms, but the definition still offers a starting point for discourse and also enables care providers to treat the patient with available evidence best clinical judgement.

There is no doubt the definition of RC is in its infancy. However, as we continue the conversation around RC this does provide us with an opportunity to ensure that both birth and aspirating on dinner are never perceived to blur into one state of respiratory deterioration.

## WHY DO WE NEED TO TAKE ACTION ON RC?

It remains difficult to predict the incidence and severity of events involving acute RC in surgical or medical patients who receive care on general wards in the hospital setting. Particularly challenging in this group of patients are the complications that arise during the peri-intubation period, such as hypotension and cardiac arrest, which often proceed to multiple organ dysfunction [4, 5]. Nonetheless, recognition of RC often prompts activation of the in-hospital rapid response team or a

“code blue.” Studies have shown that over 90% of patients who experience RC go on to require additional respiratory support, including non-invasive positive pressure ventilation or endotracheal intubation [5]. Also concerning, patients experiencing RC events have a mortality rate of 39% prior to discharge, which rises to 82% if the RC event is followed by cardiac arrest [6], and overall costs to the system associated with these events are estimated at over \$50 billion dollars annually [5].

Much of this data derives from the *Get with the Guidelines Resuscitation* cardiopulmonary arrest registry from the United States, which is a robust source of data related to the incidence and severity of RC events as well as the subsequent impact on patient outcomes and hospital system performance indicators [5, 6]. Despite the staggering association of RC with increased patient mortality, rates of endotracheal intubation, hospital length of stay, and overall poor outcome, the nature of RC events in a hospital setting remain not well studied or understood [7].

Given this gap in understanding RC events, there has been a longstanding deficiency in the literature. It may therefore seem premature to leap towards prioritizing finding solutions and articulating definitions when we don't fully understand the problem. Driven by what we do know about the impacts of RC, this resurgence of interest presents a unique opportunity for respiratory therapy as a profession. If respiratory therapists are to collectively work towards solutions that address the problems that RC presents to patients and the health care systems, then there needs to be a sound evidence base in which we can rationalize respiratory therapy practices.

We believe that the first and most important step is to undertake an appraisal of the literature that should seek to address our shortcomings in understanding the identifiable root causes of this daunting problem. Simultaneously, we need to begin clearly examining how RC may manifest differently depending on the area of patient care (i.e., procedural sedation, post-operative recovery, medical/surgical floors, etc.). Finally, we must also begin to understand how pre-existing respiratory etiology may proceed RC (i.e., impaired control of breathing, impaired airway protection, parenchymal lung disease, left ventricular failure, etc.) [2].

With an enhanced understanding of the mechanism, scope, incidence, severity, and distribution of RC events, we shall be well positioned to propose and implement meaningful solutions, such as enhanced monitoring standards (i.e., end-tidal CO<sub>2</sub>) [8] and the use of predictive and prognostic scoring systems for RC as described by Moskowitz [5].

---

<sup>1</sup>The Hospital for Sick Children (SickKids), Toronto, ON, Canada

<sup>2</sup>Vancouver Coastal Health, Vancouver, BC, Canada

<sup>3</sup>McGill University Health Centre, Montréal, QC, Canada

<sup>4</sup>Canadian Society of Respiratory Therapists, Saint John, NB, Canada

Correspondence: Roger Correia, The Hospital for Sick Children (SickKids), 555 University Avenue, Toronto, ON, M5G 1X8, Canada. E-mail: roger.correia@sickkids.ca

---

Published online at <https://www.cjrt.ca> on 15 February 2019

---



This open-access article is distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits reuse, distribution and reproduction of the article, provided that the original work is properly cited and the reuse is restricted to noncommercial purposes. For commercial reuse, contact editor@csrt.com

## ADDRESSING RC NATIONALLY

As the national professional association for respiratory therapists in Canada, the Canadian Society of Respiratory Therapists (CSRT) has a mandate to provide leadership that advances the profession, practice, and understanding of respiratory therapy. Recognizing the imperative that exists based on our growing understanding of RC across a range of contexts, the CSRT seeks innovative ways of gaining a deeper understanding of the issue and actioning emerging knowledge in practice. Concerning RC, the CSRT has engaged with our international partners as a member of the Respiratory Compromise Institute while also seeking to provide authentic leadership in Canada on the issue. To that end, the CSRT Respiratory Compromise Advisory Workgroup (the workgroup) was struck in 2017. The workgroup is comprised of practitioners and experts from across healthcare sectors who collaborate to guide CSRT initiatives.

An initial goal of the workgroup has been to bring the issue of RC to the fore in the respiratory therapy community, encouraging ongoing discourse and exploration of the topic. Constructive scholarly discussion, situated in venues such as this journal, constitute important opportunities to consider the aims of our approaches. Beyond the conversations, the workgroup has taken some significant steps towards its goals since its inception, including the development of a toolkit that has been made available for practitioners on the prevention of respiratory compromise through monitoring [9]. The toolkit is envisioned as a living repository that will be updated with the available best-practice guidelines and knowledge translation supports.

Moving forward, the workgroup plans to enhance resources available in the toolkit relative to existing knowledge gaps, as understanding in the field develops. Where possible, this may include identification of performance measures for practice and sharing implementation support tools across our many networks. Over the longer term, the workgroup looks forward to celebrating the achievements of individual practitioners or groups/organizations who demonstrate substantial impacts on the health of the patients and communities they serve.

## CONCLUSION

A limited number of patients are monitored conscientiously for potential RC, with the vast majority of those based on assessments by practitioners performed at periodic intervals that are open to a high degree of bias and subjective clinical judgement [10–12]. Awareness and understanding of RC (with or without a highly refined definition) can mitigate some of these limitations relating to delayed detection. Respiratory therapists aim not simply to react but also to prevent and detect in practice. Adopting standardized monitoring protocols within respiratory therapy clinical communities will serve at-risk patients better than traditional efforts.

The responses provided by this editorial highlight some of the significant consequences of RC that can be compounded without early recognition and definition. As a community, respiratory therapists in Canada have begun proactively providing dynamic resources and a critical eye on this issue. While initiatives already undertaken are promising, we are just beginning to scratch the surface of RC. Our practice is in constant refinement, and these are the early stages of defining and using the term “respiratory compromise.” As such, it may take some time to gain wider agreement on a more encompassing definition. In the meantime, there is an imperative to do what can be done, which is to give the clinicians the tools to identify and prevent deterioration of respiratory function early and to enable provision of the highest standard of care for patients.

## REFERENCES

1. Sorge J. Respiratory compromise needs a useful definition. *Can J Respir Ther* 2018;54(3):57.
2. Morris TA, Gay PC, MacIntyre N, et al. Respiratory compromise as a new paradigm for the care of vulnerable hospitalized patients. *Respir Care* 2017;62(4):497–512. doi: 10.4187/respcare.05021.
3. Raniere V, Rubenfeld G, Thompson B, et al. Acute respiratory distress syndrome: The Berlin definition. *JAMA* 2012;307(23):2526–33. doi: 10.1001/jama.2012.5669.
4. Jones D, DeVita M, Bellomo R. Rapid-response teams. *N Engl J Med* 2011;365:139–46. doi: 10.1056/NEJMr0910926.
5. Moskowitz A, Andersen LW, Karlsson M, et al. Predicting in-hospital mortality for initial survivors of acute respiratory compromise (ARC) events: Development and validation of the ARC Score. *Resuscitation* 2017;115:5–10. doi: 10.1016/j.resuscitation.2017.02.022.
6. Anderson L, Berg K, Chase M, et al. Acute respiratory compromise on inpatient wards in the United States: Incidence, outcomes, and factors associated with in-hospital mortality. *Resuscitation* 2016;(105):123–9. doi: 10.1016/j.resuscitation.2016.05.014.
7. Jaber S, Amraoui J, Lefrant J, et al. Clinical practice and risk factors for immediate complications of endotracheal intubation in the intensive care unit: A prospective, multiple-center study. *Crit Care Med* 2006;34(9):2355–61. doi: 10.1097/01.CCM.0000233879.58720.87.
8. Khanna A, Overdyk F, Greening C, Di Stefano P, Buhre W. Respiratory depression in low acuity hospital settings – Seeking answers from the PRODIGY trial. *J Crit Care* 2018;47:80–7. doi: 10.1016/j.jccr.2018.06.014.
9. Canadian Society of Respiratory Therapists. Toolkit – Prevention of respiratory compromise through monitoring website. Available at: <https://www.csrt.com/supports-for-practice/> (Accessed December 11, 2018).
10. Ansell H, Meyer A, Thompson S. Why don't nurses consistently take patient respiratory rates? *Br J Nurse* 2014;23(8):414–18. doi: 10.12968/bjon.2014.23.8.414.
11. Parkes R. Rate of respiration: The forgotten vital sign. *Emerg Nurse* 2011;19(2):12–17. doi: 10.7748/en2011.05.19.2.12.c8504.
12. Cretikos MA, Bellomo R, Hillman K, et al. Respiratory rate: The neglected vital sign. *Med J Aust* 2008;188(11):657–9.