Emergency medicine airway leads: a rapid response distributed educational model for emergency department COVID-19 airway management

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Abstract
With the first case of COVID-19 confirmed in Canada in early 2020, our country joined in the fight against a novel pathogen in a global pandemic. The stress of uncertainty and practice change was most apparent in the emergency department when it came to managing known or suspected COVID-19 patients requiring airway management. Recognizing the need for a coordinated approach, a province-wide rapid response distributed model of continuing professional development for airway management was developed utilizing Airway Leads to help prepare front-line medical personnel providing airway management for these patients. Airway Leads worked with local physicians to deliver consistent, high quality airway education across the province during the initial surge of cases. Education included both in-person and virtual sessions along with real-time ongoing support through provincial guidelines, videos, and other documents. Physician reported “stress level” pre- and post-Airway Lead support declined from a median score of 9 to 7 (on a 10-point Likert Scale).

Keywords Emergency medicine · Airway leads · COVID-19

Background
In early 2020, the first case of COVID-19 was confirmed in Canada [1]. Guided by international reports, provincial healthcare systems began preparing for an influx of critically ill patients requiring intubation and mechanical ventilation [2]. The severity of respiratory illness being reported, combined with the risk of virus transmission to health-care providers during aerosol-generating medical procedures [3], created an urgent need for airway education as several...
standard aspects of airway management were required to change [4].

Rationale

Clinicians were faced with the difficult task of balancing pre COVID-19 optimal patient care strategies with the health and safety of their clinical teams [3–6]. Airway interventions and therapies commonplace in the emergency department (ED) only weeks prior, were now being reconsidered with respect to their efficacy and safety profile [3–6]. Clinicians were challenged to provide a skillful approach to intubation with a high first pass success rate in hypoxemic, apnea-intolerant patients without the use of conventional active preoxygenation approaches—all while utilizing a higher level of personal protective equipment.

The Nova Scotia Health Authority (NSHA) comprises four regional health zones collectively caring for nearly one million people. Provincial COVID-19 airway management guidelines were developed to provide a safe standardized approach to airway management [7]. During the early days of the COVID-19 outbreak, guidelines for airway management were changing rapidly based on evolving Level C observational evidence, expert opinion, and the experiences of others from “hot zones” around the world. The goal of this rapid response continuing professional development intervention was to disseminate the provincially endorsed airway guidelines and support their implementation at the local level.

Description of the innovation

Four Airway Leads were recruited to develop and deliver content to each NSHA zone. Airway Leads were emergency physicians with additional expertise in airway management, medical education and procedural skill teaching. All Airway Leads were Airway Interventions & Management in Emergencies (AIME) certified instructors and received additional provincial COVID-19 optimal patient care strategies with the health and safety of their clinical teams [3–6]. Airway interventions and therapies commonplace in the emergency department (ED) only weeks prior, were now being reconsidered with respect to their efficacy and safety profile [3–6]. Clinicians were challenged to provide a skillful approach to intubation with a high first pass success rate in hypoxemic, apnea-intolerant patients without the use of conventional active preoxygenation approaches—all while utilizing a higher level of personal protective equipment.

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The pace and extent at which clinical practice has changed on the basis of Level C evidence has been unprecedented. Practice changing recommendations required adaptation, adoption and dissemination of materials that may have, in other times, been considered premature for lack of high-quality evidence. Airway Leads utilized previously existing International Airway working groups and forums, telephone and email correspondence with physicians in hot zones, and thorough review of emerging literature and consensus guideline documents to evaluate and adapt the content of education. The concept of “Airway Leads” and “Airway Groups” has been supported by the Difficult Airway Society since 1996, and this is a good example of its application at the provincial level, aimed at improving airway management from the perspectives of anatomy, physiology, logistics, and education [9].

Difficulty in the evaluation of the effectiveness of broad airway quality initiatives has been previously recognized [9]. Within days of announcing this provincial initiative, the first on site education session occurred. Therefore, a pre-intervention evaluation was not performed. Following the
COVID-19 AIRWAY MANAGEMENT TIMELINE IN NOVA SCOTIA EMERGENCY DEPARTMENTS
Managing and Disseminating Change Ahead of the Initial Surge

Province divided into four zones
Each zone with dedicated airway lead
Materials available in person and online

December, 2019
First cases of COVID-19 reported in Wuhan, China

January 31, 2020
First case in Italy

March 1, 2020
First case in New York

March 10, 2020
Nova Scotia institutes a provincial Airway Lead Mandate to distribute educational materials to each zone

March 11, 2020
Pandemic declared by WHO. Provincial airway equipment upgrades for EDs initiated

March 12, 2020
Version 1.0 Nova Scotia ED COVID-19 Provincial Airway Guidelines

March 15, 2020
First case in Nova Scotia

March 16, 2020
Safe Airway Society Guidelines published

March 17, 2020
Nova Scotia’s EM Airway Leads begin on-site and remote education for provincial EDs

March 20, 2020
First COVID-19 intubation in Nova Scotia

March 22, 2020
Version 2.0 Nova Scotia ED COVID-19 Provincial Airway Guidelines

March 30, 2020
Version 3.0 Nova Scotia ED COVID-19 Provincial Airway Guidelines

April 16, 2020
Provincial Airway Grand Rounds

May 29, 2020
First day of zero new cases in Nova Scotia

Fig. 1 Infographic
first surge of COVID-19 cases in the province, an evaluation using the web-based survey tool Opinio was sent to ED site leads to determine the usefulness of each of the interventions. Amongst physicians in their ED (our target audience for education), the perceived “stress level” pre- and post-Airway Lead support as evaluated by their site lead dropped from a median of 9 to 7 (on a 10-point Likert Scale). In allied health care providers the drop was from 8 to 7.5. ED site leads reported educational interventions as having a “high impact” on preparing their teams with median scores of 8.5–9.5/10, and the majority felt that repeating interventions such as site visits, online provincial rounds, and email/telephone support would be very useful in the setting of another surge of COVID-19 cases.

The use of Airway Leads for the delivery of a rapid response distributed model of continuing professional development allowed for the preparation of a large number of front-line medical personnel to safely provide ED airway management for patients with known or suspected COVID-19. The interventions by the Airway Leads led to an overall reduction in COVID-19 related stress amongst physicians but not allied health care providers. Involving members from this group in the development and implementation of future interventions may improve the impact.

Summary

A rapid response distributed model of continuing professional development was developed to help support emergency department teams in the optimization of airway management for patients with known or suspected COVID-19. Using geographic Airway Leads as a support network, provincially developed airway management recommendations were disseminated, implemented, and where necessary adapted to meet local needs and resources.

Compliance with ethical standards

Conflict of interest  The authors declare no conflict of interest with the publication of this paper.

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