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Safeguarding Healthcare Workers in Airway Management:

Lessons from the COVID-19 Pandemic

Summary

The SARS-CoV-2 global pandemic has increased the risks of infection to healthcare workers during patient care – particularly aerosol-generating procedures. Safe airway management and respiratory care in the future will depend on the adaptability of healthcare staff and technology to meet the challenges of a post-COVID-19 world.

Respiratory therapists are specially trained to intubate patients and manage ventilators while caring for multiple critically ill patients at once. In normal times, respiratory therapists also regularly assist pulmonologists and intensivists with flexible bronchoscopy by preparing and monitoring the patient and equipment, among other responsibilities before, during, and after the procedure. As such, respiratory therapists have been on the front lines of the battle against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the disease that causes COVID-19.

The onset of COVID-19 has put even more stress on respiratory therapists as they have been asked to care for a growing number of very sick patients in intensive care units.

Respiratory therapists and their colleagues in respiratory care and airway management will continue to face incredible infection prevention challenges as new coronavirus variants now threaten public health.

The novel coronavirus killed more than 1.5 million people worldwide and close to 300,000 people in the United States in 2020.[i] Since COVID-19 is primarily spread through airborne particulates, aerosol-generating procedures pose a significant risk to healthcare workers.

Respiratory therapists, pulmonologists, surgeons, and anesthesiologists will need to remain vigilant about the risks of infection transmission from aerosolization during respiratory care long after the COVID-19 pandemic fades into memory. Critical airway management procedures, such as bronchoscopy, intubation, and tracheostomy, require specific attention to protect healthcare workers from exposure to deadly diseases.

New guidelines and research published throughout the pandemic offer insights into precautions and adaptations that will prove useful in future respiratory care – especially the hyper-focus on personal protective equipment and the adoption of single-use technology. This white paper explores the pandemic-related guidelines for infection prevention that will help ensure the continued safety of healthcare workers during airway management procedures.

Safety Recommendations Evolve During Pandemic

Adequate preparation is key for infection prevention.

- Proper PPE (N-95 masks and face shields)
- Well-ventilated rooms
- Limit staff during procedures

"Despite new guidelines to avoid such procedures, it was quickly determined that suspected or confirmed COVID-19 patients may still need diagnostic and therapeutic airway management procedures even with the aerosolization risk."

As thousands of Americans fell ill from a respiratory illness caused by SARS-CoV-2 in March 2020, the safety of traditional methods for diagnosing and treating lung diseases was quickly called into question – among them, bronchoscopy and bronchoalveolar lavage (BAL).

March 2020, the American Association for Bronchology and Interventional Pulmonology (AABIP) released guidelines that specifically warned against using bronchoscopy and BAL for the diagnosis or treatment of suspected or confirmed COVID-19 patients.[ii] Rather, AABIP recommended nasopharyngeal and oropharyngeal swabs for collecting upper respiratory samples in suspected coronavirus cases. Even for intubated patients, tracheal aspirates and non-bronchoscopic alveolar lavage were encouraged.

Despite new guidelines to avoid such procedures, it was quickly determined that suspected or confirmed COVID-19 patients may still need diagnostic and therapeutic airway management procedures even with the aerosolization risk.[iii] A bronchoscopy, for example, could confirm a diagnosis if nasopharyngeal smears returned negative results for a patient exhibiting multiple symptoms of COVID-19. And sometimes COVID-19 and non-COVID-19 patients alike need life-saving therapeutic interventions such as intubation and tracheostomy (also performed with a bronchoscope). Tracheostomy is a common procedure for critically ill patients requiring an extended period of mechanical ventilation. And the COVID-19 pandemic has led to an unprecedented number of patients requiring mechanical ventilation.

When these kinds of procedures can't be avoided, adequate preparation is the key to infection prevention for healthcare workers and staff. That's according to airway management guidelines issued in the summer of 2020.[iv]

The number of staff involved in procedures should be reduced to limit exposure, the guidelines said. All healthcare staff should also don proper personal protective equipment (PPE), including N-95 masks and face shields, at a minimum. If possible, negative pressure rooms are preferable for intubation procedures.

One emergent study found N-95 masks to be comparable to standard surgical masks in protecting against the spread of COVID-19 during laryngoscopy.[v] The limited sample size, though, suggests further study is needed.

Innovative techniques such as using disposable, translucent drapes to create a tent around patients also emerged during the pandemic.[vi] Researchers did not recommend fully covering a patient in a drape. The drape, after all, needs to be easily removed and disposed of after the procedure. Aerosol particles should be contained within the drape at disposal.

The first cases of COVID-19 transmission to healthcare providers were reported as early as January 2020. As a result, it's difficult to get an accurate idea of how many healthcare workers have suffered from the disease, particularly if asymptomatic healthcare staff are not regularly tested.[vii] As late as Jan. 20, 2021, the U.S. reported more than 4,200 COVID-19-related deaths in a single day and more research is emerging about variants of the disease. The extra safety precautions for healthcare workers detailed in this white paper will need to continue for some time.

How Single-Use Prevents Disease Spread

The initial society guidelines for bronchoscopy during the pandemic were to not perform the procedure at all. But, if bronchoscopy was unavoidable, the March 2020 AABIP statement recommended using disposable bronchoscopes to protect patients and staff.[viii]

As the pandemic raged on, other societies and panels – in the U.S. and abroad – began to craft guidance for how to safely perform bronchoscopy and other aerosol-generating procedures on coronavirus patients as well as non-coronavirus patients needing critical care. A common theme was the recommendation for single-use technology, including single-use blades, laryngoscopes, video laryngoscopes, and bronchoscopes.

Single-use bronchoscopes are designed to be used once and discarded and do not require reprocessing — they are opened from a sterile package at point-of-care moments before the procedure preparation This helps ensure pathogens are not spread to healthcare workers during point-of-care pre-cleaning, transport, and reprocessing, or to patients in subsequent use if reprocessing is ineffective. Simply put, single-use bronchoscopes eliminate contaminated equipment handling and simplify preparation and post-procedure activities by the respiratory support staff.

More than 1 million bronchoscopies are performed annually in the U.S. under normal circumstances. While the relative risk of device-related infection is considered low, experts have acknowledged a lack of surveillance or tracing infections back to contaminated bronchoscopes may present a false picture of the true infection rate.[ix]

There have been reported cases of device-related cross-contamination that were traced back to inadequately reprocessed bronchoscopes before the pandemic. Several instances have included antimicrobial-resistant organisms such as P. aeruginosa.[x]

Cori Ofstead, an epidemiologist with 25 years of research experience, voiced an urgent need to protect patients from device-related cross-contamination in COVID-19 procedures as co-infections could greatly increase morbidity rates among patients. In a 2020 paper, Ofstead and her co-authors advocated using single-use bronchoscopes during the pandemic to protect against cross-contamination.[xi]

Single-use bronchoscopes offer obvious infection prevention benefits for both patients and healthcare workers who handle the instruments after use. In addition, single-use bronchoscopes have the added benefits of being easy to set up and operate with limited staff. This means less potential exposure to pathogens during and after procedures.

Single-use bronchoscopes ensure pathogens are not spread to healthcare workers during cleaning and reprocessing, or to patients in subsequent use if reprocessing is ineffective.

Similarly, video laryngoscopes with single-use blades can offer infection prevention benefits during intubation. Intensivists in the United Kingdom recently argued video laryngoscopes are a “safer and more efficient device to use in critically ill patients” and should be the primary tools used in intubation in a post-COVID-19 world.[xii] Since video laryngoscopes are often used when clinicians encounter difficult airways, the authors argued regular clinical use would eliminate delay from changing equipment when difficult intubation occurs on patients sick with the novel coronavirus.

The benefits of single-use technology in protecting healthcare workers (and patients) from cross-contamination can no longer be ignored.

Conclusion

The effects of COVID-19 will be with us for a long time. It’s impossible to predict when school, work and social settings will look like they did before the pandemic. Continued surges in case numbers serves as a reminder that plenty of work remains, despite newly approved vaccines.

Hospitals may be forever impacted. Respiratory therapists, pulmonologists, surgeons, and anesthesiologists have seen the risks of infection transmission from aerosolization during airway management up close and will need to adopt COVID-19-related precautions when diagnostic and therapeutic procedures become routine once again.

PPE protocols, better ventilation and accessories such as drapes and shields are vital to healthcare worker safety. In addition, the benefits of single-use technology in protecting healthcare workers (and patients) from cross-contamination can no longer be ignored.

Safe respiratory care in the future will depend on the adaptability of healthcare staff and technology to meet the challenges of a post-COVID-19 world.

Ambu is poised to meet the challenges of a post-pandemic world. Our fourth generation single-use bronchoscopes have been protecting against cross-contamination since 2009 and proven invaluable for many providers throughout the COVID-19 pandemic. In addition, our video laryngoscopes with a single-use blade offers quality performance for difficult and routine intubations. ***For more information, visit ambuUSA.com.***

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