Airon

Part of the Inspiration Healthcare Group

Simplifying Prehospital Respiratory Care

How a Common Pneumatic Respiratory Platform Improves Clinical Outcomes, EMS Readiness, and Total Cost of Ownership

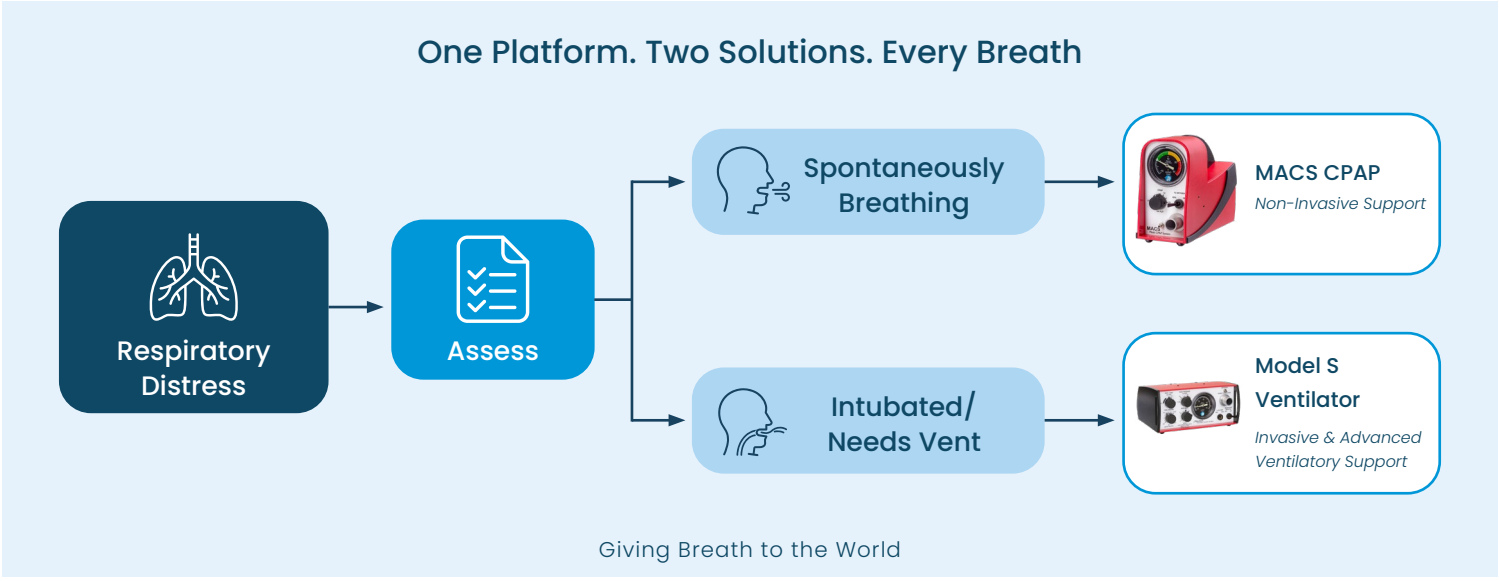


Executive Summary

Respiratory emergencies account for a significant percentage of EMS responses and continue to increase as the prevalence of chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), obesity, pneumonia, sepsis, and advanced age rises throughout the United States. Whether providing continuous positive airway pressure (CPAP) to a patient with acute pulmonary edema, ventilating an intubated trauma patient, or transporting a mechanically ventilated patient between facilities, EMS clinicians require respiratory equipment that is dependable, intuitive, and immediately available.

Historically, EMS agencies have relied upon multiple respiratory devices to meet these clinical demands. CPAP systems, transport ventilators, oxygen delivery devices, and numerous disposable circuits frequently originate from different manufacturers, requiring separate clinician education, inventory management, preventative maintenance schedules, and biomedical support. While individually effective, these disconnected technologies contribute to operational complexity, increased ownership costs, and variability in clinical practice.

The Airon MACS CPAP System and pNeuton Model S Ventilator offer an alternative approach through a common pneumatic respiratory platform. By utilizing compressed medical gas rather than batteries or electrical power, both devices provide dependable respiratory support while simplifying deployment, reducing maintenance requirements, standardizing clinician training, and improving fleet readiness. Together they provide EMS organizations with a comprehensive respiratory solution capable of supporting patients across the continuum of prehospital and transport medicine.



The Growing Burden of Respiratory Emergencies

Few clinical conditions challenge EMS providers more frequently than respiratory distress. Acute exacerbations of COPD decompensated congestive heart failure, asthma, pneumonia, sepsis, traumatic injuries, neurologic emergencies, and drug overdoses all share one common characteristic: inadequate ventilation or oxygenation can rapidly become life-threatening if not addressed early.

The importance of early respiratory intervention has been demonstrated repeatedly in literature. Numerous studies have shown that prompt initiation of CPAP in appropriate patients with acute cardiogenic pulmonary edema or COPD exacerbations can improve oxygenation, decrease work of breathing, reduce endotracheal intubation rates, and shorten hospital length of stay.[1,2,3,4,5] Likewise, mechanically ventilated patients require consistent delivery of tidal volume, respiratory rate, and airway pressure during transport to minimize secondary injury and maintain physiologic stability.

As EMS systems expand beyond traditional emergency response into critical care transport, community paramedicine, disaster response, and interfacility transfers, respiratory support has become an increasingly central component of prehospital medicine. Equipment selection must therefore balance advanced clinical capability with operational simplicity.

Why EMS Needs Simplicity

Unlike hospital intensive care units, EMS clinicians deliver care under conditions that are constantly changing. Patients are encountered in cramped bathrooms, on highways, inside industrial facilities, and in remote rural communities. Environmental conditions may include rain, extreme temperatures, limited lighting, and confined workspaces. Decisions

must often be made within seconds while simultaneously coordinating patient assessment, airway management, medication administration, communication with receiving facilities, and transportation logistics.

Under these conditions, simplicity is not merely a convenience; it is a patient safety strategy.



Every additional connector, battery, charging station, software update, or maintenance requirement introduces another opportunity for equipment failure or clinician distraction. The respiratory devices used in EMS should therefore minimize unnecessary complexity while providing clinicians with the essential capabilities required to stabilize critically ill patients.

The ideal respiratory platform should be deployable within seconds, require minimal setup, utilize intuitive controls, function independently of electrical power, and remain reliable regardless of environmental conditions. These characteristics not only improve operational efficiency but also reduce cognitive workload during high-acuity emergencies, allowing clinicians to focus on patient assessment and clinical decision-making rather than equipment management.

Why the Airon Pneumatic Platform?

Operational Challenge	Traditional Electronic Ventilator	Airon Pneumatic Platform	Benefit to EMS
Multiple Respiratory Devices	Separate CPAP and ventilator platforms	Unified respiratory platform	Standardized care and simplified operations
Disposable Circuits	Multiple circuit types	Common circuit architecture	Reduced inventory and purchasing costs
Battery Management	Recharge, replace, and test batteries	No batteries required	Always ready for deployment
Electrical Dependence	Requires electrical power for charging	Operates on compressed medical gas	Functions during disasters and power outages
Equipment Setup	Multiple menus and electronic interfaces	Simple pneumatic controls	Faster deployment and reduced cognitive workload
Preventive Maintenance	Higher maintenance due to electronic components	Minimal preventive maintenance	Lower biomedical service costs
Training Requirements	Separate competency programs	One operating philosophy	Faster onboarding and improved competency retention
Fleet Readiness	Equipment may be unavailable while charging	Ready whenever oxygen is available	Increased operational readiness
Software Management	Updates and firmware maintenance	No software updates	Reduced downtime and IT support
Total Cost of Ownership	Higher long-term ownership costs	Lower lifetime operating costs	Greater return on investment

References

1. Global Initiative for Chronic Obstructive Lung Disease. (2025). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. https://goldcopd.org
2. Gray, A., Goodacre, S., Newby, D. E., Masson, M., Sampson, F., & Nicholl, J. (2008). Noninvasive ventilation in acute cardiogenic pulmonary edema. New England Journal of Medicine, 359(2), 142-151. https://doi.org/10.1056/NEJMoa0707992
3. Osadnik, C. R., Tee, V. S., Carson-Chahhoud, K. V., Picot, J., Wedzicha, J. A., & Smith, B. J. (2017). Non-invasive ventilation for the management of acute hypercapnic respiratory failure due to exacerbation of chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews, (7), CD004104. https://doi.org/10.1002/14651858.CD004104.pub4
4. Rochwerg, B., Brochard, L., Elliott, M. W., Hess, D., Hill, N. S., Nava, S., ... & Members of the Task Force. (2017). Official ERS/ATS clinical practice guidelines: Noninvasive ventilation for acute respiratory failure. European Respiratory Journal, 50(2), 1602426. https://doi.org/10.1183/13993003.02426-2016
5. Vital, F. M. S., Ladeira, M. T., & Atallah, Á. N. (2013). Non-invasive positive pressure ventilation (CPAP or bilevel NPPV) for cardiogenic pulmonary oedema. Cochrane Database of Systematic Reviews, (5), CD005351. https://doi.org/10.1002/14651858.CD005351.pub3

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