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MEDICAL TECHNOLOGY 1, INC.

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Mass Casualty Manifold: Double Duty during a Medical Oxygen Shutdown in an Adult ICU – Saving Manpower and Increasing Safety.

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Background

During a routine or urgent oxygen 50 PSIG source shutdown in ICU, each patient must be assured of an uninterrupted source of oxygen both for manual/mechanical ventilation and low flow applications.

This usually requires a "D" or "E" sized cylinder for each patient and a staff person to monitor the cylinder, deliver ventilatory support and respond to emergencies. This places additional manpower requirements on the unit (1:1 patient: staff ratio) and increases the risk to the patient of a medical gas related interruption or inadequate/inconsistent ventilation.

One alternative method that has been used is to back feed a "K" oxygen cylinder through the wall outlet and ensure that the zone valve for the unit is closed. This decreases the manpower requirements and the risk of the gas supply being interrupted, while delivering 50 PSIG of gas. Potentially, a 28 bed ICU using this method could require 4 to 6 additional staff and up to 9 each "K" cylinders equipped with regulators to manage the gas supply (1 cylinder/ 4 beds).

Figure 1

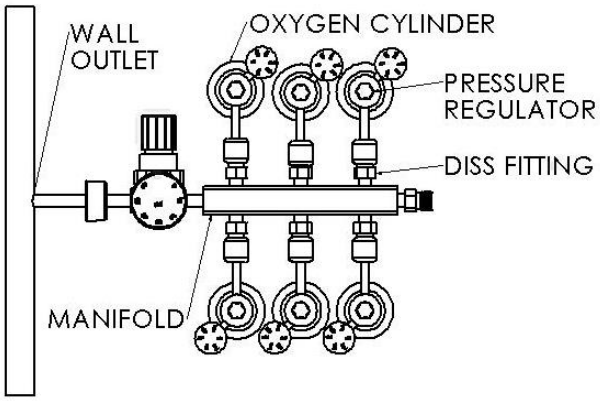
E-Vent Case™

Method

Use a mass casualty manifold E-Vent Case™ (Figure 1) from VORTRAN Medical Technology 1, Inc. (Sacramento, CA) equipped with a 20 foot high pressure oxygen hose, 7 ports DISS oxygen outlets on the distribution block and 6 "K" oxygen cylinders, each equipped with a 50 PSI output regulator and 6 foot hose attached to the 7 DISS outlets (Figure 2). For 3 hours, the 20 foot hose is attached to a wall outlet, the unit zone valve is closed, and 3 of the 6 cylinders are turned on.

Figure 2

Back Feed Mainfold



The cylinder pressures are monitored and once the pressure drops to 300 PSI, the alternate bank of 3 is turned on. The depleted tanks can then be replaced as a routine task. Oxygen is delivered via existing outlets and gas is delivered in the usual manner.

Results

This manifold required only 2 staff RTs to monitor and service the oxygen delivery. The remaining staff was able to continue with patient care in a normal manner, as if there were no interruption in gas delivery. A total of 6 cylinders equipped with 50 PSI output regulators were required. The maximum flow demand was met through the use of 3 ganged cylinders, and line pressure was sustained at 45-50 PSIG. This method allowed for 3 hours of service during a routine service oxygen shutdown.

Conclusion

In a true medical gas failure/emergency, the mass casualty manifold would allow for multiple applications, from the delivery of oxygen to patients in an alternate triage site to sustaining oxygen delivery as a manifold. Utilizing the mass casualty manifold as a mini-manifold allowed for reduced staffing requirements (only 2 RTs instead of 4 to 6), consistent oxygen delivery and no change in the delivery of ventilatory support or therapeutic oxygen delivery. With consistent replacement of emptied "K" cylinders, this manifold could sustain the ICU indefinitely. This system should be considered as part of the emergency response for every RT department.

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