Use a Bag-Valve Mask, Not a Non-Rebreather Mask, for Preoxygenating Before Intubation

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The BVM achieved FeO$_2$ concentrations similar to an anesthesia circuit in healthy volunteers.

Preoxygenation is critical prior to intubation, especially in the emergency department (ED), where this reservoir of oxygen can help mitigate unexpected hurdles encountered during intubation. There are a number of different techniques available for providing oxygen to patients before intubation, including non-rebreather masks and bag-valve-masks (BVMs), with or without concurrent use of a nasal cannula. To compare the effectiveness of these techniques, researchers measured fractional expired oxygen (FeO$_2$) concentration in 30 healthy ED staff volunteers after 3 minutes of tidal volume breathing with an anesthesia circuit and with combinations of the devices, in random order.

Mean FeO$_2$ levels achieved with the anesthesia circuit (81%) and with the BVM both with nasal cannula oxygen (75%) and without (80%) were high and not statistically different. Adding a positive end expiratory pressure valve to the BVM did not change these results significantly. However, the non-rebreather mask achieved significantly lower FeO$_2$ levels both with nasal cannula (57%) and without (52%).

**Comment:** If you are still using a non-rebreather mask to preoxygenate patients before intubation, stop! When feasible, use a BVM and have a team member hold it in place while the patient takes tidal volume breaths. Although the addition of nasal cannula oxygen decreased FeO$_2$ slightly with the BVM in this study (presumably due to a small leak around the sides of the mask), the decrease was not significant — I will continue to use a nasal cannula so that it is in place to provide apneic oxygenation during intubation.

**Note:** At the time NEJM Journal Watch reviewed this paper, its publisher noted that it was not in final form and that subsequent changes might be made.

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