

PR10: Positive End Expiratory Pressure (PEEP)

Mike Sugimoto

Applicable To

- PCP and higher

Introduction

The addition of a Positive End-Expiratory Pressure (PEEP) valve to a bag-valve mask is a non-invasive means of increasing oxygenation in patients who are in significant respiratory distress or respiratory arrest where assisted ventilations are not able to maintain oxygen saturation. It maintains air pressure in the alveoli, "splinting" them open to increase the surface area involved in gas exchange.

Indications

- Patients who remain hypoxemic ($S_pO_2 < 90\%$) despite good bag-valve mask ventilation techniques and airway management; it can be combined with high-flow nasal cannula oxygenation to maximize oxygen delivery

Contraindications

- Patients in cardiac arrest
- Patients over 12 years of age: Systolic blood pressure ≤ 90 mmHg
- Patients under 12 years of age: Systolic blood pressure \leq lower limit for age range as per [pediatric vital signs](#)
- Known or suspected pneumothorax
- Traumatic cause of respiratory arrest

Procedure

1. Attach the PEEP valve to the exhaust port on the bag-valve mask.
2. Set the dial on the PEEP valve to 5 cmH₂O.
3. Establish and maintain a good mask seal. Begin ventilating at an appropriate rate, usually no more than 8-10 breaths per minute.
4. Monitor oxygen saturation and blood pressure for changes.
5. PEEP may be increased in increments of 2.5 cmH₂O to a maximum of 10 cmH₂O.
 - [OnCall consultation required](#) if patients remain hypoxemic despite maximal oxygen therapy.
6. Continue with medications as appropriate to correct cause of respiratory distress or arrest.

Notes

- To be effective, PEEP requires a complete mask seal (the "closed circuit"). Removing the mask from the patient's face will release the end-expiratory pressure and allow alveoli to collapse. For critically ill patients, paramedics should seek to minimize the amount of time the mask is not firmly sealed to the patient's face.
- Discontinue PEEP if any of the following occur:
 - The patient's systolic blood pressure drops below 90 mmHg
 - Any contraindication arises
 - Equipment failure or concerns

