Analysis of Oxygen-Conserving Delivery Methods
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Oxygen therapy is needed to help treat patients with a variety of medical conditions. Oxygen conservation methods can be used to deliver oxygen only during the beginning of inspiration. This can provide the same medical benefits as constant oxygen delivery while using less oxygen and reducing costs. These conserving methods include intermittent flow devices and reservoir cannulas [1].

Our goal was to optimize a pulse flow and reservoir cannula device for use in children age 5 years and under. Overall the oxygen saving using the pulse flow method were much greater than for the reservoir method, especially for high oxygen flow rates. The pulse flow method was limited in the 6 month old model by the flow rate of oxygen that could be delivered by the pump, as it was not able to deliver more than ~1000 mL of oxygen during the inspiration time.

Using a pump that can deliver a higher flow rate of oxygen may make the pulse flow method more effective. Disadvantages of the pulse flow method are that it requires electricity and is more complex which may make it more difficult to implement.

The reservoir method was effective for low oxygen flow rates of approximately 500 mL/min, but as the flow rate increased the % savings decreased. One advantage of the reservoir method is that it requires electricity and is more complex which may make it more difficult to implement.

These oxygen conserving methods may be used when oxygen supplies are limited to reduce costs and allow patients to be treated for a longer period of time.

References