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Title: Transtracheal lung ventilation with a manual respiratory valve with a variable flow

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Body: In cannot-intubate, cannot-ventilate situations, a lung ventilation through a thin transtracheal cannula may be attempted. However, it may be impossible to achieve sufficient ventilation if the lungs are spontaneously emptying and dangers of barotrauma may occur. Here we present a valve (*) as a bi-directional manual respiratory pump which low flow during inspiration (by reducing gas supply to the valve) and increased flow during expiration, by increasing gas supply to the valve, permitted more effective venturi effect and efficient expiration, with low gas consumption.

The effectiveness of the valve was tested in vitro. The valve permitted to shorten the expiratory time and achieve higher minute volumes (i.e. volumes of 7L/min of gas or higher), as compared with the ventilation with the similar transtracheal cannula without variable flows (volumes achieved were about 4L/min). Variable flow provided shortening of the inspiratory time and efficient expiratory aid, and permitted I:E ratios of 1:1, or even the inverse ratio ventilation. Satisfactory lung ventilation can be assured with transtracheal ventilation with a bidirectional manual respiration valve with variable gas flow. *) Konrad Meissner, et al., Successful Transtracheal Lung Ventilation using a Manual Respiration Valve-an in vitro and in vivo Study, Anesthesiology. 2008 Aug;109(2):251-9.