

Oxygen safety valve BAROPREVENT protects against barotrauma when a mask is improperly connected to a patient with an airway device

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Problem statement

O₂ mask uses the hospital pipeline at 5 bar.

A flowmeter regulates the flow without pressure stabilization.

Improper connection to OTT might bring pipeline pressure direct on patients lung.

Pressures rises above 100 cmH₂O without humidifier, tubing or tube connection explosion.

At a flow of 15 L/min it takes less than 30 seconds to explode the lungs. (Vital Capacity of 3 L)

A simple pressure relief valve connected to the flowmeter has to stay closed to 90 cmH₂O to allow oxygen to flow through the small mask tubing. A larger tubing or pressure relief valve at the mask will never give 100% security for every patient.

Volutrauma protection requires an active safety frog device, too expensive for every oxygen flowmeter in the hospital.

Materials and Methods

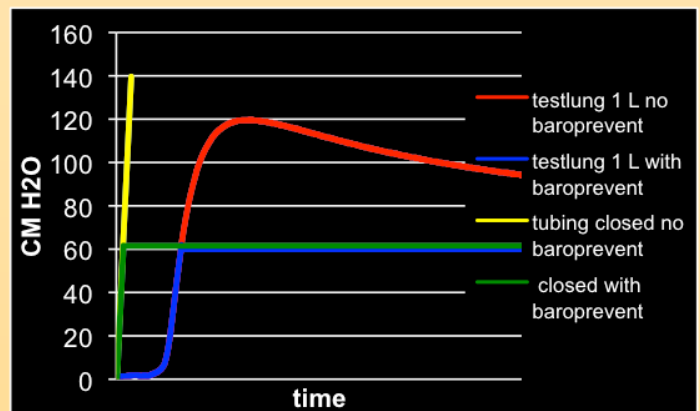
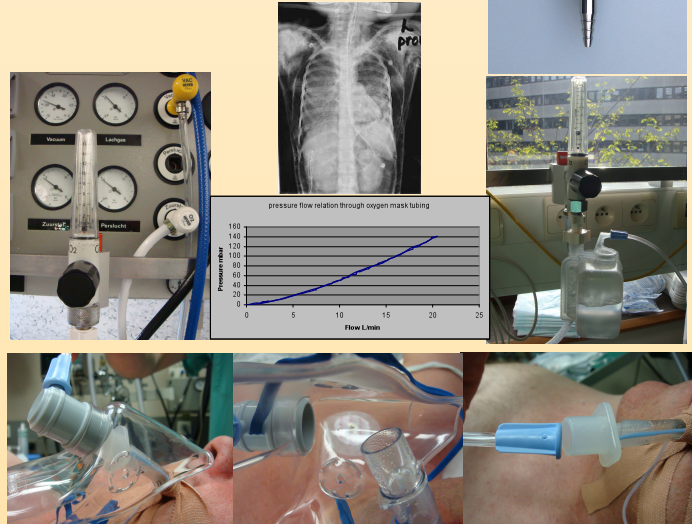
The solution build now exists of a pneumatic flow independent pressure relief valve connected to a new flow meter.

Pressure at end of tubing will never exceeds 60 cmH₂O even with high resistance tubing

No oxygen loss when fresh gas flow < 15L/min

1 liter rigid testlung was connected to an oxygen tubing or oxygen tubing was occluded. Oxygen tubing was connected to flowmeter with and without baroprevent.

10 L/min flow was set and pressure recorded till stabilisation or max of 100 cmH₂O.



Results

Without Baroprevent pressure rose immediately very high in occluded tubing or followed the compliance curve of the testlung.

With the Baroprevent safety valve, pressure was initial identical indicating no oxygen loss. At 60 cmH₂O the baroprevent opens and keeps pressure constant.

Conclusion

This Baroprevent oxygen safety valve protect the patient from barotrauma by human error.