

TOPOUT LEVERAGE EXPLAINED FOR USE WITH O2 CONCENTRATORS

In the most simple form. We breathe in a cycle of three parts; one part breathing in and two parts breathing out. Topout collects the O2 for the period of breathing out and delivers this on demand (breathing in).

Concentrators deliver 3 lpm, so at the start of any new cycle where a person was using O2 the first breath would take some part of 3 lpm being delivered to the mask. This O2 keeps flowing while they breathe out. Topout collects this gas for 2/3 of the breathing cycle (2 x 3 lpm) + 3 lpm being delivered at the time of breathing in = 9 lpm effective delivery. Effective leverage x 3.

This is the effective leverage in most simple form but does not take account of:

1. Bulk delivery of a bolus of O2
2. Large bore (low resistance) delivery tube
3. Phasing

Phasing; the O2 is delivered at a pressure greater than atmospheric to the accumulator. The O2 demand valve is held closed by the partial pressure of exhalation. As exhalation ends and inhalation begins the O2 will naturally seek to enter the mask under pressure before ambient air is drawn into the mask (this can be further enhanced by valve weighting and is subject to ongoing Topout research and current patent). The accumulator will empty and the remainder of the breath must be drawn from ambient. This gives natural phasing; delivering O2 as the first part of the breath deep into the lungs. The second part of the breath (ambient) will then fill the anatomical dead space where no O2 exchange can take place. Conventional systems oxygenate the whole breath so the first part of an exhaled breath would actually contain more than the ambient quota of 21% O2.

Perhaps a clearer indication of advantage is independent hypoxic tests carried out at altitude where a real deficiency of O2 exists. Topout was tested against the leading conventional delivery mask.

O2 delivery rate 1 lpm

Base line sats – 80%

Leading mask base 80 produced 85

Topout base 80 produced 95

$15/5 = X 3$

This work is particularly valuable because it was not a simulated environment and presents hard easy facts that corroborate the clear theory of the above x3 leverage.

Topout is still researching some the above. Our independent findings to date scientifically prove significant improvements in FiO2 over all leading conventional systems. We conclude that Topout has proven a leverage factor of at least x3. The next phase of our work for the Ministry of Defence UK may help us to establish a conclusive additional factor for bullets 1,2,and 3 above

Foot note;

If we take SAROS maximum pulse delivery of 96ml and divide into Topout 300ml we get the same leverage x3.