CPAP: “Continuous Positive Airway Pressure” or “Catalyst and Path for Aerosol Poisoning”?

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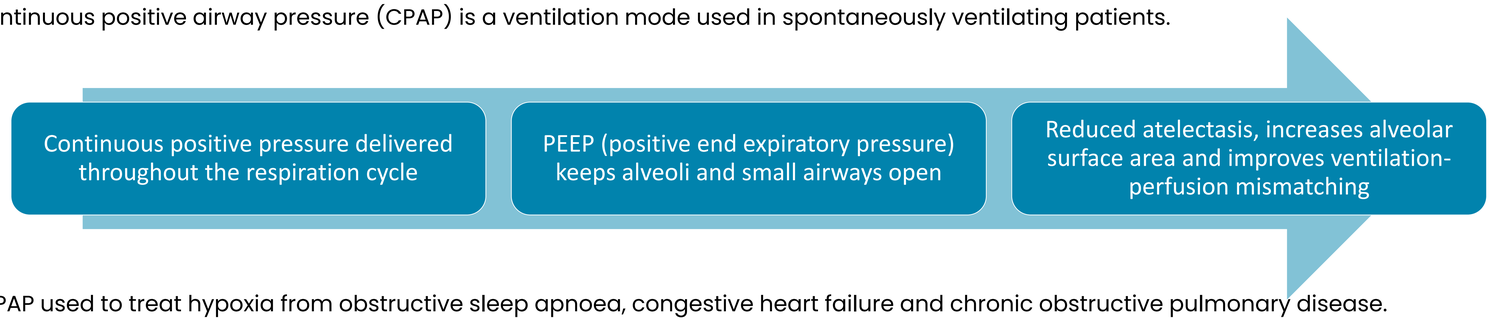
What is CPAP?

Continuous positive airway pressure (CPAP) is a ventilation mode used in spontaneously ventilating patients.



CPAP used to treat hypoxia from obstructive sleep apnoea, congestive heart failure and chronic obstructive pulmonary disease.

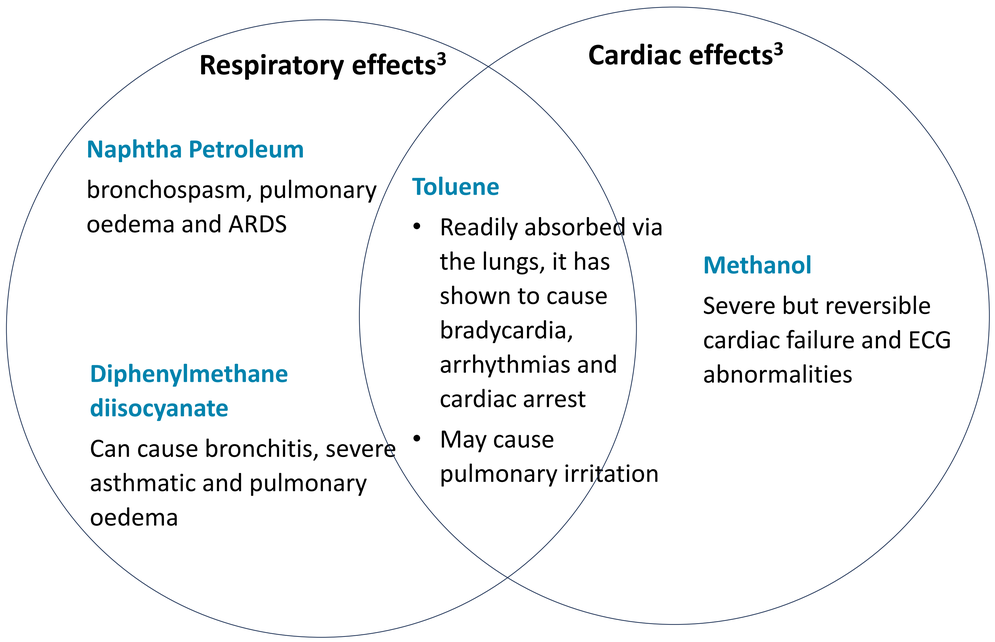
CPAP delivers a flow at constant pressure, with a delivery interface. The delivery interface options include:

- nasal CPAP: nasal prongs/small mask fitting into/over the nose
- nasopharyngeal CPAP: tube placed into nasopharynx, delivering CPAP more distally in the airways
- hood CPAP: delivered by a hood over the head with a seal around the neck
- face mask CPAP: mask fitting over the mouth and nose, particularly useful for those who are mouth breathers

Air filters are an important part of CPAP machines. They filter the air of dust, mould, pollen, pet hair and other allergens. An additional in-line disposable bacterial filter can be added to the circuit at the air outlet, which would filter out bacteria and viruses.

POR-15 ingredients

Toxin inhalation typically results in respiratory tract irritation at various airway levels or of parenchymal damage[1]. Absorption of toxins may also lead to systemic effects[2].



References
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2. Gorguner M, Akgun M. Acute Inhalation Injury. Eurasian J Med. 2010 Apr; 42(1): 28–35.
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The Highlights

Patient developed an inhalational pneumonitis and cardiac arrhythmia, following inhalation of anti-rust spray whilstusing a mask continuous positive airway pressure (CPAP) device.

The Story

A 68 year old gentleman with a background of hypertension, asthma and obstructive sleep apnoea presents to the Emergency Department (ED) with signs of hypoxia. The patient had used POR-15 anti-rust spray in his garage, where he had used his CPAP mask device as personal protective equipment. Unfortunately, the POR-15 are respiratory irritants and occasionally may cause cardiac conduction abnormalities.

After two hours of intermittent spray usage, he became short of breath and light-headed. On arrival to ED, he was found to be in severe type 1 respiratory failure, with evidence of bilateral infiltrates on chest radiograph (CXR) *fig 1a*.

He was admitted to the intensive care unit, where he remained on intermittent CPAP/high flow nasal oxygen (HFNO). Approximately 15 hours post exposure, he became profoundly bradycardic, followed by a brief episode of self-resolving cardiac stand-still and a non-shockable cardiac arrest rhythm. Spontaneous circulation was re-established after one cycle of cardio-pulmonary resuscitation.

A symptomatic junctional bradycardia persisted, thought to be due to sinus node disease from the inhaled toxins. An isoprenaline infusion was commenced and he was transferred to a tertiary cardiac centre for temporary pacing wire. He was electively intubated to facilitate a safe transfer as his oxygen requirement had increased to 60%.

Unfortunately, he also developed an acute kidney injury (AKI), likely due to toxin-mediated rhabdomyolysis. A temporary vascath was sited, however, he never required renal replacement therapy.

Staphylococcus lugdunensis, likely inoculated from a wound on his hand, was isolated from his initial blood culture and vascath tip after removal, for which he completed five days of intravenous Piperacillin-Tazobactam and 7 days of oral clindamycin.

He was discharged home 8 days after initial admission, with a repeat CXR (*fig 1c*) and a respiratory out-patient appointment. He required no further cardiology follow up as his echocardiogram was normal.

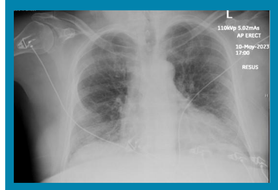

Fig 1a) CXR on admission (Day1)

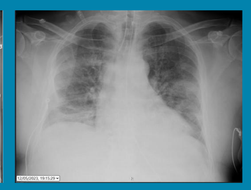

Fig 1b) CXR on Day3

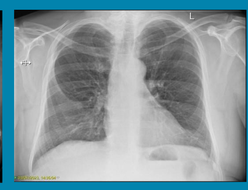

Fig 1c) CXR at follow-up