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## E-cigarette Vapour Impairs Pulmonary Surfactant Function

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## E-cigarette Vapour Impairs Pulmonary Surfactant

Emma Graham, Lynda McCaig, Akash Tejura, Gloria Shui-Kei Lau, Anne Cao, Ruud Vedhuizen

The use of electronic cigarettes (ECs) and vaping is increasing especially amongst young populations, despite continued reports of vaping associated lung injury. During a deep inhalation, the first compound EC vapour interacts with within the alveoli is pulmonary surfactant, a complex mixture of proteins and lipids responsible for stabilizing the alveoli through reducing surface tension, preventing alveolar collapse. We hypothesise that exposure to EC vapour will disrupt surfactant's ability to reduce alveolar surface tension. Bovine lipid extract surfactant (BLES) was directly exposed to vapour in a syringe, and then analysed on a constrained sessile drop surfactometer. Minimum surface tensions increased after exposure to vapour. Variations in device, nicotine, or vapour temperature had no additional effects, with some flavourings causing further surface tension increases. We conclude that vapour exposure leads to impairment of the surfactant system through increases in surface tensions, and this can contribute to lung dysfunction and subsequent injury.