

INDUSTRIAL CO POISONING

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Carbon monoxide (CO) is the commonest single cause of poisoning in both industry and the home.³ Carbon monoxide is a byproduct of incomplete combustion of carbon containing fuels including coal, wood and natural gas. Safe workplace levels of CO are below 30ppm over an 8 hour day, or 400ppm acutely, and Carboxyhaemoglobin (COHb) levels should be <5%.³ Industry is responsible for monitoring CO levels and ensuring safe work practices. Models exist that estimate the exposure level of CO, knowing the victim's physiological status following an incident. Our case was a worker who spent 8-9 hour shifts in a cold room followed by symptoms of dizziness. Four hours into a shift he collapsed. An LPG powered forklift had been operating in the cold room. Mask O₂ at 10L/min was applied 30 min after collapse. One hour later his COHb was 15.5%. On 100% O₂ for 2 hours the COHb level fell to 5.7%. The subject was left with probable neurological sequelae. To examine the available models of exogenous CO clearance and identify which would give the best estimate of CO exposure, and peak COHb level, a literature review was performed. The available evidence was sourced from textbooks, case studies, and published journal articles, using Medline, Print Google and Google Scholar. The search yielded a number of mathematical models for CO toxicity based on the Coburn Forster Kane (CFK) equation. These models predict COHb levels from given exposure levels of CO, but are limited by variations in physical and physiological status effecting the equilibrium and clearance of CO (e.g. ventilation, heart rate). With incomplete data, models by Nelson and Forbes were used, giving a value of 30-40%COHb. Although complex models are available, this case demonstrates that assumptions will usually have to be made, which may limit extrapolation for clinical and medico-legal purposes.

³*Australian Government. National Occupational Health and Safety Commission.
Exposure Standards: Carbon Monoxide, 1996*