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The role of odor and irritation, as well as risk perception, in the setting of occupational exposure limits

Abstract Objective: This paper reviews current research regarding the relationship between odor perception or irritation and setting an occupational exposure limit (OEL). Special focus was directed at those settings where a small fraction of persons report unacceptable responses to concentrations well below the OEL. **Methods:** We evaluated the published literature on the topic of irritation and olfactory response to exposure to industrial chemicals. More than a dozen researchers have been active in this area over the past 10 years. **Results:** It was found that for some chemicals, even when one maintains airborne concentrations below a particular OEL, this level of exposure may not be adequate to prevent all persons from reporting an appreciable adverse response. In some cases, worker's pre-existing belief systems about the source of an odor may be sufficient to require that they have not be exposed to any detectable concentration. In addition, detection of odors by workers may tap into the person's aversion to odors, in general. In both situations, it is often necessary to address these specific issues through risk communication and dealing directly with risk perception. **Conclusions:** For practical reasons, the current objective of organizations charged with setting OELs for chemicals is to identify concentrations that do not cause irritation or widespread reports of unpleasant sensory stimulation in the vast majority of workers (e.g., about 80–95%).

Keywords Odor · Risk perception · Chemosensory effects · Occupational exposure limits · Industrial hygiene