

**HSE (2012). “Evidence for exposure and harmful effects of diathermy plumes (surgical smoke)”.**

LINK - <http://www.hse.gov.uk/research/rrpdf/rr922.pdf>

This systematic review has considered the evidence related to the use of surgical smoke evacuation devices, and their role in reducing the exposure of UK healthcare workers (HCWs) to smoke exposure in the surgical environment. Over recent years a small number of individual UK case reports have attributed such exposure to HCWs developing respiratory ill health due to exposure of this nature. Although there are existing legal requirements within the UK for all workers to be protected from unnecessary exposure to hazardous materials, a key issue related to surgical smoke is whether there is evidence that the unpleasant, cloying, odorous smoke actually equates to a hazard, and in turn whether this poses a risk to workers exposed to it.

- Despite the small number of cases in the UK where HCWs have reported ill health attributed to surgical smoke exposure, there is no specific legal requirement for surgical departments to install smoke extraction systems for any type of surgical procedure. This is despite the fact that certain tissue cutting devices and types of surgery are known to generate more smoke and aerosols than others. Where a risk assessment indicates, COSHH regulations may apply in the operating theatre environment, as some published reports conclude that hazardous substances can be associated with surgical smoke. Under such circumstances employer must comply with the COSHH regulations to control the exposure of their staff to these substances. The only available UK guidance documents are brief, and have been released by the Medical and Healthcare Products Regulatory Agency (MHRA) and British Occupational Hygiene Society (BOHS) and have been based on a limited number of peer reviewed publications and emphasised the basic principle that exposure to smoke of any kind is probably best avoided. While this approach could be regarded as pragmatic and precautionary, there is a need for an evidence-based assessment of the published research about this topic to assess the quality of the studies that are influencing decision-making in this important working environment.
- For the research questions considered here, the challenges faced by decision makers and enforcers quickly became apparent, since the quality and quantity of evidence was limited in the context of the methodology that is used for systematic reviews of evidence. This was mainly due to the study designs employed; for example, many studies were based on experimental measurements rather than assessment of workplace exposure. Most of the studies were small sized and correspondingly of insufficient statistical power, and lacked design rigour to minimise probability of study bias.
- Despite these constraints, and taking into account the published studies included in this review, there is sufficient published evidence to consider the use of surgical smoke extraction devices and their effectiveness in reducing the levels of smoke exposure for UK HCWs.
- This review also considered the likelihood that surgical smoke exposure might lead to reporting of respiratory ill health (either acute symptoms or long latency disease), but these questions could not be answered effectively due to the lack of evidence. Some of the published data provide support for these concerns, but at a lower level of evidence that could not be used to formulate evidence based conclusions.