

Occupational Safety and Health Standards Board  
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To the Cal-OSHA Advisory Committee:

We, the members of the board for the California El Camino Real Association of Occupational Health Nurses (CECRAOHN), representing the members of the Northern California chapter of the American Association of Occupational Health Nurses (AAOHN) have reviewed the literature on surgical plume and its effects on operating room health care workers. Plume is defined as larger particulate matter produced by lasers and ultrasonic devices and is more of a concern as a biological hazard. Smoke has smaller particulate but is as dangerous due to its chemical composition (Bigony, 2007).

Exposure to plume has been a concern since 1988. Exposure to surgical personnel, (surgeons, circulating and scrub nurses, OR technicians and anesthesia care providers) depends on proximity to tissue destruction and duration of exposure in the operating room. Hydrogen cyanide and butadiene are found in surgical plume and are cardiotoxic and carcinogenic respectively. Both are volatile organic compounds that are a potential health hazard to personnel and are only two of 150 identified other substances found in surgical plume. Viable cellular matter such as HPV, HIV and polio virus have also been identified (Pierce, Lacey, Lippert, Lopez, Franke and Colvard, 2011). American Standards National Institute (ANSI) has developed standards for plume removal due to laser ablation.

There are currently no legal or regulatory mandates to control plume in the state of California. AB 402 Occupational Safety and Health Standards: Plume was vetoed by Governor Jerry Brown on the grounds that protection of workers from surgical plume does not require legislation. Governor Brown suggests and recommends petitioning the Cal-OSHA Standards Board to create a new safety plume regulation.

Multiple studies recommend removal of surgical plume by implementing smoke evacuation systems in all operating rooms in hospitals, stand-alone surgery centers and any sites where there is exposure to surgical plume. Simple use of a suction device next to the surgical site is not a long-term solution due to the need to have a surgical assist and the smoke vented to the general environment. In general, smoke extraction systems clear more particles and odor (Pillinger, Delbridge and Lewis, 2003). CECRAOHN does not endorse a specific brand of smoke extractor.

As Occupational Health Nurses and Nurse Practitioners, we support safe, healthy work environments for healthcare workers at risk of exposure to surgical plume and potential work-related disease. As CECRAOHN members, we request the Cal-OSHA Standards Board to create

a standard that requires control and removal of surgical plume in all surgical work settings, maintaining a safe environment for patients and employees.

Respectfully submitted,

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Government Affairs Representative  
CECRAOHN

## References

The following are references within the letter, other articles were reviewed that were not referenced.

Bigony, L. (2007). Risks associated with exposure to surgical smoke plume: a review of the literature. *AORN*, 86 (6), 1013-1020.

Pierce, J.S., Lacey, S.E., Lippert, J.F., Lopez, R., Franke, J.E., & Colvard, M.D. (2011). An assessment of the occupational hazards related to medical lasers. *Journal of Occupational and Environmental Medicine*, 53(11), 1302-1309. doi: 10.1097/JOM.0b013e318236399e

Pillanger, S.H., Delbridge, L. & Lewis, D.R. (2003). Randomized clinical trial of suction versus Standard clearance of the diathermy plume. *British Journal of Surgery*, 90, 1068-1071. doi: 10.1002/bjs.4214