From: McNary, Jennifer@CDPH
To: DIR RS
Cc: Delizo, Grace@DIR; Neidhardt, Amalia@DIR
Subject: FW: Surgical Plume comments
Date: Friday, January 11, 2019 5:49:15 PM

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From: McNary, Jennifer@CDPH
Sent: Friday, January 11, 2019 5:28 PM
To: Delizo, Grace@DIR <GDelizo@dir.ca.gov>; Neidhardt, Amalia@DIR <ANeidhardt@dir.ca.gov>
Cc: Materna, Barbara (CDPH-DEODC-OHB) (Barbara.Materna@cdph.ca.gov) <Barbara.Materna@cdph.ca.gov>; Armatas, Christina@CDPH <Christina.Armatas@cdph.ca.gov>
Subject: Surgical Plume comments

Dear Ms. Delizo and Ms. Neidhardt,

We are writing on behalf of the Hazard Evaluation System and Information Service (HESIS) within the Occupational Health Branch of the California Department of Public Health to express our general support for Cal/OSHA in developing a new regulation that addresses occupational exposure to surgical smoke and provide informal technical input. We believe that surgical smoke is a significant occupational hazard to healthcare workers due to widespread exposure and potentially serious health effects. A Cal/OSHA standard is needed to ensure hospitals purchase surgical plume control devices and require physicians and surgeons to routinely use the devices, which are readily available and effective in reducing exposures. The following points support our conclusion:

1. At the Advisory Committee meeting November 8, 2018, Bradley King of NIOSH presented information on surgical smoke exposure. Surgical smoke contains several known carcinogenic compounds and ultrafine particles that have the ability to reach the alveolar region of the lung. NIOSH presented information on the acute and chronic health effects ranging from eye, nose, and throat irritation to emphysema, asthma, and chronic bronchitis (NIOSH Health Hazard Evaluations 2001-2006). NIOSH also presented information from recently published research that found surgical smoke is cytotoxic in vitro (Sisler 2018).
2. Exposure to surgical plume is widespread. Surgeons, nurses, anesthesiologists, and surgical technologists are exposed to laser or electrosurgical smoke, and existing guidelines for local exhaust ventilation are not always followed. NIOSH reported that only 14% of healthcare workers exposed during electrosurgery and 47% of those exposed during laser surgery said that exhaust ventilation was always used. Also, 59% exposed during electrosurgery and 31% exposed during laser surgery reported that local exhaust ventilation was never used (Steege 2016). During the Cal/OSHA advisory meeting, many nurses relayed their own experiences and concerns that even when a

local exhaust ventilation device was available, it was not always used or was not used properly (e.g., placed close enough to be effective).

Specific comments on the draft regulatory language are:

a. Subsection (a) Scope and Application. As proposed, the standard would cover occupational exposure to surgical plume in general acute care hospitals, acute psychiatric hospitals, and special hospitals but not in medical office buildings or ambulatory surgery centers. Occupational exposure in medical office buildings and ambulatory surgery centers should be included in the scope, because procedures that produce surgical smoke occur in these settings. Also, there may be higher airborne concentrations of surgical plume in outpatient medical office buildings because required ventilation rates are lower than in hospitals.

b. Subsection (c) Written Procedures. We recommend an additional requirement that employers have an effective procedure for obtaining the active involvement of employees in reviewing and updating the written procedures performed by employees in their respective work areas or departments.

c. Subsection (d) Control Measures, (1) Engineering Control.

Subsection (A) Plume Scavenging Systems. The current draft regulation requires that "Plume scavenging systems shall be in operation continually and located as close as possible to the site-of-origin whenever surgical plume is generated." We would recommend adding a note regarding the positioning of the opening of the plume scavenging system in relation to the site of plume generation. The note could state that, to be effective, the maximum distance from the scavenging system from the site of origin will be small; for example, NIOSH said that the smoke evacuator or room suction hose nozzle inlet must be kept within 2 inches of the surgical site to effectively capture airborne contaminants generated by the surgical devices. (from: Control of Smoke From Laser/Electric Surgical Procedure: https://www.cdc.gov/niosh/docs/hazardcontrol/hc11.html)

While the draft standard references subsection 5143 in a note, some smoke evacuator users won't be familiar with those requirements for annual testing of the evacuator. We would suggest adding a statement in this draft that "The ventilation rate of the surgical plume evacuator shall be tested after initial installation, and at least annually, to verify it meets the manufacturer's specifications."

Subsection (3) requires respirators be used "when engineering controls and administrative controls do not prevent visible surgical plume from contacting the eyes or respiratory tract of employees." Cal/OSHA may wish to consider adding a requirement for respiratory protection if an odor or eye or

respiratory tract irritation is experienced which would indicate the smoke evacuator was not sufficiently effective.

References:

Steege, A.L., J.M. Boiano, and M.H. Sweeney: Secondhand smoke in the operating room? Precautionary practices lacking for surgical smoke. *Am. J. Industr. Med. 59*:1020–1031 (2016).

Sisler, Jennifer D., Justine Shaffer, Jhy-Charm Soo, Ryan F LeBouf, Martin Harper, Yong Qian and Taekhee Lee. "In vitro toxicological evaluation of surgical smoke from human tissue." *Journal of occupational medicine and toxicology* (2018).

Thank you very much for the opportunity to comment on the draft standard.

Jennifer McNary, MPH, CIH
Hazard Evaluation System and Information Service (HESIS)
Occupational Health Branch
Center for Healthy Communities
California Department of Public Health

Christina Armatas MD, MPH
Occupational Health Branch
Emergency Preparedness Team
Center for Healthy Communities
California Department of Public Health