

EVS Housekeeping Staff Ozone Exposure Assessment

Background

Recently, new cleaning technology was introduced to the hospital for the cleaning of hard surfaces. The Tersano Lotus Pro uses an electrical charge to convert atmospheric oxygen into ozone, which is bubbled through filtered water to produce “stabilized aqueous ozone”. The units were installed in utility closets throughout the hospital.

Ozone is a known respiratory irritant and a survey was conducted using test strips to determine the worst case ozone concentrations in the utility rooms when the Tersano Lotus Pro was in use. The results of those crude measurements indicated that there was potential for employee overexposure to ozone. Based on that concern, EH&S performed this inhalation exposure assessment.

Sampling Methods

On September 26, 2018, samples were collected from all first shift employees who volunteered to take part in the assessment efforts. While there were 17 volunteers, two badges were not returned at the end of shift. Therefore, a total of 15 samples were collected.

To determine the airborne ozone exposure to EVS housekeeping staff, personal exposure sampling was conducted using passive badge samplers (Assay Technology, Model 586 Ozone Monitor). Samples were collected by attaching the passive badge sampler to the employee’s clothing within their breathing zone, defined as a location up to one foot from the mouth/nose. Samples were exposed to the work environment for each person’s full shift and then sealed before laboratory submission.

Sealed samples were submitted via chain of custody protocol to SGS Galson in East Syracuse, New York for analysis on a standard turnaround time. Samples were analyzed by a modified OSHA ID-214 method using ion chromatography. SGS Galson is accredited by the American Industrial Hygiene Association Laboratory Accreditation Program (AIHA-LAP) for this analysis.

Exposure Sampling Results

No airborne ozone was observed above the laboratory’s limit of detection on any of the samples collected on housekeeping staff. These results are presented in Table 2.

Discussion

The California Occupational Safety & Health Administration (Cal/OSHA) permissible exposure limit is a legal regulatory limit for exposure of an employee to a substance. PELs are set and enforced by Cal/OSHA and are based on an 8 hour time weighted average exposure. The PEL for ozone is 0.1 ppm. Therefore, at <0.07 ppm, the measured exposure is below the regulatory limit and does not represent an overexposure.

Conclusion

Airborne ozone exposures were determined to be less than the Cal/OSHA PEL and does not present a significant inhalation risk to housekeeping staff.

Table 2. Ozone personal sampling results

Name		Date Sampled	Sample Number	Location	Sample Duration	Airborne Concentration
Amla	Bahn	9/26/18	MU5151	UT 8	479	<0.06 ppm
Antonio	Fernandez	9/26/18	MU5562	East 4	497	<0.05 ppm
Balwant	Singh	9/26/18	MU5264	PACU	n/a	n/a
Chandra	Prakash	9/26/18	MU5746	Davis 5	473	<0.06 ppm
Denise	Nelson	9/26/18	MU5613	Davis 11	472	<0.06 ppm
Gurmit	Singh	9/26/18	MU5528	Pharmacy - Ground Floor	476	<0.06 ppm
Khoda	Newaz	9/26/18	MU5868	Cath Lab	470	<0.06 ppm
Kum Kum	Shirin	9/26/18	MU5606	UT 6	479	<0.06 ppm
Martha	Evans	9/26/18	MU5456	UT 3	477	<0.06 ppm
Nisha	Venkatayo	9/26/18	MU6020	Davis 8 BMT	480	<0.06 ppm
Pam	Copeland	9/26/18	MU5721	Pavillion 2	n/a	n/a
Ricardo	Espinosa	9/26/18	MU5333	1st Floor Angio	465	<0.06 ppm
Salma	Bibi	9/26/18	MU5458	East 6	483	<0.06 ppm
Salon	Singh	9/26/18	MU5499	Central Processing	478	<0.06 ppm
Sanjana	Lata	9/26/18	MU5625	Davis 3	476	<0.06 ppm
Shyam	Kharka	9/26/18	MU5640	Davis 3	383	<0.07 ppm
Thomas	Anderson	9/26/18	MU5730	N1 Adult Annex & East 7	475	<0.06 ppm

This document was produced by the UCDMC EH&S Occupational Safety group with exposure assessment and reporting completed by Jodi Smith, CIH, CSP.