



CA·NURSES

FOR ENVIRONMENTAL HEALTH & JUSTICE

DATE: January 17, 2026

TO: **Joseph M. Alioto Jr.**, Chair, OSHSB **Kate Crawford**, Board Member
Chris Laszcz-Davis, Board Member **David Harrison**, Board Member
Derek Urwin, Board Member **Nola J. Kennedy**, Board Member
David Thomas, Board Member

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SUBJECT: **PETITION REQUESTING NEW WORKPLACE PROTECTION REQUIREMENT TO PROTECT AGAINST
PILL CRUSHING EXPOSURES IN HEALTHCARE FACILITIES**

Introduction

California Nurses for Environmental Health & Justice (CNEHJ) is a non-profit organization of individual nurses that partner with non-governmental organizations (NGOs), healthcare organizations, and communities to champion environmental health and justice. Our Greening Hospitals committee considers ways that healthcare settings can work towards sustainability and promote occupational and environmental health. Toxic workplace exposures are a prominent concern because of the chronicity of the exposures, consequently resulting in higher risks for potential adverse impacts.

Pursuant to [Government Code section 11340.6](#), this petition contains three sections:

- (1) The substance or nature of the regulation, amendment, or repeal requested;
- (2) The reason for the request; and
- (3) Reference to the authority of the state agency to take the action requested.

(1) The Substance or Nature of the Request

Pursuant to GOV section 11340.6(a)

We request the California Occupational Safety and Health Standards (OSHSB) Board (hereto called “the Board”) take steps in implementing a healthcare facility workplace requirement in the State of California for the use of fumehoods where the crushing of pharmaceuticals occurs.

(2) The Reason for the Request

Pursuant to GOV section 11340.6(b)

We are submitting this petition to address a critical safety issue affecting nurses in California: the occupational hazard posed by pill crushing. Nurses crush pills and add them to applesauce or other foods for consumption by various patient populations, such as pediatric patients and others who have difficulty with swallowing pills such as stroke patients. Nurses who are tasked with crushing pills are at risk of inhaling fine and ultrafine particulate matter (PM) released into the air which contain the medications' active and inactive ingredients. This presents a potential health hazard for the nurses in the immediate and surrounding space. Workplace protections are not currently in place to prevent these exposures.

When [Tavares, Loosely, and Shaik \(2025\)](#) evaluated particulate exposure risk with different pill crushers, containers, and crushing methods, they observed the aerosolization of Tylenol from all pill crushing procedures. Aggressive and vigorous pill crushing significantly increased the number of aerosolized particles from all devices. In addition, the pouring of crushed tablets nearly always generated the most aerosolized particles compared to the actual crushing and transitioning phases of the pill crushing process.

[Amiri et al. \(2023\)](#) corroborates the concern for pill crushing particulate matter exposure and identifies a cost-effective solution:

- PM_{10} , $PM_{2.5}$, and PM_1 are emitted during the pill-crushing process;
- The identified particulate matters, presumably containing active and inactive ingredients, were detected in nurses' breathing zones 10 inches within the crusher's nose and mouth; and

- The use of a small, ductless fume hood costing as little as \$2,000 significantly reduces the PM concentrations measured in the breathing zone.

Exposure to pill crushing in healthcare workplaces creates a hazard for nurses and neither NIOSH nor the State of California mandate exposure precautions when crushing all medications. As part of Cal/OSHA, the Board is the only agency in the State of California authorized to adopt occupational safety and health standards ([DIR, 2024](#)) to protect the approximately 700,000 nurses in California ([BRN, 2025](#)) from the occupational health hazard posed by pill crushing.

Hazards of Indoor PM Exposure

The National Institute of Occupational Safety and Health (NIOSH) has identified tablet crushing as an exposure mechanism to drugs since at least 2004 ([NIOSH, 2004](#)). For example, when wipe samples from various locations that included biological safety cabinet surfaces, floors, counter tops, storage areas, treatment area tables and chairs, and surfaces adjacent to drug handling areas were analyzed for hazardous drugs, most investigators detected one to five hazardous drugs ([NIOSH, 2016](#)).

Exposure to PM has been linked to numerous adverse impacts that include premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms like airway irritation, coughing, or difficulty breathing ([U.S. EPA, 2025b](#)). However, indoor PM exposure is less understood compared to outdoor PM exposure and may relate to particulate composition. While outdoor PM are often comprised of reactive nitrogen and sulfur species (e.g., NO_x and SO₂), indoor PM produced as a result of pill crushing is expected to be comprised of the pill's ingredients, including both active and inactive pharmaceutical compounds. Amiri et al. (2023) summarize some available research regarding adverse health impacts associated with exposure to pill crushing:

- 1) *“For example, a case study report relates the story of a pharmacist who crushed clozapine for several months in a closed room with inconsistent surgical mask usage. She was diagnosed with pneumonitis after complaining of shortness of breath. Her symptoms continued for several months but resolved when exposure to clozapine powder was stopped (Lewis et al., 2012). Multiple studies show the correlation between crushing benzodiazepine medications and nurse development of airborne occupational contact dermatitis (Gilissen et al., 2020; Hulst et al., 2010; Swinnen et al., 2014), but other drugs have also been correlated with contact dermatitis, such as beta-blockers, Angiotensin-converting enzyme (ACE) inhibitors, trazodone, ranitidine, and zolpidem (Gilissen et al., 2020; Swinnen et al., 2014). The allergic reactions might result from exposure to inactive ingredients of oral medications (Abrantes et al., 2016).”*
- 2) *“...studies have shown correlations between crushing benzodiazepine, beta-blockers, ACE inhibitors, trazodone, ranitidine, and zolpidem and the development of airborne*

occupational contact dermatitis in nurses (Gilissen et al., 2020; Hulst et al., 2010; Swinnen et al., 2014)."

- 3) *"...allergic reactions may result from exposure to inactive ingredients of oral medications (Abrantes et al., 2016; Kelso, 2014)."*

Cumulative Exposure

The greatest uncertainty surrounding the potential for adverse impacts caused by pill crushing may lie in the unknown risk for cumulative exposure to multiple pharmaceuticals. Cumulative exposure occurs when multiple stressors lead to adverse impacts in an individual, generally through the same mode of action ([U.S. EPA, 2025a](#)). However, cumulative exposure can come in the form of both chemical and non-chemical exposures—such as noise, odor, temperature, stress, or long working hours—that can predispose a population to potential adverse impacts.

Nurses regularly administer as many as 50+ medications per shift ([Hawkins and Morse, 2022](#)), leading to the potential exposure of complex mixtures. Cumulative exposures may distinguish the potential risks of multi-drug pill crushing to those associated with NIOSH-listed hazardous drugs. Where NIOSH-listed hazardous drugs are characterized by their chemical-specific toxicity profiles, identifying the risks caused by multidrug exposures presents a unique challenge because of drug-drug synergistic, additive, antagonist, and potentiation effects. Every nurse also cares for a unique group of patients, each with their own combination of medications. As a result, every nurse can reasonably be exposed to a different slate of their patients' medications, making exposure characterization a difficult task. Add patients' pharmaceutical dosing into the mix, and risk characterization may be nearly impossible. All said and done, the numerous variables at play (e.g., nurse, patients, medications, doses, etc.) present a distinct exposure scenario that warrants caution until data can better quantify the risks. This massive research gap warrants the consideration of biomonitoring research to elucidate the multi-chemical exposures that may be at play in the broader healthcare occupational workspace.

(3) Reference to the authority of the state agency to take the action requested

Pursuant to GOV section 11340.6(c)

The California Labor Code (Division 5, Part 1, Chapter 1) places a jurisdiction duty upon the Department of Industrial Relations and Occupational Safety and Health Standards Board to assure safe and healthful working conditions for all working Californians.

The following laws and regulations oblige the Board to consider workplace safety for nurses:

- **Occupational Safety and Health Act ([LAB 6300](#))**

- *“The California Occupational Safety and Health Act of 1973 is hereby enacted for the purpose of assuring safe and healthful working conditions for all California working men and women by authorizing the enforcement of effective standards, assisting and encouraging employers to maintain safe and healthful working conditions, and by providing for research, information, education, training, and enforcement in the field of occupational safety and health.”*
- **General Duty Clause ([LAB 6400 - 6401.7](#))**
 - 6400(a): *“Every employer shall furnish employment and a place of employment that is safe and healthful for the employees therein.”*

Conclusion

The increased exposures to chemicals and pathogens inherent to healthcare jobs are reported to be associated with increased rates of some diseases among healthcare workers compared to the general population (cancer: [Ekpanyaskul and Sangrajrang, 2018](#), [Lee et al., 2023](#); mental illness: [Dahal and Frogner, 2024](#); HIV: [Ostankova et al., 2023](#); and tuberculosis: [Baussano et al., 2011](#)). The health disparities between healthcare workers and the general population indicate the need for exploration and counterbalancing measures.

In the case of pill crushing, there is clear evidence that fume hoods can reduce nurses’ exposures to potentially harmful pharmaceutical particulate matter ([Amiri et al., 2023](#)). We urge the Board and California OSHA to implement guidelines that require the installation of fume hoods in medication rooms and other places where medications may be prepared within healthcare facilities. This intervention will provide a controlled environment for pill crushing, thereby preventing the release of particles into the air. Additionally, we propose that nurses—as purely a time-buying immediate precaution—wear personal protective gear, such as masks and gloves, when conducting pill crushing activities to minimize their exposure to potentially harmful particles while real solutions are put in place (See [APPENDIX: Potential Mitigation Strategies](#)).

Implementing these guidelines is crucial in ensuring the safety and well-being of nurses in healthcare facilities across California. We sincerely hope that you will consider this matter seriously and take the necessary steps to address this pressing issue.

Thank you for your attention and prompt action in this regard.

Key References

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APPENDIX: Potential Mitigation Strategies

Appendix Table 1: Timeframes and pros/cons for potential mitigation strategies for the exposure of nurses to medication particulate matter during the pill crushing process.

Timeframe	Mitigation Strategy	Pros	Cons
Immediate	Wear N95s and gloves when crushing pills	<ul style="list-style-type: none"> - Simple to implement immediately - Potentially high impact-to-cost ratio 	Does not resolve the cause of the problem (i.e., the incidental exposures)
Short-Term	Prescribe liquid or powder forms of medications	Already available for some medications	<ul style="list-style-type: none"> - Not all medications are available in liquid or powder forms - Powdered forms may also release PM into the air
Moderate-Term	Only crush in ventilated rooms under fume hoods	<ul style="list-style-type: none"> - Demonstrated to be effective - Relatively cheap (approx. \$2,000) 	<ul style="list-style-type: none"> - Implementation time - Not all rooms may be large enough
Long-Term	Prescribe liquid pharmaceuticals to avoid pill crushing	Lack of crushing prevents PM formation at the root of the problem	<ul style="list-style-type: none"> - Not all medications are available in liquid form - Complex development process - Scope greater than State of CA authority