# Summary of State Health Department Reviews of Deaths Reported to and Investigated by the Consumer Product Safety Commission Related to Exposure to Imported Drywall

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## Introduction

In March 2010, the U.S. Consumer Product Safety Commission (CPSC) requested assistance from the Centers for Disease Control and Prevention (CDC) in investigating reports of the deaths of persons who lived in or visited homes containing imported drywall. In response to this request, CDC has worked through and with appropriate state public health authorities to conduct comprehensive clinical case reviews of the deaths reported to the CPSC. This report summarizes the findings of the clinical case reviews conducted by state health authorities. It also provides conclusions and recommendations from CDC on the basis of those findings.

## Background

The CPSC is the federal agency charged with evaluating the relation between imported drywall and reported health symptoms. The agency is also charged with examining electrical and fire safety issues in the home and with tracing the origin and distribution of drywall. In December 2008, the agency began receiving complaints from occupants of structures containing imported drywall. The occupants complained that they experienced respiratory health symptoms that they believed were related to emissions from the imported drywall. In response, the CPSC sent a team to Florida in March 2009 to meet with county health officials and visit impacted homes. Since then, the CPSC and other government agencies or their contractors have conducted investigations into possible exposures to harmful contaminants associated with imported drywall. These studies include testing of the chemical composition of drywall samples (1), measurement of drywall emission rates in controlled experiments (2), and indoor air studies of homes with imported drywall (3, 4). The studies found reactive sulfur compounds, including hydrogen sulfide; however, none of the sulfur compounds found in indoor air were at concentrations historically associated with human health effects, and the concentrations found could not explain the adverse health symptoms reported to the CPSC. The largest study of indoor air, conducted for the CPSC by a consulting firm, Environmental Health & Engineering, Inc, sampled for contaminants in the air of homes where residents had complained of imported drywall (41 homes). The study also sampled ten homes from which there had been no complaints (4). Although a statistically significant association between the presence of imported drywall in a home and hydrogen sulfide concentrations was found, the mean level of hydrogen sulfide for these homes was measured at less than one part per billion (0.66 ppb). Such a low mean level is close to levels detected in background/ambient air and below levels at which most people can detect an odor (5). The results of these environmental studies and evaluations can be found at www.cpsc/info/drywall/investigation.

Among the adverse health impacts reported to the CPSC, several families reported concerns that the deaths of their family members might have been related to exposure to imported drywall. The CPSC subsequently requested assistance from CDC in the investigation of those reports involving deaths. The CPSC asked CDC to provide public health expertise and guidance in order to further the investigation of the reports of deaths and to provide a better understanding of the relationship, if any, between the reported deaths and exposure to imported drywall. This request was consistent with CDC's ongoing supportive role of CPSC's investigations of the potential health impacts related to exposure to imported drywall.

## Methods

In determining a scientifically feasible approach to investigating the reports to the CPSC of deaths of persons potentially exposed to imported drywall, CDC considered the results of previous environmental studies. These previous studies failed to document environmental exposures at levels that could plausibly result in adverse health effects. In addition, CDC reviewed the decedents' files developed from CPSC's in-depth investigation (IDI). These files contain a report narrative and other relevant documentation collected by the CPSC investigators through a Web site or through telephone and/or in-person interviews with the next of kin of decedants. Some of the IDIs included copies of medical records and death certificates provided by the next of kin or collected by CPSC in instances in which consent was obtained from the next of kin. After reviewing the CPSC IDIs and previous environmental studies, CDC determined that an objective, comprehensive review of the clinical records related to each of the reported deaths was necessary.

CDC then consulted with and received guidance from the National Association of Medical Examiners and several state medical examiners. CDC researched a number of options for obtaining an objective, expert review of the decedants' clinical histories. On the basis of these consultations, CDC determined that the individual case reviews should be conducted by the public health authorities in the states where the deaths were reported.

CDC developed and implemented a plan to refer the CPSC IDIs to state departments of health for review and to obtain additional information and medical records from next of kin of the deceased. With such additional information and medical records, reviews of the cases would be more comprehensive. The case definition for referring a case to a state public health authority was as follows: *Notification to the CPSC of a deceased person who resided in or visited a home that met the CPSC criteria for the confirmed presence of imported drywall.* The objective of these case reviews was to determine if any documented, clinical evidence suggested that any of the deaths reported to the CPSC were related to exposure to drywall.

Originally, the CPSC provided CDC with all IDIs in which a complainant reported imported drywall as a concern about a family member's death and in which the complainant consented to release contact and health information. At CDC's request, the CPSC narrowed the scope of IDIs to include only those in which the presence of imported drywall was confirmed. The resulting list of twelve cases consisted of those from Louisiana (six), Florida (five), and Virginia (one) that met either the CPSC guidelines (http://www.cpsc.gov/info/drywall/index.html) or the Florida Department of Health case definition (http://www.doh.state.fl.us/environment/community/indoor-air/casedefinition.html) for confirmation of the presence of imported drywall.

CDC obtained permission from the CPSC to contact next of kin by telephone. CDC staff then contacted each decedent's next of kin, explained the purpose of the investigation, and requested the next of kin's permission to participate. CDC attempted to obtain verbal consent from the next of kin for the CPSC to share its investigation files with public health authorities in the state where the death occurred. Consent was obtained from five next of kin in Louisiana (one family

declined to participate) and five next of kin in Florida. In the Virginia case, the decedent's next of kin had been in contact with public health authorities, and the CPSC case already had been referred to the Office of the Chief Medical Examiner when CDC began receiving IDIs from the CPSC.

In each state, the reviews were conducted by physicians who are health officials with the appropriate authority and relevant expertise and experience to conduct the reviews. The reviewers were asked to use their clinical judgment and expertise in accordance with accepted standards of practice to determine if the deaths were related to exposure to imported drywall. Each death was reviewed individually. A determination was made for each decedent by use of the available clinical evidence regarding the circumstances of the decedent's death, contributing factors, underlying illnesses and health status at the time of death, and past medical history. Additional clinical or pathology data (i.e., autopsy data) were not collected, and environmental sampling of decedents' homes was not included as part of the case review.

The states involved have state-specific procedures and authorities for obtaining medical records and conducting a public health investigation of a death. CDC worked with each state to develop a plan for the clinical case reviews in accordance with the state's specific procedure and authority. In Louisiana, the public health authority responsible for reviewing these cases is the Louisiana Department of Health and Hospital Services (LDHHS). In instances in which the CPSC case files did not contain sufficient medical records and other information relevant to the review, the LDHHS Office of the State Epidemiologist obtained additional hospitalization records and vital statistics.

Cases referred to the Florida Department of Health (FLDOH), Division of Environmental Health, were reviewed by a medical toxicologist. To obtain other relevant health-related information for these cases, the FLDOH contacted next of kin to obtain consent for release of medical records. In Virginia, the Virginia Department of Health, Division of Environmental Epidemiology, referred the single case to the Office of the Chief Medical Examiner. Under that office's authority, the medical examiner obtained additional records necessary for a review the case.

## State Summaries

Below is a summary of state public health findings of the medical record reviews. Because the state findings provided to CDC contain personal identifiers and other information considered confidential, CDC is not including identifying information in this summary of findings.

### *Summary of Louisiana Medical Record Reviews*

The LDDHS reviewed five cases from Louisiana. These cases consisted of four males and one female, aged 59–78 at time of death. All five decedents had multiple long-term, severe, preexisting chronic health conditions before their deaths. Four of the persons had heart disease in addition to such other severe illnesses as cancer, diabetes, and systemic lupus erythematosus; the fifth person had metastatic cancer and vascular-related diseases. The conclusion of the LDDHS review of medical records and other relevant information is that imported drywall was not a contributing factor in the deaths of these persons.

***Summary of Virginia Medical Record Reviews***
The state medical examiner reviewed medical records of an 82-year-old person who had chronic heart disease, acute cholecystitis, and pneumonia before death. The medical examiner reported that no clinical evidence existed in the record to link the person's death to "exposure of construction materials containing strontium sulfide."

***Summary of Florida Medical Records Reviews***
The five cases reviewed by the health official in Florida were for three males and two females, aged 60–86 at time of death. All five persons had severe preexisting chronic health conditions at the time of their deaths. Four of the persons were diagnosed with cancers (two lung, one bladder, one laryngeal), and two of these also had chronic obstructive pulmonary disease. The fifth person had a primary diagnosis of Alzheimer's disease with other chronic illnesses. The conclusion of the health official in all five cases was that no plausible evidence existed to link deaths with exposure to drywall.

## Discussion

Based on the reviews of the records and available information by the state public health authorities exposure to imported drywall was not believed to be a contributing factor in these deaths.

All the decedents had one or more severe health conditions that were unrelated to imported drywall. The majority (9 of 11 decedents) had multiple severe illnesses. Most (7 of 11) had cancer, and 7 of 11 decedents had cardiac conditions. In addition, several other severe health conditions, including renal failure and chronic obstructive pulmonary disease (COPD), existed among decedents. Without exception, review of each decedent's medical records indicated that the cause of death was a result of primary, and often secondary, preexisting chronic health conditions unrelated to imported drywall exposure.

This investigation has some limitations. The reviews were limited to the existing available clinical information, and the information may not have been complete. In addition, information on environmental exposures prior to illness or death (such as the results of indoor air testing of a decedant's home) was not available.

However this investigation achieved the objectives of a clinical case review. Because the findings come from a case review, they are applicable only to these 11 deaths. The findings cannot be used to draw broad conclusions about the health impact of residing in or visiting homes with imported drywall.

## Conclusion

In summary, in the judgments of the medical authorities who reviewed these cases, exposure to imported drywall was not believed to be a contributing factor to these 11 deaths.

## Recommendation

Although none of the 11 deaths included in this review were determined to be associated with exposure to imported drywall, the CPSC should continue to monitor health reports indicating exposure to imported drywall and request CDC assistance when necessary.

## References


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(5) Agency for Toxic Substances and Disease Registry. Toxicological Profile for Hydrogen Sulfide. 2006. Atlanta, GA. Available at URL: http://www.atsdr.cdc.gov/ToxProfiles/tp114.pdf [cited 2010 December 9].