

CORROSIVE DRYWALL:

An Epidemiological Approach



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INTRODUCTION

- A vital need exists for objective, human health exposure data related to contaminated drywall emissions.
- Federal health research is limited. It does not include epidemiological or clinical studies and merely speculates on mixture effects.
- Occupants of homes with corrosive drywall are continuing to report health effects sufficiently severe to cause some to abandon their homes.
- Time is of the essence.

BACKGROUND/EXPERIENCE

Building Health Sciences (BHS), a health-based, physician-directed environmental investigative and consulting firm, served as lead investigator for a Congressionally-mandated epidemiological study and health hazard evaluation (HHE) at a high security government agency. A comprehensive, medically-based investigation of the indoor environment and air quality (IEAQ) of this secure agency complex in Maryland was conducted over a two year period, in order to determine whether building-wide IEAQ problems were contributing to reports of work-related illness, symptom experience, discomfort and loss of productivity. Our evaluation of twelve study buildings generated four million data points and involved epidemiological questionnaires and individual health hazard evaluations.

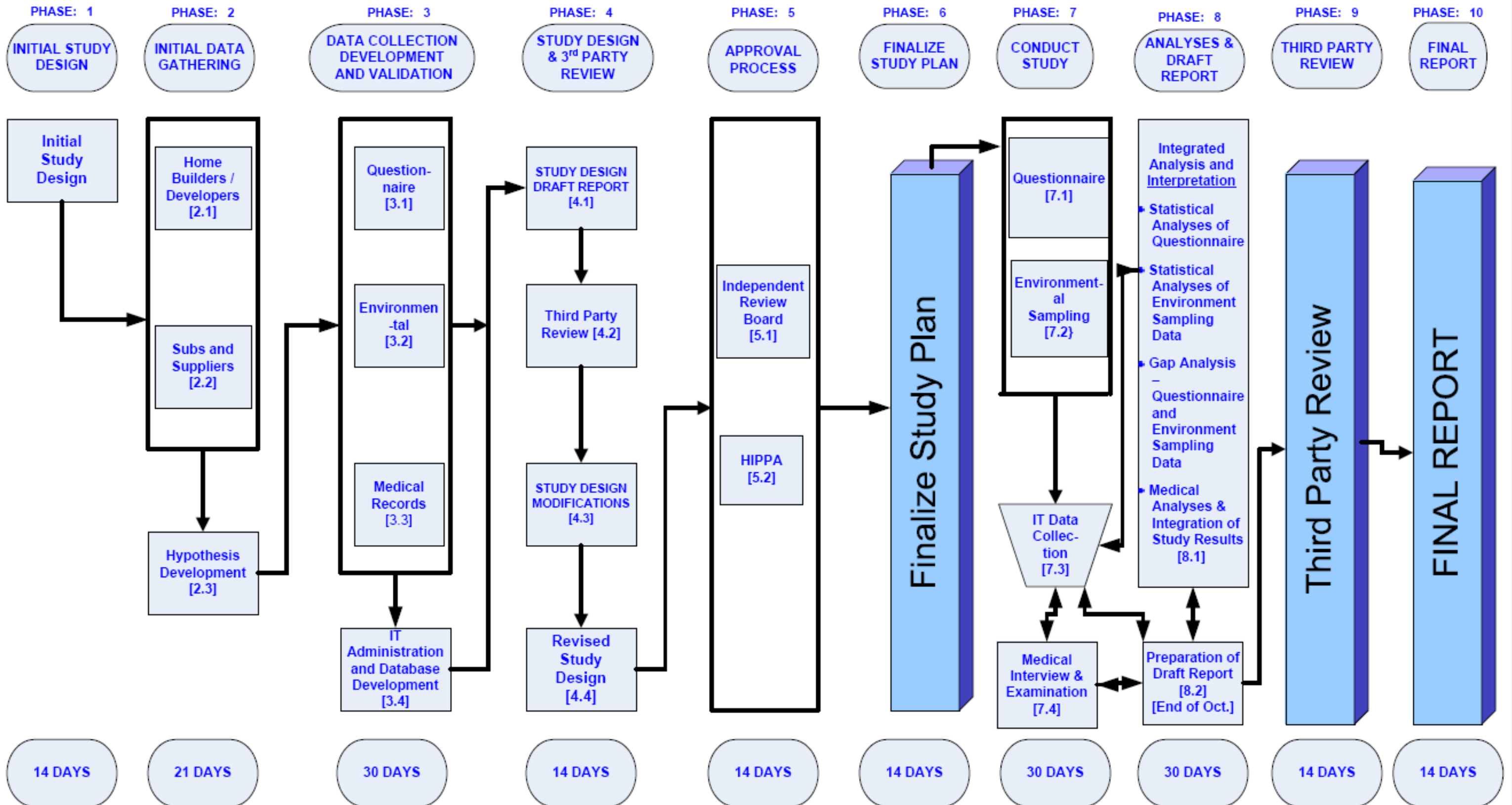
OBJECTIVES

- Determine whether corrosive drywall emissions are associated with adverse health effects as manifested by symptoms, illnesses, physical findings and/or impaired performance.
- Evaluate the nature and timing of self-reported symptoms with respect to pre-existing sensitivities, objective medical findings and exposure.
- Compare self-reported symptoms against environmental factors reported subjectively and measured objectively.
- Attempt to correlate symptoms/environmental factors and objective physical findings.
- Identify potential factors that require further analysis or scientific/medical investigations.

METHODS: Study Design

- Twenty five study homes identified utilizing homebuilders' and suppliers' records will be randomly selected from a cohort known to contain a majority of corrosive drywall.
- Fifteen control homes will be identified.
- Fifty occupants from affected homes will make up the study population.
- Twenty occupants from unaffected homes will serve as controls.

PROPOSED PROCESS FLOWCHART FOR EPIDEMIOLOGICAL STUDY TO EVALUATE POTENTIAL CORROSIVE DRYWALL HEALTH EFFECTS



METHODS: Questionnaire / Interview

- Symptom/Illness information will initially be collected using the EPA BASE Study Questionnaire modified for BHS for residential application.
- Medical Interview will be conducted by the study physician with each occupant for whom a questionnaire was obtained. In the instance of a child, follow-up interview will be obtained with the parent/guardian who completed the questionnaire.

METHODS: Statistics

- Questionnaire analysis will be based on univariate tabulation of questionnaire items and bivariate analysis.
- This will be followed by multi-variate evaluation of the statistical association of symptom/illness incidence with various measured air corrosivity levels, as well as environmental conditions, environmental comfort factors, smoking, pre-existing allergies, asthma and other relevant medical factors.
- All analysis will be performed utilizing SAS software (SAS v 9.1.3).

METHODS: Environmental

- Each home will be evaluated for the presence of contaminated drywall, odor and signs of corrosion.
- General conditions of each home, including other potential contaminant sources and history will be documented.
- Air reactivity will be measured.
- Sampling will consist of various physical, comfort and environmental parameters to evaluate the indoor environment, in addition to air corrosivity measurement to characterize the contribution of corrosive drywall emissions to the indoor environment of study homes.

METHODS: Environmental Sampling

Direct Readings

Particulate Matter

Ozone

Temperature

Relative Humidity

Carbon Monoxide

Carbon Dioxide

Air Reactivity

Environmental Parameters

Volatile Organic Compounds (VOCs)

Bioaerosols (mold spores, endotoxins)

Air-O-Cell

Formaldehyde

Biomass

Dust and Allergens

- All measurements and samples will be collected using standard NIOSH, OSHA and EPA-BASE Study protocols.
- Field staff will be blinded to current and historical data associated with sampling homes.

METHODS: Medical Evaluation

- Following the medical interview, control and study individuals will undergo medical evaluation.
- The patient evaluation will include a standard history: brief complaint, history of present illness/complaint(s), family medical/surgical history, medication use/ allergies and review of systems followed by a physical examination. Objective findings on examination will be noted. Further evaluation with allergy and/or pulmonary testing may be performed as indicated.
- Objective physical findings will be correlated with air corrosivity levels to assess the association between the presence of corrosive drywall and physical findings/illness. Next, symptom reporting and symptom onset will be correlated with both objective findings and the presence of corrosive drywall, as well as other environmental factors.

METHODS: Analysis

- Potential causes of reported symptoms and physical findings will form the basis for the development of differential diagnoses.
- Alternate causes will be identified and ruled out.
- Associations will be evaluated by regression analysis and case / control comparison.
- Recommendations for further study will be delineated.

CONCLUSION

- Only an epidemiological approach will permit the determination of whether an association exists between exposure to corrosive drywall and adverse health effects.