



The University of Kansas

Civil, Environmental & Architectural Engineering

December 23, 2008

Mr. David S. Alburty, President
AlburtyLab, Inc.
128 E. Main St.
P.O. Box 18
Drexel, MO 64742

Dear Mr. Alburty,

At your request, I have reviewed the report, "Investigation Into the Impact of Air Pressure Driven Drug Dispensing Machines on the Environment of Pharmacy Workers", for technical content. The research study described in the report was designed to determine if air pressure driven drug dispensing machines expose pharmacy workers to unsafe levels of airborne drug agents. It is an extensive study with the collection of a large amount of particle concentration data using appropriate sampling methods. The main conclusion of the study based on the data collected is that robotic machines that dispense pills using air pressure expose pharmacy workers to airborne pharmaceutical agents; and that the concentrations and particle size ranges observed frequently exceed the levels that are considered harmful under USEPA Standards (based on the outdoor, ambient air inhalable particle standard).

Furthermore, results of the study are used to state that there may be serious issues relative to exposure risks for workers in pharmacies using air pressure driven dispensing machines. This leads to the recommendation that further studies be conducted by federal regulatory agencies; and that these studies assess risk, set guidelines for these types of machines, and establish procedures to monitor the health impact on pharmacy workers.

In general, I believe that the study is well done. The air sampling methods are established and appropriate for a study of this nature. Conduct of the study is well executed with sufficient data collected to run valid statistical analysis on the data sets. The results are meaningful; and it is obvious that an air pressure driven drug dispensing machine has the potential to emit higher concentrations of inhalable particles. The studies' conclusions definitely support the main recommendation of the study – there may be serious issues relative to exposure risks for workers in

pharmacies using air pressure driven dispensing machines and additional studies are warranted to assess this risk.

However, the main conclusion of the study based on the data collected during the project period may be overstated – study finds clear evidence that robotic machines that dispense pills using air pressure expose pharmacy workers to airborne pharmaceutical agents. In the strictest scientific sense, this could only be stated if the research effort had used personnel air monitors certified by the Occupational Safety and Health Administration in conjunction with the indoor air sampling methods employed by this study. These personnel monitors would be worn by the pharmacists while they performed their every day job related activities. Such devices can be configured to sample only the 2.5 micron and less particle fraction or more commonly the 10 micron and less particle fraction. In my opinion, the results of the study clearly indicate that the air pressure driven pill dispenser has a much higher emission rate of inhalable particles; and this higher emission rate may result in higher indoor air concentrations of unhealthy pharmaceuticals. To say that the pharmacist is absolutely inhaling more pharmaceutical when working with air pressure dispensers over non-air pressure robotic dispensers or manual dispensing cannot be determined based on the study data. Personnel monitors would have to be used in order to draw this conclusion.

Caution should also be used in comparing any result (even with personnel monitors) with outdoor, ambient air inhalable particle standards. Indoor air conditions, especially in a work related environment, are a totally different situation. These types of decisions on work place air hazards have been the province of the Occupational Safety and Health Administration. It is reasonable to quote the U.S. Environmental Protection Agency's thoughts on this matter; but they have no enforcement authority in the work place. There is a danger that the reader (knowledgeable about the regulatory environment) would discount the value of the study on the grounds that the comparison of results with ambient air standards is like comparing apples with oranges. I suggest that you down play this comparison in the report. The study is of sufficient value to warrant concern without making this comparison in such strong terms.

My concern with the study's main conclusion should not deter from the importance of the study as a whole. It is clear that pill dispensing methods have the potential to drastically increase the risk of exposure by pharmacists to potentially unhealthy pharmaceuticals through respiration. This result in itself is sufficient to raise red flags and motivate government regulatory agencies to facilitate studies that would determine the level of exposure that pharmacists and pharmacy personnel are experiencing during a normal work day.

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In summary, the study is well executed with established aerosol sampling methods and sufficient data collected to do meaningful statistical analysis. I have some concern about the main conclusion of the study; but the primary study recommendation is valid based on the data collected. If you have any questions or comments concerning this review, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in blue ink, appearing to read "D.D. Lane", with a stylized flourish at the end.

Dennis D. Lane, PhD
N.T. Veatch Distinguished Professor of
Environmental Engineering