

RECEIVED BY POST JUN 11 1985

UCRL-92501  
PREPRINT

CONF-8504140--1

THE PSYCHOLOGICAL ASPECTS OF PERSONNEL CONTAMINATION

Ross L. Wilson

UCRL--92501

DE85 012955

This paper was prepared for submittal to  
Hazardous Material Conference 85,  
Oakland, CA  
April 23-25, 1985

April 1985

Lawrence  
Livermore  
National  
Laboratory

This is a preprint of a paper intended for publication in a journal or proceedings. Since changes may be made before publication, this preprint is made available with the understanding that it will not be cited or reproduced without the permission of the author.

**MASTER**

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

*MLP*

#### DISCLAIMER

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

# THE PSYCHOLOGICAL ASPECTS OF PERSONNEL CONTAMINATION\*

Ross L. Wilson  
Lawrence Livermore National Laboratory  
Livermore, CA 94550

## INTRODUCTION

This paper discusses some of the major emotional considerations involved in the treatment of people who have been contaminated with potentially hazardous materials. Although the principal focus of this paper is the treatment of people trained to work with these materials, an attempt will also be made to extend these methods to people having little or no knowledge of such matters.

In addition to the anatomic and physiological effects, accidents always result in emotional trauma. When the accident involves radioactive or other potentially toxic, carcinogenic, or mutagenic materials, there is a possibility of enhanced emotional stress due to the mystique surrounding these substances.

The remainder of this paper will address the treatment of people contaminated with radioactive materials. The examples cited are related primarily to personnel who have experienced low-level plutonium contamination at the Lawrence Livermore National Laboratory as well as an extreme case of a person who was exposed to a large quantity of americium contamination at the Hanford facilities in Richland, Washington. Since the techniques discussed have proven effective in dealing with workers exposed to these highly-toxic substances, the same basic principles can be readily applied when working with people contaminated with any material perceived to be hazardous.

## ORIENT AND TRAIN BEFORE THE ACCIDENT

People who routinely work with radioactive materials will usually receive annual training in the nature and hazards of those materials, and should be generally well-informed about radiation effects. Such orientation should include a description of the treatment to be administered in the event of contamination. When these workers become contaminated, they tend to be more cooperative during decontamination,

\*Work performed under the auspices of the U. S. Department of Energy by the Lawrence Livermore National Laboratory under contract number W-7405-ENG-48.

and are able to make more rational judgments as they participate in their treatment.

Most of the Lawrence Livermore National Laboratory's plutonium workers, for example, are well prepared and informed in this regard. Many have studied the biological effects of radiation and the treatment of contaminated personnel during their years of employment in radiation work. Observation of their perceptions and reactions when they become contaminated reinforce the importance of training programs that emphasize these topics.

It has been observed that these well-prepared workers tend to respond rationally and cooperatively when they have become contaminated. Their understanding of the minimal hazard associated with superficial skin contamination, and the ease with which such contamination is typically removed, tend to minimize their initial concerns.

On the other hand, people who only occasionally work in plutonium-handling facilities tend to be less prepared to deal with personal contamination and decontamination. Custodians, security officers, and members of the crafts are required to have only minimal training in the hazards of plutonium. An annual, one-hour orientation may have little effect on the misconceptions developed over an entire lifetime.

The responses of these people vary considerably when they are confronted with plutonium contamination of their bodies or clothing. Some have exhibited levels of calm inconsistent with their apparent level of knowledge. Many others have openly expressed their fears. In a few cases, irrational actions have been observed.

In the initial assessment of the psychological impact of a contamination accident, determination of the nature and extent of the worker's pre-accident knowledge and experience is extremely important in the planning of care and treatment.

#### AVOID SECRECY

In order to limit the development of further anxiety, it is important to establish trust and rapport between the contaminated worker and the treatment team. In promoting this trust, it is important to establish a routine so that procedures can progress on schedule and uncertainty can be minimized. Above all, the worker must be shown that concern for his or her well-being is the highest priority.

A copy of the Laboratory's established personnel decontamination procedures is posted on the wall of the decontamination room in the plutonium facility. This serves two purposes. First, since personnel

contamination is an infrequent occurrence in this facility, it reminds the decontamination team of the tested, systematic techniques that are to be used. Second, it provides the person being decontaminated with an assurance that the techniques being used were well thought out in advance, and not just random attempts to find a solution to the problem.

It has also been found to be beneficial to discuss each step of the procedure with the contaminated worker prior to its initiation. This discussion should include both the details of what is to be done as well as the possible positive and negative effects of each action.

It is imperative that the contaminated worker be involved in the decision-making process during decontamination. Although the treatment team physician and staff have the expertise to decide on an appropriate course of action, the affected worker needs to be consulted as decisions are made. This minimizes the risk of the worker feeling like an inanimate object.

It has been observed that this can be an extremely critical time emotionally for the contaminated worker. Many have commented on the concern, or lack of concern, shown for them during the initial stages of decontamination. In dealing with the technical problems associated with decontamination, the human being must not be neglected.

#### MINIMIZE ISOLATION

Depending upon the extent of contamination involved, a contaminated worker may need to be isolated from other workers during the initial steps of decontamination. Prolonged isolation can, however, have an adverse emotional effect on the worker. As soon as it is safe to do so, the worker should be allowed to come into contact with others.

Personnel decontamination is typically conducted in an isolated room or area in order to minimize the spread of contamination. This often leads the contaminated worker to conclude that he or she is in great jeopardy as well as being a hazard to others. Allowing the worker to come into contact with co-workers can help dispel undue concerns regarding the hazards associated with being contaminated.

These co-workers should be briefed prior to this initial contact. For them to be a positive influence on their co-worker they must not ridicule or condemn the actions leading to the worker being contaminated. Even when done in jest, this has proven to be extremely detrimental to the attitude of the person who was contaminated.

## PREPARE THE FAMILY

Once decontamination has been partially or totally completed, the worker's relationship to his family becomes important. The emotional benefits derived from being with family members after a contamination accident can be very important. If, however, either the family or the worker have unanswered fears associated with the accident, the overall effect can be negative.

The family must be educated as rapidly as possible after the accident. This education should include information regarding the impact of the exposure on the worker's health and well-being. It must also address the hazards, if any, that they might incur as they come into contact with the worker.

This last concern becomes extremely important if, after routine decontamination is completed, some small amount of the contaminant remains below the surface of the skin. The worker may be required to wear a covering over the affected area until the material has been released from the pores of the skin. If this is the case, discussions of potential community reactions and embarrassing situations should be undertaken with the members of the family. They can form the basis for reply to questions about the accident when they are confronted with community curiosity.

If the worker is experienced and knowledgeable, and if no residual contamination remains, he or she may be able to conduct the briefing of the family. If at all possible, a member of the treatment team should be available. In either case, the worker should decide what is in the best interests of the family.

## FOLLOWUP AFTER DECONTAMINATION

The full emotional impact of the contamination accident may not be realized for hours, days, or even weeks after the fact. Once decontamination of a worker has been completed, insure that there are no lingering concerns or unanswered questions. The worker should be given a complete evaluation of the health implications of the contamination accident based on all analyses performed during and after the decontamination process.

## CONCLUSIONS

Several psychological principles that have emerged from the treatment of radioactively-contaminated workers may be summarized as follows:

- (a) Provide pre-accident training for all radiation workers, acquainting them with the kinds of exposures they might receive and the kinds of treatment that might be appropriate following such exposures.

- (b) Avoid secrets. Share all information with the person who has been contaminated. Involve the worker in all medical decisions.
- (c) As rapidly as possible following a contamination accident, bring the worker into contact with others.
- (d) Recognize the emotions of the family and the family's fears and trauma. Educate the family as rapidly as possible to a full understanding of the accident and its implications.
- (e) Do not desert the worker after decontamination has been completed. Help the worker keep concerns in perspective.

#### REFERENCE

Brown, W. R., 1976 Hanford Americium Exposure Incident: Psychological Aspects, Health Physics Journal, Vol. 45, No. 4, Pergamon Press, 1983.