

Naval Health Research Center Detachment (Toxicology)

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**Impact of Capsicum Spray On
Individuals With Degraded Health**

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PREFACE

This review was conducted at the Naval Health Research Center Detachment Toxicology (NHRC/TD) under the direction of CDR Warren W. Jederberg, MS, MSC, USN, Officer-in-Charge NHRC/TD. It was performed under the Toxicity Profile/Human Health Risk Assessment program at the request of the U.S. Coast Guard via the Naval Environmental Health Center.

The opinions contained herein are those of the author and are not to be construed as official or reflecting the view of the Department of Defense, the Department of the Navy or the Naval Services at large.

IMPACT OF CAPSICUM SPRAY ON INDIVIDUALS WITH DEGRADED HEALTH

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ABSTRACT

Capsicum (pepper) spray is being used in law enforcement to replace more damaging CS and CD agents. Animal, human volunteer and accidental exposure data suggest that the probability of undesired effects is minimal, even to asthmatics and other individuals likely to be hypersensitive to irritants.

Capsicum (pepper) spray has been introduced in law enforcement scenarios primarily as a substitute for the alkylating agents (CS and CD) which were known to cause lethal airway diseases. It is generally considered a significant safety improvement, although it remains a significant airway irritant. This report has been prepared in response to concerns expressed over the possibility of dangerous reactions to capsicum in persons with compromised or hyperactive airways.

Experimental rat and mouse exposure (1) and analysis of human exposure through law enforcement use of pepper spray and gas (2) both conclude that there is little likelihood of an acute toxic response in healthy adults. Reports of children experiencing acute, life-threatening respiratory distress (3,4) are the result of extreme levels of exposure, but must be considered. Research performed on the nasal passages of human volunteers with allergic rhinitis suggests that airway passages which are already agitated can constrict with extreme exposure to capsaicin, the active ingredient in pepper spray (5). However, studies of individuals with asthma and chronic obstructive pulmonary disease show that although capsaicin exposure causes increased coughing, there does not seem to be any correlation with airflow limitation (6); furthermore, research performed on guinea-pigs in an induced nonacute asthma-like state agrees with the suggestion that capsaicin exposure would not cause airway constriction in asthmatics (7). In individuals with long-term exposure to irritant fumes, capsaicin challenge causes increased coughing, but did not cause wheezing or other asthma-like symptoms (8).

In summary, no evidence suggests that capsicum spray used in a conventional fashion represents any harm, even to people with imperfect respiratory health. Hyperexposure to pepper spray could cause respiratory distress, particularly in the young. No research was found relating to exposure of individuals already in acute respiratory distress. Consequently, individuals who are gasping, wheezing, or visibly cyanotic should probably not be targets for capsicum restraint; however, it seems unlikely that such persons would represent a threat appropriate for the use of capsicum.

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