

## Prevention and Management of Panic in Personnel Facing a Chemical Threat — Lessons from the Gulf War

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**SUMMARY:** During the Gulf War a number of subjects presented with panic, hyperventilation, and inability to wear respirators when chemical alarms were sounded, despite a perceived real chemical threat. Twenty-five such sufferers were seen at the Psychiatric Department of 33 General (Surgical) Hospital. This paper considers the aetiology of such responses, describes a mode of treatment which can be used in the threat situation, and considers issues of future training.

### Introduction

Most research into the effects of chemical weapons has concentrated on the toxic effects of the agents. The remarkable reduction in mortality from chemical agents observed in the first world war, and the effective treatment regimes which currently exist demonstrate the value of such an approach. A smaller body of research has considered effects of the chemical environment and the chemical threat itself. Chemical weapons have long been seen as terrifying and embodied with almost supernatural powers (1). The inspiration of fear and subsequent fall in efficiency is a recognised and desired effect of such weapons for those who use them. The performance decrement resulting from precautions required to protect against chemical weapons is also an intended result (2, 3). Protective equipment slows and coarsens activity, increases the risk of illness due to overheating and dehydration, and isolates the individual. Subsequent decontamination interferes with and delays other military tasks.

The chemical weapon can thus be seen as having three major effects in reducing enemy efficiency. It directly produces casualties, thereby removing opponents and tying up services in casualty management. It engenders fear out of proportion to the threat, so that anxiety levels are above the optimum for directed behaviour. It slows and weakens the enemy because of the effects of his own responses to the threat — detection, the use of protective equipment, and decontamination.

The British Armed Forces aim to reduce the deleterious effects on efficiency in all three areas by the twin strategies of development of effective defensive equipment, and thorough training of soldiers. The results of the first are obvious and impressive. Treatment and pre-treatment regimes have been developed. Detection systems exist. The Individual Protective Equipment (IPE) used by British servicemen in the Gulf, while still degrading performance to some extent, does

so to a considerably lesser degree than previous models or than that of many other nations.

The thorough and effective training of soldiers is essential to the effective use of all these scientific developments. The most efficient detection systems and the most reliable IPE are valueless if the soldier cannot or does not use the equipment.

Army Training Directives lay down the way in which soldiers are trained. Each soldier has a copy of the booklet "Survive to Fight" which details a series of protection skills which all soldiers are expected to master and demonstrate. They should have developed and shown competence in a schedule of skills against all the effects of chemical agents by the end of their general training, and will refresh this training throughout their military career in two ways. They will repeat lessons and demonstrate skills which include the use of IPE in a CS ("tear gas") environment at least annually, and they will take part in exercises which involve periods of chemical "play". The aim of this is clear. The process is not one of classical conditioning but rather of over-learning by repetition. Just as driving a vehicle or cleaning a personal weapon, the chemical drills should be so familiar that they will be carried out immediately and with little conscious thought when required. Such repeated training could be expected to reduce anxiety levels as it involves desensitisation by exposure in vivo to the equipment, and exposure in imagination to the agents.

The first opportunity for British forces to test the efficacy of this process of training and desensitisation came with the Gulf War. Although there was no eventual use of chemical weapons against Allied troops, it was known by all that there was a real threat of their use. A threat that was emphasised and reinforced by commanders, and led to British troops taking nerve-agent pretreatment tablets in action for the first time. During the six weeks of the preliminary air campaign there were frequent and repeated attacks with missiles, any of

which could have contained chemical agents. The threat was a real one, so that when there was an explosion or a chemical alarm, the assumption was that a chemical attack was in progress. This was a unique opportunity to observe the effects and efficacy of training since it allowed examination of those individuals who did not or could not use their protective equipment despite believing that they would die without it. This situation was entirely different from that in a training exercise. It also differed from a genuine chemical attack in that those individuals who did not use their IPE effectively were still alive and available to discuss their problems.

### Case Histories

Twenty-five people were referred to the psychiatric department of 33 General Surgical Hospital because of observed panic and hyperventilation during air raids or because of reported inability to wear IPE. It is not possible to estimate the prevalence of this problem with any degree of accuracy but enquiry revealed the presence of a number of others who were not referred. Referrals were usually made at the insistence of peers or superiors and cases referred may represent only a small percentage of those affected.

#### Case 1

A 36 year old married corporal had been a musician for some 18 years. He arrived in Saudi Arabia as a battle casualty replacement in his secondary trade of medical assistant only two weeks prior to referral. Cpl A was taken to his medical centre because a few moments after taking shelter in a slit trench in full IPE because of a missile attack, he ripped off his respirator and sat hunched and shaking in the corner of the trench.

At assessment he reported that he had never been able to tolerate his respirator and described using a whole variety of strategies to avoid having to do his Nuclear Biological and Chemical (NBC) training. He claimed that he had only been in a gas chamber once in his career. This had been 13 years previously and he had coped because he spent, and knew that he would spend, only two minutes in there.

When the hospital itself was under threat the next night he again developed hyperventilation and panic. Exploration confirmed that the anxiety was related to the respirator and his likely death because of inability to tolerate it rather than direct fear of the attack.

He was treated using the system described below with good response. He was returned to his unit where he was able to cope effectively.

#### Case 2

This 19 year old single female was referred by her superiors because of acute hyperventilation, panic and tremor which led to her removing her respirator during an air raid. She had been noticed to have rapidly become withdrawn and tearful, shaking at loud noises, and responding to questions by dissolving in tears. Prior to deployment to the Gulf she had been thought, by her

superiors, to be more isolated and less capable than her peers.

At assessment she denied previous panic in IPE, stating that she had been quite comfortable doing her training. However, she did not feel that this bore any relation to responding to real air raids or chemical alarms. The significance of her IPE had shifted from a training tool to a representation of a life threatening situation. Her fear was not of the equipment or being short of breath, but of being killed. Yet the hyperventilation produced by her panic led to her removing her mask and exposing herself to greater risk.

She was managed by applying the principles of Proximity, Immediacy and Expectancy, and her hyperventilation controlled with a behavioural approach. After three days treatment she was returned to her unit and her duties.

#### Case 3

A 53 year old reservist volunteer was taking part in an exercise when he developed chest pain and was admitted to hospital. Investigation ruled out cardiac disease. His pain returned when he had to wear his respirator again in response to a chemical alarm. At this time it was observed that the chest pain was preceded by increasing hyperventilation and obvious signs of anxiety. He was unable to tolerate his mask.

This man had served over 22 years as a regular soldier and had been a unit NBC instructor. He had never had any problem tolerating his respirator. Yet, at the time of assessment he was becoming increasingly preoccupied with a belief that he would remove his mask during an attack because of panic and that this would lead to his death. A desensitisation programme had only limited success and it gradually became clear that the underlying problem was one of a major depressive illness (as evidenced by sleep disturbance, low mood, lowered self esteem, tearfulness and increasing loss of self confidence).

He was commenced on treatment with an antidepressant and returned to UK for further treatment.

### Results

Patients referred separated into three groups. The smallest group (N = 2) were those who had previously been confident in the use of IPE and in whom the panic was a presentation of some other formal psychiatric illness such as a depressive disorder. The second (N = 5) were those who did not have sufficient experience in the use of their equipment to develop confidence in its use. In some this was a result of avoidance because of phobia. Others simply did not have sufficient experience, including a 17 year old who had joined his unit from basic training less than three months before deployment, and a foreign national who developed panic during an air raid and who had no idea how to wear his equipment although he had had two weeks training in its use. The third and largest group (N = 18) consisted of those who,

despite regular training, were unable to transfer that training to the real situation.

Twenty-three of the 25 patients were successfully returned to their units. The exceptions were the warrant officer described above, and a young soldier with confirmed chronic and severe asthma who was referred during admission for assessment of his asthma because he appeared to have a specific phobia of respirators. He gave a graphic description, repeated by other sufferers, of the mask clinging like a foreign body to the front of his face so that he was unable to breathe. Desensitisation was unsuccessful with this young man as hyperventilation was always followed by wheeze. He was returned to UK because of his asthma.

During assessments we became aware of a number of strategies used by soldiers to avoid NBC training or to negate the adverse effects of such training. The usual methods for avoiding duties were used and some people avoided longer term exposure during field training exercises by cheating. They would simply hide, or remove their masks to smoke, sleep or whatever. Other, more subtle coping strategies included, inserting objects under the respirator seal to allow air flow, loosening or removing canisters, and lifting the bottom of the mask over the chin under cover of the jacket hood.

A protocol was developed for the acute management of these cases and is reproduced below. It was specifically developed for alleviating and treating the symptoms during a chemical alert or attack and uses behavioural techniques with explanation and reassurance. It inevitably contains elements of flooding as we were unable to influence the frequency or duration of air raids and therefore of exposure. The only method of preventing exposure to the feared stimulus was by evacuation from theatre which would have been in contravention of the principles of Combat Psychiatry. The treatment regime was generally effective and most patients were able to cope satisfactorily during air raids before discharge from hospital. No patients were re-referred.

### Protocol for the control of hyperventilation in IPE

The management plan is shown under three headings:

1. *Control.* Take control of the patient. Firmly insist on compliance with your instructions. If the patient is not dizzy he should remain standing, otherwise lay the patient on the ground.

2. *Attention.* Require the patient to pay full attention to you. Ask for direct eye contact and concentration on what is said — reassure them that following your instructions will rapidly relieve their distress.

3. *Breathing.* Place a hand on both the front and the back of the patients chest, exert enough pressure for the patient to feel increased resistance to breathing. Instruct the patient to breath in as you count to three. When the inspiration is complete insist they keep the chest expanded to maintain pressure against your hands. It may take a number of attempts before they succeed. As the patient holds his breath gently ease the pressure you

are exerting with your hands. The patient will be more inclined to hold his breath as he feels the pressure ease.

The patient should hold his breath for as long as is practicable. Experience suggests 10-15 seconds between breaths reduces the effects of hyperventilation rapidly and relieves distress.

Keep talking to the patient throughout to encourage and reassure. Reward initial success in control quickly then lessen your incidence of reward as control becomes greater. To settle the patient when control is restored ask him or her to close their eyes and imagine a restful colour, and then to breathe with normal depth to a rhythm of three seconds inspiration and two seconds expiration with a seconds pause.

*Role-Modelling* The value of effective role-modelling during this intervention cannot be over-emphasised. Members of the psychiatric team are as vulnerable to anxiety as any other persons. It is therefore vital that practice with IPE, support, and supervision be a part of the team's preparation for role. Confidence in equipment and drills should be demonstrable. It is helpful for members of the psychiatric team to go to patients known to suffer distress during alerts and to dress with them. British Army training emphasises speed and such an approach encourages over-breathing. If air raid warnings reduce the urgency for preparation, then that available time can be used to the patient's benefit.

It is of benefit to debrief patients after episodes of hyperventilation using the Thoughts, Sensations and Feelings model to explore the stages of the event. In this way patients will be able to quickly identify that they are at risk and bring their breathing under control at an early stage.

### Discussion

There are no published studies known to us which consider the psychological response of soldiers who have to use their IPE to protect themselves from chemical attack. The only relevant reports are from field training exercises using simulated contamination or low concentration of irritant agents. In a reanalysis of three such studies involving a total of 366 personnel, Fullerton and Ursano (4) reported that up to 20% of trained personnel showed moderate to severe psychological symptomatology; up to the same percentage demonstrated behaviour that would put themselves or their group at greater risk of death in a real chemical environment; and between four and eight per cent terminated the experiments prematurely because of an inability to tolerate their symptoms. They describe MOPP gear (Mission Oriented Protective Posture gear, the protective equipment used by members of the United States Armed Forces) as causing symptoms associated with sensory deprivation, including apprehension, paranoia, disorientation, loss of time sense, depersonalisation, dissociation, distorted bodily sensations, hallucinations, confusion and panic. Fullerton

and Ursano raise the question of whether such responses may be “contagious” and cause degradation of efficiency in nearby personnel. This might arise in several ways. Other soldiers may develop the same sort of symptoms. They may be distracted or distressed by the actions of their colleagues, or may administer the antidotes with which they are issued.

Cadigan (5), noting the importance of psychological as well as chemical injuries in chemical warfare, suggests that “casualties will appear even before real exposure”. He points out that problems will arise from the effects of IPE and antidotes to chemical injury as well as from the chemicals themselves. The problems attributed to the use of IPE include; decrement due to distraction as a result of sweating and itching; loss of oral relief normally gained through smoking and eating or drinking; and interference in communication and socialisation. He says that increased respiratory effort is a ‘source of annoyance’ but states that through practice and with time people become acclimatized. This reference to desensitisation as a result of repeated exposure and to lack of experience as a vulnerability factor is a recurrent theme in the literature.

Brooks *et al* (6), in one of the studies reanalysed by Fullerton and Ursano, examined soldiers and medical assistants who were given tasks appropriate to their training during the one hour long chemical phase of an exercise. Twenty per cent of the subjects had problematical psychological symptoms while four per cent failed to complete the task because of symptoms of panic, hyperventilation and narrowing of vision. They reported that very few of the subjects had previously worn full IPE for as long as one hour and went on to suggest both primary and secondary prevention of such problems. Primary preventative measures were simulation, modelling, and inoculation training, while secondary measures mooted were, training in self first aid measures such as relaxation, buddy care, training in management for commanders, and training of medical personnel.

During the early phase of the Gulf War most personnel believed that they were, for the first time in their lives, under genuine threat of chemical attack, and that chemical alarms indicated imminent exposure to a toxic agent. While expecting some anxiety response, we did not anticipate the problem of personnel suffering panic and being unable to tolerate their full IPE. This was a result of two assumptions. 1. That all soldiers would be confident and competent in the use of IPE and that phobic problems would have been revealed or overcome through regular exposure. 2. That in the presence of a real threat subjects would see their respirator as a life saver, and therefore even those who had cheated previously would adhere perfectly to the drills as taught. It seems that in a minority of cases one or both of these assumptions was invalid.

1. The lack of familiarity and practice with the equipment has three explanations.

(a) Simple inexperience in personnel who have not had

sufficient time in the Army to gain the necessary expertise.

(b) The understandable but unacceptable fact that people miss some of their required training due to practical difficulties, oversight, or being “too busy”.

(c) Motivated forgetting as an avoidance response to phobia.

2. Some of the patients seen had regularly completed their annual NBC training but were unable to rely upon their IPE when faced with an apparently real danger. The explanation for this concerns the meaning or interpretation of events — the difference between training and reality. During training many people “cheat” with their IPE. Those who do not cheat know that they could safely do so if they so wished. The “threat” or stimulus for them to act in the required way comes from Army Training Directives or the Directing Staff rather than from the fear of death from a chemical agent. The locus of control is firmly fixed internally. The worst possible outcome if they cheat or if the equipment fails is a stinging face from CS or some form of reprimand from their commander. It may be that to a greater or lesser extent, people will train to pass NBC training targets rather than to “Survive to Fight”. They become proficient in the use of their equipment, but do not gain commensurate confidence in their ability to cope with a chemical environment or in the equipment’s ability to protect them from same. When faced with a real chemical threat, they are essentially unprepared despite their training. They are unable effectively and reliably to make the link between the use of the equipment in training and its ability to save their lives.

Although treatment was effective in the majority of cases, it must be remembered that while the patients believed that they were in danger from chemical agents, no chemical agent was actually encountered. Had chemical agent been present, most of the patients would have been injured or killed. It is therefore clear that prevention of such problems in the future is of paramount importance.

The primary and secondary preventive measures suggested by Fullerton and Ursano refer to individual training and to early recognition and management of problems, respectively.

The primary training issue is not simply one of increasing the frequency of NBC training. There is a need to forge a stronger link between that training and operations so that all soldiers believe that their IPE will actually protect them. Fullerton and Ursano recommended simulation, modelling and inoculation. Simulation and modelling could be achieved by increasing the frequency and duration of use of full IPE during exercises. There is, however, a problem of compliance. Control should be removed from the subject so that he **must** wear his IPE for long but indeterminate periods. Although it is recognised that there are considerable practical difficulties, one way to achieve this would be for troops to carry out normal operational activities in a CS environment. Such a strategy would also provide an

element of inoculation, albeit to an agent with comparatively minor ill-effects. In the absence of real danger, some people would still not make the necessary link between training and reality, but it would be a considerable improvement over the situation in some units where personnel undergo only brief and circumscribed exposure to CS. It would certainly considerably increase faith in the protective equipment issued.

Secondary prevention is also of considerable importance. NBC instructors and commanders should be made aware of the problems of panic and inability to tolerate IPE. If there was an ability to recognise such problems in initial training, instructors could be trained in the behavioural techniques necessary for management. Those who did not respond to such treatment could then be referred to the psychiatric services for further assessment and treatment. Similarly, cases arising de novo in trained soldiers would be recognised and referred for specialist assessment.

### Conclusions

A significant number of trained soldiers were unable effectively to use their IPE to protect themselves during what was perceived as a real chemical attack. Similar findings have been observed empirically during exercises with simulated exposure, where four to eight per cent of subjects were unable to function and a greater percentage put themselves, their peers or their mission at increased risk.

While it is recognised that alterations in training programmes would require considerable research and

trial, our experience in the Gulf war, and those of the United States Armed Forces in training suggest that a percentage of troops will be at increased risk in the presence of chemical agent despite the efficacy of protective equipment. The importance of this is obvious. The problem can be managed comparatively easily when it occurs, but there are real risks if chemical agent is actually present. Prevention, by changes in training, would clearly be a more appropriate strategy. Training needs to be frequent and universal in order to increase familiarity. It also needs to be realistic and credible if the skills learned are to be seen to be relevant in a real threat situation.

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