

# The experience of Traumatic Stress among urban firefighters

## Introduction

Firefighting offers the potential for a range of experiences that are in complete contrast to the 'normality' of everyday life. As an occupation it is associated with emergent danger, uncertainty and unpredictability. All of which would be anathema to a stereotypically 'risk-averse' public. How firefighters deal with the stresses of daily contact with danger remains largely unapprised in relevant literature.

Fire fighting is unusual in that, while the actual work tasks carried out are at times repetitive and similar, they are never the same. To understand this paradox it must be appreciated that even though many of the 'day to day' tasks are routine, the places in which they are carried out can vary unpredictably. Further, it is an occupation that may be incapable of being made safe. 'Safe' that is, in the sense that a conventional workplace can be made safe by adopting acceptable work practices carried out under defined and certain environmental conditions.

This article integrates the results of research on the work of firefighters with clinical data on post-traumatic stress disorder. It argues that certain operational factors and the emotional and psychosomatic effects of emergency response work may predispose firefighters to stress reactions by increasing their vulnerability to emergency trauma.

It derives from research on the work of urban firefighters in the (then) Queensland Fire Service (QFS)<sup>1</sup> and is based on many hours of interviews, field observation and 'ride along' experience with fire crews during actual emergency operations.

## Work factors

Operational fire fighting should be viewed as two different jobs. There are the mundane 'in-station' tasks of equipment maintenance and cleaning and there is the 'turnout'.<sup>2</sup> The notion of 'waiting' (prepared readiness) is one of the central factors in a firefighter's working life. Paradoxically, an alarm can occur at any time during a day or night shift. Firefighters must hold themselves ready to respond from the instant they 'sign-on' at the start of a shift, until it ends.

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The in-station alarm system is an important element of the response cycle. The system used by the QFS was made up of three layers. The first part entailed the automatic illumination lights on the ceiling in the fire station.<sup>3</sup> A two-tone electronic siren was then activated followed by an electric bell. Once the ceiling lights come on, firefighters cease activities, put on their protective clothing, and move to their appliances. Before the firefighters leave the Station, dispatchers from the communications centre inform the alerted station about the nature of the alarm call and the address to which they have to go.

Many responses are to false alarms. Every response however, is treated as a real emergency until details at the scene of the alarm are known. On arrival at the scene of the emergency, if there is a fire or a life rescue required, the firefighters will go into action. If however, there is no action needed, they return to their station. Repeated false alarms are a regular feature of the working day (or night) and while expected, still increase frustration and stress. While fire does not always cause the activation of heat or smoke, all responses to an 'alarm' and the 'turnout' itself remain the same.

An important factor, little noted in the workplace Health & Safety literature on fire fighting, is the way in which firefighters become conditioned (hyper-vigilant) to changes in light intensity as a result of the emergency alarm system. Light is a powerful entrainment factor for circadian rhythms (Moore-Ede & Richardson 1985, Moore-Ede 1993). Using light as part of the station alarm signal, in combination with the two other phases, is likely also to be an extremely effective process of operant conditioning.

The resultant hyper-vigilant response extends to off-duty time as well. Stories abound in the QFS about how a light turned on at home by a spouse or other family member will often trigger a hyper-vigilant startle response, even though the firefighter might be resting at home after

finishing a shift. Similar reactions to changes in light intensity often occur during their days off between 'tours.'

It is common practice, internationally, for firefighters to sleep during nightshifts. Knowing that they can be woken up at any time does not improve the quality of sleep. Even after a nightshift without a 'turnout,' there are noticeable levels of fatigue. Evidence exists that a definite 'baseline' level of stress exists even during shifts without alarms (Lim et al. 1987). This may suggest that a degree of anticipation of the 'next' turnout is common. Such anticipation combined with the sleep interruption caused by nightshift turnouts is likely to enhance fatigue.

## Critical Incident Stress

Physical exhaustion however, is probably the most benign 'take home' artifact of the sub-culture of fire fighting. While firefighters normally do not take home the black humour of the mess room, an invisible element of their work often goes home with them: the grief and emotional shock of exposure to accident trauma.

Even though fire fighting is a well-recognised, essential and reliable aspect of the 'Institutional Safety Net,' the extent of exposure to these hazards and their effects may not be widely appreciated outside the occupation. There is a tendency for firefighters to keep these experiences to themselves even to the point of excluding their families from knowledge of daily events. These submer-sion reactions to trauma represent a hidden and sometimes secretive element of firefighting work.

The following are verbatim excerpts from interviews with full-time urban firefighters (Barnes 1996):

*I went to an MVA<sup>4</sup>, my first one. I couldn't talk about it for 2 years afterwards. My wife noticed something was wrong when I came home*

## Notes

1. The research in question was carried out in 1994. Following a major review in 1996 the organisation became the Queensland Fire and Rescue Authority: See Barnes (1996).

2. The turnout is the colloquial term for the act of responding with full lights and sirens.

3. These 'lights' are found on the ceilings of nearly every room of a fire station. In recent times the use of a physical bell has been discontinued.

that night. I said that I'd been to a bad MVA and that I didn't want to talk about it. She didn't ask! I also remember a two-car MVA I went to a few years ago. I was starting a day shift and we were 'turned out' to relieve a crew at this MVA. The accident happened at about 6am. Both couples in each car were incinerated. The first responding crew didn't realise that people were trapped until they put out the fires. We cut them out (of the wreckage) however. A friend of mine who was in the initial crew came to visit me a few days later. He told me that he had three showers trying to get the smell of burnt flesh out of his hair ... He kept smelling the bodies! (Interview Transcripts: Junior Officer)

Uncertainty is major element of the working life of firefighters. The normative use of humour and satire by firefighters is likely to act as a mask for an 'endemic' state of anxiety about knowing you can be called on to carry out traumatic and stressful work at any time day or night. For example:

'... I think with our sense of humour, we develop towards dealing with job, a lot of that really comes home to me when you have got to deal with motor vehicle accidents. Fortunately which we don't have to do very much at all these days at (location not identified). To deal with picking someone, bits of someone out of the front of motor vehicles, if you do it once you know you can be called on to do it any day of the week that you work. I believe you have the attitude that you get these from time to time it is a horrible morbid task and not enjoyed by anyone and I don't think I would stay in the job if I had to dwell on the real aspect of the job'

**Interviewer:** You escape, you put it out of your mind, ... the possibility that the next bell will be an MVA?

Yeah and that would go for people involved with bodies that we might encounter in house fires or factory fires. Death in general is not something to be considered or mulled over, it is something to be avoided. The subject of it is to be avoided from possible thoughts.' (Interview Transcript: Firefighter)

A firefighter's training might be seen by some, as a 'vener' that offers a degree of protection from the stresses of their work, by preparing them for the reality emergency response. This is a false

assumption (Mitchell 1988a). No amount of training, can prepare emergency responders for the trauma of dismembered bodies, the screams of injured children, knowing that people may be trapped in a burning building, or having to deal with distressed people who suspect family members may be trapped. Such experiences are often so extreme that the ability to cope with them is overwhelmed (van der Kolk & Saporta 1993).

As mentioned above, firefighters can carry a range of emotional stresses with them when they go off-duty. Significant deterioration in family relationships, contact with close friends as well as problems with other work colleagues is well known among individuals exposed to trauma and human suffering (Solomon & Flum 1988). A number of firefighters of all operational ranks participating in the work reported here, stated that they had undergone a divorce or were currently separated from spouses. In such instances, individuals could suffer more extensive effects from stress. For example:

'... I feel sorry for someone who is always going through bust ups with wives and going home to their motel room or their unit or something on their own. The only time that they get to shed that load is when you come back to work the next day.'

**Interviewer:** How do they shed it?

'Well obviously, they bring it up quite a lot by asking questions like, it might have been a pretty terrible thing and the subject might come up about this particular prang and they will be the first ones to say yeah yeah I went to that. Oh really, how do you feel about it ... da da da ... and that is their way of trying to shed or carry the burden of that drama. Once they keep it inside, they are on the line, they are just self-destructive. All the older guys they actually, without even realising it, they get back to the station and they will sit down and talk to you. You don't even know ... you just realise they have just spoken about it for two hours whenever it may be and then they do not want to hear about it any more because they have said their point, they shed the load for you, actually taken it off you, as well the load they are carrying themselves because they are so hardened they can do that, carry two or one on one. That is just the little things that you sit back and think, 'you bugger so that's what you were doing!'

'What do you do, do you go back three weeks later and thank them for that,

then you'll make a total wank of yourself? Do you just shut up and politely ignore that you understand it, what he has done to help you out and you use those skills and that knowledge that you have attained from him, on the next young guy or on the next Officer? It could be an older guy too that cracks. I think it is something that everybody carries and wears because there are different ways of showing it.' (Interview Transcript: Firefighter)

Anxiety resulting from traumatic occupational experiences can manifest in a number of ways. For example:

'... I know guys that have gone silly, well not silly, that is probably not the right word for them, but have been mentally affected from going to, being put under a stressful situation such as going to MVA's where they have come into contact with people they do know are killed and it is evident in the way they go about their work, well probably not station work, but when they turn out, how they react and respond, they have not ever really gotten over that problem or that incident which is sad because it is made good blokes who I suppose were good officers or potentially could have become good officer. I don't know how you judge a good officer but anyway they were good blokes for a start and they were doing a good job, ... it's made them dysfunctional at a job which is really bad because it has (expletive) up their career I suppose.'

**Interviewer:** And their life?

'And their life as well that is it. You often just think of it as just affecting their career but I suppose you know even for me looking and talking about accidents and stress, like even I drive along the road and I am always thinking about what I would look like if I was in a car mangled up or that could be me, that is weird probably rotten things to think but also sort of wonder, shit is this going to be the last time I am going to be driving along this stretch of road, and like we drive along, there has been an accident over the bridge and that and the accident happened on the two inside lines, if my wife's driving I always say don't drive in the lane, drive over here.'

**Interviewer:** And she does not understand why you say it?

'She will say oh why what is the big deal? I say well (expletive) last week there was a big truck going one way

#### Notes

4. An MVA is a Motor Vehicle Accident

and a little van coming the other way and the person who was in the little van was found in a hundred pieces, that is what they don't understand. I suppose it made me a lot better driver to a degree because I am always looking out for everyone else, but she cannot understand why I am doing it, why I am being so defensive in my driving skills and that is all borne of the fact of going to so many accidents, cutting people out and thinking (expletive), this could have been avoided due to this, or this could have been avoided due to that.' (Interview Transcript: Junior Officer)

Symptoms of stress may be difficult to differentiate from the background level of practical jokes and black humour that is a normative element of fire fighting culture. Unless an individual suffering from stress behaves in a very unusual manner that attracts the attention of colleagues, his symptoms may be missed and he might not receive suitable or timely treatment. The officers whose words appear above, are some of the many firefighters whose ability to function has been affected by stress. Exposure to trauma of the kind seen by emergency workers is an occupational hazard over which they have little or no control (Brown & Campbell 1991).

With continued exposure to emergency trauma, it is possible that firefighters may become sensitised to it, and thus become more likely to suffer stress reactions following further incidents. Such sensitivity might predispose certain individuals to feelings of anxiety about coming 'on-shift.' The following interview transcript relates to such anxieties:

'... If you got stressed every time turning out to jobs you wouldn't do it would you? I find it upsetting when you find babies killed or burnt and people hacked to pieces in road accidents. You do it but that's a stressful part of the job. If it wasn't stressful you'd forget it ever happened. I vividly remember certain things that have happened, two kids burnt to death in car, a bad MVA bodies chopped up. I remember them as if they were still happening in front of me. I don't think it effects the way you run your life but it must have some effect if you remember it so well. It effects people differently. Some people spend the entire shift here dreading the bells going off. Some people who have left the job because they don't like turning out. From 7.45am until 5.45pm they'd

be nervous.' (Interview Transcript: Junior Officer)

**Interviewer:** Are you ever anxious about turning out to MVA's, ... the thought of dismembered bodies?

'... You always wonder if you get a turnout to a car accident say. I suppose one thing you are always thinking about is, to me, early years of the fire service, my first couple of accidents and extrications were people I knew and friends, and there was a couple of really bad ones in (location not identified) right when I very first started, joined up and there was two fatalities and one accident which were both friends of mine, because (location not identified) was only a small place then so you basically knew everyone and then was another one just a few weeks later with a couple of other people so often I always think oh (expletive) is it someone I know and then secondly I don't really feel scared about it, I wonder (expletive) how mangled up these lot are gonna be I suppose.'

**Interviewer:** How do you prepare for that?

'I don't know then again we might have a black humour because I suppose, we well, at (location not identified) anyway, we used to make horrible jokes about deaths and things like that and it was probably pretty gruesome to outsiders but for us it was a way of I suppose coming to grips with what had gone on. I don't know if that is the right assessment.'

**Interviewer:** Sort of like an immunisation against losing it, you joke about it?

'Well possibly, I don't know, maybe it is. That's what we used to do and we still do it so I suppose that is it. I have never been one to sit back and say oh (expletive) I went to this terrible accident and I couldn't stand it and all that sort of and then like that it has always been. I often find myself, that straight after the incident, because we can be there for a couple of hours as you know, and I will forget a lot of what has gone on when I come back. You know, I will remember the bits and pieces of it but a lot of it will be possibly blanked out of my mind. Whether that is another way of handling it I don't know. I haven't, personally, had any decapitations yet, I've had a few messy ones but most of the body parts were intact. I've had whole limbs missing. I can watch the TV and parts come on and I think oh this the 'gory' bit and I'll change the channel.'

**Interviewer:** Because of your exposure to these things on the job?

'I don't know but I just don't need to see that anymore I don't particularly want to see that anymore.'

**Interviewer:** Do you ever have intrusive thoughts about road accidents, flashbacks?

'I can still see a 16 year olds eyes, I think those things will never go away you'll always remember bits and pieces of it.'

**Interviewer:** Can those sorts of things make you harder?

'Yes you can get that way. You might show less emotion and switch that part off, to become callous.' (Interview Transcript: Junior Officer)

Once a team of firefighters return from an MVA or a fire, they are theoretically, available for another emergency response, and could be 'turned-out' at any time. If there has been an injury or deaths during the response a 'debriefing' will be offered. Details about the emotional state of the crews will be sought after returning from a difficult 'turnout.' However, if the responders themselves say that they do not need assistance, forced counseling is unlikely.

At a simplistic level, a key differentiating factor between a fire fighter and a member of the public may be more familiarity with danger. Such familiarity may not necessarily imply greater comfort with such dangerous work. The evidence listed above suggests that firefighters work with considerable degrees of concern about future contact with traumatic and hazardous situations.

Because firefighters often return to 'active' status soon after returning from a high stress turnout, unresolved emotional reactions to the horrible sights, sounds and actions of previous work and anxiety about being called to similar work, may complicate or even retard their ability to do their job. Ongoing exposures to this type of trauma without adequate counseling and stress de-briefing, may contribute to more serious and progressive emotional dysfunction.

### Physiological correlates of emergency response

The functional in-station role of firefighters was described previously, as one of 'waiting' (preparedness). It is within this mode of the occupation that the physical form of the tension is experienced. The physical reality of this tension has been established in ergonomic studies of operational firefighters (Phoon et al. 1983, Lim et al. 1987). The tension seems to derive from what must be for some individuals an almost tangible anticipation

of an alarm.

It was suggested also that with repeated and ongoing exposure to accident trauma and other sources of stress, firefighters might develop feelings of anxiety about coming to work and the nature of the alarms to which they may have to respond. I argued also that the 'turnout cycle,' as the central emergency response task of firefighting, combines with the hazards and dangers inherent to the job to offer ample opportunity for such exposures to occur.

The connection between emergency response work, long-term post-traumatic stress disorder and other anxiety conditions has been noted by many experts (McFarlane 1988a, 1988b, 1993; Mitchell 1988a & 1988b; Mitchell & Dyregrov 1993; Williams 1993). Weisæth (1989) suggested that there are three susceptibility factors or contexts that are important in the development of PTSD. These are:

1. high-risk situations—the presence of severe trauma situations
2. high-risk persons—the presence of vulnerability in exposed people, and
3. high-risk reactions—the presence of early symptoms that may be indicative of the onset of future chronic conditions.

In the case of firefighters, all three susceptibility factors are available. Their work entails going into high-risk situations on daily (nightly) basis. As a result of previous exposure to trauma, and/or knowledge of such events, they are themselves, the high-risk persons suggested by Weisæth (1989). Finally, given the conditioned response experienced when an alarm is received, firefighters may be more likely to experience traumatic reactions if the right visual, auditory cues, and action follow.

Mitchell (1988a) reported that after repeated exposures to trauma, emergency response workers could become less functional and develop chronic phobic avoidance behaviours. He cited evidence that during the air war over England in WWII, veteran firefighters and rescue workers became increasingly traumatised when faced with the destruction caused by daily bombing raids.

Folkman & Lazarus (1988) suggested that this type of emotional response could become linked to an anticipation of similar events in the future or even similar conditions. Van der Kolk et al. (1985) have reported an analogue to this stress reaction in animals subjected to repeated and unavoidable electric shocks. After a time, the animals give up even trying to avoid the discomfort and become listless and passive. van der Kolk et al. (1985)

describe this response as 'learned helplessness.' Maier & Seligman (1976)<sup>5</sup> link this act of 'giving-up' with the animal's inability to control (cease) the shocks as well as a reaction to the shocks.

Van der Kolk et al. (1985) have suggested that a generalised result of such 'inescapable stimulation' in animals, is an increased turnover of norepinephrine and increased plasma concentrations of catecholamine as well as depleted norepinephrine levels in the brain. They suggest a direct analogy between animal responses to inescapable shock, and the social withdrawal symptoms of PTSD noted in humans. They further link the decreased motivation and occupational functioning (learned helplessness?) exhibited by many trauma sufferers with chronic norepinephrine depletion.

Under normal physiological conditions, such glandular depletions are transitory. For chronically affected test animals and trauma sufferers, it is logical to suspect that some form of physiologically driven dysfunctional 'loop' mechanism is in operation. Anisman (1978) has suggested that given previous exposure to traumatic stress, the reintroduction of a stressor can lead to rapid and extreme neurochemical changes and a disruption of normal homeostatic rebalancing mechanisms.

Van der Kolk et al. (1985) also identified clinical symptoms such as hyper-reactivity (startle responses, explosive outbursts, nightmares, intrusive recollections) as being linked to chronic adrenergic hypersensitivity caused by catecholamine depletion triggered by episodes of acute trauma. van der Kolk & Saporta (1993) suggested that traumatic experiences that overwhelm a person's means to cope, can predispose them to excessive future reactions to stress. Gamberale et al. (1990) comment that such recurrent 'experiences' can cause psychosomatic changes which, if frequent enough, can lead to permanent variation of physiological functioning.

An important factor identified here but missing from the literature on trauma reactions among firefighters, is the influence of alarm systems in the entrainment of a 'conditioned' psychosomatic response. As an entrainment mechanism, the alarm system is simple but powerful. As described earlier, the alarm process used by

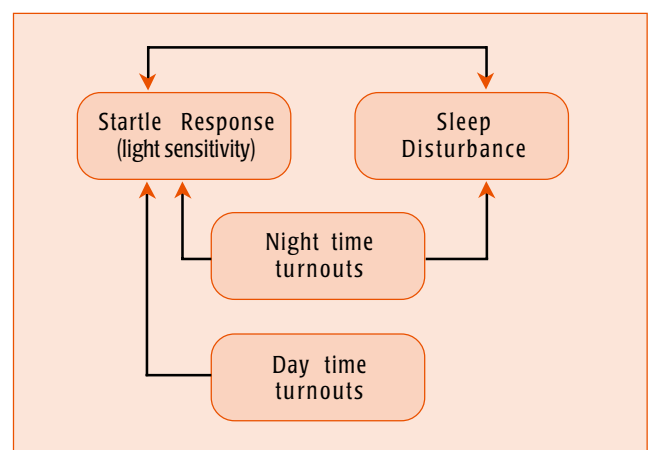
the QFS in all fire stations is in three parts. First, a light is turned on in the ceiling of every room in the fire station. This is followed by a two-tone electronic siren and the ringing of a continuous electric bell. At its most basic level, the alarm contains two elements that cause physical reactions that are very similar to certain key diagnostic criteria for PTSD. These being a hyper-vigilant reaction to changes in light intensity and disturbed sleep.

Startle reactions and states of hyper-arousal and hyper-vigilance are well documented as physical symptoms resulting from traumatic stress (Carlier & Gersons 1994). *Figures 1 and 2* present theoretical descriptions defining how the in-station alarm system may trigger a CIS entrainment process.

*Figure 1* displays how both day and nightshifts inculcate a conditioned reflex to changes in light intensity. As mentioned above, bunkroom lights are turned on automatically by the dispatching centre once an emergency call is received. Rutenfranz et al. (1977) have identified the important influence that night work has on circadian rhythms and re-entrainment of physiological functions resulting from changes in working and sleeping times.

Humans, like animals, possess innate circadian rhythms that are calibrated by 'Zeitgebers' (synchronising cues). Rutenfranz et al. (1977) confirmed that for humans, light is an important circadian trigger but suggest that it is not as dominant as awareness of clock time or the influence of social context.

Moore-Ede & Richardson (1985) however, put greater emphasis on light as an influencing factor on the rhythm of human physiology. They report that human sleep and wakefulness patterns as well as neuroendocrine and thermoregulatory systems resynchronize slowly after abrupt changes in environmental cues.



*Figure 1: Relationship between Physiological response of firefighters and alarm systems.*

They also suggest links between circadian disruption and digestive imbalances as well as cardiovascular disease (1985). Both of these conditions have been identified as health concerns for firefighters. Partinen (1994) suggested further, that stress and sleep disorders are mutually dependent. That is, stress causes disturbed sleep which, in turn, provokes more stress.

The relationship between hyper-vigilance and sleep disturbance suggested in *Figure 1*, may not by itself, be a significant concern. The '10-14' shift system<sup>6</sup> worked by the QFS firefighters allows four days off after the two consecutive day and two nightshifts.

This period might be adequate for rebalancing circadian rhythms in some individuals. The factor linking critical incident stress (CIS) with hyper-vigilance and sleep disorders, is likely to be pre-existing anxiety about 'turnouts' or some other aspect of emergency response work. Bourdet & Goldenberg (1994) report that concern about threatening situations or thoughts of stressful images before sleep, have been causally linked to an increased incidence of spontaneous awakenings and subsequently, reduced rest.

As suggested above, emergency response workers who are repeatedly exposed to traumatic stressors may be likely to suffer from progressive forms of emotional dysfunctioning. Gersons & Carlier (1992) showed that traumatised individuals can become 'locked' into increased levels of arousal, sleep disturbances and enhanced shock reactions. They further suggested that PTSD may be viewed as the end result of a series of self-perpetuating reactive mechanisms.

For firefighters such traumatic reactions could be characterised as retrospective (recollection of past turnouts that were stressful) and prospective (anticipation of the next alarm and what they

may be required to do). If anxiety about the next 'turnout' is present, then it is possible that 'alarms' would become a trigger reaction similar to that suggested by Gersons and Carlier (1992).

The combination of individuals already sensitised to CIS, and a system of work that exacerbates and may even progress these sensitivities, is a non-trivial problem. Given these conditions, it is possible that the progressive and ongoing cases of PTSD noted in a number of studies on firefighters may be confounded by a conditioned response to the alarm system used. Thus, the relationship shown in *Figure 2* is suggested.

For most individuals, the onset of PTSD can be diagnostically linked to a previous exposure to traumatic events or recognition of some form of overwhelming personal threat. For firefighters, all of these symptomatic and causal factors are available within the occupation on a daily basis.

McFarlane (1993) reported on studies carried out on a sample of professional, urban firefighters suffering from PTSD following the Ash Wednesday bush-fire emergency. He suggested that PTSD symptoms like sleep disturbances and hyper-vigilant reactions, are confounded by the presence of other co-existent disorders, possibly sharing a common aetiology.

McFarlane (1993) further argued that a key factor in the progression of acute CIS to PTSD in his sample of firefighters, was the presence of concurrent anxiety conditions.

McFarlane may not have recognised that such concurrent or pre-existing neuroses in his cohort of firefighters, may be linked to reactions to the alarm system used, in combination with previous exposures to CIS. Findings from this study suggest that it is extremely likely that the firefighters

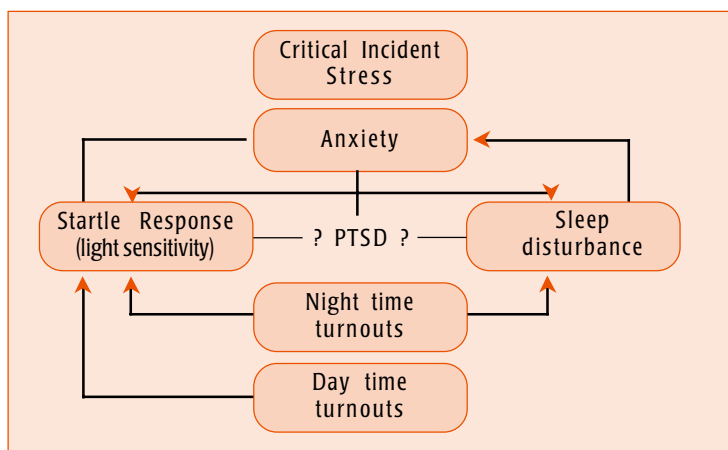
studied by McFarlane were already sensitised to emergency trauma from previous workplace exposures to CIS.

*Figure 3* displays a framework defining a common mechanism between neuro-physiological adaptations to the emergency response tasks of firefighting and established clinical signs of PTSD. The framework suggests that a mechanism similar to the chronic endocrine imbalance described by Anisman (1978) may be in operation. Workplace factors and the psycho-physiological adaptations reported in this study, are directly analogous to known diagnostic criteria for PTSD.

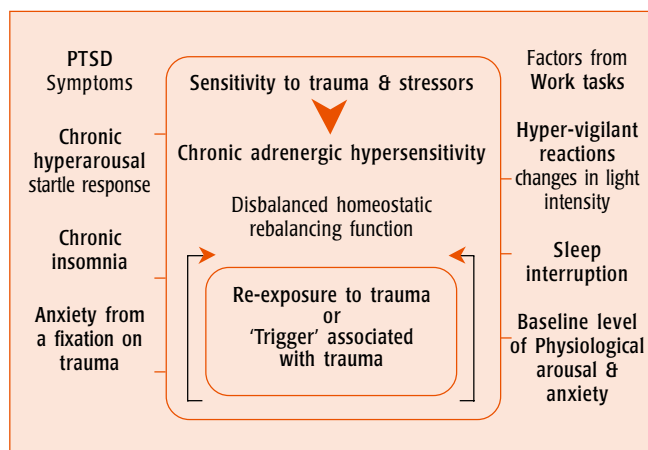
The 'sensitivity' to traumatic stress described above resembles a classical conditioned response. When a susceptible person thinks about, or comes into some contact with a 'cue' that they associate with the original trauma, they may exhibit some form of defensive reaction. For military veterans suffering from combat stress, such a cue might be the sound of a low flying helicopter. In the case of firefighters, an appropriate cue might be a fire alarm, or getting onto a fire truck during the start of a turnout, or any 'trigger' associated with their work.

Findings from the research upon which this paper is based suggest that merely driving past the scene of a motor vehicle accident that they had once attended can cause a stress reaction. Triggers causing psychic 'flashbacks' are not the only concern however.

What is implied in *Figure 3* is that a similarity exists between the concomitant factors of the work tasks of fire fighting and key symptoms of PTSD. Reactions to the work tasks in firefighting may in fact



*Figure 2: Suggested link between Critical Incident Stress and Post-Traumatic Stress Disorder among firefighters mediated by repeated participation in Emergency Response.*



*Figure 3: Mechanisms for a link between physiological factors common to the work tasks of firefighters and Post-Traumatic Stress Disorder.*

engender a predisposition towards traumatic stress or even increase the likelihood that they may arise.

## Conclusion

Findings from studies reported here constitute empirical evidence that for emergency responders it is possible to become 'locked in' to a regular cycle of trauma exposure, and a rapid return to operationally 'ready' status. That is, they are made available for another turnout immediately, or soon after returning from a previous emergency situation.

Without the opportunity to interrupt the emotional reaction of an earlier traumatic response and with ongoing exposure, a downward spiral of 'inescapable' stress responses may be instigated. Sensitivity to such an entrainment process may already be in place for many professional firefighters and other emergency responders as part of their work tasks.<sup>7</sup>

An integrated strategy operating on a number of levels is required. Obviously, the prevention of emergency situations would eliminate the circumstances in which exposure to trauma occurs. In addition, processes that prepare and inform new emergency responders, and their families, about the traumatic reality of the work is also of paramount importance. Family support is a key factor that should not be overlooked.

These items balanced with the timely therapeutic intervention into cases of acute and chronic stress reactions is needed. Timely debriefing of acutely traumatised emergency workers is a likely means of alleviating the conditioning effects of the 'emergency response cycle' as is the availability of ongoing institutional support.

Beyond this, a more effective means to enhance the early identification and rehabilitation of chronic trauma sufferers is also needed. While privacy and ethical issues are critical factors and adherence to standard Human Resource Management principles is required, examination of opportunities on how to better deploy a safety net to cater for individuals who carry such semi-invisible injuries is important.

## References

Anisman, H. 1978, 'Neurochemical changes elicited by stress: Behavioural correlates,' in Anisman H. & Bignami G. (eds.), *Psychopharmacology of Aversively Motivated Behaviour*, Plenum Press, New York.

## Notes

7. This includes volunteers from rural fire services and retained firefighters.

Barnes P.H. 1996, *Life as a Coiled Spring: Hazard and Risk Perception in a Metropolitan Fire Service*, unpublished Doctoral Thesis, Griffith University.

Bourdet C. & Goldenberg F. 1994, 'Insomnia in Anxiety: Sleep EEG changes,' in the *Journal of Psychosomatic Research*, Vol. 38, Suppl. 1, pp. 93–104.

Brown J.M. & Campbell E.A. 1991, 'Stress Among Emergency Services Personnel: Progress and Problems,' in *Journal of Social and Occupational Medicine*, Vol. 41, No. 4, pp. 149–150.

Carlier I. & Gersons B. 1994, 'Trauma at work: post-traumatic stress disorder—an occupational health hazard,' in *Journal of Occupational Health & Safety—Aust. NZ*, Vol. 10, No. 3, pp. 264–266.

Folkman S. & Lazarus R. S. 1988, 'The Relationship Between Coping and Emotion: Implications for theory and research,' in *Social Science & Medicine*, Vol. 26, No. 3, pp. 309–317.

Gamberale F. et al. 1990, 'Behavioural and Psycho-physiological effects of the physical work environment' in *Scandinavian Journal of Work & Environmental Health*, Vol. 16, Suppl. No. 1, pp. 5–16.

Gersons B.P.R. & Carlier I.V.E. 1992, 'Post-traumatic Stress Disorder: The History of a Recent Concept,' in the *British Journal of Psychiatry*, Vol. 161, pp. 742–748.

Lim C.S., Ong C.N. & Phoon W.O. 1987, 'Work stress of Fireman as measured by heart rate and catecholamine,' in the *Journal of Human Ergology*, Vol. 16, pp. 209–218.

Maier S.F. & Seligman M.E.P. 1976, 'Learned Helplessness: Theory and Evidence,' in the *Journal of Experimental Psychiatry*, Vol. 105, pp. 3–46.

McFarlane A.C. 1993, 'PTSD: Synthesis of Research and Clinical Studies,' in Wilson J.P. & Raphael B. (eds.), *International Handbook of Traumatic Stress Syndromes*, Plenum Press, New York, pp. 421–429.

McFarlane A.C. 1988a, 'The Longitudinal Course of Post-traumatic Morbidity: The Range of Outcomes and their Predictors,' in *The Journal of Mental and Nervous Disease*, Vol. 176, No. 1, pp. 30–39.

McFarlane A.C. 1988b, 'The Phenomenology of Post-traumatic Stress Disorders following a Natural Disaster,' in *The Journal of Nervous and Mental Disease*, Vol. 176, No. 1, pp. 22–29.

Mitchell J.M. 1988a, 'The Impact of Stress on Emergency Services Personnel: Policy Issues in Emergency Response,' in Comfort L.K. (ed.), *Managing Disasters - Strategies and Policy Perspectives*, Duke University Press, Durham, pp. 199–214.

Mitchell, J. T. (1988b) 'Stress: The history, status and future of Critical Incident Stress Debriefings,' in the *Journal of*

*Emergency Medical Services*, Nov., pp. 46–52.

Mitchell J.T. & Dyregrov A. 1993, 'Traumatic Stress in Disaster Workers and Emergency Personnel: Prevention and Intervention,' in Wilson J.P. & Raphael B. (eds.), *International Handbook of Traumatic Stress Syndromes*, Plenum Press, New York, pp. 905–914.

Moore-Ede M. & Richardson G.S. 1985, 'Medical Implications of Shift-Work,' in *Ann. Rev. Med.*, Vol. 36, pp. 607–617.

Moore-Ede M. 1993, *The twenty-four Hour Society (Understanding Human Limits in a World that Never Stops)*, Addison-Wesley Pub. Co., Reading.

Partinen M. 1994, 'Sleep Disorders and Stress,' in *The Journal of Psychosomatic Research*, Vol. 38, Suppl. 1, pp. 89–91.

Phoon W. et al. 1983, 'A cross sectional study on the health of firefighters on Singapore,' in the *Japanese Journal of Industrial Health*, Vol. 25, pp. 463–470.

Rutenfranz J. et al. 1977, 'Biomedical and psychosocial aspects of shift work,' in the *Scandinavian Journal of Work Environment & Health*, Vol. 3, pp. 165–182.

Solomon Z. & Flum H. 1988, 'Life Events, Combat Stress Reaction and Post-Traumatic Stress Disorder,' in *Social Science & Medicine*, Vol. 26, No. 3, pp. 319–325.

van der kolk B. et al. 1985, 'Inescapable Shock, Neurotransmitters, and Addiction to Trauma: Toward a psychobiology of Post Traumatic stress,' in *Biological Psychiatry*, Vol. 20, pp. 314–325.

van der Kolk B.A. & Saporta J. 1993, 'Biological Response to Psychic Trauma,' Chpt. 2 in Wilson J.P. & Raphael B. (eds.), *International Handbook of Traumatic Stress Disorders*, Plenum Press, New York, pp. 25–33.

Weisæth L. 1989, 'The stressors and the post-traumatic stress syndrome after an industrial disaster,' in *Acta psychiatr. scand.* Suppl. 355, Vol. 80, pp. 25–37, 74

Williams T. 1993, 'Trauma in the Workplace,' Chapter 78 in Wilson J.P. & Raphael B. (eds.), *International Handbook of Traumatic Stress Syndromes*, Plenum Press, New York, pp. 925–933.

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