

## CO-Gas Safety Unintentional Carbon Monoxide Poisoning Case Study

### GILL WING, Survived in 2016



*Gill Wing*

**Age:** 50

**Fuel:** Mains gas

**Appliance & Location:** Central heating boiler in her home

**Notes by CO-Gas Safety:** This private householder had her boiler serviced annually by Gas Safe registered engineers, but it was her neighbour's carbon monoxide alarm that saved her from a potentially fatal fault in the design of her installation. In this case study she tells of the frustration she then experienced when accessing medical help.

I own my own home, an end-of-terrace house, which has a gas boiler housed in an external cupboard next to my front door. I have the boiler serviced by a Registered Gas Engineer every year. The last service before the events described below was in December 2015.

On 8 November 2016, my gas supply was compulsorily turned off. This was because the carbon monoxide (CO) leaking from my boiler had set off my next-door neighbour's CO alarm. When her alarm had sounded, my neighbour immediately called out an engineer from British Gas, believing her own boiler to have developed a fault. However, the fault turned out to be with mine.

#### **An immediate danger to life**

The engineer explained that he was legally obliged to cap a gas supply if the levels of CO measured above 80 parts per million (ppm). The levels in my boiler cupboard measured 21 times higher: 1,718 ppm. The form he gave me after he'd disabled my boiler described this toxicity as presenting 'an immediate danger to life'. I was extremely shocked.



#### **Location of the two boilers**

My external boiler cupboard and that of my neighbour's are located next to each other. These cupboards are adjacent to our front doors and below our bedrooms. In September, while tending her front garden, my neighbour had heard the gas in my boiler 'popping' as if the pilot light wasn't catching, and had recommended I book a service. I'd immediately contacted my Registered Gas Engineer but, despite repeated calls, texts and emails over a period of six weeks or so, he'd failed to make contact. Events then overtook me, because it was a particularly demanding time at work, and I'd also suffered injuries in two accidents in quick succession, so was distracted with recuperation.

The previous month, I'd had a couple of out-of-character trip accidents in the street within three weeks of each other, falling full-length on both occasions. In the first, I tore the rotator cuff in my shoulder and, in the second, I sprained my jaw, bruised my chin and sustained a black eye and whiplash. The jaw injury left me unable to chew or close my misaligned teeth without pain in my ear for several weeks, and the shoulder injury took 18 months to heal, during which I didn't have full use of my left arm. I'd put these accidents down to absent-mindedness caused by stress, but their having taken place in quick succession prompted my GP to sign me off work for a fortnight's sick leave.

### **Discovery of CO leak from boiler**

It was during the last few days of my leave, much of it spent recuperating in bed, that I discovered that CO had been leaking from my failing boiler. Despite insisting my partner – who lives elsewhere in a flat – bought a CO alarm, I didn't have one myself. I'd mistakenly thought my boiler being located outside my house, in a draughty cupboard, meant I was safe from any fumes. However, as I would learn, those fumes had actually been going straight up through a vent in the eaves of the dormer roof a few inches above the flue. From there, they'd travelled into the roof void over my bedroom – and, later, on a windy day, my neighbour's. The flue had been installed in the 1980s – and, by current legal standards, it was much too short. Given what I was breathing in, it was little wonder, then, that I'd been feeling worse while signed off work, rather than better – I'd been waking very early each morning, when the heating came on, my heart pounding, feeling exhausted and low.

### **Seeking medical help**

My gas supply having been capped by the British Gas engineer called out by my neighbour, I went within the hour to my local pharmacy, which, I learnt, had a blow device called a Smokerlyzer<sup>1</sup>, used to measure the CO levels in the lungs of those trying to give up smoking. Mine measured 14 parts per million (ppm), which is comparable to the levels of someone regularly smoking a pack of cigarettes. The pharmacist tested his own levels to give me a comparison and his measured 2ppm. Neither of us has ever smoked. Since the levels decrease with every in and out breath, they'd clearly have been higher still had I been tested earlier, while still in my home, breathing the noxious air.

I went next to my doctors' surgery, where I was given an emergency appointment within 10 minutes. My GP advised that I should go immediately to A&E – a drive of some 45 minutes. Although I was promptly triaged on arrival, the wait for a test to determine the levels of CO in my blood was around an hour, with another hour's wait after that to see a consultant. Almost five hours had passed since I'd left home after my boiler had been condemned and the presence of high levels of CO confirmed.

### **Why are you here?**

When the time finally came for my assessment, the consultant asked me what had brought me to A&E. I explained that I believed I'd suffered chronic CO poisoning, possibly over several months, but certainly over a few weeks, and referenced the levels referred to above. He asked me twice, 'But why are you here?' and then, 'Do you have a letter from your GP?' I replied that I'd been referred by my GP and had been supplied with an explanatory letter by my pharmacist. However, he waved that away, saying, 'That's of no use to me – I don't know what measure was used.' He also refused to look at the form supplied by British Gas declaring the levels presented an 'immediate danger to life', saying, 'I'm not a heating engineer.' Yet any layperson would have been able to appreciate the relative difference between my levels and the norm.

### **The consultant's assertion**

The consultant's assertion that he knew nothing about heating engineering didn't prevent him telling me there was likely to be no significant problem with my boiler because my neighbour's alarm would've been sufficiently sensitive to have been set off well below the level of dangerous toxicity. But this is simply not true – I've since learnt that even if a CO alarm conforms to the European appliance standard BS EN 50291-1:2018, one can become seriously ill after exposure to levels that aren't high enough to actually set it off. That means it's possible to be unknowingly subjected intermittently to quite high levels – for example, 29 ppm for 24 hours or more; 50 ppm for 59 minutes; 100 ppm for 9 minutes; or 300 ppm for 2 minutes. Yet the World Health Organisation's

recommendation for safe 24-hour exposure is a minuscule 4.5 ppm.<sup>2</sup> Even if this were not the case, the CO levels in my neighbour's house that triggered her alarm would've been far lower than I had been subjected to in my own house, right next to the malfunctioning boiler. The consultant also claimed most of the CO would have been dispelled into the air. By now I also knew that this was untrue in my case, given the position of the flue.

### **Google it**

Nonetheless, when I explained that I was on sick leave after two trip accidents, and had been suffering acute anxiety and depression, he told me CO poisoning causes an array of neural symptoms. 'Google it,' he said. I already had, and knew from the NHS website that it can cause ataxia, or a lack of co-ordination – the same website that advises sufferers to go immediately to A&E if they have been exposed to high levels of CO<sup>3</sup>.

### **You only have yourself to blame**

Concluding my consultation, the consultant asked, 'Are you the homeowner or a tenant?' 'The homeowner,' I replied. 'Then you have only yourself to blame.' I was a 50-year-old homeowner who responsibly maintained my property and regularly maintained all my appliances. On that occasion, however, I was a vulnerable patient. Most would agree that an unsubstantiated value judgment such as this is highly inappropriate, not to mention unfeeling, in the medical context.

In December, encouraged by my GP, I made an official complaint about the consultant. I wanted him to understand how his ill-informed approach and flippant attitude had made me feel when I was already distressed. I attached a report drawn up by a fellow CO-poisoning survivor and an academic to promote the awareness, understanding and diagnosis of chronic CO exposure. It had been disseminated by the Chief Medical Officer to all GPs and prompted a national poster campaign. In it, the consultant would have read that CO has a half-life of four-and-a-half hours, which would have explained why, when I finally presented for the test, he was able to dismiss my carboxyhaemoglobin levels as 'within the range expected for non-smokers living in a city' and to conclude that 'no abnormality was detected'. I was also interested in his opinion as to why, during the period in which I maintain I was being poisoned, I suffered short-term memory loss that resulted in my leaving the handbrake off my car twice and my car keys in a shop on two consecutive days and, on a third, in the car door, and in losing the keys to my partner's home. The response – when I finally received it three months later, after two reminders that it was overdue – was disappointingly disengaged.

### **Awareness campaign long overdue**

I'm really supportive of the work of hard-pressed clinicians, especially in the current climate. I hope that, in highlighting the variable level of NHS care I received – excellent from my pharmacist and GP, and poor from the A&E consultant – I can help improve the consistency of treatment for anyone else unlucky enough to have an encounter with carbon monoxide in the future. Another awareness-raising campaign would seem to be long overdue. This would ensure that medics know that a person presenting at hospital after exposure to carbon monoxide needs an *immediate* breath and blood test, and that a thorough investigation into the circumstances of their exposure and its aftermath are essential.

### **Sources**

<sup>1</sup> <https://www.bedfont.com/shop/smokerlyzer>

<sup>2</sup> [http://www.euro.who.int/\\_data/assets/pdf\\_file/0009/128169/e94535.pdf](http://www.euro.who.int/_data/assets/pdf_file/0009/128169/e94535.pdf), p86

<sup>3</sup> <https://www.nhs.uk/conditions/carbon-monoxide-poisoning/>