

CO-Gas Safety Unintentional Carbon Monoxide Poisoning Case Study

TOM HILL, Deceased in 2015



Tom (left) with his brother

Age: 18

Fuel: Butane gas cylinder

Appliance: Portable cabinet heater

Location: Rented holiday cottage in remote part of Angus, Scotland

Notes by CO-Gas Safety: Tom's parents have generously written this account of the tragedy that killed their son while he was on holiday in Scotland. A portable gas heater was found to be at fault but the main concern they have is to make people aware of how serious it can be if a carbon monoxide alarm sounds, and what action to take if one does. Never ignore one or assume it is faulty.

Tom was just 18 years old and had earned a scholarship to Stirling University to study aquaculture. On his first half-term holiday he went to stay at a remote stone cottage in Scotland with his girlfriend Charlotte and her immediate family. We found out that Tom had suffered a fatal accident when the police called at our house late on the night of 28th October 2015. For our family, everything changed in an instant.

Tom's accident

Glenmark Cottage was off grid. It had no electricity or mains gas, and heating was provided by a wood-burning stove and portable gas heaters. Tom went to have a bath on the afternoon of the 28th October. The portable gas heater in the bathroom was lit. Tom closed the bathroom door, unaware that the heater was catastrophically malfunctioning. He was found by Charlotte and her family, unconscious on the bathroom floor. Because of the weather and remote location, it was a long wait for an ambulance and during that time Charlotte's family all worked hard trying to keep Tom alive with CPR. Tom was pronounced dead in the ambulance on his way to hospital. The post-mortem examination revealed that his death was caused by carbon monoxide poisoning.

After Tom's death the site was investigated by the police and the Health and Safety Executive (HSE). The portable heater initially worked without fault, but on closer examination it became apparent that there was a crack in its ceramic burner. This meant that, intermittently, the combustion took place behind the ceramic element and, when that happened, lethal levels of carbon monoxide were released. This type of flueless cabinet heater should never have been used in an enclosed space without ventilation, and particularly not in a bathroom, where steam would compromise the combustion process even further.

Legal consequences

The investigation into Tom's death took some time. The Health and Safety Executive found that the heaters in the property were totally unsuitable for the room size and function. There was also a lack of understanding concerning the requirement for their regular maintenance and who was responsible for ensuring it was done.

The property was let by a tenant from the owner. He then sub-let it to a small group of friends as a holiday home. Both parties were prosecuted for breaches of Health & Safety regulations in 2021. They both admitted that between March 2008 and October 2015 they failed to ensure gas cabinet heaters were maintained in a safe condition to prevent the risk of injury to holiday residents. The owner was fined £120,000 and the tenant was fined £2,000.

An inspection of the gas appliances, including the heaters, had been carried out by a local tradesman. However, he stated that he had not been instructed to carry out the full Gas Safety Checks that are legally required for rented properties. He did not have the Gas Safe Registration or qualifications to do this correctly (but had not made the owner or tenant aware of this). In fact, at the time only 8 out of 11,600 gas engineers in Scotland were qualified to work on this type of mobile gas cabinet heater. No prosecution or fines were brought against the tradesman due to technicalities about whether or not he had been engaged to carry out gas work while not Gas Safe Registered.

No criminal charges were brought against any of the above-mentioned parties regarding Tom's death.

Multiple failings leading up to Tom's death were identified

Scotland holds Fatal Accident Inquiries (FAIs) for a small number of deaths, mainly sudden/unexplained deaths – it is different to the inquest system in the rest of the UK. Heard before a court, the purpose of an FAI is not to apportion blame or liability but to establish the circumstances of the fatality and see what steps could be taken to minimise the likelihood of such an event reoccurring. In 2023, after the Health & Safety prosecutions, a Fatal Accident Inquiry looked at the chain of events that lead to Tom's death. It was confirmed again that the heaters were unsuitable for the property and no system was in place for their regular maintenance. Also, no instructions for their use were available in the cottage.

The previous tenant at the cottage had already reported that the heater in question wasn't burning properly and was making spluttering noises. Whilst this was happening, the carbon monoxide alarm had sounded. The previously-mentioned tradesman, who supplied and delivered gas to the property, was asked to visit and inspect the heater. He failed to identify the crack in its ceramic plaque, and did not inform the tenant, who employed him, that such a heater was unsuitable for use in a bathroom.

However, the other issue discussed in detail at the FAI was that of the carbon monoxide alarm, which should have prevented Tom's death. There was a carbon monoxide monitor in the property (it had already sounded for the previous tenant) but it was incorrectly fitted and Charlotte's family didn't realise the importance of its positioning, or what to do when it signalled the possible danger.

A life-saving warning was missed

On the evening of 27 October 2015, the day before Tom's death, the carbon monoxide alarm sounded again. The heater in the bathroom was in use with the door open at the time. The alarm was located on the kitchen worktop. Charlotte's father assumed that the alarm had been triggered by combustion products travelling through a nearby vent that was associated with the gas-powered fridge. He took the alarm outside to receive fresh air and then replaced it in a different location on the kitchen worktop, happy that it had stopped sounding.

Members of the group discussed not using the gas heaters again, and Tom voiced his concerns about the dangers of CO, but it was dark outside and they were in a very remote location so it was decided not to call for help at that point. Charlotte's father decided to wait and see if the alarm activated again; if it did then they would seek help. There was no information or guidance available within the cottage on gas safety and no instructions on what to do in the event of an alarm sounding.

The need to understand what to do if an alarm sounds

At the FAI we asked the Sheriff to consider making a recommendation that clear instructions are available to all holiday tenants explaining what to do if a CO alarm sounds, so that all those present would be properly informed about the seriousness of the situation and know what steps to take. If the alarm had been sited correctly, to the manufacturer instructions, and the occupants had known to take its activation more seriously, then perhaps Tom's death could have been avoided. The Sheriff did do this, as well as recommending that if portable cabinet heaters are within a rented property then they should carry full instructions and a warning not to move them.

The aftermath of this tragedy

The owners immediately ceased letting the cottage and it has not been let since. They and the tenant admitted their part and representatives of the estate have made it very clear that they regret what happened. The tradesman no longer carries out any form of gas work.

Our main concern is that people are properly informed about the correct action to take if a CO alarm sounds. We believe that despite the many failings that occurred prior to Tom's death, the one thing that should have saved Tom's life was the carbon monoxide alarm. It is the final safety net to limit poisoning or prevent death, so people need to be made much more aware of what to do when an alarm sounds. We now have to wait to see if the Sheriff's recommendations are implemented.

We miss Tom every day, we still find it really hard to accept that an 18-year-old could be the victim of such a set of circumstances and nobody is actually charged with causing his death. Whilst many people have shown how sorry they were about what happened, we believe that the tradesman who checked on the appliances appears to have attempted to distance himself from any responsibility.

Alison and Jerry Hill

CO-Gas Safety comments

We are so grateful to Tom's family for sharing their experience with us in this way.

CO-Gas Safety considers that had everyone concerned been fully aware of the dangers of carbon monoxide, that CO can't be sensed using human senses, and that less than 2% of CO in the air can kill in less than three minutes, this tragedy just might not have happened. We have been lobbying for a widespread campaign to raise awareness almost since we started in 1995.

We are pleased that regulations regarding CO alarms in rented accommodation are being improved over time. In Scotland, it is now compulsory to have an audible CO alarm in *all* domestic properties that use any carbon-based fuel appliance. In England and Wales, this is now required in all *rented* properties with such appliances, both privately-rented and social housing, although gas cookers are nonsensically excluded in the English regulations. The legislation in Northern Ireland is a little more complicated but CO alarms have been required in any properties with newly-installed carbon-based appliances (excluding cookers/hobs) since 2012.

Alarms are not a fail-safe, as Tom's case sadly shows.

Firstly, even audible alarms to EN50291 will not alert users to low levels of CO that can cause chronic and long-lasting symptoms. Please see www.co-gassafety.co.uk/about-co/alarms-2/ for the levels at which they are required to sound and www.co-gassafety.co.uk/case-studies/non-fatal/ for case studies of survivors of CO exposures, many of whom have ongoing debilitating conditions.

Secondly, users need to ensure that there are enough alarms cited across the property; anywhere where appliances powered by a carbon-based fuel are located. Be mindful that CO is insidious and can move between floors, and even through walls, so even rooms without an appliance should ideally be monitored. This is particularly important for rooms used for sleeping.

Thirdly, users need to be aware that not only do audible alarms need to be located and installed to the manufacturer's instructions, but battery-operated ones need to have active batteries and be tested regularly. When first purchased they may need a plastic tab removing to allow batteries to connect. Their sensors have a finite life, usually 7-10 years, so it is important to check them for a use-by date (or write on them when they were purchased as an alternative reminder). In addition, they need to be checked for dust and cobwebs, which may block the sensor.

Finally, as Tom's family have stated, users need to know what to do in the event that they activate. Do *not* assume that the alarm is faulty. Open windows and doors, turn off all appliances, get outside and call the Fire and Rescue service, who have equipment to test for CO.