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All-Party Parliamentary carbonmonoxide Group

PREPARE PRACTICE PROTECT

IMPROVING CARBON MONOXIDE SAFETY IN HEALTH AND CARE SERVICES

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Foreword

It has been a pleasure to serve as the Chair of this inquiry. Our health and social care workforce is now more needed, valued, and treasured than perhaps it has ever been. This inquiry started pre-pandemic and only served to emphasise just how important the NHS and social care staff are to British society.

Our work has progressed despite obvious challenges with engaging the health and social care workforce. We have enjoyed evidence and insight from clinical professionals on the frontline, employers, advisers, and regulatory managers overseeing and generating sector policies.

The inquiry findings are timely for another reason- households in fuel poverty are at an elevated risk of carbon monoxide exposure.[1] More and more homes are falling into fuel poverty as energy prices soar, and cost-of-living pressures have ramped up. It is more important than ever that professionals working in homes are aware of and equipped to deal with the risks that could harm them and the patients, clients, and customers whom they support.

Carbon monoxide is a very real risk for home environments. The Gas Safe Register has found a high level (1 in 5 and 1 in 6) of faulty or dangerous gas appliances in homes in the UK, which could harm occupants by emitting carbon monoxide and other pollutants.[2]

The brave and tenacious individuals who enter the homes of others to provide treatment, care, and support must be assured that the environment they are working in is safe. Sadly, we have seen evidence that the mechanisms which are supposed to protect these professionals are not routinely in place, and the volume of risk assessments being carried out is less than half of what it should be.

Naturally, it is not only other people's homes which can present risk. Health and social care professionals can protect themselves by being aware of the dangers of carbon monoxide in their own homes and wider settings. Maintaining the wellness and safety of the workforce and reducing sickness-related absence is vital.

By understanding the symptoms of carbon monoxide poisoning and knowing the right questions to ask, professionals can more readily identify cases of potential exposure and respond appropriately. This can assist patients in accessing the correct treatment and can also point to where home environments may be unsafe. As carbon monoxide can lead to long term health conditions, a correct diagnosis of poisoning could avoid years of illness and repeat GP or A&E visits, thus reducing pressures on the NHS and wider workforce.

Individual professionals can only do so much alone. For change to be effective, it must be supported by sector-wide safety practices and protocols to follow. Awareness alone can only identify problems; it is vital to have management support and a pathway to ensure that the issues identified can be safety resolved.

The co-benefits of good practice are clear: a healthy and educated workforce, reduced demand on the health care system, and better public health. All these advantages can be gained by implementing small changes, such as training to enable early identification of carbon monoxide poisoning, and taking preventative action, such as installing alarms and regular appliance servicing.

[1] Understanding Carbon Monoxide Rise in Households Vulnerable to Fuel Poverty, National Energy Action, 15 September 2017: Understanding Carbon Monoxide Rise in Households Vulnerable to Fuel Poverty- National Energy Action (NEA)

[2] 1 in 5 homes in UK have unsafe gas appliances, Gas Safe Register 2019: Gas safety confusion puts vulnerable people at risk- Gas Safe Register; Is your area gas safe? Gas Safe Register 2022: Is your area gas safe? | Gas map (staygassafe.co.uk)

The report's recommendations are written for those with influence in the sector: regulatory bodies, professional bodies, local and central government. The evidence we have seen and heard strongly demonstrates that this is where change must be driven from, for it to be effective, listened to, and implemented.

Since we started this inquiry, the public and political focus on indoor air quality (IAQ) has grown, as further evidence has come to light about the impacts that IAQ can have on health.[3] The Chief Medical Officer Chris Whitty has recognised the need for further research in this area, and we hope that this report will help to provide some of the evidence that is needed to secure positive change.[4]

I would like to express my thanks and gratitude to all who have been involved in the inquiry, who have given their time and shared expertise freely with the overarching aim of improving public health.

Yours sincerely,

Liz Twist MP

Liz Twist MP

Labour, Blaydon constituency

[3] Air Quality Expert Group report 'Indoor Air Quality', 1 November 2022: Report: Indoor Air Quality- Defra, UK
[4] Chief Medical Officer's annual report 2022: air pollution, 8 December 2022: Chief Medical Officer's annual report 2022: air pollution- GOV.UK (www.gov.uk)

Executive Summary

This inquiry has thoroughly explored and examined how positive change can be cultivated and embedded in health and social care. Research sought to identify the essential ingredients and components to improve practice in a manner that is effective, supportive to staff, and long-lasting/enduring. As set out in the COMed (the All-Party Parliamentary Carbon Monoxide Group's medical and healthcare working group) report ***'Carbon monoxide poisoning: saving lives, advancing treatment'***, carbon monoxide is an underestimated risk to public health in society.[5] Improving practice in the health and care sector will enhance professionals' diagnostic abilities, enabling them to identify and stop exposure, as well as to proactively protect themselves and their patients from risks.

Professionals in the health and care sector care deeply about those they treat, whether these are called patients, clients, or service users (and these terms are used interchangeably throughout the report). Our approach aims to empower and support professionals to deliver services in a safe and protective manner which better serves them and their patients. This will build an additional layer of protection for those who are the most vulnerable in society, and the professionals working to reduce vulnerabilities. It has not been our approach to call for additional regulation, as this could add to pressures on the sector and risks becoming a 'tick box' exercise, rather than being regarded as a valuable safety measure.

The inquiry has faced several challenges. The pandemic has made it difficult to engage with professionals working in the sector as they have been, and continue to be, under extreme pressure; with many facing 'burn-out' or illness themselves. Awareness of carbon monoxide exposure as a health risk is low, and many professionals are not aware of the correct actions to take once exposure is suspected.

Despite these challenges, the inquiry connected with over a hundred health and care sector professionals, who participated in primary research and provided their expert insight and analysis to assist the inquiry. Once aware of the risks, many professionals expressed their surprise and concern at the lack of carbon monoxide specific safety practices in place. Many participants shared that after engaging with the inquiry and understanding the potential health impacts they had assessed their own safety practices in relation to carbon monoxide.

The results have been wide ranging and extremely valuable, revealing several findings that were not initially expected. The role of Home Improvement Agencies (HIAs) has come into sharp focus, and we have been impressed to see the excellent examples where HIAs work with local authorities and care providers to identify unsafe or at-risk areas of the home and work to resolve these. Some HIAs have decided to take a 'no questions asked' approach as it is more effective to simply 'put things right' rather than to require the tenant to complete paperwork or provide evidence to show that they meet a particular threshold.

One of the starkest findings of the inquiry was the low level of written risks assessments carried out according to professionals. Risk assessments (one area where it was anticipated that carbon monoxide safety check could be housed) were reported to take place in less than half of the circumstances when they should be mandated. Additionally, awareness of the risks of carbon monoxide is very low, and most people associated carbon monoxide with death only, and anticipated that exposure would lead to an 'all or nothing' outcome for those poisoned.

[5] Carbon monoxide poisoning: saving lives, advancing treatment, report published 12 October 2017, COMed. Available: Carbon monoxide poisoning: saving lives, advancing treatment | Policy Connect

The recommendations developed in the inquiry have been carefully considered, to ensure the right balance is struck between action by sector leaders, local authorities, central government, employers and service providers, and individual practitioners. To be most effective, practice improvement must be adequately funded, and accepted and embedded at each level of the sector. Training and awareness are beneficial, but without support from the employer, professionals can only change their practice in minimal ways.

The inquiry recommends that sector leading organisations such as regulators, professional bodies and Royal Colleges develop tailored guidance on carbon monoxide for their own professions, accounting for any specific needs or points of consideration. It is essential that guidance and advice is provided by a trusted source, otherwise it is highly likely to be ineffective and ignored.

Many of the report's recommendations are aligned with government or parliamentary objectives, such as those in the social care white paper: ***"People at the Heart of Care"***; the Lords Select Committee Inquiry into the integration of primary and community care; the revised Air Quality Strategy from Defra; and the NHS preventative healthcare agenda; and the levelling up approach to health inequalities taken by the Office for Heath Improvement and Disparities (OHID), and the Department for Levelling Up, Communities and Housing.[6]

There is a clear recognition from policy makers that investing in protective measures and integrating services can reap huge benefits for British society, the health and social care workforce, and the effective operation of public services.

The practical recommendations developed in this report can assist in the drafting and implementation of supportive policies that will aid best practice and protect society for many years to come.

[6] Department for Health and Social Care: Policy paper: People at the Heart of Care: adult social care reform white paper, 1 December 2021, available: People at the Heart of Care: adult social care reform white paper- GOV.UK (www.gov.uk); Integration of Primary and Community Care Committee, Lords Select Committee, inquiry launched 3 February 2023: Integration of Primary and Community Care Committee- Summary- Committees- UK Parliament; Consultation outcome: Revised national air quality strategy, last updated 28 April 2023. Available: Revised national air quality strategy- GOV.UK (www.gov.uk); The Government's 2022-23 mandate to NHS England, Objective 4: Embed a population health management approach within local systems, stepping up action to prevent ill health and tackle health disparities; last updated 30 March 2023; available: NHS mandate 2022 to 2023- GOV.UK (www.gov.uk); Office for Heath Improvement and Disparities (OHID), "About Us" available: About us- Office for Health Improvement and Disparities- GOV.UK (www.gov.uk)

Introduction

This inquiry examined the extent to which frontline health and social care professionals (HSCPs) are aware of and protected from carbon monoxide, to determine how improvements can be made in an effective, manageable, and practical way. Improving carbon monoxide safety can benefit both HSCPs and patients, supporting the preventative health agenda.

The challenging work of HSCPs has come into particularly sharp public focus during the pandemic. There is a clear need to protect the workforce and reduce pressures wherever possible.

As highlighted by Chief Medical Officer Chris Whitty in his annual report, greater attention should be given to indoor air quality and the impact this has on health.[7] People spend around 80 to 90% of their time indoors, and action to improve indoor air quality can make a significant difference to public health.

Our primary research has explored: HSCPs' awareness of carbon monoxide; the variety of safety processes across health and social care; and how practice improvement is stimulated in the sector.

Lines of inquiry:

The three lines of inquiry identified by the steering group and pursued by this inquiry are:

a) How are carbon monoxide risks in domiciliary settings managed by existing processes, and are health and social care professionals generally aware of the risks posed by carbon monoxide?

b) How can carbon monoxide safety processes be improved in health and social care, are there examples of best practice in the sector to learn from?

c) What can regulatory bodies and sector leaders do to encourage better carbon monoxide safety and awareness in health and social care?

Rationale

Carbon monoxide is a poisonous gas that has no taste, colour, or odour; and thus, it cannot be detected by human senses. It is produced by the incomplete combustion of carbon-based fuels such as gas, oil, liquefied petroleum gas (LPG), biomass, and wood. At high concentrations, carbon monoxide can cause death.

Carbon monoxide is not only fatal but linked to many health conditions and illnesses; from which individuals may never fully recover.[8] Carbon monoxide has been associated with acquired brain injury; neurological symptoms; low birth weight in babies; reduced mortality; sensory impairments; falls; and even personality change; in addition to cases of fatality.[9] The report by COMed in 2017 ***'Carbon monoxide poisoning: saving lives, advancing treatment'***, included several case studies describing such effects.[10]

[7] Chief Medical Officer's annual report 2022: air pollution, 8 December 2022, available: Chief Medical Officer's annual report 2022: air pollution- GOV.UK (www.gov.uk)

[8] Townsend CL, Maynard RL, Effects on health of prolonged exposure to low concentrations of carbon monoxide, Occupational and Environmental Medicine 2002;59:708-711.

[9] Chelsea A. Chambers, Ramona O. Hopkins, Lindell K. Weaver & Colin Key (2008) Cognitive and affective outcomes of more severe compared to less severe carbon monoxide poisoning, Brain Injury, 22:5, 387-395, DOI: 10.1080/02699050802008075; Croxford, B., Leonardi, G.S. & Kreis, I. Self-reported neurological symptoms in relation to CO emissions due to problem gas appliance installations in London: a cross-sectional survey. Environmental Health 7, 34 (2008). https://doi.org/10.1186/1476-069X-7-34; Ritz B, Yu F. The effect of ambient carbon monoxide on low birth weight among children born in southern California between 1989 and 1993. Environ Health Perspect. 1999 Jan., 107(1):17-25; Chen K, et al. Ambient carbon monoxide and daily mortality: a global time-series study in 337 cities. Lancet Planet Health. 2021 Apr;5(4):e191-e199. doi: 10.1016/S2542-5196(21)00026-7. PMID: 33838734.; L. Borras, E. Constant, P. De Timary, P. Huguelet, Y. Khazaal, Long-term psychiatric consequences of carbon monoxide poisoning: A case report and literature review, La Revue de Médecine Interne, Volume 30, Issue 1, 2009, Pages 43-48, ISSN 0248-8663, https://doi.org/10.1016/j.revmed.2008.04.014; Number of deaths from accidental poisoning by carbon monoxide, England and Wales, deaths registered in 2021, ONS. Available: Number of deaths from accidental poisoning by carbon monoxide, England and Wales, deaths registered in 2021- Office for National Statistics (ons.gov.uk)

[10] Carbon monoxide poisoning: saving lives, advancing treatment, report published 12 October 2017, COMed. Available: Carbon monoxide poisoning: saving lives, advancing treatment | Policy Connect

The COMed group has since then continued to work on identification, diagnosis and treatment methodologies, and this work shows that there are three contexts in which sub-lethal carbon monoxide exposure can occur:

- Where an individual has survived an acute exposure but has still absorbed a high level of carbon monoxide; for example, when they have been removed from a life-threatening situation just in time.
- If there is a chronic exposure an individual may suffer noticeable poisoning symptoms that stop short of fatality but cause illness and/or noticeable detrimental conditions to arise.
- The most common situation is likely to be individuals who are exposed to prolonged 'low levels' of carbon monoxide; as their symptoms develop slowly over time as the poison accumulates in the blood, and subsequent conditions may be attributed to other causes, such as ageing, stress etc.

Carbon monoxide has a far greater affinity to haemoglobin than oxygen, with some estimating that it is 245 times higher.[11] This means that if an individual is exposed to a sub-lethal level of carbon monoxide for extended periods of time, or repeatedly over a short time, the poison 'sticks' to the blood, and levels of carbon monoxide in the body can increase gradually. This gradual poisoning and the subsequent development of symptoms over time can add to the difficulty of diagnosis, and the importance of having alarms installed.

One study found 4.3% of patients presenting with non-specific symptoms in the Emergency Department had unexpectedly raised carboxyhaemoglobin (COHb) levels, indicating recent exposure.[12] The Gas Safe Register has found a high prevalence (1 in 5 and 1 in 6) of faulty or dangerous gas appliances in homes in the UK.[13] Such appliances could pose a risk to health by emitting carbon monoxide and other pollutants. Without adequate preventative, responsive, and monitoring measures in place, both patients and professionals could be at risk of unnecessary harm from carbon monoxide in many domestic and community environments.

Carbon monoxide exposure in society has significant implications for public health; particularly as it has worse effects on vulnerable groups, such as pregnant women, the elderly, disabled people, those with existing illnesses, children, and babies. People living in homes vulnerable to, or in, fuel poverty are at greater risk of exposure to carbon monoxide.[14]

As noted by UK Health Security Agency, "[i]t can be hard to tell the difference between the effects of being exposed to carbon monoxide at low levels for a long time and other common illnesses."[15] This makes it even more important for frontline professionals to understand the signs and symptoms of carbon monoxide poisoning, so individuals are correctly diagnosed and not continuously returning to homes that are making them unwell. The COMed report ***'Carbon monoxide poisoning: saving lives, advancing treatment'*** noted the difficulties in diagnosis across the different healthcare professional sectors, where equipment, time, and resource vary.[16]

This inquiry sought to explore which solutions would protect both professionals and the public, and how such measures could be implemented effectively.

[11] UKHSA: Carbon monoxide: toxicological overview, Updated 24 May 2022: Carbon monoxide: toxicological overview- GOV.UK (www.gov.uk)
[12] Clarke S, Keshishian C, Murray V, et al. Screening for carbon monoxide exposure in selected patient groups attending rural and urban emergency departments in England: a prospective observational study. BMJ Open. 2012 ;2(6):e000877. DOI: 10.1136/bmjopen-2012-000877. PMID: 23242237; PMCID: PMC3533103.
[13] 1 in 5 homes in UK have unsafe gas appliances, Gas Safe Register 2019: Gas safety confusion puts vulnerable people at risk- Gas Safe Register; Is your area gas safe? Gas Safe Register 2022: Is your area gas safe? | Gas map (staygassafe.co.uk)
[14] Understanding Carbon Monoxide Rise in Households Vulnerable to Fuel Poverty, November 2017, National Energy Action. Available: Understanding Carbon Monoxide Rise in Households Vulnerable to Fuel Poverty- National Energy Action (NEA)
[15] UKHSA, Carbon monoxide: general information, last updated 24 May 2022: https://www.gov.uk/government/publications/carbon-monoxide-properties-incident-management-and-toxicology/carbon-monoxide-general-information
[16] Carbon monoxide poisoning: saving lives, advancing treatment, report published 12 October 2017, COMed, a sub-group of the All-Party Parliamentary Carbon Monoxide Group (APPCOG). Available: Carbon monoxide poisoning: saving lives, advancing treatment | Policy Connect

Regulatory landscape

There are many rules and regulations which relate to workplace safety in health and social care, for example the Health and Safety at Work Act 1974, the Care Standards Act 2000, the Health and Social Care Act 2012, and the Care Act 2014.

Under the current regulations, there is no specific requirement for carbon monoxide to be considered as a risk, or for workers to receive awareness training on carbon monoxide. However, there are existing mechanisms established by these obligations for health and safety which could feasibly be expanded to include carbon monoxide.

Section 23 of the Care Standards Act, 2000 (CSA) establishes the National Minimum Standards for care agencies, detailed in guidance from the Department of Health[17] for domiciliary workers, these include:

- conducting a risk assessment in all new homes which must be agreed by all parties and including a plan to manage, and review identified risks (Standard 12),
- a procedure in place for reporting new risks which arise including defective appliances, equipment, fixtures or security of the premises (Standard 12.6), and
- protocols for emergency situations (Standards 12 and 15).

Employers have a duty to provide a safe working environment for their employees, under the Health and Safety at Work Act 1974.[18] However, this does not relate to environments which are not under the control of the employer, for example community settings managed by third parties, or household environments.

As there is no expressed requirement for carbon monoxide to be considered as a risk or to be specifically addressed in any mandatory health and safety practices within health and social care, it is incumbent on those in the sector to raise awareness, support improvement, and embed good practice.

The opportunity

In addition to protecting frontline staff when undertaking work in domestic environments, there is a significant opportunity for HSCPs to safeguard patients in their homes. A wide range of HSCPs deliver services in domestic or community settings; including occupational therapists, social workers, midwives, nurses, and care workers. These professionals are ideally placed to identify and address carbon monoxide exposure: with status as a trusted adviser, access to the individual's home, and existing healthcare knowledge.

[17] Care Standards Act (2000), s.23, available: Care Standards Act 2000 (legislation.gov.uk); Domiciliary Care, National Minimum Standards: Regulations, Care Standards Act (2000), Department of Health, available: 2553.pdf (housingcare.org)
[18] Health and Safety at Work etc. Act 1974, s.2: Health and Safety at Work etc. Act 1974 (legislation.gov.uk)

The Gas Safe Charity noted in an evidence session that people who are especially vulnerable, for example those in fuel poverty, with disabilities, or who do not speak English as their first language are particularly vulnerable to long term low-level carbon monoxide poisoning. This is compounded by the fact that such individuals are naturally harder to reach with support and advice. The Gas Safe Charity's research established the concept of 'trusted intermediaries' and found that the best way to communicate with these individuals is through the professionals that they trust, whether that be health and social care professionals or the fire and rescue service, or volunteers.

HSCPs often interact with several individuals each day. Enabling them to act as trusted intermediaries with an understanding of carbon monoxide can provide an effective and manageable route to protecting a broad range of vulnerable individuals; generating benefits for public health. It is well established that children are more susceptible to the health impacts of poor air quality.[20] Pregnant women and babies also have altered haemoglobin to the average adult human, which makes them more vulnerable to the impact of carbon monoxide poisoning.[21] Healthcare and other professionals should take great care to look out for potential signs and symptoms of carbon monoxide exposure when interacting with pregnant woman and families with young children.

The All-Party Parliamentary Carbon Monoxide Group (APPCOG) believes there may be a significant opportunity to improve carbon monoxide safety practices in the health and social care sector, which would benefit the workforce, protect people receiving care, and support preventative healthcare.

[19] Information shared at first inquiry steering group meeting, 11 May 2021: Gordon Lishman, Founder, Gas Safe Charity
[20] "Why is air pollution especially harmful to babies and young children?" Asthma and Lung UK, page updated 1 June 2022
[21] Kaufman DP, Khattar J, Lappin SL. Physiology, Fetal Hemoglobin. [Updated 2022 Mar 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK500011/

Research methods

Participants

Four professional groups have fed into this research:

Group 1: Health and social care professionals working directly with the public (via survey, interviews, focus group and inquiry engagement)

Group 2: Organisations implementing good practice (via structured interviews)

Group 3: Sector leaders who can influence change, including professional bodies and regulators (via structured interviews and written submissions)

Group 4: Inquiry steering group and COMed (a working group of the APPCOG with expert medical and scientific members) members, who have provided advice and analysis to support the development of the inquiry

Method: Survey, Group 1

The survey was designed to gain an understanding of the general levels of awareness and the propensity of information or training provision on carbon monoxide in the health and social care sector (the first line of inquiry).

Ten questions were determined as the maximum number that health and social care professionals could be expected to answer. It was decided that any incomplete responses would be disregarded. These questions (including one option to provide an email address for further engagement) were co-designed with members of the steering group and checked over by an opportunistic sample of two health and social care professionals working in domiciliary settings, to ensure clarity.

It was decided that asking 'testing' questions where participants would be required to select a correct or incorrect response was not appropriate here. This was due several reasons: the simplistic design of the survey would not enable feedback to be given so that participants could see if their response was correct or not; it seemed overly burdensome on the participants to ask this; and the existing feedback indicated that most professionals would not know the correct answer and therefore may disengage with the survey, resulting in many incomplete responses.

The conclusion was that the survey would ask about 'confidence levels' in relation to responding to an emergency situation, and then the relationship between confidence and accuracy could be tested with the focus group.

Once agreed, the survey was launched on the Survey Monkey website with explanatory text including a link to the inquiry homepage.

Correspondence inviting professionals to respond to the survey was sent to over 100 health and social care providers; with mixed responses. The link to the survey was also shared on social media, gaining pick up from several Royal Colleges and regional branches of Royal Colleges, in addition to care sector organisations.

96 responses were received in total, two of which were disregarded as the professionals were not working in the UK.

Method: Parliamentary evidence sessions with the steering group, Groups 1 and 4

As the inquiry took place during the pandemic, most evidence sessions were held online. Members of the steering group provided their insight and expertise, which has guided and shaped the inquiry.

Meeting schedule:

Date	Chair	Overall content
11 May 2021	Liz Twist MP	Evidence shared from Think CO, Gas Safe Charity, National Care Association
8 June 2021	Baroness Finlay of Llandaff	Thematic review and consideration of survey questions for frontline professionals
14 September 2021	Liz Twist MP	Evidence from survey results: data trends, preparing focus group content and structure
21 February 2023	Liz Twist MP	Parliamentary evidence session with frontline health and social care professionals (first in-person meeting). Review of inquiry findings and draft recommendations

Method: Interviews with best practice organisations/service providers, Group 2

Structured interviews were used to gain an understanding of how carbon monoxide safety processes can effectively be improved in the health and social care sector (the second line of inquiry).

Organisations with a proven track record in best practice were identified by key collaborators Think CO, Gas Distribution Networks and the fire and rescue service. In total, five organisations agreed to be interviewed: Care & Repair Cymru, Care and Repair Scotland, Care and Repair Manchester; Changing Lives; and Oxford City Council Housing Improvement Agency. Interview questions aimed to establish why providers had decided to undertake a change in practice (i.e., taken steps to improve carbon monoxide safety); what benefits this had achieved; and if there were any challenges to implementing change or continuing with their improved practices. This intelligence was used to inform this report's recommendations for actions to be taken by regulators and industry leaders, who are key agents in the practice change journey.

Method: Interviews with regulators and sector leaders, Group 3

Two regulators were identified as fundamental to health and social care: the Care Quality Commission (CQC) and the Health and Safety Executive (HSE). The CQC participated in an oral interview and the HSE responded via a formal written statement.

Sector leaders were identified as organisations that have powerful influence in the sector and provide support, advice, or guidance for their members which can stimulate practice change. Sector leading organisations who participated include: The Royal College of Midwives (RCM), The Royal College of Nursing (RCN), The Association for Real Change (ARC), The National Care Association (NCA), and the National Association for Safety and Health in Care Services (NASHiCS).

Structured interviews were designed to gain an understanding of what regulatory bodies and sector leaders can do to encourage better carbon monoxide safety in the health and social care sector (the third line of inquiry) and what challenges can be anticipated when seeking to improve practice.

Findings from Primary research

The inquiry collected primary evidence through five processes:

I. Health and social care professionals: survey

II. Health and social care professionals: oral evidence from an interview, a focus group and a parliamentary evidence session

III. Structured interviews with best practice providers (referred by stakeholder organisations)

IV. Structured interviews and written responses from regulators and sector leading organisations and bodies

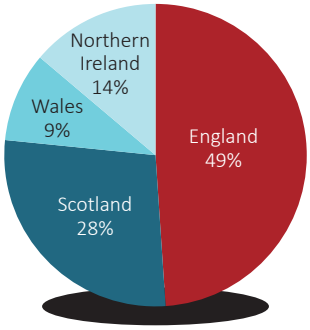
V. Four evidence sessions with steering group members, of which two included external sector experts

Health and social care professionals

Survey responses were obtained from 96 health and social care professionals. Two responses were discounted, as they were not from professionals working in the UK, leaving 94 respondents in the dataset.

Of these 94, 53 professionals (56%) reported they did work in individuals' homes. All respondents had worked in health and social care for over three years; (94%) stated they had worked in health and social care for over five years.

Survey respondents: Occupational location



Employers:

NHS	Private Care Company	Council	Direct payment Recipient	Other
90%	4%	3%	1%	2%

Information and Training on carbon monoxide:

Survey findings indicated that training or provision of information on carbon monoxide was infrequent, only 40% of 94 respondents had received some information or training.

Nation	Training/Info? Yes	Training/Info? No	Other
All respondents (94 total)	40%	53%	7%
England (46 respondents)	26%	63%	11%
Scotland (26 respondents)	62%	35%	3%
Wales (9 respondents)	56%	44%	0%
Northern Ireland (13 respondents)	31%	61%	8%

Training was most usually provided by the employer (25/37 – 68% of training), it was also reported that training had come from a private provider (5/37 – 14% of training). Some respondents were unsure if they had received information or training, and some felt they had but could not recall the source. None of the respondents reported receiving information or training from the council, their union or professional body.

Case Study:

Benefit of training for individuals

(shared at Steering Group evidence session 11 May 2021):

A re-ablement officer with training on carbon monoxide signs and symptoms had been to a property to fit a shower, when he noticed yellow flames and marks on the fire. He recalled from his training that this was an indication of carbon monoxide exposure, so he spoke to the owner, who said she had been suffering from headaches and not feeling well. Knowing that these could be symptoms of carbon monoxide exposure, the re-ablement officer arranged for an engineer to come and check the appliances. Once the engineer attended, the fire was immediately condemned and removed, and it was deemed there was definite leakage causing carbon monoxide exposure. If this re-ablement officer had not been on the training, he might have simply installed the shower and then left, leaving the owner in a home slowly filling with toxic gas.

Responding to an alarm:

Respondents were asked to rate their confidence level on a five-point scale from “Not at all confident” to “Extremely confident”. Here, the categories for “Not at all” and “Not very” have been combined, as have “Very” and “Extremely” confident to provide a comprehensive overview.

	Not Confident	Somewhat Confident	Very Confident
No Training	49%	41%	10%
Overall	35%	47%	18%
With Training	21%	47%	32%

It is notable that with training, professionals reported feeling more confident in responding to alarms. However, of the survey respondents who had received training or information, just 1 in 3 (32%) confirmed they would be ‘extremely’ or ‘very’ confident in responding to a carbon monoxide alarm and 1 in 5 professionals still felt ‘not confident’.

Health and Social Care Professionals working in domestic settings

Four of the ten survey questions related to professionals working in service users’ homes or in domiciliary settings. Of the 94 UK based respondents, it was determined that 43 respondents were likely to be working in homes (as they had responded to both Question 6 and 7, relating to homes), and a further ten may be working in community-based or similar settings (as they had responded to Question 8 relating to risk assessments).

Time spent in homes

Of the 43 respondents working in homes, the 58% majority (25/43 professionals) reported spending just an average of 30 minutes to 1 hour in each client or service users' home. Only one professional reported spending over eight hours in a home, and the vast majority (91%) stayed in homes for two hours or less.

Time spent in home	Number of respondents	% of respondents (of 43)
Under 30 minutes	7	16%
30 minutes to 1 hour	25	58%
1 – 2 hours	7	16%
2 – 8 hours	3	7%
More than 8 hours	1	2%

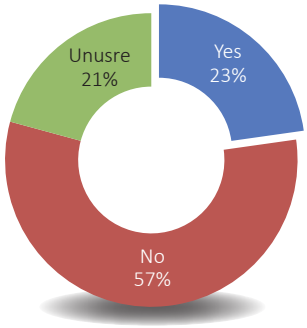
Risk Assessments:

Of the 53 professionals who responded to the question on risk assessments, just 12 (23%) confirmed these do take place. Of those 12, only three could confirm that risk assessments include any questions or checks for carbon monoxide safety.

This means in 94% of applicable cases, carbon monoxide risk was not assessed (50/53 respondents).

Responses from health and social care professionals (HSCPs) Carbon Monoxide Specific Practices

Generally, it was rare for participants to engage in any carbon monoxide specific safety practices. Those working in midwifery reported the lack of a process or pathway to refer a mother who returns a high carbon monoxide reading and is not a smoker. At present, such an individual would be sent to A&E. However, after what is likely to be a long wait before being seen, their COHb (carboxyhaemoglobin) levels would have reduced significantly and hence there would be limited or no evidence for the clinician to use to form a diagnosis. It is unclear what advice A&E is providing in such cases.



Participants who did undertake risk assessments reported not recalling any carbon monoxide relevant questions.

When asked about their confidence in responding to a suspected carbon monoxide emergency, professionals stated mixed confidence levels, broadly reflecting the distribution of confidence level reported in the survey. Those who reported feeling confident did know the correct procedure to follow when questioned, and even those who reported being unsure how to respond made appropriate suggestions of safe actions to take.

Housing

Professionals are witnessing poor housing conditions, which they believe may be linked to poor health outcomes (such as unsafe gas appliances, damp, mould, etc.). However, when trying to raise their concerns with the local authority in writing they are ignored. Communication between professionals is poor, and referral channels such as generic email accounts are not well managed. Councils need to be enabled to provide more housing of a suitable standard. Waiting lists are long, and in some cases, people are being housed inappropriately due to lack of alternative social housing stock.

> *We're looking for more suitable accommodation and the council wrote back to me and said we've got 10,000 people on our waiting list.*
>
> Research participant, Health and Social Care Professional

Working with other services

'Integrated Services' may have been designed in a relatively meaningful way but in practice did not work effectively. In principle, designs included designated points of contact/referral between services, with phone numbers as well as email addresses, and training on the referrals process involving teams from health, social care, and housing in the same session. NHS healthcare professionals working in the community found that social care professionals seem to have a better chance of success when raising concerns with housing teams.

> *We've got these designated emails, but actually, we don't have a lot of standing with housing. We actually don't have any standing. It just goes on file… it's kind of like fallen on deaf ears.*
>
> Research participant, Health and Social Care Professional

Training

Employers need to reserve time for professionals to complete training in a meaningful and effective way; training should be regarded as essential instead of additional. CPD training and accredited content on carbon monoxide safety would be helpful.

> *People are fighting to get on the mandatory training, everyone on the speciality wants to get on the training, but there's not enough time allocated.*
>
> Research participant, Health and Social Care Professional

Data sharing

Access to patient data was also raised as an issue, as professionals often do not have access to the whole of a patient's file or results. Information must be requested and shared between health care institutions, creating unnecessary administration, points of potential failure, and avoidable delays. If all healthcare professionals could access a patient's full healthcare record from a single source, it would greatly improve their ability to detect patterns, diagnose, and make treatment or care recommendations.

The way that data is held and shared by the NHS in Scotland is more centralised and accessible than in England.[22] In England, each Clinical Commissioning Group (CCG) operates independently, and patient records are not commonly part of a national database. In Scotland, most patient data is centrally held by NHS Scotland. This means large scale monitoring and evaluating is more challenging and does not support HSCPs in England as well as in Scotland.

Participants made several specific suggestions around practice improvement, for example around building regulations and lone working, which will be outlined in the 'Recommendations' section.

Structured interviews with best practice providers

Organisations were motivated to take action on carbon monoxide for a range of reasons, from receiving funding from Gas Distribution Networks to engagement with the local authority. All participants referenced an external factor that led to this change.

Actions taken to improve carbon monoxide safety were themed around training for staff, installing alarms, and establishing regular safety practices such as monthly alarm testing. Reports of staff feedback were all positive, the only negative impact referenced was difficulty in storing alarms when these are received in bulk.

The main challenges participants spoke of related to funding. All organisations operated on a mixed funding model, including third sector funding from Welsh Government, the Better Care Fund, a safety and security grant, local authority support, charity funding, schemes for boiler and home upgrades, benevolent funds, and grant funding. This can be a challenging operational environment, particularly if schemes are short-lived and application processes change frequently. Funding was identified as the main barrier that participants perceived to continuing with their new safety practices.

Responses from regulators and sector leading organisations and bodies

Structured interviews were undertaken with organisations identified as regulators or sector leading organisations for health and social care. Most participants proposed a facilitative approach- supporting and encouraging practice change by providing advice and guidance, rather than through imposing sanctions. Penalties are part of the tool kit available to statutory regulators, however these are generally used sparingly.

Opportunities for promoting best practice included: regular email communications, magazines, and social media channels; events and workshops; providing training and advice and celebrating those organisations doing well by using them in case studies and as examples of best practice. Inspections carried out by those with regulatory functions could both reward positive actions and highlight areas for improvement.

Challenges in the sector included gaining the attention from professionals; the pressures on the sector in terms of resource and demand; and inconsistency in practice between NHS Trusts, nations, and different professional groups.

[22] How the NHS handles your personal health information, NHS Inform: How the NHS handles your personal health information | NHS inform

Case Study:

Oxford City Council, integrating services and aligning practices in the local authority

Oxford City Council has developed several practices that support integration and improve outcomes for patients. They have developed a strong relationship with the Housing Improvement Agency (HIA), which is able to carry out adaptations and repairs in the community for elderly or vulnerable people, helping to prevent hospitalisations and ensure people remain safe in their homes. Several factors have helped to make this integration work:

- Social care and HIA staff have undertaken the same training program on carbon monoxide safety with educators Think CO.
- The HIA employs a handyperson locally in the community who is generally available (potentially contracted full time for the HIA) and can swiftly see to repairs.
- The HIA also employs two occupational therapists in the community and a full time PR person to promote the services the HIA can offer, for example holding coffee mornings and manning a stall in the local hospital lobby.
- Simple referral pathway: social services can make quick referral to HIA, the process is not long and the HIA will assess to see if they can help or not – there is a low administrative burden on the referrer.
- Clear benefit: staff are made aware that just one referral can trigger a whole range of home improvements for the client.
- Tick list: a mandatory 'tick list' helps staff to identify gaps in safety (for example an out-of-date carbon monoxide alarm) so they can be rectified.
- Using funding from a range of sources including the Better Care Fund, Safety and Security grant and benevolent funds.
- Working closely with charities active in the community, for example Dementia Oxford, to secure referrals for home improvements.
- The HIA has been working with local fire and rescue services to commission and distribute carbon monoxide alarms.
- Staff from different departments took part in the same training and have standardised processes which are well understood and monitored.
- The benefit of improvement has been made clear, so that the change in practice is seen as a positive improvement that will alleviate pressures on the workforce rather than a burdensome exercise.

Findings from evidence sessions

The Steering Group met at four evidence sessions between May 2021 – February 2023:

A. 11 May 2021, online session with guest speakers Nadra Ahmed CBE, Hilary Bath, and Simon Main from Think CO and Gordon Lishman from Gas Safe Charity

B. 8 June 2021, online session with Baroness Finlay

C. 14 September 2021, online session chaired by Liz Twist MP, with presentation of survey results

D. 21 February 2023, parliamentary session chaired by Liz Twist MP, with three health and social care professionals

Awareness of the risks posed by carbon monoxide is generally very low in the sector. Most healthcare professionals have the same level of awareness as the public and associate carbon monoxide risk with mains piped gas only. The vast majority believe carbon monoxide either kills you or is not present; and professionals are not well informed of the health risks posed by sub-lethal exposure. Ensuring that employers understand the sub-lethal impacts of carbon monoxide exposure and the associated health risks is likely to be a pivotal element in motivating changes in working practices.

Individual practitioners may not hold decision making powers or be able to influence their employer to implement or improve carbon monoxide safety practices. Front line staff who attend training with Think CO frequently report that they cannot embed practices in their organisations as they are not decision makers.

To effectively improve carbon monoxide safety in health and social care, both a 'top-down' and a 'bottom-up' approach will be required. The 'top-down' approach will involve employers, agencies and care providers implementing carbon monoxide safety practices throughout their organisations, making staff aware of these practices, and providing training opportunities. The 'bottom-up' approach will involve staff and HSCPs undertaking training, incorporating the new carbon monoxide safety practices into their work, and educating those receiving services about how best to reduce and monitor the risks of carbon monoxide exposure.

Some carbon monoxide alarms can be integrated with phone apps to produce rich, easily accessible data. This may provide helpful information for professionals who suspect carbon monoxide exposure.

Care Plans, emergency protocols, and risks assessments could all be useful vehicles to establishing carbon monoxide safety processes.

Personal Atmosphere Monitors (PAMs) can pick up carbon monoxide levels more quickly and accurately than an alarm, and these might help to ensure that staff are protected in uncertain circumstances. The devices are not cheap, however, and with public services low on resource it might not work as a nation-wide solution. Private employers or self-employed practitioners may wish to consider investing in such equipment if they feel at risk.

It is also helpful to refer clients and patients to the Priority Services Register (PSR) as a standard part of signing them up to a service or taking their details, as people with health needs can access greater support with utilities if on this register.[23]

[23] Priority Services Register (PSR), via https://www.thepsr.co.uk/

Conclusions

The conclusions have been structured to reflect the original three lines of inquiry:

Current practice: risk management and carbon monoxide awareness

Overall, carbon monoxide risks are not well managed or thoroughly understood; and awareness of carbon monoxide is relatively low.

This finding is supported by the focus group, where only specialised staff had received initial (if any) training on carbon monoxide; and this was generally limited to tasks required in their role. Some ad hoc training might take place linked to a specific individual or scheme, but these types of sessions were not followed up and did not generally lead to improvements in practice.

More positively, focus group attendees who stated they would feel confident responding to an emergency situation did report the correct protocol when asked. Even those who stated they were uncertain gave correct answers, such as opening windows and doors and switching off gas appliances. However, a gap was identified in terms of a protocol for suspected carbon monoxide or sector guidance on procedure, which would need to take into consideration individual client needs. For example, some clients may require two people to lift them safely. If waiting outside for the carbon monoxide risk to disperse, consideration may also be needed to keeping clients warm, especially if they are vulnerable.

Awareness of the symptoms of carbon monoxide is low in frontline professionals, and COMA was not recognised by any of the sector leaders or best practice organisations that engaged with the research. COMA refers to a four-question diagnostic tool to aid identification of carbon monoxide exposure.

Only 23% of survey respondents could confirm that risk assessments were carried out before working in home environments, or at all. Discussions in the focus group indicated that the Care Plan is more widely used as a document to check risk. However, as the Care Plan is checked daily it may not be the right place to include carbon monoxide risk. Those living in rural areas who use wood as their main source of heat may be at an elevated risk, as they can be sleeping in the same room as the heat source. It may be valuable to develop specific advice for healthcare professionals working in these types of environments, where there are limited heating alternatives.

What works to improve carbon monoxide safety?

Training

In-person workshops run by external providers are generally preferred for staff training; for example, sessions with the fire and rescue service have proved popular and tend to be well remembered. Attendees commented that training should be regularly refreshed to be effective, otherwise information can be forgotten and the exercise risks becoming a waste of time. In house online training is thought to be the least impactful, often being rushed through to get it out of the way. Good practice is to set aside specific time for staff to complete meaningful training during work hours, perhaps with other colleagues so there are opportunities for discussion and debate.

Practices

Practices that have been successfully implemented and integrated to improve safety and awareness include:

- Establishing a carbon monoxide evacuation protocol and practicing this with staff
- Installing alarms in shared areas and ensuring both residents and workers understand what they are (for organisations providing residential care)
- Refreshing training in carbon monoxide safety regularly, aligning with other health and safety procedures like fire
- Embedding mandatory questions and appliance checking practice into existing safety regimes
- Providing information and reminders to patients
- Having a regular servicing/checking schedule for appliances and alarms to sign-off devices together

Support from beyond the sector

One of the most significant contributing factors to achieving best practice is having strong links to those who can provide support, either within the local authority or another provider of housing support. Housing Improvement Agencies within local authorities can have a huge impact on reducing carbon monoxide risks if there is a clear and simple process for referrals to be made from healthcare personnel. Once a problem has been identified, it is vital that health and social care staff know they can get support to resolve the issue.

Some professionals spoke of attempting to raise health concerns resulting from poor housing, with local authority housing providers, including by writing letters. Unfortunately, without good links between services these letters often seem to be ignored, perhaps due to a lack of resource or availability of alternative housing stock. Social workers were thought to have greater influence with housing teams, perhaps due to a closer working relationship.

Professionals reported having a generic email address to contact the housing team, but without knowing the person who would receive the email or even if it would be read. In some cases, providers have a policy against writing formal letters to the council as it is seen as a waste of time. It seems that in practice healthcare, social care, and housing tend to work in silos, despite government's efforts towards integrated care systems.

What sector leaders can do to encourage good practice

- Explain why a change in practice is needed and why it is relevant to a specific profession.
- Provide or signpost to guidance that is clearly relevant, accessible, visually engaging, and ideally interactive.
- Offer access to advice, respond to questions and clarify the benefit of good practice and relevance to the role.
- For those with regulatory powers, the inspection regime can encourage practice improvement by recognising good and outstanding performance in unmandated areas such as carbon monoxide and gas safety.
- Referring to the principles in the Code of Practice can help professionals to relate to pursuing best practice and going beyond minimum standards and seek to develop their own knowledge base.
- Focus on managers to ensure staff are provided with support and monitoring progress as changes are embedded into practice.
- Develop or signpost to CPD training or accredited courses such as The Institution of Safety and Health (IOSH).
- Disseminate carbon monoxide safety information both verbally and visually at networking events, newsletters, webinars, and in social media channels.
- Recommend that carbon monoxide safety messages and practices are incorporated into existing regular health and safety practices and emergency procedures and demonstrate how this could be done. For example, with a template policy or example case study.

Recommendations

The golden thread

The inquiry recognises that both 'top-down' and 'bottom-up' approaches are needed to achieve practice improvement for carbon monoxide safety.

- Top-down improvements could include the implementation of safety schedules, setting up clear referral pathways and the provision of guidance and advice. However, if professionals are not aware of risks and trained in carbon monoxide safety, these structures may remain unused or may be treated as a 'tick box' exercise.
- Bottom-up improvements could include individual professionals taking part in awareness training and educating themselves about the steps to take in case of an emergency. However, if practice improvement is not supported by employer recognised protocols, professionals may not be able to take any remedial action if a risk has been identified.

In isolation, neither approach will effectively achieve change, a golden thread of improvement must run throughout organisations.

Information is only as good as its source

It is important that professionals and providers recognise and respect the source of any advice, information, or guidance directed at them. To be effective, bottom-up improvements should be stimulated by employers, who in turn should look to sector leaders and regulators for guidance. Policy Connect and the APPCOG reported in 2015 that "alongside awareness-raising, data, context and messengers are all vitally important factors in determining the effectiveness of carbon monoxide safety efforts, influencing heavily the extent to which safety messages reach (and are understood in) each … situation."[24]

- Regulators and sector leaders should help employers to improve their carbon monoxide safety practices by developing specific materials, such as template policies, checklists, and practical guidance. Examples of 'top tips' to consider can be found in Annex I.
- In turn, employers should signpost individual practitioners to official guidance and materials. Some 'top tips' for employers to include can be found in Annex II.

Recommendations for regulators and sector leaders

Recommendations for regulators and sector leaders have been grouped into three categories: Preparation, Practice and Protection.

[24] Carbon Monoxide: From Awareness to Action, Policy Connect, 19 September 2015: Carbon Monoxide: From Awareness to Action | Policy Connect

A - Preparation

A1 Training for carbon monoxide

Develop or sign-post organisations and individual members to role-specific CPD accredited training for carbon monoxide safety.

- Training should be completed in paid time and ideally facilitated by an in-person workshop. Online training may not be as effective as it is less memorable.
- Training should be repeated annually, and internal practices should be reviewed to ensure they reflect any developments in best practice.
- Training should demonstrate why carbon monoxide safety is relevant to specific health and social care roles and areas of practice (e.g., trips and falls, pregnancy, dementia, heart and lungs, child health).

A2 Emergency protocol

Response protocols must be established in advance, so that in an emergency situation or a suspected emergency, professionals immediately know what action to take.

- Employers should ensure that each service user/client has an emergency evacuation procedure in place, and that staff are well aware of these procedures.
- Both physical and mental factors should be considered, for example if clients are required to be outside for a period of time this may carry environmental risks such as stress and cold.
- Professionals should be encouraged to save the gas emergency number on their phones: 0800 111 999, in addition to any internal reporting lines, so they know who to contact.

A3 Guidance and advice

Guidance and advice must be provided in addition to training. If employers or professionals are unsure about practices or encounter an unusual situation, they may need support to identify the correct action to take.

- Regulators and sector leaders are ideally placed to issue sector-wide trusted guidance and to establish advice services, such as phone lines or monitored peer-to-peer discussion platforms.
- Carbon monoxide safety guidance should be both stand alone, and be incorporated into existing guidance and advice, for example guidance on environmental risks and hazards.
- The inquiry recommends that NICE publish the Quality Standard for Indoor Air Quality at Home, for which the consultation closed April 2022; and consider developing further quality standards for indoor air quality training and practices in health and social care.[25]
- An inspection aid developed by Public Health England, for Environmental Health Practitioners to identify carbon monoxide risks in homes, may be useful for sector specific professionals to review.[26]

[25] NICE Indoor air quality at home. Online: https://www.nice.org.uk/guidance/indevelopment/gid-qs10113
[26] Carbon monoxide (CO): residential inspection aid, PHE 2015: Carbon monoxide (CO): residential inspection aid - GOV.UK (www.gov.uk)

B - Practices

B1 Regular health and safety regimes

Carbon monoxide safety practices should be incorporated into existing health and safety processes.

- Emergency protocols for carbon monoxide incidents should be practiced on a regular basis, for example, incorporated into fire safety rehearsals.
- Specific awareness training for carbon monoxide safety should be repeated at least annually and should be part of staff on boarding procedures.
- Testing of alarms should be scheduled on either a monthly or weekly basis.

B2 Rewarding practices

Organisations going above and beyond should be rewarded, either in the inspection regime (if a regulator), or as a good practice example shared via communications with the membership (if a sector leader).

C - Protection

C1 Symptoms awareness

One of the key ways that professionals can protect themselves and the community is by identifying potential carbon monoxide exposure through a developed understanding of the symptoms of poisoning. As noted in the introduction, carbon monoxide exposure produces non-specific symptoms which can easily be attributed to other conditions, such as headaches, dizziness, nausea, feeling out of breath, and inability to concentrate. Low-level carbon monoxide exposure (which may not be detected by an alarm) can be extremely harmful if not addressed. By being prepared, professionals will be aware of the symptoms and enabled to follow a pathway to protect their patients from harm.

C2 Carbon monoxide alarms

There are significant differences in carbon monoxide alarm requirements, and housing regulations more broadly, across the UK's four nations. This is likely to lead to variance of protection in homes, and in particular inconsistency between rented and owner-occupied properties. Carbon monoxide alarms are now legally required in most rented homes and when a fixed combustion appliance is installed in any home in England; in most rented homes in Wales, and in homes of all tenure in Scotland. The regulations in Northern Ireland apply to private tenancies and installations of new appliances.

Some care providers have been able to access free carbon monoxide alarms via their Gas Distribution Network. Regulators and sector leaders should share opportunities to access alarms and other services with their members and networks; as this can be the trigger to wider practice improvement. Some carbon monoxide alarms can be integrated with phone apps to produce rich, easily accessible data. This may be helpful information for professionals who suspect carbon monoxide exposure.

C3 Personal Atmosphere Monitors (PAMs)

PAMs can provide an additional level of protection for professionals, and are more sensitive than alarms, sensing lower level of carbon monoxide more quickly than a domestic carbon monoxide alarm. Unfortunately, PAMs are significantly more expensive than alarms. Individual practitioners working in homes which present higher levels of risk (such as homes in fuel poverty) may wish to invest in this personal protective equipment. Regulators and sector leaders can inform employers about PAMs where appropriate.

Recommendations for central government

1. Unlocking preventative health benefits

The mitigation of carbon monoxide risks should be considered within the preventative healthcare agenda by NHS Improvement, Health Education England, NHS Scotland, the Office for Health Improvement and Disparities (OHID) and other relevant authorities. Authorities may find it beneficial to examine the potential economic and public health benefits of subsidising or providing grants to support training, events, and the development of national resources for health and social care professionals (ideally specific to their role) and their employers to embed learning and support good practice in carbon monoxide safety.

Carbon monoxide alarms should be mandated within Approved Document M, which provides information about the ease of access to, and use of, buildings, including facilities for disabled visitors or occupants.[27] This small regulatory amendment would mean occupants of newly built or adapted homes would enjoy the protection of a carbon monoxide alarm.

2. Reducing accidents and hospital admissions

The Government should consult on how Home Improvement Agencies (HIAs) in England can best support the local healthcare system, for example, by reducing falls and hospital readmissions. Foundations is the national body for HIAs in England, which is well known in some sectors (e.g., occupational therapy) but not as well known in others. If better referral processes to HIAs were available, significant opportunities to resolve health conditions exacerbated by poor housing could be unlocked at an earlier stage.

Research using evidence from Care and Repair Wales (the Welsh National Body for HIAs) has found that people who were given help with home repairs were less likely to suffer falls (from trying to do the repairs themselves), and hence could stay safe in their homes, reducing care demand.[28] This work highlights the importance of HIAs in society, and the broad benefits that linking services can have in reducing pressure on health and social care and the NHS.

3. Connecting public services

The Government and local authorities should consider the role of the Fire and Rescue service within public safety. The Home Office should engage with the National Fire Chiefs Council to explore what resource the service would need to undertake a greater role of carbon monoxide safety training in the community, specifically with health and social care teams in local authorities.

4. Reducing workforce pressures and the healthcare burden

The Government should consider how improved referral processes between services could free up sector resource in the long term. If environmental issues impacting health (e.g., poor housing) were resolved more swiftly, individual cases would require less attention overall, and reduce the demand for services. Providing healthcare professionals with a pathway to resolve or at least engage with health conditions exacerbated by poor housing also empowers them and can help to reduce burnout from feeling helpless. Those working in social care do not appear to face the same communication challenges with referrals. The House of Lords Select Committee for the Integration of Primary and Community Care is currently undertaking an inquiry exploring improved ways to integrate the delivery of effective primary and community care services.

[27] Building regulations, Approved Document M; Last updated 7 June 2021, available: Access to and use of buildings: Approved Document M- GOV.UK (www.gov.uk)
[28] Joe Hollinghurst, Helen Daniels, Richard Fry, Ashley Akbari, Sarah Rodgers, Alan Watkins, Sarah Hillcoat-Nallétamby, Neil Williams, Silviya Nikolova, David Meads, Andy Clegg, Do home adaptation interventions help to reduce emergency fall admissions? A national longitudinal data-linkage study of 657,536 older adults living in Wales (UK) between 2010 and 2017, Age and Ageing, Volume 51, Issue 1, January 2022, afab201, https://doi.org/10.1093/ageing/afab201

Recommendations for local authorities

5. Integrating services

As recommended in the NICE guidance and the White Paper ***"People at the Heart of Care: adult social care reform white paper"***, local authorities should seek to integrate social care, health care, and housing departments so that IAQ concerns can be communicated and resolved effectively.[29] One way to start this journey might be with combined training sessions, to clarify roles and the communications channels between departments, and ensure staff know how to cross communicate.

When aiming to reduce health and care needs, a joined-up, regional approach may be more effective than local authorities acting alone. For example, there are 17 hospitals in Wales, this small number has helped to ensure consistency and address areas of challenge, leading to a successful project which improves patient flow and reduces re-admissions, saving the NHS in Wales an estimated 25,000 bed days each year.[30]

This success could be replicated by taking a regional approach in England, as opposed to local authorities acting individually. Hospitals may provide an ideal opportunity for joined-up working, as they are visited by many people who live in different local authorities.

6. External support

Local authorities should consider promoting the Priority Services Register (PSR) to households.[31] The PSR is a free UK wide service which provides extra advice and support to households, including when there is an interruption to electricity or gas supply. Consumers who are accepted onto the PSR are more likely to be offered additional support. For example, some services (such as grid re-connection) may be provided free of charge.

Local authorities may benefit from engaging vulnerable households with local Fire and Rescue Service (FRS) teams, which may provide 'Safe and Well' visits to support households with fire and household safety.[32] The National Fire Chief's Council is developing sector specific training on carbon monoxide to be undertaken by every Fire and Rescue Service in England, which could have significant impacts in improving Indoor Air Quality if fully rolled out.[33]

Local authorities may find it helpful to explore what free support is available from local organisations so this can be signposted to the public. Organisations such as Age UK and Citizens Advice offer energy saving advice and support for people in need. Some branches have even been providing carbon monoxide alarms free of charge, as part of a partnership with the Gas Distribution Networks.[34] Reducing fuel poverty by providing support with economic energy use can help to protect households from carbon monoxide risks.

[29] People at the Heart of Care: adult social care reform white paper, Published 1 December 2021, DHSC: https://www.gov.uk/government/publications/people-at-the-heart-of-care-adult-social-care-reform-white-paper
[30] Hospital to Healthier Home project: Hospital to a Healthier Home | Care & Repair (careandrepair.org.uk)
[31] Priority Services Register, available: https://www.thepsr.co.uk/
[32] 'What is a Safe & Well visit?', Hampshire and IoW Fire and Rescue Service: https://www.hantsfire.gov.uk/safety/home-safe-home/safe-and-well/
[33] Carbon monoxide safety: Position statement, National Fire Chief Council: https://www.nationalfirechiefs.org.uk/Carbon-monoxide-safety-position-statement
[34] 'Gas networks partnering with Citizens Advice to support over 17,500 vulnerable people'; SGN, 20 Jan 2022: https://www.sgn.co.uk/news/gas-networks-partnering-citizens-advice-support-over-17500-vulnerable-people

Annex I

Top tips for individual professionals and practitioners

Protect yourself at work by:

1. Learning the symptoms of carbon monoxide poisoning, the potential sources of carbon monoxide in the home, and what to do if a carbon monoxide alarm sounds or if you suspect carbon monoxide exposure has occurred.
2. Save the Gas Emergency Number on to your phone so you are prepared: 0800 111 999
3. Familiarise yourself with carbon monoxide alarms where possible, both at home and at work. Check the location, press to test, and check the expiry date.
4. Inform tenants about carbon monoxide and how to stay safe with regular appliance servicing and by installing alarms.
5. Make sure you know the protocols for each client if emergency evacuation is required. Seek advice from your employer for support if required.

Community working

- Reporting safety risks: If you see unsafe housing or a concerning indoor environment, it is advisable to take a short video or some photographs to record this so it can be reported effectively (with resident permission)
- It might be helpful to refer clients and patients to the Priority Services Register (PSR) as a standard part of signing them up to a service or taking their details, as people with health needs can access greater support with utilities if on this register.
- Lone working: make sure you have someone to call on entry/exit if you are visiting an empty building or a high-risk environment. Your employer may have a policy on this, or you can ask a friend or colleague to buddy up with you. Make sure you know what to do if the call doesn't come within a certain timeframe.
- Those working in maternity: continue to take breath readings for carbon monoxide once the baby has been born. Carbon monoxide exposure may still be a risk from environmental sources; as mother and baby tend to share the same environment carbon monoxide in the mother could be a warning for the child being exposed.

Annex II

Top tips for employers

Employers, managers, and service providers can get ahead through:

Training

1. Support employees to undertake regular training in carbon monoxide safety, ideally in workshops run by external organisations (such as the Fire and Rescue Service) that take place within working hours. Knowledge should be tested, and training should be refreshed each year. See example provider: Think CO | Gas Safe Charity (gassafecharity.org.uk)

Protocols

2. Establish emergency protocols and procedures for responding to suspected carbon monoxide or an alarm activation. Clinical staff should be made aware of the National Poisons Information Service (NPIS), which they can contact for advice if carbon monoxide exposure is suspected.
3. Employers of community-based staff: Protocols for responding to a carbon monoxide alarm will need to take consideration of the needs of individual clients; for example there may be mobility/access/lifting considerations where patients require two people or supportive equipment to move them. These must be developed and practiced by staff.

Practices

4. Embed carbon monoxide safety within existing fire safety practices and training and ensure these are carried out regularly
5. Celebrate staff who go above and beyond in safe practice and promote carbon monoxide safety with clients. Share any positive case studies from this, for example where a member of staff has identified a potential exposure and has taken correct action.
6. Employers of community-based staff: Set up regular carbon monoxide alarm testing schedules that are signed off.
7. Employers of community-based staff: Consider providing staff with personal equipment to detect carbon monoxide, such as a portable carbon monoxide alarm or a Personal Atmosphere Monitor in case they are visiting a property without any alarms installed.

Guidance and advice

8. Share guidance and advice on carbon monoxide safety with staff from reputable sources, for example a professional body or regulator. See example from the Royal College of Nursing: Carbon monoxide poisoning: what nursing staff need to know.[A]

Support

9. It may be beneficial to seek out connections with Home Improvement Agencies (via the local authority), Fire and Rescue Services, and any other supportive or charitable housing improvement services, to understand the services they can offer and how the referral processes work. If possible, ask a representative from a supportive organisation to attend an internal meeting with staff to outline the referrals process and what services are available.

[A] Royal College of Nursing: Carbon monoxide poisoning: what nursing staff need to know | RCN Magazines | Royal College of Nursing, accessed: https://www.rcn.org.uk/magazines/Clinical/2022/Nov/Carbon-monoxide-poisoning-awareness

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Care & Repair Cymru, Care and Repair Scotland, Care and Repair Manchester, Changing Lives, Oxford City Council Home Improvement Agency

Think CO, Lewisham NHS Trust, The OT Service

The COMed group for feedback and commentary

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About the All-Party Parliamentary Carbon Monoxide Group

The All-Party Parliamentary Carbon Monoxide Group (APPCOG) is the leading forum for Parliamentarians to discover, discuss and promote ways of tackling carbon monoxide poisoning in the UK. Through a busy programme of events and research, the Group seeks to push the vital issue of carbon monoxide safety up the political agenda, to improve government policy, to support research and to raise public awareness of the threat posed by carbon monoxide.

The APPCOG draws on a wide range of stakeholders; working closely with leading figures in academia, the scientific and medical community, the civil service, Ofgem, industrial public bodies, gas distribution networks and those with direct experience, such as CO survivors, campaigners and charities. Policy Connect provides the secretariat for the APPCOG, which was formed in 2012. We are committed to ensuring our actions and funding are entirely transparent.

About Policy Connect

Policy Connect is a cross-party think tank. We specialise in supporting parliamentary groups, forums and commissions, delivering impactful policy research and event programmes and bringing together parliamentarians and government in collaboration with academia, business and civil society to help shape public policy in Westminster and Whitehall, so as to improve people's lives.

Our work focusses on five key policy areas which are: Education & Skills; Industry, Technology & Innovation; Sustainability; Health; and Assistive & Accessible Technology.

We are a social enterprise and are funded by a combination of regular annual membership subscriptions and time-limited sponsorships. We are proud to be a Disability Confident and London Living Wage employer, and a member of Social Enterprise UK.

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