International Association of Fire Chiefs

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Reducing Home Oxygen Therapy Fires and Injuries Starts at the Federal Level

The increasing prevalence of home oxygen therapy (HOT) fires is significantly adding to our nation's fire deaths. According to a report produced by the National Fire Protection Association (NFPA), the incidence of home oxygen patients dying in fires involving home oxygen equipment within the U.S. is more prevalent than previously reported, with one patient dying every four days (Hall, 2023). Fires involving home oxygen are a significant risk to the safety of firefighters. Two firefighters die each year fighting HOT fires and many more are injured. "The enrichment of normal room air with oxygen increases the energy, heat release and severity of any fire. What can normally be a fairly nonflammable substance can, in the presence of oxygen, burn with vigor and produce noxious fumes very rapidly" (Cooper, 2015). Five firefighters in Tacoma, Washington, were injured in a June 2023 fast-moving apartment fire that was later determined to be caused by smoking and home oxygen use.

This problem is not a rare isolated anomaly. "Around 16 million people have been diagnosed with Chronic Obstructive Lung Disease (COPD) in the U.S. (1 in 8 over the age of 45), with millions more undiagnosed. Of these, an estimated 1.5 million require home oxygen therapy" (American Thoracic Society, 2018). Research shows 1.5 million people are prescribed home oxygen. Of that number, "It is difficult to determine how many individuals on HOT continue to smoke. Estimates range from **10% to 50%** due to the addictive nature of nicotine. "

The International Association of Fire Chiefs' Fire & Life Safety Section (FLSS) board members met in May to discuss this important issue and how the problem could be reduced or resolved. Representatives from BPR Medical and Sunset Healthcare Solutions presented an approved medical device that serves as a fire break when oxygen tubing is exposed to fire. The thermal fuse costs $4.45. Installing a thermal fuse at the nasal cannula connection and at the oxygen concentrator has the potential to reduce HOT fires. Trial installation programs in places like Spokane Valley, Washington, and within the State of Wyoming can be replicated nationally and provide accurate future data. The thermal fuse is an FDA listed medical device manufactured in the United Kingdon (UK) with two independent medical supply wholesale companies both competitively listing the device for sale within the U.S. No other engineering solution currently exists to reduce HOT fires.

The IAFC-FLSS board formed a HOT working group that includes national fire service organizations, burn centers, burn survivor advocacy groups, as well as home health medical equipment providers and distributors. The Veterans' Health Administration requires a

bidirectional thermal fuse to be installed on all HOT systems involving veterans. According to FLSS Chair Chief Greg Rogers, "The FLSS along with the HOT working group has a real potential to lead this effort in partnership with the Centers for Medicare and Medicaid Services (CMS) to reduce fire deaths in the U.S. by 12% and save Medicare nearly $500 million in burn care expenses they currently pay. Simply adding thermal fuses to oxygen tubing as a cost-effective engineering solution has been proven to greatly reduce HOT incidents and fatalities in the UK." In July 2023, The Joint Commission identified National Patient Safety Goals associated with HOT fire incidents.

The last two fatal fires in Nevada, Iowa, occurred in April 2022 and in April 2023. Both fires involved home oxygen and cigarettes. We believe the placement of two thermal fuses could have prevented the loss of life and the large medical expense to the injured family members. This cost does not reflect the probable negative mental health impact to responding firefighters and the cost incurred for fire organizations when taking care of their responders. We have a simple and effective proven solution to a growing problem that needs your attention.

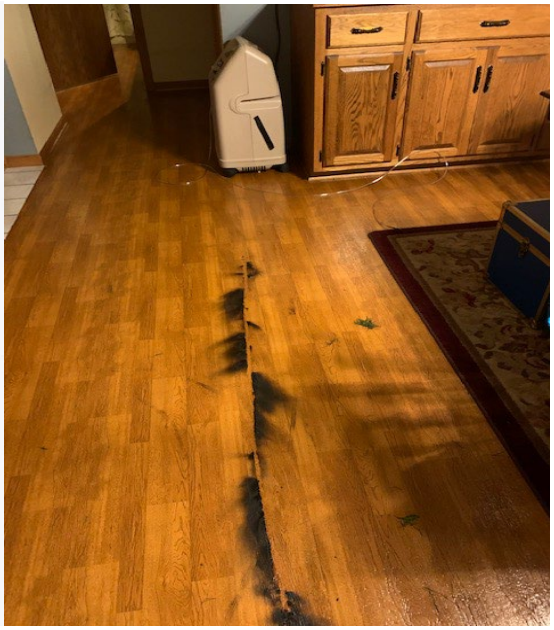
There are 35 members representing 25 groups who are committed to partnering with Centers for Medicare and Medicaid Services (CMS) to reduce burn deaths, civilian injuries, and injuries to our nation's firefighters. Those entities are:

*Addison Fire Department (Illinois)
*American Association of Homecare
*American Burn Association (ABA)
*Applied Home Healthcare Equipment
*Appy & Associates, LLC
*Battlefield Fire Department (Missouri)
*BPR Medical
*Chamber Hill Strategies (Washington, DC)
*Colorado Division of Fire Prevention and Control
*COPD Foundation
*International Association of Fire Chiefs' (IAFC) Fire and Life Safety Section (FLSS)
*International Association of Fire Fighters (IAFF)
*Michigan Medicine- University of Michigan Trauma Burn Center
*National Association of State Fire Marshals (NASFM)
*National Fallen Firefighters Foundation (NFFF)
*Nevada Fire Department (Iowa)
*Phoenix Society for Burn Survivors
*South Metro Fire Department (Colorado)
*Sunset Healthcare Solutions
*Wilmington Fire Department (North Carolina)
*West Bend Fire Department (Wisconsin)
*Wyoming State Fire Marshal
*Underwriters Laboratories (UL)
*University of Iowa Hospitals and Clinics (Iowa)
*Valley Hospital - MultiCare Health System (Washington)

This fire in Nevada, Iowa, killed one person and caused severe burn injuries to two other family members who were intubated for weeks at a trauma burn center. The treatment costs were approximately $19,719 per day, per person (excluding ambulance and helicopter transportation). The total cost will top $1.2 million for the care received and anticipated additional surgeries. Those funds could have funded 269,000 thermal fuses for high-risk patients in this one fire alone.

According to the Centers for Disease Control and Prevention's (CDC) WISQARS injury database, in 2020 there were 281,801 fire/burn injuries in the U.S. These injuries cost $3.9 billion ($3,862,650,000) in medical costs, and $41.6 billion ($41,599,370,000) in combined medical/work/life loss costs, (National Center for Injury Prevention and Control, CDC WISQARS accessed on 8/4/2023).

The thermal fuse is a bidirectional valve, meaning it completely shuts off the flow of oxygen – whichever way it is fitted – when exposed to fire. From 2013-2018 after mandated implementation in the United Kingdom, only one home fatality has been recorded with home oxygen use.



Oxygen-enriched fires are a significant risk to firefighters. Normal conditions are oxygen-deprived because the modern fuel packages in homes today consume all the available oxygen in the room to sustain the fire. Adding oxygen to these fuel loads from concentrators is creating a more deadly fire condition for firefighters. Stopping the flow of oxygen can reduce risks for patients, firefighters, and family members in the home.

Goals for partnering with the Centers for Medicare and Medicaid Services (CMS):

1) **Work with CMS to integrate this new thermal fuse technology for all high-risk patients who are non-compliant smokers and prescribed home oxygen.**

2) **Partner with the HOT working group to reduce fires associated with home oxygen use.**

3) **Reduce costs associated with burn care currently paid for by Medicare systems.**

4) **Develop a CMS policy statement recommending the installation of fire breaks for high-risk patient groups and educate the accrediting bodies about this recommendation.**

Future goals for the HOT working group beyond the CMS goals:

1) **Reduce firefighter injuries related to HOT fires by 12%.**

2) **Reduce fire fatalities involving civilians and firefighter deaths by 12% related to home oxygen and smoking.**

3) **Develop a model education program for stakeholders and families to educate them on the cannula thermal fuse.**

4) **Work with health care providers, physicians, medical equipment providers, and the fire service community risk reduction experts to develop smoking cessation programs to improve safety, and quality of life and decrease medical costs.**

REFERENCES:

American Thoracic Society., (2018). Optimizing Home Oxygen Therapy. An Official American Thoracic Society Workshop Report | Annals of the American Thoracic Society (atsjournals.org)

BPR Medical., (2021). *A risk-based approach to safer home oxygen delivery.* http://www.firebreaks.info/wp-content/uploads/2021/11/BPR-US-Whitepaper-2021-FINAL.pdf

Cooper, Brendan G., (March 2015). *Home Oxygen and Domestic Fires.* Doi: 10.1183/20734735.000815

Hall, Shelby., (May 2023). *Fires and Burns Involving Home Medical Oxygen*. NFPA.org.

Holguin, Briseida., (June 2023). *Firefighters, neighbors hurt when Tacoma apartments erupt in flames. KIRO 7, https://www.kiro7.com/news/local/firefighters-neighbors-hurt-when-tacoma-apartments-erupt-flames/ZYPQ7ZA4WZA5ZNFHBW2FNVYZVE/*

Mastropieri et al., (2020), 18 Stop the Burn: A Smoking and Home Oxygen Safety Initiative with Use of Firebreaks, Journal of Burn Care & Research, 41(1): S15.

"NEISS Highlights, Data and Query Builder," U.S. Consumer Product Safety Commission, https://www.cpsc.gov/cgibin/NEISSQuery/home.aspx.

Weighted to reflect population differences: BPR Medical (2019), The prevalence and impact of home oxygen fires in the U.S., available at: http://www.firebreaks.info/wp-content/uploads/2019/09/BPR-WhitePaper-2019-v6.1.pdf

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