Reducing Fires and Burns from Smoking While Using Medical Oxygen

Abstract

There is a growing awareness of the incidence of fires due to smoking while on oxygen therapy equipment. Smoking is the leading cause of fire-related deaths in all home fires, whether or not home oxygen is in use.[1] Several studies have revealed an increased incidence of burn injuries associated with home use of medical oxygen, and it is believed that the frequency of fires has been grossly underestimated. Clinicians, providers, manufacturers, and regulators of this equipment strive to reduce the number of burn injuries and deaths. Responses and recommendations appear to be ineffective, perhaps due to a lack of communication or a knowledge deficit concerning oxygen fires; particularly the incidence of unreported thermal burns, the ease with which tubing is ignited while oxygen is flowing, and the characteristic burn pattern toward the oxygen supply. This paper discusses the causes of home medical oxygen fires, explains cannula burn patterns and firebreaks, and identifies potential cost-effective solutions.

The Dangers of Smoking While Using Oxygen Therapy Equipment

Ninety-five percent of chronic obstructive pulmonary disease (COPD) is caused by smoking, with most smokers eventually developing some degree of pulmonary impairment. COPD may occasionally occur in nonsmokers as a result of environmental factors such as dusts, chemicals, or air pollution; or genetic factors such as alpha-1 antitrypsin deficiency.[2] COPD is the most common reason for long-term oxygen therapy (LTOT) prescriptions.[3] An estimated 182 home fires in the United States (US) involve oxygen therapy equipment each year, resulting in 60 injuries and 46 deaths. An additional 1190 thermal burns involving oxygen therapy equipment require treatment each year in emergency rooms, with nearly half resulting in hospital admissions, yet the majority are not reported to fire officials.[4] For the two million oxygen patients in the US, this means one burn for each 1,543 patients every year. Smoking rates for oxygen patients in the US vary greatly; some sources estimate 10 to 20 percent, while other sources estimate rates as high as 30 to 50 percent.[5, 6] Smoking while on oxygen therapy is responsible for the majority of home oxygen fires and resulting deaths.[4] These incidents are well documented due to the involvement of fire departments. However, patients who smoke while using home oxygen cause an alarming number of thermal burns in the US each year that are not reported to fire authorities. It is feared that this number is greatly underestimated, and will grow as the 50- to 75-year-old population grows, along with their need for oxygen therapy equipment. [5]

Oxygen patients have been observed smoking while using their oxygen therapy, and many have even reported engaging repeatedly in this risky behavior. Cannula ignition can

occur during the initial lighting of the cigarette, bringing the cigarette too close to the cannula tips and having it flare up, or through the relighting of cigarettes, which might be more common since the mandated use of self-extinguishing cigarettes.

Smoking while using oxygen therapy greatly increases the risk of facial burns. Facial burns account for 89 percent of all thermal burns, and although the overall burn size is generally small, due to the intense heat of the flame and possible inhalation of hot toxic smoke, significant injuries frequently occur to the patient's upper and lower airways. This can require hospital admission or specialized treatment at burn centers, and often results in death. At least a thousand burn injuries a year happen when cannula tips ignite after coming in close contact with cigarettes, lighters, or matches. In many cases, patients quickly remove the cannula and extinguish the fire, and fire authorities are never notified by the patient or hospital. Patients are usually hesitant to report these occurrences, possibly due to embarrassment, or because they do not want to get blamed for the incident, since they were informed of the fire danger and fear their oxygen equipment will be removed, although this rarely occurs.

Consequences of these fires can be catastrophic for home oxygen patients, since their health is often already so fragile that even small burn injuries frequently have poor outcomes. The disease processes that necessitate oxygen therapy contribute to mortality from burns that younger, healthier patients would be expected to survive.[5] These patients differ from standard burn patients because they are older, have higher rates of inhalation injury, and require much longer hospitalizations, despite the mean affected total body surface area (TBSA) of only 3 percent .[7] Mortality rates attributed to home oxygen fires may be understated for these compromised patients. Many times, these related deaths are listed as natural causes, when the exacerbation was triggered by the fire injury. Some experts, particularly the Thoracic Society of Australia and New Zealand, feel that the risk of fire for patients who continue to smoke cigarettes while using oxygen therapy outweighs the treatment benefits.[8]

Patients who remove the cannula and place it next to them while they smoke create an oxygen-enriched environment, particularly closest to the cannula tips, of bedding and other combustible materials that can create a flash-fire with just an ember. While oxygen itself does not burn, it greatly lowers the ignition point of combustible materials.

The degree of injury is related to factors that impair the patient and/or delay reaction time, and impairment is much more likely with smoking material fires than with other fires. The percentage of alcohol involvement among fatal victims was 23 percent for smoking material home fires in 2004-2008, compared to 11 percent for all other home structure fires with a known heat source as the cause of ignition. The percentage with possible other drug impairment during the same time period was 10 percent for smoking material home fires, compared to 4 percent for all other home structure fires with a known heat ignition source. Sadly, smoke alarms were not present in 43 percent of the fatalities involving home oxygen equipment [4]

Most fire deaths in the bedroom occur as a result of smoke inhalation while sleeping, whether oxygen is involved or not. Smoking in bed greatly increases the probability of

falling asleep, and with it the probability of the cigarette touching and igniting the bedding or oxygen tubing. In addition to sleeping, many victims of fires caused by smoking materials are affected by alcohol, drug impairment, or a health condition that limits mobility, cognitive function, or the ability to react prior to the fire. Impairment is much more likely with smoking material fires than with other fires.

Cannula tubing burn pattern: back to the oxygen source

Oxygen cannula and tubing made of polyvinyl chloride (PVC) is commonly used to administer oxygen therapy. A cannula refers to a patient interface, which has two vinyl tips, or prongs, for positioning at the base of the nostrils, and attaches to tubing of lengths up to 50 feet (15.2 m). Most homecare companies use cannulas of four or seven feet (1.2 or 2.1 m), and supply ample lengths of additional oxygen tubing in the range of 25 to 50 feet (7.6 to 15.2 m). This allows a patient to move about freely within the home and away from the oxygen supply, which is often heavy and difficult to move. The oxygen equipment can be located in a central position of the home, such as a hallway, living room, bedroom, or even on a different floor or level. Tubing is commonly gathered and coiled up to prevent tripping and clutter while it rests on the floor, as one does with a long extension cord. When a patient moves around the home, the position of the tubing changes and touches combustible materials, such as carpeting, bedding, furniture, curtains, and clothes.

Although the cannula does not easily ignite in room air or with a pulsing oxygen conserving delivery system, when a continuous flow of oxygen passes through it, the cannula tips and tubing will easily ignite when in close proximity to any flame or ember. The nasal cannula tubing, a PVC product, produces toxic black smoke when burning, releasing highly flammable vinyl chloride gas.[6] Although referred to as a cannula fire, a more accurate description is cannula torch or fuse, because of its intense flame and the speed with which it ignites combustibles as the fire advances up the tubing towards the oxygen supply.

Any portion of the cannula and tubing can ignite from a flame or cigarette ember, and the point of ignition is generally very recognizable, as it presents delineation between the burned and intact tubing. This flame can travel both externally or internally down the tubing, giving off a loud whistling sound. Once ignited, the fire consumes the tubing, leaving a charred trail of ash and melted tubing as it advances, always toward the oxygen supply.[9] A 4-foot (1.2 m) Salter 1600-4 cannula ignited at the tips takes about 2.5 minutes with a flow rate of 2 liters per minute (LPM), 4.5 minutes with a flow of 3 LPM, and 10 minutes with a flow rate of 5 LPM to burn to the connection. Although burn times seem counter intuitive for each liter flow listed, results were validated. Higher oxygen flows create a slower moving, more intense fire as it burns back to the oxygen source. As the tubing burns, combustible materials ignite along its path, creating additional fires. The fire can bypass and jump sections of crossed or coiled tubing as it continues to burn towards the oxygen supply. The tubing can also whip around, in a manner similar to an unattended garden hose, fanning its reach to ignite combustibles. If a humidifier bottle is used, it also will readily burn, capable of causing additional damage to the device or

allowing the fire to breach the cabinet, depending on its location. Gathered or coiled oxygen tubing on and around the oxygen supply, particularly an oxygen concentrator, can cause the cabinet of the concentrator to ignite, sustain heavy damage, or even become unrecognizable.

Oxygen Concentrators Inherently Safer Yet Wrongly Blamed

The most common medical oxygen supplied for use in the home is an oxygen concentrator, a machine that separates room air and concentrates the oxygen. A trail of burned tubing outside and downstream of the machine is evidence of oxygen flowing within the tubing and an external ignition source, as fire always advances toward, rather than away from, the oxygen supply. In fact, when PVC tubing was ignited by a fire investigator, it stopped burning within 20 seconds of shutting off power to the oxygen concentrator.[9] Concentrators damaged by fire may incorrectly be identified as the ignition source when this burned tubing is observed by people who are not aware of this specific burn pattern. This may create an erroneous belief that oxygen concentrators are unsafe, when these electromechanical devices do not store oxygen, cannot explode, and stop functioning when fire enters the device. If the concentrator is the ignition source, there will be no evidence of burnt tubing leading up to the machine.

The cause of the fire is frequently misrepresented by grieving family members, which may lead even experienced fire investigators to erroneously blame the concentrator. A malfunctioning oxygen machine was initially believed to be the cause of a tragic blaze that killed four children and an elderly grandmother on LTOT because the machine was found melted in the rubble, and the family reported it to be the ignition source.[10] Later investigation revealed that the family had attempted to move a burning couch outside, but could not get it out the door; it is now believed that the fire started when the patient was smoking while using her oxygen on the couch.[11] Another grieving family attributed their loved one's death to an exploding oxygen concentrator, even though her death certificate states that the cannula, the tube which delivers oxygen into the nostrils, ignited.[12] Additionally, in both of these fires, as well as all others, the fire advanced toward the oxygen supply, not away from it; since oxygen flow is needed within the cannula to produce its characteristic burn pattern, this provides evidence that the machine was not the source of ignition.

Oxygen Gas Cylinders and Liquid Oxygen Canisters Present Additional Hazards

An even greater hazard is present during fire with liquid oxygen canisters or compressed oxygen gas cylinders. Unlike oxygen concentrators, which separate the oxygen present in room air, these oxygen systems add oxygen contents to the room and can rupture or explode, releasing large quantities of oxygen into the room, greatly increasing the rate of combustion, generating more heat, and even causing fragments of the tanks to become

projectiles. A recent mobile home fire in Florida caused oxygen tanks to explode, accelerating the fire as well as the danger to firefighters.[13] Two fatal fires caused by LTOT patients smoking in Pitt County, North Carolina, became significantly more dangerous for victims and rescuers after oxygen tanks exploded. Both patients died in the separate incidents nine hours apart, and three firefighters were injured.[14] In yet another incident in Florida, two firefighters and a neighbor were injured in a mobile home fire that ignited medical oxygen tanks, throwing one of the rescuers 15 feet (4.6 m) in the blast.[15] Another explosion during a fatal fire in Washington caused fragments of the pressurized tanks to hit firefighters as they attempted to reach the victim, who had started the blaze by smoking while using medical oxygen.[16]

Although the scope of this paper does not address fires outside of the home environment, these incidences do happen in other settings with any type of oxygen source, including piped oxygen in facilities. Fires and burns have occurred in hospitals, automobiles, or any other area where patients use medical oxygen and smoke. Patients smoking while using oxygen recently caused two fires in hospitals in the United Kingdom (UK). In December 2011, a lung cancer patient did not survive a fire ignited by a cigarette lit in a hospital bathroom after removing an oxygen mask connected to a tank. [17] Another patient in 2012 using an oxygen canister sparked an explosion with his lighter, burning his hands and nose. [18] A smoker with oxygen tanks in the car endangered rescue workers as well as his own life when his car exploded and the cylinders became missiles.[19]

Firebreaks

Firebreaks are secondary prevention measures, as are smoke alarms and fire extinguishers, because they do not prevent fires, but instead attempt to reduce negative consequences. Firebreaks are single-use, thermal fuses designed to stop the flow of oxygen along the oxygen supply tubing, thus preventing the spread of fire past their location. They are used as connectors in the oxygen supply line or at the oxygen source, incorporating a small piece of plastic that holds open a spring-loaded valve. When the fire reaches the plastic, it melts, allowing the spring to push the valve shut, stopping the flow of oxygen. They can be installed between the cannula and the oxygen supply tubing and at the oxygen source. They are promoted to provide additional time for evacuation, to prevent the spread of fire upstream to the equipment, and to reduce the probability that the fire will spread further. The BOC Group holds the patent for this device, which is manufactured by BPR Medical in the UK.

While some agency and home medical equipment (HME) providers view firebreaks as a way of improving patient safety, others share an unfavorable view, regarding them as only a secondary measure that increases cost and does not address the behavior modification needed to lessen the high incidence of thermal burns to the face. Others are concerned that firebreaks may send the wrong message to patients: smoking while on oxygen therapy is somehow made "safer" with the installation of these devices. Firebreak use may give patients a false sense of security and promote dangerous behavior. Unfortunately, many incidences of fires and burns while using oxygen therapy remain undocumented, making it difficult to accurately report incidences and properly credit

potentially effective measures. However, in the UK where firebreak use has been required since 2006, there is a comprehensive reporting system, in addition to an established working group of oxygen suppliers, health care agencies, and Fire and Rescue Services whose goal is to raise awareness of the dangers of smoking while using oxygen.[20, 21] Unfortunately, according to the Department of Health, the collated smoking-related oxygen fire incidents results are alarming: 141 incidences, of which 106 were related to smoking, occurred in the period April 2010 – March 2011.[22]

Based on 100,000 patients on home oxygen, this correlates to an annual incident rate in the UK of one incident per 709 patients, more than double the US incident rate. It is possible that a false sense of security may contribute to the higher UK rate.

In considering the use of firebreaks, it is important to consider their placement in the oxygen cannula and tubing, as well as their limitations.

Placement

A firebreak's effectiveness in reducing fire potential is directly related to its proximity to the ignition point.

In the UK, home oxygen installation is rather unique. A house is piped with safety tubing affixed to the wall, with two or more outlets where the cannula is attached. The National Health Service (NHS) Home Oxygen Service Specification (2005)[23] has a requirement for firebreaks. Although not detailed in the requirement, it is largely accepted that firebreaks need to be placed as close to the patient as possible. Other agencies and standards require oxygen concentrators to be fitted with a means of preventing fire from entering the machine.[24] Therefore, there needs to be at least two firebreaks: one close to the patient and another at the oxygen supply. Since humidifiers are highly flammable with oxygen flow, a firebreak would also be needed at this spot, amounting to three firebreaks per installation.

The overwhelming majority of home oxygen fires are started by the patient at the cannula.[4] Currently, there is no firebreak device on the market that fits into the most common point of ignition: the ends of the cannula prongs.

Inner channels are incorporated in most cannulas and tubing as a safety feature, the purpose which is to prevent the occlusion of oxygen flow when tubing is kinked. These channels prevent the splicing of oxygen tubing to accommodate the firebreak; consequently, the closest opportunity to install a firebreak is at the connection between the cannula and the oxygen tubing.

Common cannula lengths are four and seven feet (1.2 and 2.1 m), with a seldom used one-foot (.3 m) cannula available. The cannula is added to one or more 25-foot (7.6 m) sections of oxygen tubing. While it appears that a shorter length cannula would be safer, a firebreak connected to a one-foot cannula would be easily bypassed by a cigarette dangling from the outstretched arm of a sleeping patient, creating the deadliest of all scenarios.

A firebreak located close to, or at, the oxygen supply has minimal benefit. A fire reaching this point has traveled the length of the tubing, already creating serious damage. There is an elevated risk when gas and liquid oxygen cylinders and canisters are involved: large quantities of oxygen can be released, or the cylinder can rupture or explode with the intense heat of a fire. An oxygen concentrator does not present this danger, as it will stop functioning when fire enters the unit.

Limitations

A 2008 product recall was issued in response to the possibility of inappropriate activation of firebreaks, which would stop the flow of oxygen.[25] As a result of this possibility, instructions for use have been amended to recommend a backup oxygen supply for patients who could be distressed or suffer injury or death if their oxygen flow is stopped unexpectedly.

Firebreaks do not prevent fires, injuries or even deaths.

Firebreaks do not extinguish fires. Combustible items such as clothing, bedding, carpeting, curtains, or furniture already ignited will continue to burn.

Firebreaks do not prevent oxygen enrichment of bedding and seating materials when a cannula is placed on them.

Firebreaks are ineffective when the fire is started upstream of the device.

Firebreaks can be bypassed by the fire when positioned on flammable surfaces, or when the tubing is coiled.

Firebreaks do not stop the release of thick noxious smoke which can overcome patients very quickly.

Firebreaks are directional and may be inserted the wrong way by patients.

Firebreaks have a 4-year life span.

Firebreaks create back pressure, and can result in reduced oxygen delivery when using orifice flow controllers, or reduced sensitivity and performance when using oxygen conserving devices. If devices deliver both continuous flow and pulse flow delivery, the firebreak may need to be removed during the pulse flow delivery mode.

Firebreaks built into oxygen concentrators or added to their outlets do not address the humidifiers when used.

Firebreaks only partially limit fire potential; requirement mandates would add substantial cost without evidence of effectiveness. Of the 1190 thermal burns annually, 1059, or 89 percent, burn the face of the patient. Patients who smoke and set themselves on fire at the cannula pull it off quickly and extinguish the fire. It is unlikely that firebreaks will

reduce this type of fire injury or resulting death, since the fire begins proximal to its placement in the tubing.

Effective Solutions for Reducing Fires, Burns, and Deaths While Using Oxygen

The most important solution is a coordinated effort by prescribing clinicians and equipment providers to highlight and stress the dangers of smoking while on oxygen therapy through aggressive patient and caregiver warnings and education by prescribing clinicians and equipment providers.[6]

Smoking cessation is the safest way to reduce the incidence of home oxygen fires. Unfortunately, an estimated 30–50 percent of these patients continue to smoke. Many are unwilling to quit at this point in their lives, after decades of smoking. Nicotine addiction is a chronic, relapsing disease; less than 3 percent of attempts to quit result in sustained, 12-month cessation.[26] LTOT patients who smoke must be offered smoking cessation interventions, such as nicotine replacement therapy, to prevent nicotine withdrawal.[27]

If patients are going to continue to smoke, it is imperative that they understand the importance of turning off the oxygen, removing their cannula, and leaving the room where their oxygen was in use. [Appendix A] These three precautions, in addition to thoroughly explaining the dangers and consequences of smoking with oxygen therapy equipment, need to be clearly stated and presented separately from the accompanying user manual. [Appendix B] The majority of LTOT patients are elderly, and many have impaired vision, lower reading levels, and even different primary languages. Brochures and educational materials need to include pictures that perhaps realistically depict the results of a cannula fire with facial burns, as this is a very real possibility for patients who smoke while using their oxygen. [Appendix A] Educational DVDs should be produced and widely distributed. [28, 29] These videos should teach safety measures and include graphic representations of the tragic consequences that can result to families from smoking while using oxygen. The prescribing clinician and home oxygen provider share responsibility for discussing and documenting education about the hazards of smoking during oxygen therapy at the initiation of LTOT. This information needs to be reviewed at regular intervals.

A signed checklist and agreement to comply with smoking safety guidelines should be completed by the HME provider. Any witnessed violations of safety guidelines, such as smoking while oxygen is in use, should be reported to the prescribing clinician within 48 hours.[30, Appendix C] Repetition is an effective way to reinforce safety messages. The US Food and Drug Administration (FDA) requires warnings about the dangers of smoking on every package of cigarettes,[31] not on the bottom of ashtrays. Similarly, nasal cannulas are disposable items used with all oxygen systems, and require regular replacement. Their user instructions present the best opportunity for a repetitive, highly visual safety message. FDA involvement would be required to implement this intervention.

Clinicians and providers should strive to fully inform patients and their families of the risks and benefits of oxygen therapy. However, should the patient choose to continue to smoke without taking the necessary precautions, the risk of unsafe oxygen use may lead to a difficult decision of equipment removal; as an alternative, clinicians should consider exchanging continuous flow delivery with a pulse-only system. These systems are widely used for ambulation and conserve oxygen by allowing flow only when triggered by inhalation. This prevents oxygen enrichment of seating and bedding materials when the cannula is placed on them, and greatly reduces the oxygen zone about the face. The cannula does not easily ignite or burn back to the source when used with these systems.

Conclusion

Regulating agencies, HME providers, manufacturers, and health care providers who prescribe oxygen equipment all strive to formulate and recommend effective strategies to reduce the incidence of fires involving home oxygen equipment. These strategies must be effectively communicated to our patients and caregivers. It is dramatic to witness how easily and violently a nasal cannula burns. Perhaps if those who are setting up equipment and taking care of LTOT patients have viewed footage of the way these materials ignite and burn, as well as the resulting injury and damage it creates, then this danger would be more thoroughly and emphatically explained to patients and caregivers.

The use of oxygen while smoking is product misuse with deadly consequences, yet patients ignore repeated warnings even after they have had near misses or burn injuries. This warrants patient behavior modification through primary prevention measures: education and instruction. Primary prevention is always preferable to secondary prevention when dealing with the health of patients. Education is the key to reducing the impact of unsafe choices and the incidence of fires as a result of this risky behavior. While patients may not be as concerned with their own health and safety, stressing the need for the safety of loved ones together with invoking the support of family members to reinforce the steps needed to reduce risks may prove effective.

Secondary prevention measures, such as smoke alarms, fire extinguishers and firebreaks are intended to identify and treat fires early that have already occurred, but do nothing to prevent them or reduce the number of occurrences.

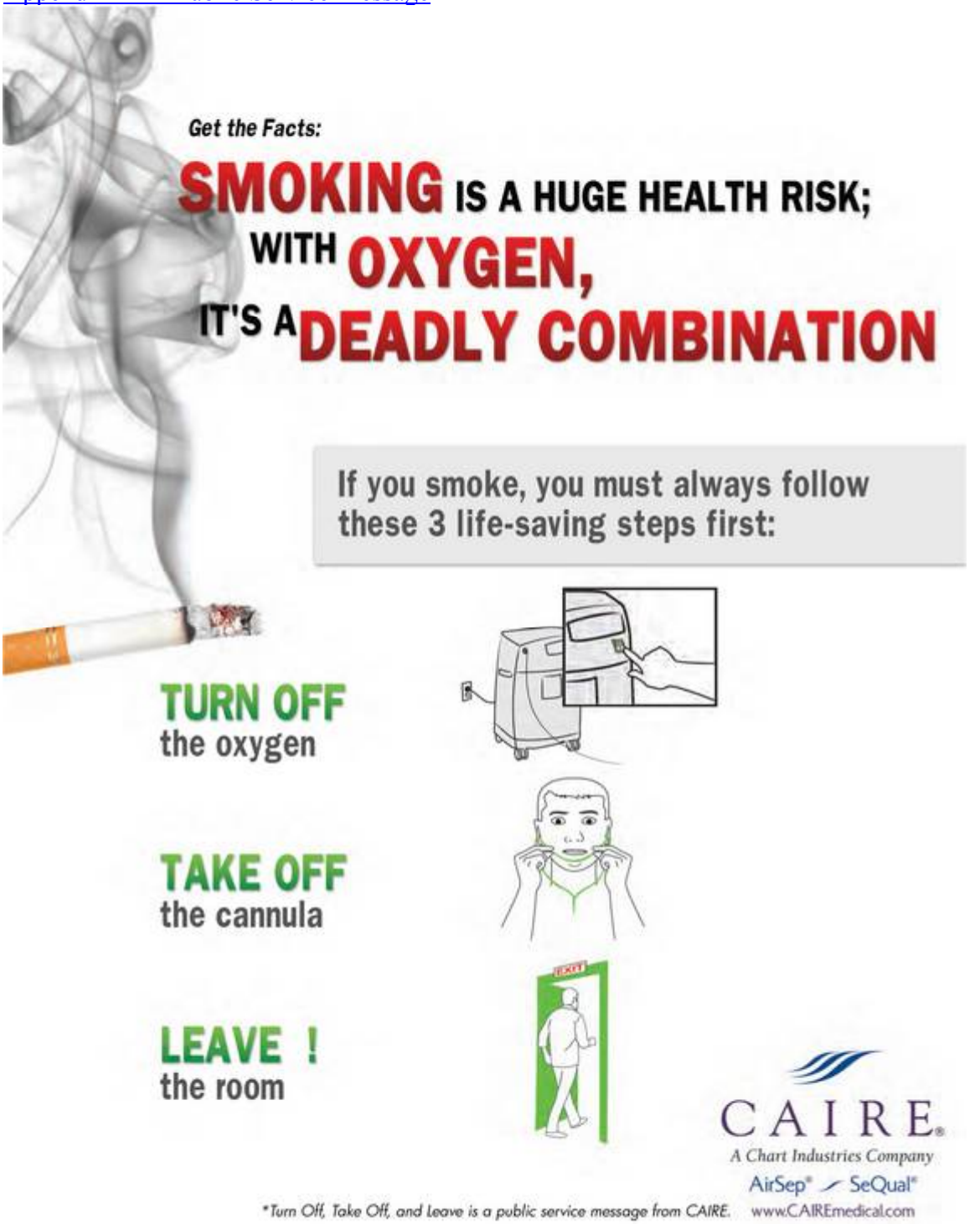
Oxygen equipment includes warnings about the dangers of smoking in their user manuals, and the devices are marked with symbols prohibiting smoking; yet, there is no warning on the oxygen cannula. While the industry's objective is no smoking, the reality is that up to 50 percent of LTOT patients continue to smoke. Although the principle of autonomy grants patients the right to continue to smoke, it is imperative that they turn the oxygen off, remove their cannula, and leave the room where their oxygen was in use.
Appendix A,B,C

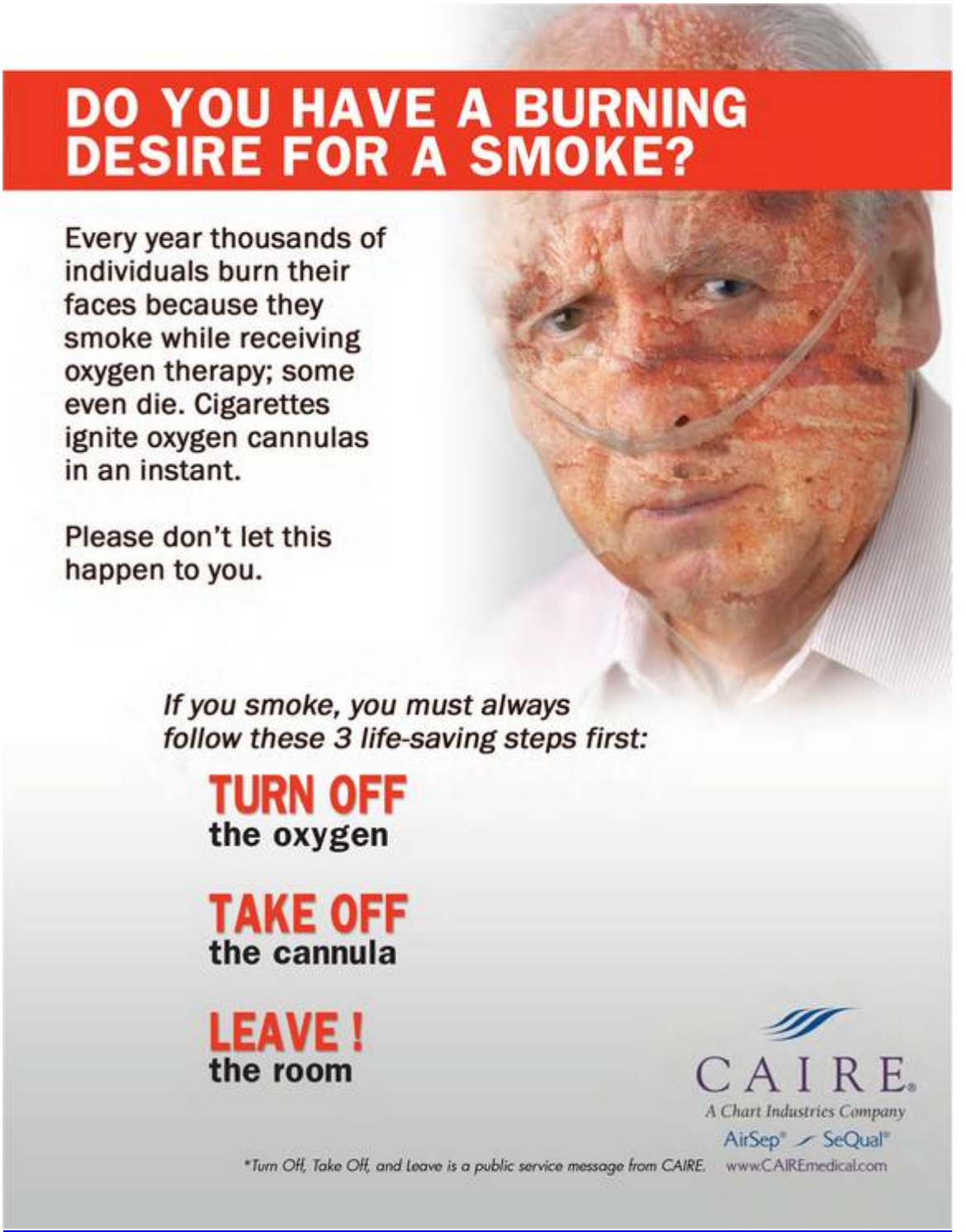
For those patients who continue to disregard warnings and engage in reckless behavior, pulse-only oxygen delivery systems represent a viable technical solution.

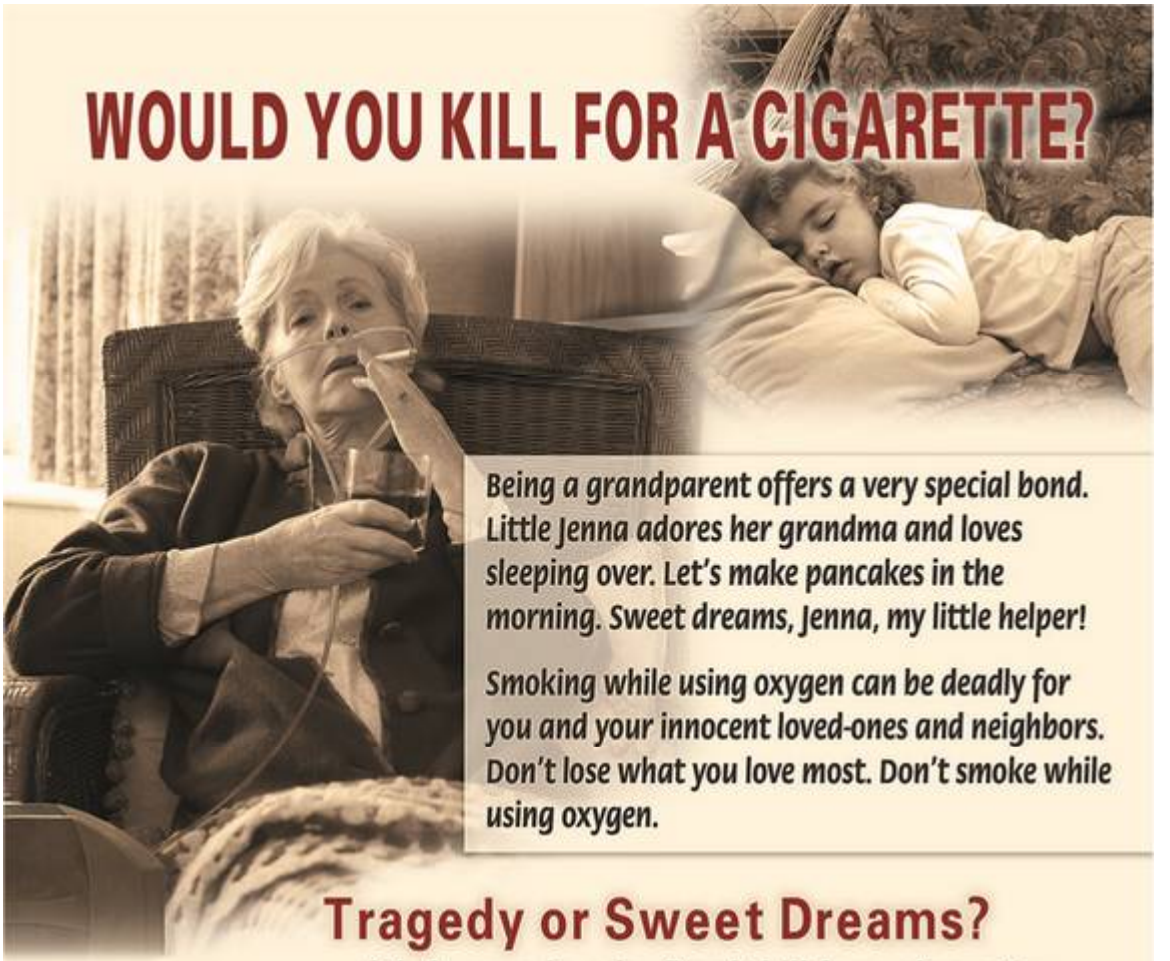
Smoking is the number one cause of death in home fires for all households in the United States, and 7 percent of the estimated 680 home fire deaths per year are related to the use of oxygen therapy equipment. For the two million households that use home oxygen, there is the added hazard of high concentration oxygen. While the size of the oxygen-enriched environment created by an oxygen concentrator in and around the patient is debatable, what happens when patients bring their cigarette too close to the cannula is irrefutable. Oxygen is not flammable, but it converts cannulas and oxygen tubing into easily ignited fuses set off by cigarettes, causing potentially deadly situations for patients and their families. Sadly, most of these injuries and deaths are preventable.

[For inquiries, contact: mpd@airsep.com]

Appendix A — Public Service Message







WOULD YOU KILL FOR A CIGARETTE?

Being a grandparent offers a very special bond. Little Jenna adores her grandma and loves sleeping over. Let's make pancakes in the morning. Sweet dreams, Jenna, my little helper!

Smoking while using oxygen can be deadly for you and your innocent loved-ones and neighbors. Don't lose what you love most. Don't smoke while using oxygen.

Tragedy or Sweet Dreams?

It's in your hands. Don't kill for a cigarette.

If you smoke, you must always follow these 3 important life-saving steps first:

TURN OFF the oxygen

TAKE OFF the cannula

LEAVE ! the room

CAIRE®
A Chart Industries Company
AirSep® SeQual®
www.CAIREmedical.com

*Turn Off, Take Off, and Leave is a public service message from CAIRE.

Appendix B — Warnings for User Manual

DO NOT OPERATE THIS EQUIPMENT WITHOUT FIRST READING AND UNDERSTANDING THIS MANUAL. IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS AND INSTRUCTIONS, CONTACT YOUR EQUIPMENT PROVIDER BEFORE ATTEMPTING TO USE THIS EQUIPMENT; OTHERWISE, INJURY OR DAMAGE COULD OCCUR.

Smoking while using oxygen is the number one cause of fire injuries and related deaths. You must follow these safety warnings:

Do not allow smoking, candles, or open flames in the same room with the device or within 5 feet (1.52 meters) of the oxygen-carrying accessories.

Smoking while wearing an oxygen cannula can cause facial burns and possibly death.

Removing the cannula and putting it on clothing, bedding, sofas, or other cushion material will cause a flash fire when exposed to a cigarette, heat source, or flame.

If you smoke, you must always follow these 3 important steps first: turn off the oxygen concentrator, take off the cannula, and leave the room where this device is located.

"No Smoking – Oxygen in Use" signs must be prominently displayed in the home, or where the oxygen concentrator is in use. Patients and their caregivers must be informed about the dangers of smoking in the presence of, or while using, medical oxygen.

Appendix C — Home Oxygen Fire Safety (Sample Form)

Home Oxygen Patient Fire Safety Agreement

- Patient has been informed that oxygen makes things burn easily and rapidly, and there must be no open flames, matches, lighters, candles, or heat sources within 5 feet (1.2 m) of the oxygen equipment or oxygen cannula and tubing.
- Patient has been informed that no smoking is permitted while oxygen is in use.
- Patient has been informed that no smoking is permitted while wearing an oxygen cannula, as it results in fire, facial burns, and possibly death.
- Patient has been informed that removing the cannula and placing it on surfaces such as bedding, sofas, and other cushion material while oxygen is flowing will cause a flash fire when exposed to a cigarette, heat source, or flame.
- Patient has been informed that oxygen must be turned off when not in use.
- If unable to stop smoking, the patient has been instructed on the 3 Life-Saving Steps: always turn off the oxygen, take off the cannula, and leave the room where the oxygen supply is located.
- Smoke alarms are present, and patient agrees to test alarms monthly.
- "No Smoking, Oxygen in Use" signs are provided and posted.
- The "3 Life-Saving Steps" signs are provided and posted.

I agree to comply with the above safety guidelines:

_____ _____
Patient Signature Date

_____ _____
HME Representative Signature Date

HME Representative Comments: _____

_____

_____

_____

Note: These safety warnings must be covered during oxygen equipment installation and at each patient visit. If risky behavior is observed, such as smoking while using oxygen, smoking in close proximity to oxygen equipment or accessories, or absent smoke alarms, this form will be signed and forwarded to prescribing clinician within 48 hours.

MK285-1 08/12

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