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Hazards of using portable oxygen equipment in smoking-permitted areas

Smoking near portable oxygen equipment can result in explosions and fires that are life-threatening. This can happen in a home, as well as a public place that is smoking-permitted. The United States Food and Drug Administration (FDA), the National Fire Prevention Association (NFPA), and other leading experts on home oxygen therapy use, recommend that smoking should not be allowed where portable oxygen is in use – see details on page 2.

A. Hazards in Housing and Public Places that are Smoking-Permitted

Housing residents may need to use portable oxygen, when residing in single-building, or multi-unit housing. A neighboring tenant or visitor who smokes on property could create a hazardous condition of an explosion or fire, due to igniting the oxygen from their lit cigarette. Note that breathing-disabled persons may require a reasonable accommodation of a 100% smokefree environment, in the home, at work and in public places. Creating 100% smokefree policies reduces the risk of fire in multi-unit buildings, especially in buildings that house tenants using medical oxygen for health reasons (seniors and children with asthma, COPD, etc). A tenant on portable oxygen needs a 100% smokefree living environment, and this may include not only their apartment, but neighboring apartments due to shared ventilation systems and air space between walls, floors and ceilings where secondhand smoke can seep through. Common areas such as hallways, stairwells, laundry rooms and other shared space also need to be 100% smokefree, as well as outdoors near entrances and exits to buildings, and by open windows to their units.

Note that a breathing-disabled person, whether or not using portable oxygen, may require a reasonable accommodation of a 100% smokefree unit, and even building. A person may temporarily qualify as disabled, such as asthmatic or COPD onset due to secondhand smoke exposure. A person may also be qualified as disabled, even if medications help to mitigate their condition.

Housing authorities and market rate property owners and managers should institute a smokefree policy. At a minimum, the policy should ban smoking in units where portable oxygen is in use, as well as in neighboring units and in all common areas and outdoor areas where persons on portable oxygen need to go through. Not only will this policy protect the tenants and visitors from these types of fires, but it may also protect the housing authority and property owner and manager from liability for damages. The best protection would be to institute a policy that requires the building and outdoor property be 100% smokefree.

In 2009, the Titusville Housing Authority in Pennsylvania unanimously approved a 100% smoking ban throughout its properties, both inside its facilities and outside on the property including the parking lots. This policy was in response to a nearby housing authority fire started when a lit cigarette ignited a portable oxygen tank. This Titusville Housing Authority policy was instituted on the advice that it would protect the housing authority from being liable for damages. Read the Titusville Housing Authority resolution 650-09 bans smoking inside the buildings and outside (http://www.njgasp.org/Titusville_PA_housing_policy_650-09.pdf); resolution 661-09 (http://www.njgasp.org/Titusville_PA_housing_policy_661-09.pdf) requires tenants using portable oxygen to sign an acknowledgment agreeing to proper use and storage, including no smoking in room when in use. 2009 news article from the Titusville Herald http://www.njgasp.org/Titusville_Housing_Authority_newsclip.pdf

Public places that are smoking-permitted, create a hazardous condition for visitors using portable oxygen on premises. For example, nonsmoking casino patrons and visitors may use portable medical oxygen in a smoking-permitted casino. By allowing smoking and lighted cigarettes on a gaming floor near portable oxygen use, casinos create a potentially hazardous and deadly environment. Casinos may need to reasonably accommodate several categories of breathing-disabled patrons, and provide a 100% smokefree casino that is free of environmental and safety hazards, such as lighted smoking-materials:

- (1) A person on portable oxygen may be classified as breathing-disabled (chronic asthma, COPD, cardiac condition), and thus require a reasonable accommodation of a 100% smokefree casino.
- (2) A person (breathing, cardiac conditions, etc.) whose disability is adversely affected by secondhand smoke may qualify as breathing-disabled, and require a reasonable accommodation of a 100% smokefree casino.
- (3) A person may also qualify temporarily as disabled, such as asthmatic or COPD onset due to secondhand smoke exposure, and need an accommodation of a 100% smokefree environment in a public place, such as a casino.
- (4) Taking medications help to mitigate a disabling condition, no longer disqualifies a person from being qualified as disabled, since the underlying medical condition continues to exist.

Below please find: Expert recommendations on home oxygen therapy usage, from NFPA, FDA and home oxygen therapy manufacturer; news stories describing explosions, fires, and death that resulted when people smoked while using portable oxygen tanks, and research on the subject.

B. National Fire Prevention Association Recommendations/Precautions

1. The National Fire Prevention Association (NFPA) recommends that smoking should not be allowed in a home where oxygen is in use, and encourages smokers to smoke outside. Source: National Fire Protection Association website in "Selected Published Smoking-Material Fire Incidents". (March 2006)

<http://www.nfpa.org/assets/files/PDF/Smokingmaterialincidents.pdf>

2. NFPA's August 2008 research report, *Fires and Burns Involving Home Medical Oxygen*, (by Marty Ahrens, Fire Analysis and Research Division <http://www.nfpa.org/assets/files/pdf/os.oxygen.pdf> shares findings on smoking materials-related fires:

- "Smoking is by far the leading cause of burns, reported fires, deaths, and injuries involving home medical oxygen." U.S. fire departments responded to an estimated average of 182 home fires per year in which oxygen administration equipment was involved in ignition. Forty-six people per year died in these fires. Smoking is by far the leading factor in these incidents.
- Smoking materials were the heat source for 73% of medical oxygen-related burns seen at hospital emergency rooms. NFPA, August 2008.
- Fire Safety Tips for Home Medical Oxygen Users: Smoking should not be allowed in a home where oxygen is used. Even if oxygen is not being used, it may have saturated the home including clothing, curtains, furniture, bedding, hair, and anything in the area. Safety Tips: Never smoke in a home where oxygen is used, and post "no smoking" signs in and outside of the home to remind residents and guests not to smoke.

2. The NFPA states that smoking materials (cigarettes, cigars, pipes, etc.) are the leading cause of fire deaths in the United States. Roughly one of every four fire deaths in 2001 was attributed to smoking materials. Source: NFPA's "The Smoking-Material Fire Problem", August 2006, by John R. Hall, Jr.

<http://www.nfpa.org/assets/files/PDF/OS.SmokingMaterials.pdf>

3. The United States Fire Administration's 2007 campaign to prevent home fires from smoking is called "If you smoke, put it out. All the way. Every time." The campaign includes Consumer Fact Sheets in English and Spanish

(<http://www.usfa.dhs.gov/downloads/pdf/smoking/ConsumerFactSheet.pdf> and

(<http://www.usfa.dhs.gov/downloads/pdf/smoking/ConsumerFactSheetSpanish.pdf>).

Pertinent campaign messages are:

- Smoking is the #1 cause of home fire deaths in the United States.
- Never smoke in a home where portable oxygen is used, even if the oxygen is turned off.
- Most home fires are caused by smoking materials start inside the homes.
- If one smokes, to do so only outside and not in the home.

USFA is a division of the Federal Emergency Management Agency (FEMA) and is part of the U.S. Department of Homeland Security.

C. FDA Recommendations/Precautions

The FDA regulates medical gases, such as oxygen, as prescription drugs, and regulates the related delivery hardware, such as concentrators, tubing, and regulators, as medical devices.

1. FDA And NIOSH Public Health Advisory: Explosions and Fires in Aluminum Oxygen Regulators, February 1999. "This notice is to advise you of hazards with oxygen regulators made of aluminum and to provide recommendations regarding these devices." "Safe Practices for Handling and Operating Oxygen Equipment: Storage, Maintenance and Handling: Do not allow smoking around oxygen."

2. Consumer Safety Officer Duane Sylvia, for the Food and Drug Administration's Center for Drug Evaluation and Research stated: "My experience has been that

smoking around oxygen may cause fires... Smoking anywhere near oxygen, even in the same room, can be extremely dangerous." FDA consumer magazine, July-August 2000. http://www.fda.gov/fdac/features/2000/400_gas.html

D. Home Oxygen Therapy Usage Precautions

The Cleveland Clinic Health System provides precautions when using portable oxygen, if the user is near a combustion source. Their website expressly states the following:

"Do not smoke nor allow others to smoke in the same room as your oxygen system. Cigarette smoking is very dangerous: sparks from a lighted cigarette could cause facial burns."

"Is home oxygen therapy safe?"

Yes. Oxygen is a safe gas as long as it is used properly. Contrary to what most people believe, oxygen will not explode. Oxygen does, however, support combustion. Therefore, any material that is already burning will burn much faster and hotter in an oxygen-enriched atmosphere. It is very important to follow these precautions so that you and your family are safe when you are using your oxygen.

Oxygen use precautions

1. Stay at least six feet away from any open flame or heat source (candles, gas stove, etc.) when you are using your oxygen system. If you must cook while using oxygen, make sure your tubing will not touch the gas flame or electric burner (tuck the tubing in your shirt or position it behind you).
2. Do not store your oxygen system near any heat sources or open flames.
3. Do not smoke nor allow others to smoke in the same room as your oxygen system. Cigarette smoking is very dangerous: sparks from a lighted cigarette could cause facial burns.
4. Post "No Smoking" signs in the room where your oxygen is kept.
5. Keep the oxygen system away from aerosol cans or sprays, including air fresheners or hair spray. These products are very flammable.
6. Do not use cleaning products or other products containing grease or oils, petroleum jelly, alcohol or flammable liquids on or near your oxygen system. These substances cause oxygen to be flammable."

Source: <http://www.cchs.net/health/health-info/docs/2400/2412.asp?index=8707>

E. Studies on Medical Oxygen Use and Smoking, Resulting in Fires/Fatalities

The August 8, 2008 issue of The Morbidity and Mortality Weekly Report (MMWR), by the U.S. Centers for Disease Control, stated: "Strategies to prevent fire-related injuries should be emphasized. Patients and their household contacts should be thoroughly educated about the dangers of smoking in the presence of medical oxygen." Morbidity and Mortality Weekly Report has an article titled Fatal Fires Associated with Smoking During Long-Term Oxygen Therapy --- Maine, Massachusetts, New Hampshire, and Oklahoma, 2000—2007, 57(31);852-854.

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5731a3.htm?s_cid=mm5731a3_e

7% of fatal victims who were smokers were under treatment for medical oxygen, when the smoking material ignited the fire. Hall JR, Ahrens M, Rohr K, Gamache S, Comoletti J. Behavioral mitigation of smoking fires through strategies based on statistical analysis. Emmitsburg, MD: US Department of Homeland Security, US Fire Administration; 2006, page 21. <http://www.usfa.dhs.gov/downloads/pdf/publications/fa-302-508.pdf>

Residential Smoking Fires and Casualties, U.S. Fire Administration/National Fire Data Center, June 2005. <http://www.usfa.dhs.gov/downloads/pdf/tfrs/v5i5.pdf>

F. News stories: Smoking near portable oxygen usage results in explosions

A tenant died from a fire that was started by careless smoking while using oxygen as reported May 17, 2011. He lived in Newton, NJ on the 5th floor of a 10 story apartment building. All other residents had to be evacuated and 5 other residents in the building were taken to the hospital for smoke inhalation and minor injuries. Reported by Daily Record. http://www.njgasp.org/Daily_Record_Fire_with_oxygen_use_5-17-2011.pdf

Five tenants are injured, and 8 apartments are extensively damaged, from a fire caused by a tenant smoking while using medical oxygen. Reno Nevada, May 8, 2009. Injuries sustained by four tenants from other apartments ranged from burns to broken ribs, to smoke inhalation. The elderly resident using oxygen dropped their cigarette onto the floor. Oxygen bottles exploded in the fire. Reported by Reno Gazette-Journal. http://www.tobacco.org/articles/category/fires/?code=fires&pattern=oxygen&starting_at=15

Tenant displaced by upstairs neighbor's fire due to smoking when using medical oxygen. Berkeley, NJ, October 28, 2006. Reported by Asbury Park Press. http://www.njgasp.org/i_health_Fire_man_on_oxygen_drops_his_cigarette%5B1%5D.pdf

Additional newscips on fires caused by smoking near portable oxygen usage are reported at www.Newsbank.com. Go to <http://nl.newsbank.com/sites/lmdb/>, and in the search box, type "smoking oxygen fire".

Visit the Tobacco.org website where you'll find plenty of news articles about fires caused by smoking near portable oxygen:
http://www.tobacco.org/articles/category/fires/?code=fires&pattern=oxygen&starting_at=15

Cigarette Break Kills Patient On Oxygen, January 19, 2006

"A resident died at an Escondido, CA, nursing home after his oxygen tank burst into flames, according to the San Jose Mercury News. The 67-year-old man was reportedly sitting outside at Palomar Heights Care Center and smoking a cigarette while his oxygen was turned on. SNF employees sprayed him with a fire extinguisher after the tank exploded, but the man later died of burns and inhalation at a nearby hospital."

Publisher's Note: Risk managers need to re-think their smoking policies

http://www.medlaw.com/healthlaw/HOSPITAL/6_2/cigarette-break-kills-pat.shtml

Sacramento, California. A woman using oxygen at home and smoking causes injury and property loss. "A Grass Valley woman was burned over half of her body Tuesday morning when her home oxygen pump - attached to an oxygen tank - ignited by her cigarette, exploded and burned down her home on the 10000 block of Lovus Court. Deborah Miller was airlifted to UC Davis Medical Center in Sacramento for burns she received Tuesday shortly before 6 a.m. in the house fire. She was listed in critical condition Tuesday

afternoon. Two of her family members received minor injuries in the fire, said Nevada County Consolidated Fire District Fire Chief Tim Fike."

<http://www.theunion.com/article/20060201/NEWS/60131010&SearchID=73262835027211>

Postscript: The Grass Valley woman subsequently died of her injuries

<http://theunion.com/article/20060204/NEWS/102040146&SearchID=73262835348836>

G. Fires caused by Smoking-Related Materials, Casualties

Smoke-Free Housing Consultants <http://www.s-fhc.com/firerisk.htm> summarizes quotes from leading fire prevention organizations and insurance companies, regarding fires started by smoking-related materials. The following is shared directly from Smoke-Free Housing Consultants' website:

Federal Emergency Management Agency's (FEMA's) U.S. Fire Administration, Press Release dated July 20, 2005; Release Number: HQ-05-154:

In 2002 alone, lighted tobacco products caused an estimated 14,450 residential fires, 520 civilian deaths, 1,330 injuries, and \$371 million in residential property damage, according to a new report issued today by the Federal Emergency Management Agency's U.S. Fire Administration.

Michael D. Brown, Under Secretary of Homeland Security for Emergency Preparedness and Response and head of FEMA said the report shows that smokers need to be more attentive. "Each year, smoking fires generally result in the highest fatality rate and are among the highest injury rates for residential fires," Brown said. "Smoking fires account for a large number of preventable fires and injuries. ...

The report, Residential Smoking Fires and Casualties, was developed by the National Fire Data Center, part of FEMA's U.S. Fire Administration, and is based on data from the 2002 National Fire Incident Reporting System (NFIRS). The report summarizes the characteristics of smoking fires, with an emphasis on the casualties associated with these fires. Forty percent of all smoking fires start in the bedroom or living room/family room areas of the home. In 35% of smoking fires, upholstered furniture, mattresses, pillows, or bedding were the items first ignited.

A copy of the full report can be downloaded from:

www.usfa.fema.gov/statistics/reports/pubs/tfrs.shtm

U.S. Consumer Product Safety Commission: "More than 90 percent of residential fire deaths and injuries result from fires in one and two family houses and apartments. Property losses exceed 4 billion dollars annually, and the long term emotional damage to victims and their loved ones is incalculable."

<http://www.cpsc.gov/cpsc/pub/pubs/556a.html>

National Fire Protection Agency: "More people die in smoking-material fires than in any other type of fire in the U.S."

<http://www.nfpa.org/assets/files/PDF/ossmoking.pdf>

The Hartford Insurance Company: "More people die in fires started by smoking materials than in any other type of fire. These fires start when lighted tobacco products, most often cigarettes, are improperly discarded or abandoned and ignite

mattresses, bedding, upholstered furniture, trash and other combustible items."
<http://hartfordauto.thehartford.com/Safe-Driving/Home-Safety/Fire-Safety/>

H. NJ Uniform Fire Code 5:7-3 applicable to smoking while using portable oxygen

Section 102 (General Provisions) – 102.1.1 #1 Dangerous conditions that are liable to cause or contribute to the spread of fire in or on said premises, building or structure or endanger the occupants thereof;

Section 308 Open flames – 308.2 Where Prohibited. A person shall not take or utilize an open flame or light in a structure, vessel, boat, or other place where highly flammable, combustible or explosive material is utilized or stored.

Section 308.2.1 Throwing or placing sources of ignition. No person shall throw or place, or caused to be thrown or placed, a lighted match, cigar, cigarette, or other flaming or glowing substance or object on any surface or article where it can cause an unwanted fire.

Section 308.3 Open flame. A person shall not utilize or allow to be utilized an open flame in connection with a public meeting or gathering for purposes of deliberation, entertainment, amusement, instruction, education, recreation, awaiting transportation or similar purpose in Group A or E occupancies without first obtain a permit.

Section 310 Smoking Prohibited areas. Smoking shall be prohibited where conditions are such as to make smoking a hazard, and in spaces where flammable or combustible materials are stored or handled.

Section 3003.7 Separation from hazardous conditions.

Section 3003.7.7 Sources of ignition. Open flames and high temperature devices shall not be used in a manner which creates a hazardous condition.

NFPA (Codes and Standards) 55: Compressed Gases and Cryogenic Fluids Code, echoes Section 3003.7.7 for sources of ignition.