
Guide to Teaching Fire Safety to Students with Disabilities

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Guide to Teaching Fire Safety to Students with Disabilities

Michael H. Minger Foundation (www.mingerfoundation.org)

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FORWARD

With great passion for the work our foundation does in raising awareness about campus fire safety, we are pleased to offer this guide as a tool for addressing fire safety concerns for students with disabilities. As part of this project, we have had a great opportunity to work with wonderful young people who live everyday with functional differences, and who have enlightened us all about the challenges they face and given us a glimpse of how we can better assist them. I am humbled by their courage and inspired by their strength to continue to look for ways to improve fire safety conditions for all students.

We have much work to do. This is just the beginning of bridging a gap that has existed much too long in addressing fire safety issues for our disabled students. The college students we have worked with have hearing, sight or mobility impairments as well as a student with a learning disorder, Aspergers which is often referred to as a "hidden disability."

My son, Michael, was a student with a learning disorder. He was a serious student, with a 3.936 GPA, and he was very excited to have the opportunity to go to college. Michael was killed in a residence hall fire and his learning disorder was a factor in his death.

Our mission is to continue to improve campus fire safety for all students, with a focus on our students with disabilities. Our goal is to minimize their potential risk and save the other Michaels that are attending colleges and universities across our nation.

Thank you so much for your commitment to making our campuses safer and for teaching these vital fire safety messages to these students.



Gail L. Minger, President
Michael H. Minger Foundation
www.mingerfoundation.org

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INTRODUCTION

Fire safety is something that everyone should have the opportunity to learn and practice. However, there are different demographics for which there need to be different styles of teaching. Different ages, cultures and abilities. For each of these different demographics it is important that the fire safety educator tailor his or her teaching style to ensure that this life-saving information is understood and effectively communicated. While the purpose of this Guide is to provide information on how to teach fire safety to college and university students with disabilities, the information in this document can be used for a wide range of people of any age, whether they are attending a college and university or not.

This Guide was developed under a Department of Homeland Security Fire Prevention and Safety Grant awarded to the Michael H. Minger Foundation. The Foundation was formed to honor the life of Michael H. Minger following his tragic death in an arson fire in a residence hall at Murray State University on September 18, 1998. The purpose of the Foundation is to raise awareness and better educate the millions of students attending colleges and universities across the nation about fire safety and was established to address the needs of students with disabilities and how campus communities can better serve this group of students. The Foundation strives to improve fire safety on college and university campuses and, through these endeavors, save lives.

To help in guiding the progress of this grant, an Advisory Committee was formed of experts with a diversity of backgrounds. Regular teleconferences were held with this Committee to keep them apprised of the grant progress and for the project to benefit from their experience and their access to institutions of higher education.

Advisory Committee

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Overseeing the grant was a project management team that was comprised of Gail Minger, president of the Michael H. Minger Foundation and Ed Comeau, owner of writer-tech.com and publisher of Campus Firewatch.

Mrs. Minger lost her son, Michael, in a residence hall arson fire in 1998 and since that time has become a strong advocate for campus fire safety. She is a recognized national expert in the field and has been instrumental in effecting change in Kentucky with the passage of the Michael Minger Act and nationally as well. She is a member of the Board of Advisors for Security on Campus, was a member of the Board of Directors for the Center for Campus Fire Safety and is Founding Advisory Board Member for Common Voices, a fire safety advocacy organization comprised of fire safety survivors and parents which was awarded the Paul Sarbanes Fire Service Safety Leadership Award. She is also the recipient of the Jeanne Clery Advocate of the Year Award.

Mr. Comeau is the former chief fire investigator for the National Fire Protection Association, current publisher of Campus Firewatch, and founder and former director of the non-profit Center for Campus Fire Safety. He is the author of the chapter on campus fire safety for the NFPA Fire Protection Handbook and organizer of the annual National Campus Fire Safety Month campaign each September. He has worked on a number of educational programs including *To Hell and Back: College Fire Survival* and *Graduation: Fatally Denied*. He was selected to serve on the U.S. Department of Education committee developing the regulations for the Campus Fire Safety Right-to-Know Law as a representative of the Minger Foundation.

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1.0 OVERVIEW

This guide was developed under a grant awarded from the DHS/FEMA's Grant Program Directorate for Assistance to Firefighters Grant Program to the Michael H. Minger Foundation (www.mingerfoundation.org). The goal of this guide is to provide information to assist in teaching fire safety to students with disabilities.

1.1 Audience for this guide

The intended audience for this guide is campus and community fire safety educators and others that may be tasked with teaching fire safety to students with disabilities. This guide is for those that have knowledge in fire safety education but may not have experience in teaching it to students with disabilities. For this reason, this guide does not go in depth into basic fire safety information which can be found elsewhere, such as at the U.S. Fire Administration (www.ufsa.dhs.gov) or the National Fire Protection Association (www.nfpa.org). What it does focus on is how to interact with these students and how this basic fire safety information may need to be tailored to address the needs of these students.

1.2 Students with disabilities

There are many definitions of disabled and, for your purposes, a definition does not matter. What matters is that you have a person who has a functional disability (hearing, visual, mobility, learning/developmental disorder) that you need to address in making sure they know what to do to prevent a fire and what to do in the event that one breaks out.

It is important to also include caregivers in this training as well as the student. A caregiver is a vital part of any fire safety plan for students with disabilities and these people should know, just as much as the student, how to prevent a fire and what to do in the event that one breaks out.

It is unknown exactly what impact disabilities have on the number of fire deaths and injuries. The U.S. Fire Administration has made an effort to identify the impact of disabilities through two recent publications, Residential Building Fires Involving Individuals with Physical Disabilities (June 2011) and Residential Building Fires Involving Individuals with Mental Disabilities (June 2011), both available from the Minger Foundation's web site.

What is important to note in these reports is that the number of fires, deaths, injuries and property damage reported is an extremely small percentage of all residential fires that occur each year in the United States. This information was taken from the National Fire Incident Reporting System which is a voluntary national reporting system that not all fire departments use. For this reason, there are gaps in the reporting system which necessitate making estimates as to the full scope of the data. Given the relatively extremely small number of fires and the gap in the reporting system, the relevance of the data in relation to real-world experience may be inconsistent.

1.3 Life-long skills

What you are teaching these students is for life, not just while they are attending college. They will always need to know about two ways out, smoke alarms, sprinklers and cooking fire safety. This also applies no matter where they are, whether it is their residence hall, apartment, house, nightclub, movie theater or restaurant. What is important to emphasize is that this knowledge is something they will always need, now and long into the future. After all, fire safety, it's a part of living!

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1.4 Personal responsibility

Everyone, whether they have a disability or not, has a personal responsibility for their own fire safety. It is society's and the school's responsibility to provide students with a fire safe environment. However, it is the student's responsibility to be personally fire safe by knowing how to prevent a fire and what to do if one should break out.

The student is responsible for finding fire safe housing, whether it is on- or off-campus and ensuring that it is maintained in a safe condition. This includes factors such as ensuring that the smoke alarms are always operational, for example.

It is also the student's responsibility to seek help and learn and practice the skills they need before a fire. It is important to emphasize that no matter how fire safety he or she may be, that may not always be the case with others around them and could place them in danger with their unsafe fire behavior.

1.5 What this Guide is about

This Guide is about

- How to tailor the discussion to the person's specific needs
- How to communicate effectively with students with disabilities
- Specific requirements that may be needed to ensure the person's fire safety.

It is not possible in this guide to address every fire safety issue or all of the different disabilities that exist. This guide focuses on four general areas of disability:

- Vision
- Hearing
- Mobility
- Learning or developmental disorders

The material provided by this project should be used in conjunction with other appropriate educational material.

1.6 Resources available from the Michael H. Minger Foundation

As part of this project, the Minger Foundation has developed several tools to assist the fire safety educator.

Videos

Five videos are available at www.mingerfoundation.org. Four of them feature students with different disabilities talking about fire safety. These are all closed-captioned and available for viewing through the Minger Foundation web site.

- Hearing – Sarah Honigfeld
- Vision – Carey Scouler
- Mobility – Shari Zakim
- Learning and Developmental Disorders – Ian Miller

The fifth video is a train-the-trainer production that features each of the students talking about how to best teach them fire safety. It also features a narrative from Captain Bill Cannata who has an autistic son and teaches first responders how to deal with people with autism during emergencies.

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These videos were filmed and produced by a team of recent graduates from Emerson College who brought a vital, real-world perspective of student fire safety to the project through their production company is Handheld Studios (www.handheldstudios.com)

- Matthew Hashiguchi
- Rachel Rynderman
- Elaine McMillion
- Nathaniel Hansen

Research

The Minger Foundation has compiled an extensive (and growing) library of research focusing on fire safety for people with disabilities that is available on at www.mingerfoundation.org. The listing of documents, at the time of publication of this guide, is included in Appendix B.

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2.0 DISABILITIES

As mentioned earlier, this guide focuses on four general areas of disabilities.

2.1 Vision

Visual

People with visual impairment have a medical condition or impairment that impedes their ability to have aided or unaided vision.¹

Blind

People who are blind have a medical condition or impairment that completely impedes their ability to have aided or unaided vision.²

2.2 Hearing

Deaf

People who are deaf may have either a medical condition or impairment that impedes their ability to hear.³

Hard of Hearing

People who are hard of hearing may have been born hard of hearing or have lost their ability to hear later in life. They may use assistive devices, such as hearing aids, but when they remove these devices they are deaf.⁴

2.3 Mobility

People with mobility impairment have a disability or medical condition that impedes their ability to stand aided or unaided without support of an assistive device.⁵

¹Fire Safety Solutions for People with Disabilities, Oklahoma State University, p 4 www.mingerfoundation.org/projects/fire-safety-info/downloadable-resources/

²ibid.

³ibid.

⁴ibid.

⁵ibid.

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2.4 Learning and developmental disorders

Individuals with learning disorders have normal intelligence but have trouble with academic and/or social learning. They may have trouble with reading or mathematics or spatial information. Learning disorders includes individuals with Asperger Disorder; these individuals have trouble understanding voice tone, gestures, facial expressions, and other social communications. They may be disturbed by loud noises, bright lights, or crowds of people. Individuals with Attention Deficit Disorder are included in this category. These individuals may have trouble planning ahead or thinking carefully before taking an action.⁶

⁶Personal communication, Dr. Michele Berg, Family Service and Guidance Center

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3.0 FIRE SAFETY TOPICS

Three fire safety/prevention topics were selected after asking campus fire safety experts across the nation what were the topics they felt were underserved and the most needed.

- Egress
- Cooking
- Fire safety equipment
 - Automatic fire sprinklers
 - Smoke alarms

This guide does not provide comprehensive information about each of these fire safety topics but focuses on the impact that a person's disability may have. This guide should be used with other resources and information available from organizations such as the U.S. Fire Administration or the National Fire Protection Association in teaching this material.

3.1 Concerns regarding fire safety and disabilities

Depending upon the disability, or disabilities, a person may have, a fire safety plan may have to be tailored to their specific needs. For example, for a person who is deaf or hard of hearing, special devices may be needed to alert them to a fire.

These modifications may also depend upon the type of building they are living in. For example, if someone uses a wheelchair and depends upon an elevator to normally access the upper floors of a building, a plan should be developed for when an elevator is not available during an emergency evacuation.

3.2 Approaching the issue of fire safety for students with disabilities

First and foremost, talk with the student and ask:

- What are their concerns about fire safety in relation to their lifestyle
- What provisions might need to be made for them in relation to their disability
- Ask how they can help you help them be fire safe

Developing a dialogue with the student to learn more about his or her concerns and needs is a critical step in developing a fire safety training program and a fire safety plan. The NFPA has developed a Personal Emergency Evacuation Planning Checklist (Appendix C) that can assist you and the student in identifying potential concerns before the emergency.

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Determine the student's needs BEFORE the training session.

For example, you need to determine if

- You will need a sign language interpreter for a student that is deaf or hard of hearing
- There are access difficulties with the facility that may impact someone who is mobility impaired
- Your presentation is heavily visually-based which will not be as effective with someone who is visually impaired
- You have students that have learning disorders for which you will have to take a different approach. For example, a student with reading problems may learn more easily through listening. You can read text on slides or other materials aloud. A student with Asperger disorder may be distracted or anxious if there is a large group present and may need a place to sit that is somewhat away from the group.
- You may also get guidance from the school's Office of Disabilities Services. Every school is mandated to have someone who is responsible for providing disabilities services to the students. Staff in the Office of Disabilities Services is invested in the safety of their students, are willing to help, and are very knowledgeable about a broad range of disabilities and instructional strategies that are effective with students with disabilities.

4.0 SOCIAL ETIQUETTE WHEN WORKING WITH PEOPLE WITH DISABILITIES

Some people are unfamiliar with how to interact with people with disabilities and unintentionally may say or do something that is inappropriate. There are some simple guidelines that you can follow in your interactions to avoid this from happening (the following material is taken from Fire Safety Solutions for People with Disabilities developed by Oklahoma State University. This document is available at www.mingerfoundation.org.)

- Use “People First” language. Say “a person who is deaf” and not “deaf person.”
- Say “people with disabilities” as opposed to “handicapped, challenged or special”
- Avoid making assumptions about someone and their disability.
- Try to give people with disabilities options rather than dictating what they must do.
- Disregard the idea that you are saving people with disabilities. Many are self-reliant.
- Greeting people with disabilities. You can use common expressions such as “see you later,” or “Did you hear about that?” Don’t be embarrassed.

4.1 Interacting with people who are visually impaired or blind⁷

Social Etiquette for people who have visual impairments or are blind

- Tell the student when you leave, even if for a minute. Tell them how long you will be gone.
- Identify to whom you are speaking if there is a group of people present.
- Explain to people with visual disabilities where you will place tools or other objects that you may be using.
- Do not move items without telling people with visual impairments.
- Walk on the opposite side of the person who is using a service animal.
- If people with visual impairments use a cane and have set it down, do not move it, ask them to move it themselves.

⁷Fire Safety Solutions for People with Disabilities, Oklahoma State University, Appendix F, p. 5. www.mingerfoundation.org/projects/fire-safety-info/downloadable-resources/

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Greetings for people who have visual impairments or are blind

- When you approach people with visual impairments, state clearly who you are in a normal tone of voice.
- When extending a handshake, say “let’s shake hands,” so people with visual impairments know what you are doing.
- Announce your presence by speaking first. Touch people with visual impairments lightly on the arm to indicate exactly where you are located. Sometimes it is difficult for them to determine exactly where you are because the acoustics of rooms vary.
- Look directly at people with visual impairments. This may feel awkward at first because you are used to having direct eye contact with the person with whom you are speaking. People with visual impairments may not be used to looking directly at you, but you should still practice direct eye contact. If you keep direct eye contact, you help people with visual impairments stay focused on where you are in the room. In addition, if you keep direct eye contact, you ensure that you will be more easily heard because you are speaking directly to them.

Providing directions to people who have visual impairments or are blind

- Provide people with visual impairments verbal directions. Do not grab their arm and attempt to guide them.
- When giving directions, be specific. For example, if you are approaching steps, state how many steps and if the steps go up or down.
- Avoid giving directions that are clarified through body language. For example, if you say “over there,” you mean “look where I am pointing.” If you say “by the green dumpster,” you are giving a visual clue. Instead, say “Take twelve steps forward, turn to your right, and take six steps forward” or “Just to the right of the dumpster which is twelve steps from your back exit.” You can use shape descriptions if doing so will assist people with visual impairments in understanding the size of an object.

4.2 Interacting with people who are mobility impaired⁸

Social Etiquette with people who are mobility impaired

- If possible, place yourself at eye level with people with mobility impairments, preventing them from getting a kink in their neck. If you cannot lower yourself to eye level, you need to allow enough distance between yourself and people with mobility impairments so not to force their head into an awkward position.
- The taller you are, the more distance you should allow. If the conversation will take awhile, find a chair.
- When talking to people with mobility impairments, sit directly in front of them. Sometimes it is difficult for them to turn their body in the wheelchair to see you.
- Never pat them on the head or shoulder. You would never pat anyone else on the head; it is degrading.
- Do not lean on the wheelchair, or any other assistive devices (canes, walkers, etc.). Assistive devices are an extension of their personal space.
- Try to give people with mobility impairments options rather than telling them what to do. Then they can adapt to fit their needs and abilities.
- Do not assume all exits work with all types of mobility devices. Wheelchairs vary in size and functionality. Make sure you develop exit routes with assistive devices in mind. If people with mobility impairments indicate that a pathway is not accessible, respect their authority on the matter. People with mobility impairments have accurate knowledge about how their assistive technology functions in their own home.
- Do not place any items on the desktop of people with mobility impairments, if they have one attached to the wheelchair. This is inconsiderate unless they offer first.

Greetings with people who are mobility impaired

- Extend your hand for the usual handshake greeting. Let people with mobility impairments decide how long and the strength of the handshake. It may seem awkward at first. Remember, shaking hands indicates that you respect people with mobility impairments.

Providing Directions to people who are mobility impaired

- Do not assume that people with mobility impairments want you to push their wheelchair. Ask first.

⁸Ibid Appendix F, p. 7

4.3 Interacting with people who are deaf or hard of hearing⁹

Although people who are deaf or hard of hearing may not be able to hear you, it is important that you speak clearly and face them when you are speaking with them.

People who are deaf often communicate through American Sign language (ASL). ASL is a unique language, just like Spanish or Russian. You will not be able to intuitively translate because ASL has unique syntax (the ordering of the words is not the same as in English). You may have to work with an interpreter. When you speak, the interpreter will translate what you say to the person who is deaf. Therefore, you should expect your interactions to take twice as long.

Social Etiquette for people who are deaf or hard of hearing

- Ask people who are deaf or hard of hearing what their preferred method of communication is if they do not tell you. There are three methods by which people who are deaf or hard of hearing may want to communicate: lip reading, sign language, and written language. People who are deaf or hard of hearing should decide which communication method to use and should reserve the right to change communication methods during your visit. Lip reading is fatiguing for those who are deaf or hard of hearing, so you should keep the conversation short and concise. A person who is lip reading may only get 30-50% of what you say. Be patient and understanding.
- Make eye contact and hold up your hand to get the attention of the person before speaking. This alerts them that you wish to speak with them.
- Literacy is not a gauge of intelligence, and English is the second language of people with hearing impairments. People who are deaf or hard of hearing may have difficulty reading and writing in English because American Sign Language has a different structure and set of rules.
- Do not write in the air. No one, hearing or otherwise, can remember air-written letters and words. Use paper and pencil in such cases.
- Do not stand between people who are deaf or hard of hearing and the interpreter. If you do this, you are interrupting the conversation, which is rude. If you must pass through, do so quickly.
- If people who are deaf or hard of hearing use a hearing aid, ask them if there are any background noise distractions. They may request that you minimize these noises. For example, if you are wearing a radio, the static noise may create too much background noise.
- Try to give people who are deaf or hard of hearing options rather than telling them what to do.

⁹ Ibid, Appendix F

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- Avoid showing impatience because less assertive people who are deaf or hard of hearing may indicate they understand concepts that they do not understand. Why? They say they understand to avoid conflict.
- Explain any interruption before attending to it. For example, if your cell phone rings, excuse yourself first.
- Avoid saying “Never mind” or “It’s not important” when people who are deaf or hard of hearing do not understand. This is insulting because it is often seen as an indication that they do not deserve the patience involved in repeated communication processes.

Greetings for people that are deaf or hard of hearing

- Speak clearly in a normal tone of voice. Do not exaggerate your lip movements.
- Remember, not all people who are deaf or hard of hearing can read lips. If they do read lips, they will struggle to understand how you articulate your words. Still, do not exaggerate or change the way you speak.
- Do not chew gum or tobacco. Remove your sunglasses, so people who are deaf or hard of hearing can see your eyes.
- Avoid touching your face while speaking. This prevents people who are deaf or hard of hearing from seeing your mouth.

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Requesting Information from people who are deaf or hard of hearing

- Use short, simple sentences.
- Do not fluctuate the volume of your speech.
- When you seek a lot of information, ask for feedback to make sure you are understood. You may have to repeat your request verbatim several times. When you request something complex, give people who are deaf or hard of hearing examples.

Giving directions to people who are deaf or hard of hearing

- Use short, simple sentences.
- Do not fluctuate the volume of your speech. When you have a lot of information to convey, ask people who are deaf or hard of hearing for feedback to make sure they understand. You may have to repeat information verbatim several times. When you talk about something complex, give examples.
- Try to give people who are deaf or hard of hearing options rather than telling them what to do.

Working with an interpreter for people who are deaf or hard of hearing

- Speak directly to people who are deaf or hard of hearing, not the interpreter. Remember, the people who are deaf or hard of hearing are the people with whom you are speaking.
- Do not fluctuate the volume of your speech.
- When you have a lot of information to convey, ask people who are deaf or hard of hearing for feedback to make sure they understand. Sometimes information is lost during the interpretation process. You may have to repeat information verbatim several times. When you talk about something complex, give them examples.
- Plan for frequent breaks. Interpreting is physically and mentally demanding because the interpreter translates the information into another language.

4.4 Interacting with people who have a learning or developmental disorder¹⁰

Social Etiquette for people who have a learning or developmental disorder

- There is no special etiquette that must be observed when working with students with learning or developmental disorders. These students have normal intelligence, normal hearing and vision, and normal mobility. Their disorder is often “invisible” and you most likely will not be aware of their area of difficulty upon first meeting. The exception will be the students with Nonverbal Learning Disorder or Asperger Disorder (which is on the Autism spectrum) as students with these disorders will likely appear very awkward socially and may have difficulty understanding or responding to your social communications.

Greeting for people that have a learning or developmental disorder

- Students with learning disorders that are primarily related to problems with reading, math, written language, or attention have social skills that range from being very outgoing and socially sophisticated to being somewhat socially awkward. In other words like most people you meet. Greet the student with a learning disorder as you would greet anyone else. It will help the student if you state clearly who you are, what you do, and the purpose of your work with the student. “Hi, I’m Tom. I am a fire fighter and today I am going to help you learn about fire safety in your school residence and in public places.”
- Students with Asperger Disorder and students with a Nonverbal Learning Disorder are usually very awkward socially. They may have trouble understanding voice tone and some social gestures. Some of these students will not be comfortable with eye contact or physical contact. If you extend your hand for an introductory handshake and the student does not respond, simply drop your arm and continue with the verbal introduction. The student does not intend to be rude but may find touching your hand to be too anxiety producing. These students also have trouble understanding anything that is not stated directly. State clearly who you are, what you do, and the purpose of your work with the student.

¹⁰ Personal communication, Dr. Michele Berg

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Providing Directions to people that have a learning or developmental disorder

- The strengths and weaknesses of students with learning disorders related to academics can vary greatly from one student to another. Some will have trouble remembering what he/she hears and may need you to speak slowly and repeat important information. Some students do very well with listening but have trouble with information that they need to read and remember. Some students have trouble understanding visual information or get confused by spatial directions such as “left” and “right” or “north” and south”.
- A teaching style that allows the students with a learning disorder the opportunity to use multiple learning paths should work well with students with learning disabilities. Speak slowly and clearly. Do not use a lot of jargon (you should not, anyway, no matter who the audience is). If you use slides or visual information, read the information out loud and explain what the visual information means. If you are not sure that the student has understood, have the student tell you in his/her own words the important points that you have presented.

Interacting with Students with Learning or Developmental Disorders

- Students with Asperger Disorder and Nonverbal Learning Disorder often have trouble understanding jokes and can be very literal. For example, if you jokingly say, “when you hear the fire alarm, run for the hills!”, the student may think he/she is literally supposed to run to the nearest hill. It is important to use very clear simple and straight-forward language. These students can have very advanced vocabularies but have trouble with figures of speech and language that is too abstract. Avoid sarcasm as these students often do not understand sarcasm and may be confused by it.
- Students with Asperger Disorder are often unaware of how their behavior affects those around them. If you are working with a group of students, this student may become too talkative and may need you to (kindly and in a warm manner) set limits on their participation. For example you may say, “Since we have limited time, you may ask three questions. If you have additional questions, you and I can talk together after the class.” Some students with Asperger Disorder or Nonverbal Learning Disorder may appear withdrawn and aloof; however, lack of eye contact does not necessarily mean that the student is not interested and is not listening.
- Students with attention problems may have trouble focusing on what you are saying even though they are interested in the topic. A simple handout that provides the key points that you are covering will help the student track what you are saying. Some students who are hyperactive will be better able to pay attention if they can also move around or “fidget” while you are talking.

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Again, the student should help you identify what they feel would be helpful in the fire safety learning situation.

- For hands-on experiences, such as if you are demonstrating how to use a fire extinguisher, remember that some students with learning disorders have trouble with coordination and/or managing mechanical tasks. These students may need several attempts before they are successful and will appreciate encouragement, support, and re-statement/simplification of instructions. Some students will do best by watching you demonstrate but others may do better with simple clearly sequenced verbal instructions.
- Many students with learning disorders have spatial problems. The statement, “the fire exit door is about 10 feet to the left of the entrance to the cafeteria” may be impossible for such students to visualize. They may need to not only physically locate the fire exit but to also attach the location to something they can remember verbally, such as “the fire exit door is on the same side of the wall as the elevator door. It is by the window that faces the pond. There is a red sign over the exit door.”
- Please be aware that while some students will be able to remember fairly lengthy verbal cues, others will need simple and short verbal cues.
- Also remember that you cannot assume that a student with a learning disorder will generalize what they learn. Point out important generalizations such as “The fire exit door is located at both ends of the hallway on every floor”.

5.0 FIRE SAFETY CONCERNS RELATING TO SPECIFIC DISABILITIES

5.1 All disabilities

An important point to recognize is that there are a number of students that may have multiple disabilities and the training that you deliver may have to be tailored to address these factors. This is another example of why it is so important to talk with the student and learn what situation they are in and what fire safety challenges they may face.

Personal responsibility

Everyone, whether they have an impairment or not, is responsible for their own fire safety. All students are responsible for choosing fire-safe housing, knowing how to prevent a fire and knowing how to react if a fire should break out, no matter where they are.

It is society's responsibility to provide students with safe buildings to live and work in, but unfortunately, this does not always happen. . Students should learn how to recognize unsafe conditions in any building, be it a residence hall, apartment, restaurant, movie theater - any place they may be.

Fires can happen at any time and no matter how fire-safe an individual they may be, this is not always the case for others around them. They may have nothing to do with a fire starting, but they need to know how to react when one does occur.

The skills that students learn are for life. They will always need to know these skills even after they leave college.

Smoke alarms

Smoke alarms are a vital part of any fire safety plan. There is a great deal of discussion presently going on regarding the appropriate type of smoke alarm to use and the following is a very brief summary of smoke alarm attributes.

A smoke alarm is a stand-alone unit that both detects smoke and sounds an alarm. These are the ones that are commonly found in a home. A smoke detector is a unit that is connected to a fire alarm system, such as that in a residence hall. It detects smoke and sends a signal to the fire alarm system which, in turn, activates devices on the system such as horns and strobes.

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There are two types of smoke alarms generally available that use different sensing technology to detect smoke.

Photoelectric

Generally better at detecting slower, smoldering fires. Will also detect faster, flaming fires. They are better at not being activated by normal cooking activity.

Ionization

Generally better at detecting faster, flaming fires. Will also detect slower, smoldering fires. They are more prone to being activated by normal cooking smoke.

There are also smoke alarms that incorporate both types of technology into one unit. However, these units are not necessarily an optimal solution since the sensitivity of the two sensors can be adjusted to minimize false alarms which can reduce their ability to detect dangerous conditions equal to a single-sensor unit.

There is a great deal of discussion in the fire safety community over which type of detector is "better." Both will detect smoke, the question is which one will react quicker. There is a growing movement across the country with jurisdictions beginning to move towards photoelectric smoke alarms because they are more suited to detecting smoldering fires and are not as prone to be disabled because of unwanted or nuisance alarms.

Photoelectric smoke alarms tend to cost slightly more than ionization, but not significantly. Ionization are the more common smoke alarms in place in most homes.

Fire alarm systems, such as you might find in a residence hall, are generally equipped with photoelectric smoke detectors.

The leading cause of fatal fires is smoking materials, which can often start as a smoldering fire, which photoelectric smoke alarms are better at detecting. The leading cause of residential fires is cooking fires, where photoelectric smoke alarms are less prone to false-alert.

Research has also shown that photoelectric smoke alarms are less likely to be disabled by the occupant because of false alarms.

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5.2 Visually impaired or blind

General information for students with visual impairments or are blind

It is important to realize that students with visual impairments or are blind can be found anywhere and everywhere. There should not be any assumption as to where they might be living (such as on the first floor of a building).

The goal of the fire safety training is to provide students with visual impairments or who are blind the information they need to keep themselves safe through their own personal responsibility for fire safety.

While the person with visual impairment or blind may be very independent, there are times when they are going to need some assistance, be it simply having someone identify the exits for them when they enter a room or building, or leading them out during an emergency in an unfamiliar occupancy.

There is a difference between someone who has been visually impaired all of their life and someone who has recently become visually impaired.

- Someone who has been visually impaired all of their life is comfortable with living in a world without vision.
- Someone who has recently become visually impaired may be going through the transition and learning how to live and navigate in a new world. Fire safety may not be something that is typically covered during this process.¹¹

The following information is in addition to that which would normally be taught regarding egress, cooking safety, smoke alarms and sprinklers.

Fire Prevention for students with visual impairments or are blind

As with all demographics, preventing the fire from occurring in the first place is the most effective fire prevention strategy.¹² If there is no fire, then there is no need for smoke alarms or sprinklers to come into play or to need to escape from a smoke-filled building.

¹¹Fire Risks for the Blind or Visually Impaired, FEMA 1999, p 13

¹²Ibid, p 12

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Cooking

Students with a visual impairment or are blind may have a higher chance of accidentally starting a fire through ordinary activities, such as cooking, for example, because they may not observe hazards such as combustibles next to the stove.¹³ Students with visual impairments or are blind may not necessarily observe a fire in its incipient stages or be able to take the proper steps to extinguish the fire.¹⁴

- Cooking is the leading cause of all residential fires and one of the significant contributing factors is unattended cooking.
- The area around where they are cooking should be clear of any combustibles such as paper towels, grocery bags, etc.
- The student should not be wearing any loose clothing that may catch fire such as a scarf, or a sweatshirt with baggy sleeves.
- It is important to emphasize to all students, not just those with disabilities, that once they start cooking they must stay with the food until it is done. If they must leave the room, they must turn off the appliance that they are using (stove, oven, portable skillet, toaster oven, etc.).
- Students with visual impairments or are blind might not see a fire in its incipient stages or as it is growing until the smoke alarm is activated and may not realize what action is needed to suppress the fire.
- If a smoke alarm is accidentally activated while cooking, use the hush feature to temporarily silence it or fan the smoke away from the smoke alarm. Do NOT every remove the batteries or take down the smoke alarm – clear out the smoke instead.

Fire Safety for students with visual impairments or are blind

Egress

Students with visual impairments or are blind may not be able to assess the level of smoke buildup and be able to make a decision as to whether it is safe to move through a smoke-filled room or corridor to escape.

On the other hand, a blind person is used to navigating through their environment without visual cues so he or she may have an advantage over a sighted person in getting out of a smoky environment (assuming the smoke is not so severe that it does not overcome the person).

Students with visual impairments or are blind rely on audible cues when they are navigating. In a high-noise environment, such as may occur when a fire alarm system or smoke alarms

¹³bid

¹⁴bid

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have been activated, it may be difficult for them to use audible cues.¹⁵

Most students, when evacuating a building, usually use the same route that they take when they enter a building and are not familiar with a secondary route. This is the time to make the student familiar with it. In addition, secondary routes are often those that are not frequently used by the occupants and they may contain a number of obstacles or storage that present a problem during evacuation such as bicycles, recycling containers, storage, etc. If this can't be done with the instructor, the student should be encouraged to do this on their own as soon as possible. This should become a habit whenever they move into a new place and periodically to make sure the exit route is still clear.

Whenever they enter a building or room with which they are not familiar they should ask someone to identify for them where the second exit is located.

Areas of refuge

Depending upon a building's design, it may contain designated areas of refuge. These are areas where people who would have difficulty evacuating a building can gather and be protected from the fire.¹⁶

Even though it may not be designated as such, there may be areas that can be used as an area of refuge, such as a large stairwell landing. It is important that the person taking shelter there not impeded the evacuation of others.

If the person must take shelter in an area of refuge it is vital to let the fire department know. This can be done by a phone (some areas of refuge may have a phone or by cell phone) or having someone who is evacuating tell the fire fighters. It is safer to have several people tasked with this responsibility to make sure the message is passed.

¹⁵Ibid

¹⁶Ibid, p 5

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Shelter in place

There may be situations where it is safer to “shelter in place” because the conditions on the primary and secondary egress routes are impassable. It is important to teach students with disabilities what to do when they might be forced to shelter in place.

- Close the door
- Alert someone that they are trapped by using a phone (landline or cell), calling out the window or yelling
- Do NOT break out the window unless absolutely necessary. The person can get injured doing this and also it may now allow smoke to enter the room. It is OK to open the window, if it can be closed again, to alert people outside or for fresh air.
- Place something such as a rolled up towel at the base of the door to stop smoke from entering the room.
- If available, putting tape on the cracks on the door will also help stop smoke from entering the room.
- Do not reopen the door to check conditions unless absolutely necessary. This can allow smoke and heat into the room.

Smoke alarms

Everyone should live in housing equipped with either smoke alarms or smoke detectors. If a person with visual impairment is living in an apartment or private residence, they should be taught how to test and replace the batteries in a smoke alarm (this is covered in the video made as part of this program available on www.mingerfoundation.org). Smoke alarms/detectors provide the early warning that is vital in reacting to a fire.

Automatic fire sprinklers

Automatic fire sprinklers will provide an unparalleled level of safety if a fire should break out. A sprinkler system will control or extinguish the fire and sound an alarm, providing notification to the occupants and to the fire department. When there may be the potential for a delayed response to a fire or an alarm, sprinklers can provide the additional time that might be needed.

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5.3 Deaf or Hard of Hearing

General information for students who are deaf or hard of hearing

It is important to realize that students who are deaf or hard of hearing can be found anywhere and everywhere. There should not be any assumption as to where they might be living (such as on the first floor of a building).

The goal of the fire safety training is to provide students who are deaf or hard of hearing the information they need to keep themselves safe through their own personal responsibility for fire safety.

Text messaging is a key method of communication for students who are deaf or hard of hearing. Many schools, as a result of the Virginia Tech tragedy, have implemented alerting systems that involve sending out either broad-based or focused text messages. However, these cannot be depended upon as a reliable and consistent means of communication as the end user may have to “opt in” to the system, he or she may not have their phone with them, etc.

Some specific concerns include:

- During an emergency, students who have a hearing impairment may not immediately hear the alarm and react promptly.
- They may not be able to hear verbal instructions and respond properly.
- This may be particularly problematic if a building is equipped with a fire alarm system that gives audible directions for evacuation.
- This may also be an issue when a fire fighter who is wearing breathing apparatus is attempting to give instructions but his or her lips are obscured by the mask, not allowing the person who is hearing impaired to read lips.

The following information is in addition to that which would normally be taught regarding egress, cooking safety, smoke alarms and sprinklers.

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Fire Prevention for students who are deaf or hard of hearing

As with all demographics, preventing the fire from occurring in the first place is the most effective fire prevention strategy.¹⁷ If there is no fire, then there is no need for smoke alarms or sprinklers to come into play or to need to escape from a smoke-filled building.

Cooking

- Cooking is the leading cause of all residential fires and one of the significant contributing factors is unattended cooking.
- The area around where they are cooking should be clear of any combustibles such as paper towels, grocery bags, etc.
- The student should not be wearing any loose clothing that may catch fire such as a scarf, or a sweatshirt with baggy sleeves.
- It is important to emphasize to all students, not just those with disabilities, that once they start cooking they must stay with the food until it is done. If they must leave the room, they must turn off the appliance that they are using (stove, oven, portable skillet, toaster oven, etc.).
- Students with hearing impairments might not hear a fire in its incipient stages or as it is growing until the smoke alarm is activated..
- If a smoke alarm is accidentally activated while cooking, use the hush feature to temporarily silence it or fan the smoke away from the smoke alarm. Do NOT every remove the batteries or take down the smoke alarm – clear out the smoke instead.

Fire Safety for students who are deaf or hard of hearing

Egress

Most students, when evacuating a building, usually use the same route that they take when they enter a building and are not familiar with a secondary route. This is the time to make the student familiar with it. In addition, secondary routes are often those that are not frequently used by the occupants and they may contain a number of obstacles or storage that present a problem during evacuation such as bicycles, recycling containers, storage, etc. If this can't be done with the instructor, the student should be encouraged to do this on their own as soon as possible. This should become a habit whenever they move into a new place and periodically to make sure the exit route is still clear.

¹⁷Fire Risks for the Deaf or Hard of Hearing, FEMA 1999, www.mingerfoundation.org/projects/fire-safety-info/downloadable-resources/

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Areas of refuge

Depending upon a building's design, it may contain designated areas of refuge. These are areas where people who would have difficulty evacuating a building can gather and be protected from the fire.¹⁸

Even though it may not be designated as such, there may be areas that can be used as an area of refuge, such as a large stairwell landing. It is important that the person taking shelter there not impeded the evacuation of others.

If the person must take shelter in an area of refuge it is vital to let the fire department know. This can be done by a phone (some areas of refuge may have a phone or by cell phone) or having someone who is evacuating tell the fire fighters. It is safer to have several people tasked with this responsibility to make sure the message is passed.

Shelter in place

There may be situations where it is safer to "shelter in place" because the conditions on the primary and secondary egress routes are impassable. It is important to teach students with disabilities what to do when they might be forced to shelter in place.

- Close the door
- Alert someone that they are trapped by using a phone (landline or cell), calling out the window or yelling
- Do NOT break out the window unless absolutely necessary. The person can get injured doing this and also it may now allow smoke to enter the room. It is OK to open the window, if it can be closed again, to alert people outside or for fresh air.
- Place something such as a rolled up towel at the base of the door to stop smoke from entering the room.
- If available, putting tape on the cracks on the door will also help stop smoke from entering the room.
- Do not reopen the door to check conditions unless absolutely necessary. This can allow smoke and heat into the room.

¹⁸Ibid, p 5

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Smoke Alarms

Everyone should live in housing equipped with either smoke alarms or smoke detectors. Smoke alarms/detectors provide the early warning that is vital in reacting to a fire.

One of the biggest risk to this demographic is that the occupant may not receive the warning early enough to react or escape from the fire. This is the key to survival.¹⁹

A different type of smoke alarm may be needed that is equipped with visual warning devices, either as part of the smoke alarm or an adjunct device that reacts to the activation of the smoke alarm. Devices called "bed shakers" will vibrate when activated by a building fire alarm system or the sound of a smoke alarm, alerting the occupant when they are asleep in the bed. Today's building code requirements call for building fire alarm systems to also be equipped with visual warning strobes.²⁰ However, this is not the case in typical residential smoke alarms and it will be necessary to install smoke alarms that do have a strobe feature as part of the design. In most cases, because of the power needed to run a strobe, these have to be hard-wired smoke alarms and not battery-operated.

Recent research done at the University of Maryland tested people (which included a large group of deaf students from Gallaudet University, a university in Washington for people who are deaf or hard of hearing) who are hard of hearing and deaf in a sleep laboratory to evaluate what type of devices were the most effective at waking them when they are in various stages of sleep. Previous research had found that strobes were very effective in waking sleeping occupants, but the latest research found that strobes were not as effective as bed shakers. A copy of this study is available online at <http://www.mingerfoundation.org/docs/16>.

Automatic fire sprinklers

Automatic fire sprinklers will provide an unparalleled level of safety if a fire should break out. A sprinkler system will control or extinguish the fire and sound an alarm, providing notification to the occupants and to the fire department. When there may be the potential for a delayed response to a fire or an alarm, sprinklers can provide the additional time that might be needed.

¹⁹ibid, p 11

²⁰ibid, p 11

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5.4 Mobility impairment

General information for students with mobility impairments

It is important to realize that students with mobility impairments can be found anywhere and everywhere. There should not be any assumption as to where they might be living (such as on the first floor of a building). "People with mobility impairments represent a segment of the population with one of the highest risks of dying in a fire," according to one government study.²¹ The goal of the fire safety training is to provide students with mobility impairments the information they need to keep themselves safe through their own personal responsibility for fire safety.

Mobility impairments can be permanent or temporary, such as a sports injury. At some point in life, everyone will probably suffer a mobility impairment (either temporary or permanent). Some students have been disabled all their lives and some are "newly disabled," either temporarily or permanently. Those that are "newly disabled" are at a higher risk of re-injuring themselves.²²

Depending upon the severity of the mobility impairment, the person may be completely self-sufficient and live independently without assistance or may require varying levels of assistance, up to a full-time caregiver. People who may be assisting someone with mobility impairment should also receive the same fire safety training as the student.

The following information is in addition to that which would normally be taught regarding egress, cooking safety, smoke alarms and sprinklers.

²¹Fire Risks for the Mobility Impaired, FEMA 1999, p 3 www.mingerfoundation.org/projects/fire-safety-info/downloadable-resources/

²²Ibid , p 9

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Fire Prevention for students with mobility impairments

As with all demographics, preventing the fire from occurring in the first place is the most effective fire prevention strategy.²³ If there is no fire, then there is no need for smoke alarms or sprinklers to come into play or to need to escape from a smoke-filled building.

Cooking

- Cooking is the leading cause of all residential fires and one of the significant contributing factors is unattended cooking.
- The area around where the student is cooking should be clear of any combustibles such as paper towels, grocery bags, etc.
- The student should not be wearing any loose clothing that may catch fire such as a scarf, or a sweatshirt with baggy sleeves.
- It is important to emphasize to all students, not just those with disabilities, that once they start cooking they must stay with the food until it is done. If they must leave the room, they must turn off the appliance that they are using (stove, oven, portable skillet, toaster oven, etc.). Since a student with a mobility impairment may not be able to get back to the burning food quickly, this is particularly important.
- If a smoke alarm is accidentally activated while cooking, use the hush feature to temporarily silence it or fan the smoke away from the smoke alarm. Do NOT ever remove the batteries or take down the smoke alarm – clear out the smoke instead.

Fire Safety for students with mobility impairments

Egress

One of the biggest risk to this demographic is that the occupant may not be able to react quickly and escape from a fire or evacuate a building quickly. This is the key to survival.²⁴

Devices that are typically used by students with mobility impairments to get into a building, such as elevators, may not be available to them during an emergency. Elevators may be automatically recalled to the ground floor when the building fire alarm system is activated, leaving someone with a mobility impairment trapped on an upper floor.²⁵

During the fire safety training program, the instructor and the student should walk the entire primary and secondary evacuation route to identify any problems that may hinder escape. This could include elevators that are automatically recalled to the ground floor during a fire alarm activation, doors along the

²³ibid, p 9

²⁴ibid, p 9

²⁵ibid, p 9

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escape route that may not be wide enough to accommodate a wheelchair, door hardware that is difficult to operate, obstacles such as recycling containers that may impede movement and stairs, to mention just a few.

Most students, when evacuating a building, usually use the same route that they take when they enter a building and are not familiar with a secondary route. This is the time to make the student familiar with it. In addition, secondary routes are often those that are not frequently used by the occupants and they may contain a number of obstacles or storage that present a problem during evacuation such as bicycles, recycling containers, storage, etc. If this can't be done with the instructor, the student should be encouraged to do this on their own as soon as possible. This should become a habit whenever they move into a new place and periodically to make sure the exit route is still clear.

Some facilities may have special evacuation chairs that can be used to move students with mobility impairments down stairs. This operation requires a team of people to assist the person with mobility impairments. There are several things to keep in mind, however:

- People using these devices need to be trained in their operation. Will there always be a team of people available to evacuate the occupant?
- It may take several people to transfer the student with mobility disability from a wheelchair into the evacuation chair.
- When the person is brought down, they will need a wheelchair on the floor where they have been brought to. Has this been built into the plan?
- It may not always be necessary to evacuate a student with mobility impairments but instead shelter the person in place in an area of refuge. This, however, is a judgment call that must be made in consultation with proper authorities and may depend upon the incident.

Areas of refuge

Depending upon a building's design, it may contain designated areas of refuge. These are areas where people who would have difficulty evacuating a building can gather and be protected from the fire.²⁶

Even though it may not be designated as such, there may be areas that can be used as an area of refuge, such as a large stairwell landing. It is important that the person taking shelter there not impede the evacuation of others.

If the person must take shelter in an area of refuge, it is vital to let the fire department know. This can be done by a phone (some areas of refuge may have a phone or by cell phone) or by having someone who is evacuating tell the fire fighters. It is

²⁶Ibid, p 5

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safer to have several people tasked with this responsibility to make sure the message is passed.

Shelter in place

There may be situations where it is safer to “shelter in place” because the conditions on the primary and secondary egress routes are impassable. It is important to teach students with disabilities what to do when they might be forced to shelter in place.

- Close the door
- Alert someone that they are trapped by using a phone (landline or cell), calling out the window or yelling
- Do NOT break out the window unless absolutely necessary. The person can get injured doing this and also it may now allow smoke to enter the room. It is OK to open the window, if it can be closed again, to alert people outside or for fresh air.
- Place something such as a rolled up towel at the base of the door to stop smoke from entering the room.
- If available, putting tape on the cracks on the door will also help stop smoke from entering the room.
- Do not reopen the door to check conditions unless absolutely necessary. Re-opening the door can allow smoke and heat into the room.

Smoke alarms

Everyone should live in housing equipped with either smoke alarms or smoke detectors. Smoke alarms/detectors provide the early warning that is vital in reacting to a fire. Students with mobility impairments may need assistance in installing or testing a smoke alarm or replacing the battery each year. Some smoke alarms are designed with a feature where a television remote control can be used to test the smoke alarm and also to silence it temporarily (hush feature) if it should be activated by a non-emergency condition, such as smoke from cooking. In addition, the smoke alarm test button may be large enough and have an indentation that allows for a broom handle or pole to be used to test it.

Automatic fire sprinklers

Automatic fire sprinklers will provide an unparalleled level of safety if a fire should break out. A sprinkler system will control or extinguish the fire and sound an alarm, providing notification to the occupants and to the fire department. When there may be the potential for a delayed response to a fire or an alarm, sprinklers can provide the additional time that might be needed.

5.5 Learning or developmental disorder²⁷

General information for students with learning or developmental disorder

1 out of every 5 people have some form of a learning disorder (29th Annual Report to Congress, US Department of Education, 2010) and almost 10% of college undergraduates have a learning disorder (Heath Resource Center, 2011). Although Learning and Developmental Disorders occur with a relatively high frequency, it can be hard, if not impossible, to identify these individuals upon casual meeting. These students may have one or more learning disorders and their disorders can vary from mild to severe. Yet they can still be very good students who are able to function successfully in an academic environment. Students with learning disorders process information differently from their nondisabled peers. Some do better by reading, others by seeing, hearing or doing. You won't know the best learning path for any individual student unless they explain this to you. In reality, this is the case for the general population – we all learn in different ways and have different sets of strengths and weaknesses.

In addition to the information provided earlier in the section “Interacting with people who have a learning or developmental disorder,” something to keep in mind is that some students with a learning or developmental disorder may rely heavily on lists to function. Lists provide a logical, sequential set of actions to help guide the student in daily living and school. This strategy could possibly be applied to fire safety as well. You could help the student develop a list of what actions to take during an emergency. It is important to keep in mind that this list must be concise and not have a large number of possible scenarios in it, as this could be confusing to the student.

During an emergency, students with learning or developmental disorders may “shut down” because of the sensory overload caused by the sound of the smoke alarm or building fire alarm. They also may take instructions very literally, so if you say “wait here for a minute” they may wait – for only a minute. On the other hand, if you say “wait until I come back,” they may wait, even though the conditions are deteriorating. These reactions are most likely to occur with students who have Asperger Disorder but can occur with students who have other learning disorders. When teaching fire safety, it will be important to state the obvious.

Students with learning or developmental disorders may be more sensitive to the sound of a smoke alarm. For this reason, it is helpful to be with them when they install or test smoke alarms and you may have to do it for them. Having a smoke alarm that they can practice on (that is not installed) may be helpful as well.

²⁷ Dr. Michele Berg was a significant contributor to this section

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The following information is in addition to that which would normally be taught regarding egress, cooking safety, smoke alarms and sprinklers.

Fire Prevention for students with learning or developmental disorders

Cooking

- Cooking is the leading cause of all residential fires and one of the significant contributing factors is unattended cooking.
- The area around where students are cooking should be clear of any combustibles such as paper towels, grocery bags, etc.
- The student should not be wearing any loose clothing that may catch fire such as a scarf, or a sweatshirt with baggy sleeves.
- It is important to emphasize to all students, not just those with disabilities, that once they start cooking they must stay with the food until it is done. If they must leave the room, they must turn off the appliance that they are using (stove, oven, portable skillet, toaster oven, etc.).
- If a smoke alarm is accidentally activated while cooking, use the hush feature to temporarily silence it or fan the smoke away from the smoke alarm. Do NOT ever remove the batteries or take down the smoke alarm – clear out the smoke instead.

Fire Safety for students with learning or developmental disorders

Egress

Most students, when evacuating a building, usually use the same route that they take when they enter a building and are not familiar with a secondary route. This is the time to make the student familiar with any secondary routes .

Please be aware that students who have trouble with spatial information may have a great deal of trouble locating and following a secondary route. They may need help identifying a secondary route. They may also need help in finding that same secondary route in a fire situation when they are anxious or frightened.

When possible, the student should be helped to find the secondary route and to practice finding that route from a number of different locations in their building. As the student practices locating the route, the student should be encouraged to make a written outline detailing the location of the route and landmarks along the way to the exit.

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Avoid using spatial terms and directions such as left, right, north, south as this may not be useful to students who have trouble with spatial information. Use verbal markers. For example, the student might write:

- *The first thing to do is go to the stairwell leading to the lobby.*
- *Once in the lobby, turn toward the vending machines.*
- *Go through the door right next to the vending machines.*
- *Follow the hallway to the red exit sign.*
- *Go through the door to the outside.*
- *Walk across the parking lot and wait in the front of McCullom Hall for further instructions.*

Most students, when evacuating a building, usually use the same route that they take when they enter a building and are not familiar with a secondary route. This is the time to make the student familiar with it. In addition, secondary routes are often those that are not frequently used by the occupants and they may contain a number of obstacles or storage that present a problem during evacuation such as bicycles, recycling containers, storage, etc. If this can't be done with the instructor, the student should be encouraged to do this on their own as soon as possible. This should become a habit whenever they move into a new place and periodically to make sure the exit route is still clear.

Locating secondary routes should become a habit whenever the student moves into a new place. The student should find someone who can help him/her to locate appropriate secondary routes for a safe exit. The student should also make a written note containing verbal instructions for locating and following the route. The student should be encouraged to periodically check to make sure all exit routes are clear. If the routes are not clear, the student needs to know who is responsible for ensuring that the route is clear and how to contact that person.

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Areas of refuge

Depending upon a building's design, it may contain designated areas of refuge. These are areas where people who would have difficulty evacuating a building can gather and be protected from the fire.²⁸

Even though it may not be designated as such, there may be areas that can be used as an area of refuge, such as a large stairwell landing. It is important that the person taking shelter there not impede the evacuation of others.

If the person must take shelter in an area of refuge it is vital to let the fire department know. This can be done by a phone (some areas of refuge may have a phone or by cell phone) or having someone who is evacuating tell the fire fighters. It is safer to have several people tasked with this responsibility to make sure the message is passed.

Shelter in place

There may be situations where it is safer to "shelter in place" because the conditions on the primary and secondary egress routes are impassable. It is important to teach students with disabilities what to do when they might be forced to shelter in place.

- Close the door
- Alert someone that they are trapped by using a phone (landline or cell), calling out the window or yelling
- Do NOT break out the window unless absolutely necessary. The person can get injured doing this and also it may now allow smoke to enter the room. It is OK to open the window, if it can be closed again, to alert people outside or for fresh air.
- Place something such as a rolled up towel at the base of the door to stop smoke from entering the room.
- If available, putting tape on the cracks on the door will also help stop smoke from entering the room.
- Do not reopen the door to check conditions unless absolutely necessary. This can allow smoke and heat into the room.

²⁸Ibid, p 5

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Smoke alarms

Everyone should live in housing equipped with either smoke alarms or smoke detectors. Smoke alarms/detectors provide the early warning that is vital in reacting to a fire. Because of their potential sensitivity to loud noises, some students with learning or developmental disorders may need assistance in installing or testing a smoke alarm or replacing the battery each year. Some smoke alarms are designed with a feature where a television remote control can be used to test the smoke alarm and also to silence it temporarily (hush feature) if it should be activated by a non-emergency condition, such as smoke from cooking. In addition, the smoke alarm test button may be large enough and have an indentation that allows for a broom handle or pole to be used to test it.

Automatic fire sprinklers

Automatic fire sprinklers will provide an unparalleled level of safety if a fire should break out. A sprinkler system will control or extinguish the fire and sound an alarm, providing notification to the occupants and to the fire department. When there may be the potential for a delayed response to a fire or an alarm, sprinklers can provide the additional time that might be needed.

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6.0 CONCLUSION

Fire safety is important for everyone, both knowing how to prevent a fire and how to react to one if it should occur. However, a fire can be even more dangerous for people with disabilities because they may not be alerted, or able to react, as quickly as others. This places them at a much higher risk to being injured or killed as a result.

Knowing how to prevent a fire in the first place is the best line of defense. But as fire-safe as someone may be, that may not always be the case with those around them, particularly in a college setting where there are a large number of young people living together, on their own, often for the first time in their lives. That is why someone with disabilities must constantly be aware of their surroundings and how to react quickly, and appropriately, if an emergency should break out.

The lessons covered in this Guide are, literally, lessons for life. While hopefully these students will never need to use this life saving information while at school, they will have had this exposure to carry with them through the rest of their lives. They will always need to know about smoke alarms, fire sprinklers, cooking safety and knowing two ways out, no matter where they may be.

This project is the first step in developing focused fire safety information for students with disabilities. We are hoping that future projects will allow us to expand into other areas of fire safety and cover the concerns of other disabilities. We appreciate the support the Fire Prevention and Safety Grant program provided to the Minger Foundation in helping us move forward with this important effort.

There is so much more to be done and we hope the resources we have developed will provide the groundwork for improvements in this area of fire safety. We would appreciate you sharing any research or information on this subject with us so we can include it on the Minger Foundation's web site (www.mingerfoundation.org). By working together, we can make the world that much safer for people with disabilities which will make it safer for all of us.

Thank you so much for your dedication!



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APPENDIX A MATRIX OF TRAINING CONCERNS

Disability	Special Considerations	Logistics	Hardware
Hearing Impairment	<ul style="list-style-type: none"> ● Sign language interpreters ● Speaking directly to the person ● Closed captioning ● Visual smoke alarms/fire alarms 	<ul style="list-style-type: none"> ● Hiring sign language interpreters ● Making all material closed-captioned 	<ul style="list-style-type: none"> ● Smoke alarms with strobes ● Tactile devices that work in conjunction with smoke alarms (bed shakers)
Visual Impairment	<ul style="list-style-type: none"> ● Do not rely heavily on video for education ● All video must be narrated to be effective 	<ul style="list-style-type: none"> ● Ensuring that all video material also has audio captioning ● Identifying secondary means of egress and ensuring they are passable by people with visual impairments 	<ul style="list-style-type: none"> ● Computer screen readers (although this might not be needed during training but in pre- and post-training exercises.
Mobility Impairment	<ul style="list-style-type: none"> ● Do the elevators go to ground when the building fire alarm system is activated? ● Is there a second means of egress that is accessible? ● Are there areas of refuge? ● Is there a plan in place for assisting mobility impaired? ● Is the plan dependent upon people being available to carry it out? 	<ul style="list-style-type: none"> ● Training teams of people and the person with a mobility impairment in how to use stair chairs/evacuation chairs ● Identifying secondary means of egress and ensuring they are passable by people with mobility impairments ● If training in the evacuation chairs is to be done, teams of people will need to be pre-identified and made aware of their roles and responsibilities. 	<ul style="list-style-type: none"> ● Evacuation chairs
Learning or developmental disorders	<ul style="list-style-type: none"> ● Repetition ● Lists ● address sensitivity to stimulus issues 		<ul style="list-style-type: none"> ● Smoke alarm to help the student become accustomed to the sound

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	<ul style="list-style-type: none">• Many students with learning disorders have trouble generalizing what they learn in one setting to a different setting. The trainer should encourage the students to think about how their dorm or residence is alike/different from what has been modeled and how they can adapt the information to their specific living situation.• Trainers need to be aware that students with Nonverbal Learning Disorder and Asperger Disorder often have significant difficulty interpreting spatial information ... so the “you are here” maps are often useless to these students. Students with spatial and/or directional confusion need help thinking about the tools/cues they need in a fire situation. For example, a friend or a dorm counselor could help them translate the exit map on their floor into a brief written step x step set of instructions that does not include directions (go to the hall, turn toward the end of the hall with the window, open the door next to the window and go down the stairs ...)		
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APPENDIX B RESOURCES

Research Resources

This is a listing of the documents that have been compiled on the Minger Foundation web site www.mingerfoundation.org as of the publication of this document. It will be regularly updated online so the most current information can be found online.

General Topics	
<p>Emergency Evacuation Planning Guide for People with Disabilities (NFPA, 2007, PDF 792 kb)</p>	<p>This guide was developed in response to the emphasis that has been placed on the need to properly address the emergency procedure needs of the disability community. This Guide addresses the needs, criteria, and minimum information necessary to integrate the proper planning components for the disabled community into a comprehensive evacuation planning strategy.</p>
<p>Evacuation Planning for Occupants with Disability (National Research Council, Canada, Guylene Proulx, 2002, PDF 327 kb)</p>	<p>Considerable focus has been given in the last few decades to accessibility while “egressability” has not received as much attention. The concept of “egressability” does not imply that the means of egress should be the same for everyone, but that there should be an equal level of life safety for everyone. In Canada, federal and provincial human rights legislation requires safe access and egress from buildings for people with disabilities.</p>
<p>Evacuation of Students with and Without Access and Functional Needs (Webinar)</p>	<p>This webinar was held by the Federal Emergency Management Agency. This presentation is on strategies for planning and responding to the needs of children during evacuations and features Marcie Roth, director of the Office for Disability Integration and Coordination at the FEdearl Emergency Management Agency, and Richard Devylder, Senior Advisor for Accessible Transportation at the U.S. Department of Transportation.</p>
<p>Fire Safety Solutions for People with Disabilities (Oklahoma State University, 2007, PDF 1.9 mb)</p>	<p>This is a comprehensive overview of a smoke alarm installation program done in Oklahoma. This report includes detailed information on working with people with disabilities, social etiquette, and appropriate terminology to be used.</p>
<p>Higher Education and Disability (General Accounting Office, 2009, PDF, 1.82 mb)</p>	<p>Research suggest that more students with disabilities are pursuing higher education than in years past, and recent legislative changes, such as those in the Higher Education Opportunity Act and Post-9/11 Veterans Education Assistance Act of 2008, have the potential to increase the number and diversity of this population. GAO was asked to examine (1) what is known about the population of postsecondary students with disabilities; (2) how postsecondary schools are supporting students with disabilities; (3) what challenges, if any, schools face in supporting these students; and (4) how the Department of Education is assisting schools in supporting these students. To conduct this work, GAO analyzed federal survey and some state data;</p>

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	conducted site visits; interviewed agency officials, disability experts, school officials, and students; and reviewed laws, regulations, and literature.
Personal Emergency Evacuation Planning Checklist (NFPA, Microsoft Word, 204 kb)	
Report on Fire Safety for Students with Disabilities in Higher Education (Minger Foundation, 2009)	This report, prepared under a 2008 DHS Fire Prevention and Safety Grant, detailed the level of fire safety education for students with disabilities being conducted on campuses.
Residential Building Fires Involving Individuals with Physical Disabilities (USFA, 2011, PDF 899 kb)	This is a topical study from the United States Fire Administration outlining the contributing factors and fires involving people with disabilities.
Residential Smoke Alarm Update (Oklahoma State University, 2010, PDF 76 kb)	An update from OSU regarding the waking characteristics of smoke alarms.
Social Etiquette – Tips for Firefighters who Work with People with Disabilities (OSU, 2010, PDF 116 kb)	<p>Social etiquette and working with people may seem like common sense. But working with people with disabilities introduced many new environmental variables, such as service animals and interpreters. You may find that when you work with people with disabilities you feel uncertain of acceptable social etiquette because the situation is new to you. By reading this guide, you can be prepared to work with interpreters and to respect the work of service animals. The working experience can be positive for everyone.</p> <p>In addition, you need to learn the terms considered improper, discriminatory, and out-of-date, so you can avoid insulting people with disabilities. If you use these terms you are demonstrating a lack of respect because such terms cause hurt feelings. As in any working relationship, hurt feelings can lead to a lack of cooperation, which could lead to the failure of this program</p>
Writing for People with Disabilities – People-first Checklist (OSU, 2010, PDF 117 kb)	Easy modifications to your writing style will ensure you communicate effectively with people with disabilities.

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Hard of Hearing and Deaf	
Fire Risks for the Deaf or Hard of Hearing (USFA, 1999, PDF, 302 KB)	People who are deaf or have hearing impairments, those who are blind or have vision impairments, and those with mobility impairments may face unique challenges in an emergency. Their ability to detect a fire or escape its effects may be hindered by their impairments. As a result, people with these impairments are at a greater risk of death or injury due to fire.
Plain Language Checklist when Writing for People who are Deaf (Oklahoma State University 58 kb)	Plain language ensures that your audience can understand not only the technical terms and concepts but also the directions and descriptions you provide. Writing in a concise form with an emphasis on the most important information will help your audience understand your meaning and engage more fully in the concepts.
Residential Smoke Alarms for People who are Deaf or Hard of Hearing and People with Disabilities (OSU, 2011, PDF 25 kb)	<p>Recent studies of the wakefulness of different alerts conclude that a strobe light is not effective in waking hard of hearing adults or young adults who are moderately alcohol impaired. There is no study to confirm this with people who are deaf.</p> <p>These recent studies indicate that a tactile alert device (bed shaker) is effective in waking adults who are hard of hearing and that a square wave lower frequency sound is effective in waking these adults as well as young adults who are moderately alcohol impaired.</p>
Waking effectiveness of emergency alerting devices for the hearing able, hard of hearing and deaf populations (University of Maryland, 2007, PDF, 1.1 mb)	<p>The study presented measures the awakening effectiveness of a number of commercially available emergency alerting devices. Three groups of varying hearing levels were tested: hearing able, hard of hearing, and deaf. The devices evaluated are a typical audible smoke detector, a strobe light, and a bed shaker. The subjects were monitored for sleep stage during the single night tests and the emergency alerting devices were activated in Stage 2, Delta and REM stages of sleep.</p> <p>Results indicate that the audible smoke detector was most effective for the hearing able population and least effective for the deaf population. The recommended alternative to the audible smoke detector, the strobe, was the least effective device when measured against the total United States population. The vibratory tactical devices were most effective across all hearing categories and sleep states. When the tactile signal of the bed shaker was modified to vibrate intermittently, all persons were effectively aroused.</p>

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Learning and Developmental Disorders	
Residential Building Fires Involving Individuals with Mental Disabilities (USFA, 2011, PDF 744 kb)	A topical study issued by the United States Fire Administration looking at the contributing factors and statistics for fires involving people with mental disabilities.
What are the Fire Safety Education Needs for Young Adults with Autism Spectrum Disorders (Executive Fire Officer paper, 2011, 255 kb)	A National Fire Academy Executive Fire Officer paper written by Tim Leidig, a fire officer and father of an autistic child.

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Mobility Impairments	
Fire Risks for the Mobility Impaired (USFA, 1999, PDF 376 kb)	People who are deaf or have hearing impairments, those who are blind or have vision impairments, and those with mobility impairments may face unique challenges in an emergency. Their ability to detect a fire or escape its effects may be hindered by their impairments. As a result, people with these impairments are at a greater risk of death or injury due to fire.
Risk Reduction Factors of the Mobility Impaired Residents of Sweetwater County Fire District 1 (EFO paper, PDF 193 kb)	A National Fire Academy Executive Fire Officer paper looking at the issues concerning residents with mobility impairments in a fire district in Wyoming.
World Trade Center Disaster, Occupant Behavior, Egress and Emergency Communications (NIST, 2005 PDF 4.3 mb)	A study conducted by the National Institute of Standards and Technology on the human behavior factors of the World Trade Center disaster, including looking at people with disabilities.
Vision Impairments	
Fire Risks for the Blind or Visually Impaired (USFA, 1999 PDF 385 kb)	People who are deaf or have hearing impairments, those who are blind or have vision impairments, and those with mobility impairments may face unique challenges in an emergency. Their ability to detect a fire or escape its effects may be hindered by their impairments. As a result, people with these impairments are at a greater risk of death or injury due to fire.



APPENDIX C PERSONAL EMERGENCY EVACUATION PLANNING CHECKLIST

Name: _____ Primary Location: _____
Building (home, office, etc.): _____ Primary Phone: _____
Address: _____ Cell Phone: _____
Floor: _____ E-mail: _____
Service Animal: Yes No

OCCUPANT NOTIFICATION

Type of Emergency	Method or Device for Notification
Fire:	_____
Earthquake:	_____
Flood:	_____
Storm:	_____
Attack:	_____
Other (specify):	_____

	YES	NO	N/A	Comments
Are there emergency notification devices (alarms, etc.) appropriate for this person?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does this person know the location of each emergency notification device/system and understand its meaning/function?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does this person know how to sound the alert for emergencies (manual pull box alarms, public address systems, radio, telephones)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If telephones are used to report emergencies, are emergency numbers posted near telephones, on employee notice boards, or in other conspicuous locations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there a way for a person with a hearing or speech impairment to report an emergency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the communication system also serves as an alarm system, do all emergency messages have priority over all non-emergency messages?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there a unique signal (sound, light, header) to indicate an emergency message?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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WAY FINDING

	YES	NO	N/A	Comments
Is there a usable way out?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Where is it? (List all and indicate nearest.)				
Where is the established outside meeting place?				
Is the usable circulation path clearly marked to show the route to leave the building or to relocate to some other space within the building in an emergency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If a person exiting a doorway or turning a corner could inadvertently be directed into the path of a moving vehicle, is a safeguarding device with a warning sign in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the stairs in the circulation path lead anywhere but out of the building, are doors, partitions, or other effective means used to show the correct route out of the building?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do doors used to connect any room to a circulation path have proper maneuvering clearances?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Can the doors be easily unlatched?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do exterior circulation paths (balcony, porch, gallery, roof) meet the preceding four requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the exterior circulation path have guardrails to protect open sides of walking surfaces?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the exterior circulation path smooth, solid, and a substantially level travel surface?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the exterior circulation path <i>not</i> branch off and head away from the public way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is each exit marked with a clearly visible sign reading "EXIT" in all forms (visual, tactile, Braille)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is every doorway or passage that might be mistaken for an exit marked "NOT AN EXIT" or with an indication of its actual use in all forms (visual, tactile, Braille)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are signs posted and arranged along circulation paths to adequately show how to get to the nearest exit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the signs clearly indicate the direction of travel in all forms (visual, tactile, Braille)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do brightly lit signs, displays, or objects in or near the line of vision <i>not</i> obstruct or distract attention from exit signs, particularly for people with low vision?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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USE OF THE WAY

	YES	NO	N/A	Comments
Are circulation paths always free of obstructions, including furniture and equipment, so everyone can safely exit the building during an emergency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are people <i>not</i> required to travel through a room that can be locked, such as a restroom?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do all interior doors, other than fire doors, readily open from the inside without keys, tools, or special knowledge and require less than 5 pounds of force to unlatch and set the door in motion?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are exit signs <i>not</i> obstructed or concealed in any way, particularly for people with vision impairments who need to find and feel the sign?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are exit doors kept free of items that obscure the visibility of exit signs or that may hide visual, tactile, or Braille signage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the emergency escape path clear of obstacles caused by construction or repair ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the circulation path maintain a clear height of 6 feet 8 inches at all points?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do objects that stick out into the circulation path, such as ceiling fans and wall cabinets, <i>not</i> reduce the minimum height and width of the circulation path?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are usable circulation paths at least 32 inches wide for any segment less than 24 inches in length and 36 inches for all segments 24 inches or longer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is each usable circulation path a permanent part of the facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the circulation path is not substantially level, are occupants provided with appropriate stairs or a ramp?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do building circulation paths lead to a public way, that is:				
Directly outside or to a street or walkway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
To an area of refuge and from there to a public way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
To an open space with access to the outside?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
To streets, walkways, or open spaces large enough to accommodate all building occupants likely to use the exit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

TYPE OF ASSISTANCE NEEDED

	YES	NO	N/A	Comments
Can the person evacuate himself or herself with a device or aid?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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What is the specific device or aid?			
Where is the device or aid located?			
Does the person need assistance to evacuate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What does the assistant(s) need to do?			
Does the assistant(s) need any training?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the training been completed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Where will the assistant(s) meet the person requiring assistance?			
When will the person requiring assistance contact the assistant(s)?			

Number of Assistants Needed

How many assistants are needed?

How will the assistant(s) be contacted in an emergency?

Name	Phone	Cell Phone	E-mail
Assistant 1			
Assistant 2			
Assistant 3			
Assistant 4			
Assistant 5			
Assistant 6			

SERVICE ANIMAL

	YES	NO	Comments
Has the person discussed with emergency management personnel his or her preferences with regard to evacuation and handling of the service animal?	<input type="checkbox"/>	<input type="checkbox"/>	
Has the person thought about under what circumstances a decision may have to be made about leaving the service animal behind?	<input type="checkbox"/>	<input type="checkbox"/>	
What is the best way to assist the service animal if it becomes hesitant or disoriented?			
Do first responders have a copy of the detailed information for the service animal?	<input type="checkbox"/>	<input type="checkbox"/>	

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	YES	NO	Comments
Where are extra food and supplies kept for the service animal?			

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APPENDIX D RESIDENTIAL SMOKE ALARMS FOR PEOPLE WHO ARE DEAF OR HARD OF HEARING AND PEOPLE WITH DISABILITIES

(Updated August 2011. Prepared by Oklahoma State University. Used by permission, Nancy Trench, OSU, ntrench@osufpp.org)

Fire Protection Publications (FPP) at Oklahoma State University has been installing smoke alarms for people with disabilities in Oklahoma for almost 7 years. The following is a summary of the current status of smoke alarms being used by FPP and our grant partners.

Previous editions of NFPA 72 required a high intensity strobe light in sleeping rooms to alert/wake people who are deaf. The strobe light requirement of 177 candela (cd) if the signal is placed within 24 inches of the ceiling or 110 cd if placed more than 24 inches from the ceiling (Table 18.5.4.6.2 NFPA 72, 2010).

Recent studies of the wakefulness of different alerts conclude that a strobe light is not effective in waking hard of hearing adults or young adults who are moderately alcohol impaired. There is no study to confirm this finding with adults who are deaf.

These recent studies indicate that a tactile alert device (bed shaker) is effective in waking adults who are hard of hearing and that a square wave lower frequency sound is effective in waking these adults as well as young adults who are moderately alcohol impaired.

These recent studies also document that the current temporal three high frequency 3100 Hz alert sound required by UL 217 for smoke alarms in the US is the least effective in waking people.

Residential Smoke Alarms are primarily intended to wake people to fires while they are sleeping and give them time to escape. Most home fire deaths are at night during the time most people are sleeping. Smoke alarms also alert people to fires during waking hours while they are in the home.

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FACT SHEET

Current edition of the code	NFPA 72, National Fire Alarm and Signaling Code, 2010 Edition.
Smoke alarms for homes	Chapter 29 Single- and Multiple-Station Alarms and Household Fire Alarm Systems
Paragraph concerning people with hearing loss	<p>29.3.8 Notification appliances provided in sleeping people with hearing loss rooms and guest rooms for those with hearing loss shall comply with 29.3.8.1 and 29.3.8.2</p> <p>29.3.8.1 Mild to Severe Hearing Loss – required to provide a low-frequency alarm signal in the sleeping room. The low frequency signal must be a square wave frequency of 520 Hz. This signal (sound) can be produced by a smoke alarm or a separate notification appliance.</p> <p>29.3.8.2 Profound Hearing Loss-a tactile notification (uses touch or vibration) appliance and the previously required high intensity strobe light.</p>
UL 217	UL 217 Single and Multiple Station Smoke Alarms
UL 1971	UL 1971 Signaling Devices for the Hearing Impaired

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NFPA 72 Definitions

Hearing Loss - A full or partial decrease in the ability to detect or comprehend sounds. The severity of hearing loss is measured by the degree of loudness, as measured in decibels, a sound must attain before being detected by an individual. Hearing loss can be ranked as mild, moderate, severe, or profound. It is quite common for someone to have more than one degree of hearing loss (e.g., mild sloping to severe). The following list shows the rankings and their corresponding decibel ranges:

Mild: For adults: between 25 and 40 dB For children: between 15 and 40 dB

Moderate between 41 and 55 dB

Moderately severe between 56 and 70 dB

Severe between 71 and 90 dB

Profound 90 dB or greater

Household Fire Alarm System - A system of devices that uses a fire alarm control unit to produce an alarm signal in the household for the purpose of notifying the occupants of the presence of a fire so that they will evacuate the premises.

Notification Appliance - A fire alarm system component such as a bell, horn, speaker, light, or text display that provides audible, tactile, or visible outputs, or any combination thereof. (SIG-NAS)

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Equipment Search Results

LIFETONE HLAC100 and HLAC150 – AC powered tactile and signaling device activated by any standard residential smoke alarm. It emits a low frequency alert sound and tactile alert bed shaker. The LIFETONE has 7 day back up battery life. It is UL 217 and UL 1971 listed. This device is to be located by the head of the bed and is activated by a standard T-3 sound (temporal-three three beeps and a pause) 3100 Hz alert from a smoke alarm. LIFETONE setup requires testing of the most remote smoke alarm.

SafeAwake - works in conjunction with a standard smoke detector. It “listens” for the sound from your smoke detector. It activates an intermittent, motor-driven bed shaker which vibrates the bed and emits a high-decibel, low frequency (500Hz) audible signal. Also flashes a white light. It is UL 217 and UL 1971 listed by ETL. SafeAwake includes a battery backup that will keep SafeAwake working for up to 24 hours if the power is off. When testing your smoke alarms the SafeAwake alerts for 2 full minutes.

The Loudenlow is a battery powered ionization smoke alarm with a low frequency high decibel sound. Three battery powered models are on the web site. These models use 6 AA batteries requiring 12 month replacement. Web site says: “Uses U.L. listed ionization chamber and detection circuitry”. This does not mean the Loudenlow is UL 217 listed. The equipment is not currently in the online certification directories for verification.

Silent Call models 318 Mhz and 418 Mhz are battery powered (12 month) photoelectric smoke alarms with wireless transmitters and bedside receivers. Receivers activate 110 candela strobe light and optional bed vibrator. Back up battery available and sold separately. Receivers can also alert to other devices such as telephone and doorbell with different vibrator pulse patterns. The web site offers other options. Some Silent Call equipment is ETL listed.

Krown Manufacturing device is a transmitter attached to the outside of a smoke alarm and the transmitter sends a signal to the receiving device which has strobe, optional bed shaker and other features such as back up battery. Not currently found in the online certifications directories for verification of listing.

There may be other products on the market. You can check for equipment listing at these sites:

Underwriters Laboratory(UL):
www.UL.com

Click Certifications in the red heading area on the home page. See On-line Certification Directory. Enter search criteria.

Intertek (ETL)
www.intertek.com

See bottom of screen for Product Directories and click. Then click on ETL Listed Mark Directory and enter search criteria.

OSU selected the First Alert SA302CN Dual sensor (photoelectric and ionization) long life battery smoke alarms that can be tested and silenced with a TV remote control for installation in Oklahoma.

Many people who are deaf or hard of hearing are older adults and may have other disabilities. This remote control feature allows them to test and silence their alarms.

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People who are blind may need to silence a smoke alarm to use common household sounds to navigate their escape.

People who use mobility devices can test their own smoke alarms without assistance. The current pricing for our projects when purchased in large quantities is \$24.50 no shipping.

OSU selected the LIFTONE HLAC100 and HLAC150 for our projects. The current pricing for our projects when purchased in large quantities is \$75. This includes the per unit shipping cost.

For people with profound hearing loss, an AC powered smoke alarm with visual alert is being installed. These smoke alarms are primarily being installed outside the sleeping area or in a living space for visual notification during the day time or waking hours. Currently the Gentex 7139LS is being used. The current pricing for our projects is \$110 no shipping.

More from NFPA 72, 2010

18.4.5.3* Effective January 1, 2014, where audible appliances are provided to produce signals for sleeping areas, they shall produce a low frequency alarm signal that complies with the following:

- The alarm signal shall be a square wave or provide equivalent awakening ability.
- The wave shall have a fundamental frequency of 520 Hz \pm 10 percent.

29.4 Assumptions.

29.4.1 Occupants. The requirements of this chapter shall assume that occupants are not intimate with the ignition and are capable of self-rescue.

29.4.2 Escape Route.

29.4.2.1 The requirements of this chapter shall assume that the occupants have an escape plan. **29.4.2.2** An escape route shall be assumed to be available to occupants and to be unobstructed prior to the event of the fire.

29.4.2.3 The escape route shall be along the normal path of egress for the occupancy.

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From the NFPA Appendix:

NFPA 72 is intended to provide reasonable fire safety for persons in family living units.

Reasonable fire safety can be produced through the following three-point program:

- (1.)Minimizing fire hazards
- (2.)Providing fire-warning equipment
- (3.)Having and practicing an escape plan

Minimizing Fire Hazards. This Code cannot protect all persons at all times. For instance, the application of this Code might not provide protection against the following three traditional fatal fire scenarios:

- (1.)Smoking in bed
- (2.)Leaving children home alone
- (3.)Cleaning with flammable liquids, such as gasoline