



HEALTHIER WORKPLACES | A HEALTHIER WORLD

Home Health Care Aides: Occupational Health and Safety Challenges and Opportunities

White Paper

In partnership with



HUMAN FACTORS
and ERGONOMICS SOCIETY

[aiha.org](https://www.aiha.org)

Version 1 | August 5, 2021

Sponsored by AIHA's Healthcare Work Group and the AIHA Ergonomics Committee.

August 5, 2021.

Contributors:

- Colin J. Brigham, CIH, CSP, CPE, CPEA, CSPHP, FAIHA, TRC Companies
- Kermit G. Davis, Ph.D., CPE, FHFES, FAHIA, University of Cincinnati
- Ninica Howard, MS., CPE, Safety and Health Assessment and Research for Prevention (SHARP) Program
- Matthew S. Macomber, MS, CIH
- James D. McGlothlin, Ph.D., CPE, FAHIA, Purdue University

Occupational Injuries and Illnesses of Home Health Aides

The home health care market will be a \$400 billion per year enterprise in 2021. The world's population is aging at a faster rate than at any time in history and people are living longer. Currently, in the United States, 10,000 Baby Boomers turn 65 years old every day and 70% will require long-term care in their lifetime (Genworth, 2021). However, the cost of that care varies considerably based on care setting, geographic location, and the level of care required. Table 1 shows the projected health care costs for typical care options in 2020 and 2050. Because of large cost differences between in-home care and nursing home facilities, it is very likely that in-home care needs will eclipse nursing home care. In addition, because of the COVID-19 pandemic, during which nearly 40% of all COVID-19 related deaths occurred among nursing home residents, there may be a cultural change among senior citizens in where they prefer their health care delivered.

Table 1: Annual median cost of care, 2020 vs 2050 (adapted from Genworth, 2021).

In-Home Care	Community and Assisted Living	Nursing Home Facility
Homemaker Services 2020 \$53,768 2050 \$130,509	Adult Day Health Care 2020 \$19,240 2050 \$46,701	Semi-Private Room 2020 \$93,075 2050 \$225,917
Home Health Aide 2020 \$54,912 2050 \$133,286	Homemaker Services 2020 \$51,600 2050 \$125,247	Private Room 2020 \$105,850 2050 \$256,926

According to the U.S. Bureau of Labor Statistics (BLS) there are approximately 3.4 million people employed as home health and personal care aides in the Home Health Care Services sector (BLS, 2021). Home health and personal care aides (Standard Occupation Classification code 31-1120) are expected to grow by 34% between 2019 to 2029, much faster than the average for all occupations (BLS, 2021). This sector is expected to grow to close to 4.6 million workers by 2029 (BLS, 2021)

The BLS reports the median annual wage for home health and personal care aides was \$27,080 in May 2020 (BLS, 2021). At first glance, this seems to be an occupation where workers can make a decent wage. The actual hourly salary ranges from \$8.10–\$19.00 per hour, with the median at \$11.34 an hour (BLS, 2021) However, inconsistent hours and the transient nature of the workforce results in the majority of these workers working part time and earning a median income of only \$13,800 in 2016 (PHI, 2017). This places the median salary at about half of the poverty level for a family of four (Health and Human Services, 2020).



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with



While there are many different types of home health care workers, including physical therapists, social workers, respiratory therapists, and many others, the focus of this white paper will be on home health care aides, also referred to as personal care aides, home health care nursing aides, in-home aides, home aides, home health care assistants, and home health aides. With respect to national BLS statistics, home health aides, personal care aides, and nursing assistants have been combined to describe this working population.

In 2018, nationally, there were 49,040 reported injuries and illnesses among home health care aides (BLS, 2018a). Among the injury and illness cases, 43% were 45 years or older (BLS, 2018c). The average age of home health care aides is expected to increase, making them susceptible to cumulative disorders and injuries (Luz et al., 2015). Based on Ohio Bureau of Workers' Compensation (OBWC) claims, home health care aides had the highest average total costs per claim (around \$15,000/claim) (Davis et al., 2021). Shoulder injuries for home health care aides had the highest average total claim costs (\$20,600/injury) of all occupations, settings, and body areas combinations (Davis et al., 2021). Figure 1 shows the medical costs for back, knee, shoulder, and multiple MSD claims for home health care workers with overexertion and falls being the largest contributors (Figure 2) (Davis et al., 2021). Opioid medications are a common method for pain management. As we have seen, increased prescriptions of opioid medications have led to widespread misuse and an epidemic of overdoses in the United States. Among OBWC claims, opioid prescriptions were most frequent for home health care aides and nurses, with 18.9% and 17.7% having been prescribed opioids, respectively (Davis et al., 2021).

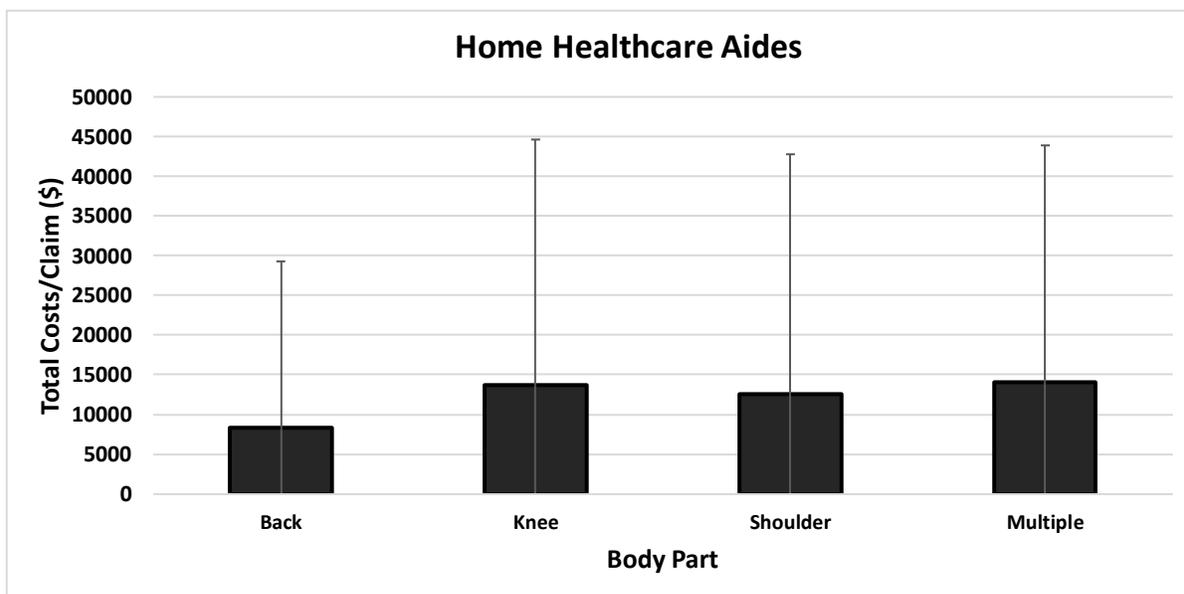


Figure 1: Average of total costs (medical and indemnity) for musculoskeletal injury claims for home health care aides in the Ohio Bureau of Workers' Compensation System (Adapted from Davis et al., 2021).

The most frequent injury type among home health care aides were strains, sprains, and tears, with an incidence rate of 205.6 injuries per 10,000 full-time workers (FTEs) and a prevalence of 36% (BLS, 2018g). Pain and soreness were also a frequent injury type, accounting for 26% of the reported cases and having an incidence rate of 111.0 injuries per 10,000 FTEs (BLS, 2018g). Bruises and contusions were reported at a rate of 32.3 injuries per 10,000 FTEs (BLS, 2018g). In 2018, 46% of the reported injuries and illnesses required 5 days or less away from work, while 26% required more than 30 days of time loss (BLS, 2018b). Injuries to home health care aides required the most days away from work among health care support occupations, with a median of 13 days (BLS, 2018b). Home health care workers oftentimes are exposed to second-hand smoke (see Figure 3) (Hittle et al., 2016).

Though the rate of underreporting in home health care is unknown, underreporting of occupational injuries and illnesses is a widespread problem across the United States, including health care (Wueller and Bonauto, 2014; Galizzi et al, 2010). Additionally, employees may feel that the negative consequences for reporting injuries are not worth the perceived benefits (Hansell et al, 2018). Employees may feel responsible and that an injury was their fault. Too often, home health care aides feel that injuries are just a part of their job, believing that client care comes before their safety (Quinn et al, 2016). Home health care aides generally work alone and often injuries are not observed by anyone to support the home health care aides' claims. Or, if they are observed, it is by a patient, care recipient, resident, or client (hereafter called patient), someone who may have incentive not to corroborate the home health care aide's report.

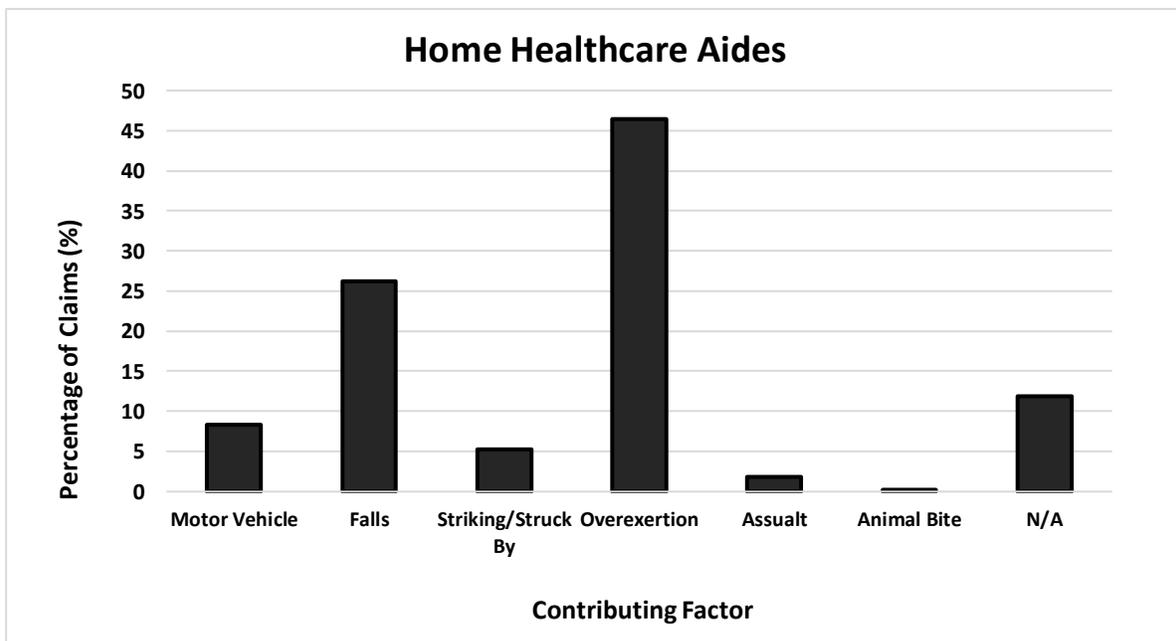


Figure 2: Hazards for home health care aides that were attributed to musculoskeletal claims in the Ohio Bureau of Workers' Compensation System (Adapted from Davis et al., 2021).

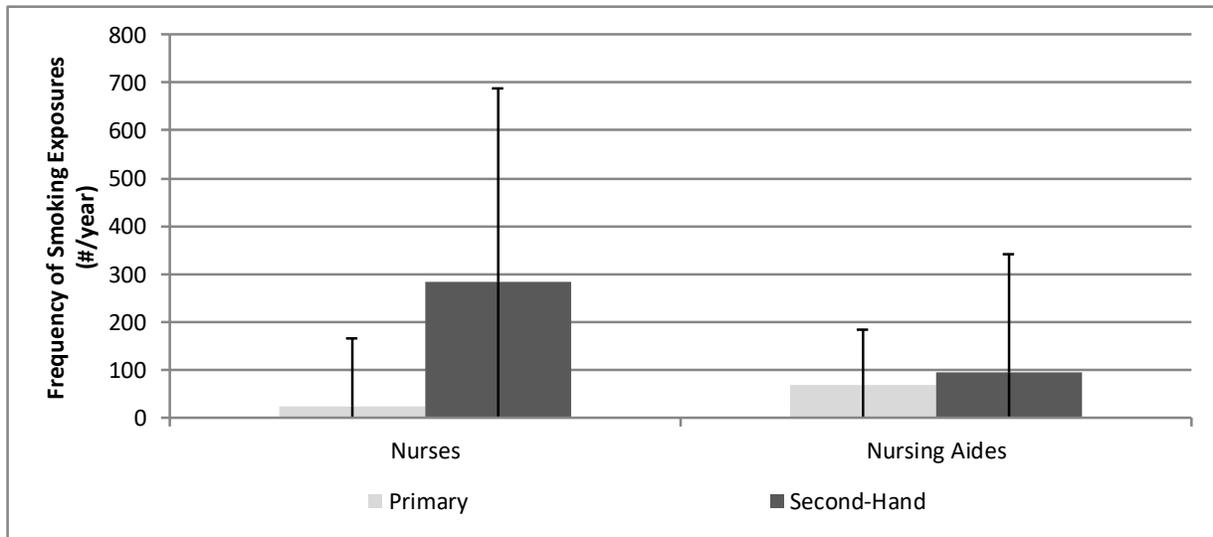


Figure 3: Smoking exposures for home health care aides (as compared to nurses) with secondary smoke greater than primary smoking (Adapted from Hittle et al., 2016).

Violence in the workplace can take on many forms. The Occupational Safety and Health Administration (OSHA) defines workplace violence as any act or threat of physical violence, harassment, intimidation, or threatening, disruptive behavior in the workplace. Violence, in whatever form, is a hazard faced by home health care aides. These workers can face violence from both the patient they care for as well as the patient’s family members and others inside and outside of the home. In a cross-sectional study on workplace violence against homecare workers, reported past-year incidents included verbal aggression (50.3% of respondents), workplace aggression (26.9%), workplace violence (23.6%), sexual harassment (25.7%), and sexual aggression (12.8%) (Hanson et al. 2015). These acts were significantly associated with greater stress, depression, sleep problems, and burnout (Hanson et al, 2015). Workplace violence among home health care workers has been shown to have an indirect impact on lower affective commitment, enhanced withdrawal, poor interpersonal job performance, and greater neglect (Barling et al, 2001). Verbal abuse is often the most common form of workplace violence experienced by home health care aides. Risk factors for verbal abuse include clients with dementia and homes with too little space (Karlsson et al, 2019).

Historically, home health care aides face many challenges, including low pay, difficult working conditions, turnover, and few training opportunities. In 2020, according to the Home Health Care News, the turnover rate for home health care aides was 36% (Holly, 2020). Thus, high levels of turnover will endanger the home health care aide occupation’s effectiveness at adequately providing care in homes, due to reliance on less-trained individuals or lack of aides to fulfill demand. Turnover is oftentimes problematic for providing continuity of care and developing trusting relationships with patients.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with



Unique Risk Factor Exposures among Home Health Care Workers.

Home health care aides provide critical assistance for their patients' basic needs. These individuals are placed in situations where health and safety hazards are often not in their control and can present a myriad of dangers. Home health aides face unique exposures as they go into multiple homes per day (Hittle et al., 2016, Suarez et al., 2017, Agbonifo et al., 2017). Some of the more unique exposures as compared to the rest of the health care sector include over the road vehicle accidents (e.g., driving to multiple homes each day), Infections, cigarette smoke (secondhand smoke), pests (e.g., cockroaches and bed bugs), and pets (e.g., bites and tripping hazards).

A high incidence of injuries among home health care aides is often attributed to patient handling activities (Galinsky, Waters & Malit, 2013; Hittle et al, 2016; Wipfli et al, 2012). In 2018, BLS reported 11% of reported injuries were caused from overexertion when lifting and lowering (BLS, 2018f), with an incidence rate of 45.8 injuries per 10,000 FTEs (BLS, 2018h). The patient was identified as the factor responsible for the injury in 49% of the cases (BLS, 2018d), with an incidence rate of 220 injuries and illnesses per 10,000 FTEs (BLS, 2018i). Worker motion or position was reported as the factor responsible for an injury at a rate of 33.2 injuries per 10,000 FTEs (BLS, 2018i). The incidence rate for back injuries among home health care aides was 109.5 injuries and illnesses per 10,000 FTEs (BLS, 2018j), accounting for 28% of injuries and illnesses (BLS, 2018e). Shoulder injuries occurred at a rate of 35.9 injuries per 10,000 FTEs and hand and wrist injuries had an incidence rate of 37.5 injuries per 10,000 FTEs (BLS, 2018j). Overexertion, likely due to moving patients and medical equipment, was reported as the main cause in 43% of the claims reported to Ohio Bureau of Workers' compensation during a 4-year period (Davis et al., 2021). Two factors related to home health care likely increase the impact of patient handling on home health care aides: the lack of access to patient handling equipment and working alone in the home with no assistance in patient transfers or repositioning.

Falls, slips, and trips are also common causes of injuries among home health care aides (Merryweather et al, 2018). In 2018, the BLS reported 22% of injuries among home health care aides were caused by slips, trips, and falls (STF) (BLS, 2018f). The incidence rate for a STF injury was 96.3 injuries per 10,000 FTEs (BLS, 2018h). Floors, walkways, and ground surfaces were identified as factor responsible for the injuries in 17% of the cases (BLS, 2018d), an incidence rate 73.8 injuries and illnesses per 10,000 FTEs (BLS, 2018i). Lower extremities were injured at a rate of 73.7 injuries per 10,000 FTEs (BLS, 2018e, accounting for 18% of the injuries and illnesses in 2018 (BLS, 2018j).

Though acts of violence toward home health care aides is most likely underreported (Campbell et al, 2014), it has been documented in the literature (Hanson et al, 2015; Merryweather et al, 2018; Geiger-Brown, 2007). While home health care aides may be exposed more frequently to environmental hazards, threats and verbal or physical abuse has been found to be a greater concern (Sherman et al, 2008). Nationally, in 2018, the rates of injuries to home health care and personal care aides from intentional and unintentional violence by another person were 17.4 per 10,000 FTEs and 7.1 per 10,000 FTEs, respectively. (BLS, 2018h). This can be compared to an injury rate of 12.4 and 5.1 for all health care support occupations (BLS, 2018h).

The nature of providing care services in several different residences puts home health care aides at risk of injuries from motor vehicles (Denton, 1999; Hittle et al, 2016, Davis et al., 2021). Nationally, in 2018, 3% of

the reported injuries were a result of roadway incidents with vehicles (BLS, 2018f), with a rate for intentional and unintentional violence by another person of 13.7 injuries per 10,000 FTEs (BLS, 2018h).

Developing Mental Well-Being Issues

The toll on the mental well-being of home health care aides is not often mentioned when describing the impact of providing care. The focus is primarily on the physical health and safety of these workers. An examination of Washington State's Behavioral Risk Factor Surveillance System (BRFSS) survey data between 2011 and 2016 (Howard and Marcum, 2020) found that home-based health care support workers experienced a mean of 5.0 days of poor mental health per month, significantly more than all other occupations in the survey. Almost a third (32%) reported being diagnosed by a medical professional with a depressive disorder, including major and minor depression. Again, this was significantly more than all other occupations combined, though not significantly different from non-home-based care occupations. Several factors have been identified as significant sources of stress that impact the health of these workers, including low pay and limited or no benefits, hazardous home conditions, pressure from expectations of family and friends, lack of respect as a member of the health care team, and coping with client deaths and personal bonds (Zoeckler, 2018). For many home health care aides, building and maintaining close relationships with those they care for is considered an integral part of the care they provide (Fransoza et al., 2018; Markkanen et al, 2007). Strong emotional bonds between client and worker in a long-term care setting resulted in better emotional health of the employee, with reduced absenteeism and less emotional exhaustion (Barsade et al, 2014). However, aides can experience significant grief when a client dies (Zoeckler, 2017). This grief is often disenfranchised grief, making it difficult to process or work through. Agencies often lack programs or structures to support their employees in their grief (Barooh et al, 2019). Agencies with restrictive contact policies, that do not allow employees to contact the family following a client's death, limit the opportunities of employees for grief processing activities, such as thinking and talking about the death (Boerner et al, 2016).

Wellness programs for home health care aides have not been well reported within the industry. Because home health care aides' workplace is in their clients' homes, it may be difficult for health promotion programs to be implemented there. Compounding this lack of reporting of such programs in the literature, there is little research to identify program best practices in this environment or the feasibility of such programs for home health care aides (Muramatsu et al, 2017). Muramatsu et al (2017) found that a workplace health promotion program targeted for clients and aides alike resulted in an increase in time that older aides actually spent doing the types of physical activities that they delivered to their clients. NIOSH has developed the Total Worker Health® (TWH) Program, a strategy that integrates protection from work-related health and safety hazards with health promotion to prevent injury and illness. It is based on the acknowledgement that work is a social determinant of health. TWH programs involve multi-component interventions. Interventions may include organizational or policy changes paired with procedure changes to reduce exposure to a specific occupational hazard and education regarding health behaviors. The Community of Practice and Safety Support (COMPASS) intervention for home care workers was developed by Oregon Healthy Workforce Center with a TWH perspective (Olson et al, 2015; Olson et al, 2016). The intervention involved education on safety, health, and well-being, as well as goal setting, self-monitoring, and structured social support. The COMPASS program saw significant improvements in the use of ergonomics tools and techniques



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with



for physical work, hazard correction in homes, fewer lost workdays due to injury, and greater fruit and vegetable consumption. However, there are several challenges to implementing TWH interventions in a home health care setting. Employees of smaller companies may have less access to resources to develop TWH interventions. Most home health care agencies do not offer health insurance, making comprehensive TWH interventions difficult. Other contextual factors, besides health care coverage, which affect the health of home health care aides may modify the effectiveness of any intervention, including availability of paid sick leave and work culture.

Limited Training in Health and Safety for Home Health Care Aides

Because of the unique characteristics of home health care, continuous and effective training is needed (Agbonifo et al, 2017). Unfortunately, home health care services have been organized around regulations and payments designed for inpatient and outpatient acute care settings, ignoring the specific training necessary for appropriate practice in the home environment and giving little consideration of the complexity or level of skill required for home health care (National Research Council, 2011). The increasing presence of technology in the home has increased the complexity of care. Unlike nurses and therapists, the minimum educational requirement for home health care aides is a high school diploma or GED (BLS, 2021). There are no federal training standards or training requirements for home health care aides (BLS, 2021). These are left to the purview of individual states, and, as such, training specific to the home environment may be inadequate. A review of state training requirements for personal care aides in Medicaid-funded programs found large variations in the required hours of training, the competencies required, curriculum content, and testing (Marquand and Chapman, 2014). One example is the requirements in the state of Michigan, where most home health care aides are trained through online two-week courses. Though they must meet the State of Michigan Nurse Aide Training Curriculum Model (Michigan Department of Licensing and Regulatory Affairs Bureau of Health Care Services Revised, 2014), only one of the required 49 tasks addresses body mechanics. None of the required 49 tasks mention home health care aides' safety, situational awareness, or workplace violence. To be licensed as a Certified Nursing Assistant (CNA) in Michigan, an individual must complete a minimum of 75 hours of training with at least 16 hours being classroom instruction. An additional 16 or more must be devoted to skills training (including coverage of 49 specific tasks) (Michigan Department of Licensing and Regulatory Affairs Bureau of Health Care Services Revised, 2014). In comparison, a police officer must complete 594 hours of training in an academy (Michigan Commission on Law Enforcement Standards, 2020) and a licensed mortuary professional must have 60 semester hours of college courses, a nine-month course in mortuary science, and one year of residency under a licensed mortician (Michigan Mortuary Science, 2020).

Lack of Standards and Regulation at Federal or at State Level

There are currently no federal worker safety standards that are targeted specifically towards the protection of the health and safety of home health care aides. However, the Occupational Safety and Health Administration (OSHA) has implemented ten National Emphasis Programs for targeting compliance inspections in high-hazard industries. According to the agency, "National Emphasis Programs (NEPs) are temporary programs that focus OSHA resources on particular hazards and high-hazard industries. Existing and potential new



In partnership with



emphasis programs are evaluated using inspection data, injury and illness data, National Institute for Occupational Safety and Health (NIOSH) reports, peer-reviewed literature, analysis of inspection findings, and other available information sources.” (OSHA, 2020). Inspection data is also used to start a NEP if there are a significant number of citations for a health or safety issue in one industry. As of 2020, OSHA has issued NEPs for:

- Combustible Dust (03/11/2008)
- Hazardous Machinery (2/10/2019)
- Hexavalent Chromium (02/23/2010)
- Lead (08/14/2008)
- Primary Metal Industries (10/20/2014)
- Process Safety Management (PSM) (01/17/2017)
- Shipbreaking (03/07/2016)
- Silica, Crystalline (02/04/2020)
- Trenching and Excavation (10/01/2018)
- Nursing Home and Residential Care Facilities (09/01/2002 and 04/05/2012)

There have been two NEPs for nursing homes and residential care facilities but never one for home health care. OSHA is divided into ten regions, and the regions can have local emphasis programs (LEP) that are enforcement strategies at the regional level (OSHA, 2020). These LEPs allow a focus on region-level priorities that may not be addressed through the federal NEPs. Currently, there is one regional LEP for health care, which does not specifically cover home health care. Region 6, which includes Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, issued CPL 2 02-00-029A on October 1, 2019. The LEP is titled “Regional Emphasis Program for Health Hazards in the Health Care Industry”. The program covers North American Industry Classification System (NAICS) code 621493, Freestanding Ambulatory Surgical and Emergency Centers. Establishments in this NAICS may provide some home health care services.

States who run their own occupational safety and health administration programs (State Plans) are another source of potential coverage of health and safety practices for home health care aides. There are currently 22 State Plans covering both private sector and state and local government workers, and there are six State Plans covering only state and local government workers (OSHA, 2020). These states are required to have strategic plans with goals to reduce illness and injury rates in high-hazard industries. Michigan, for example, has a strategic plan with the following goal: “Reduce by 2% a year (10% total for 5 years) the total incident rate of non-fatal worker injuries and illnesses in high-hazard general industries and other industries showing emerging hazards” (MIOSHA, 2020). The list of high-hazard industries includes hospitals (NAICS code 622) and nursing and residential care facilities (NAICS code 623). Some of these facilities will provide services in the homes of patients. This means facilities in the high-hazard industries may receive comprehensive programmed inspections that audit the facility’s compliance with standards that apply to their industry. In addition, any serious health or safety hazards in plain view may be investigated.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with



Common Practices to Mitigate Risk of Injury from Patient Handling Tasks among Home Health Care Aides.

A case study conducted by one of the authors of this white paper was used to identify common high-risk tasks from patient handling in home health care activities, such as patient loading into and removal from a vehicle, transfers from the bed to a wheelchair or chair (when the patient wakes up) or from a wheelchair or chair to the bed (when the patient goes to sleep), maneuvering in and out of showers, and during toileting. The following provides examples of possible solutions to these high-risk tasks but is not intended to be comprehensive.

Getting in and out of an automobile: If a client is able and capable of getting out of their home for shopping or other appointments, the home health care aides should be trained in safe patient handling for lifting and transferring them in and out of an automobile (Figure 4). Use “pivot plates” (Figure 5) for the patient to stand on and be pivoted by the home health care aide to get into and out of the passenger seat in the automobile. Also, low-friction fabric pads, or pivot cushions, can be placed on the passenger seat to make it easier to rotate the patient in place, reducing the force needed by the home health care aide to properly position the patient.



Figure 4. Transferring a patient out of a vehicle.



Figure 5. A pivot-plate.

Moving the patient from bed to chair (waking up) and from chair to bed (going to sleep) (Figure 6): Ideally, the height of the bed should be higher than the chair when moving patients from the bed to a chair and lower when moving the patient from a chair to the bed. As such, a height-adjustable bed is best when the patient is unable to perform these maneuvers by themselves. The use of a gait belt will provide adequate hand holds during these transfers, while a pivot plate will aid in shifting the orientation of the patient's feet as the transfers are made. Also, the use of a transfer board may be helpful when performing these patient transfers.



Figure 6. Chair to bed transfer using a pivot.



Figure 7. A power lift-assisted transfer.

Showering: To safely transfer a patient from a wheelchair or scooter to a shower chair, the home health care aide must get closer to the patient. Placing the knees on each side of the patient's thighs will allow this.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with



Proper and safe use of powered lift assist devices: Although patient handling lifts are rarely available in the home, a lift assist device (Figure 7) is the best way to transfer a patient in the home. Use of these devices requires training and experience.

Toileting: Moving a patient from a wheelchair to the toilet (and vice versa) is one of the most difficult maneuvers a home health care aide completes (Figure 8). Home health care aides should perform the transfer with the patient as close to them as possible. Placing the knees on each side of the patient's thighs will allow this (Figure 9). This maneuver should only be done if the patient can support a portion of their weight.

Another opportunity to help mitigate potential patient handling issues is the use of patient gait belts. As shown in Figure 10, advantages of using a gait belt include improving the handholds of the home health care aide during patient handling, giving the home health care aide more control in moving a patient from one spot to another, and helping to stabilize a patient to maintain their balance during ambulation.

NIOSH has numerous resources on their website ([bit.ly/nioshhomecare](https://www.cdc.gov/niosh/homecare/)) concerning home health care.

Suggested Steps for Better Protecting Home Health Care Workers

While there are currently many factors creating undue stress and potential for harm to home health care aides, the following actions would significantly reduce this potential for harm and increase quality of care:

- 1) Establish an occupational health and safety management system for providing home health care that allows employers and their employees (care providers) to **Control, Anticipate, Recognize, and Evaluate** risk factors and hazards to them in the workplace (Brigham, 1994). Companies need to adopt practices to ensure **C.A.R.E.** is implemented into the industry, otherwise this should be done through regulation of employers of home health care workers.
- 2) Develop minimum standards nationally for training that includes safe patient handling and mobility, de-escalation of situations for workplace violence and harassment, proper hygiene, and injury prevention.



Figure 8. Toileting a home health care patient.



Figure 9. Proper positioning for transferring a patient to the toilet.



Figure 10: Lifting patient with the aid of a gait belt by a home health care worker from a seated to standing position.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with



- 3) Provide education to the general public regarding health and safety hazards in their homes that can harm home health care workers and hazards which make it difficult to provide quality care to their loved ones. These hazards may relate to design, maintenance, or personal practice deficiencies.
- 4) Set minimum pay levels sufficient enough to provide a living wage and reduce the occurrence of turnover.
- 5) Provide safe patient handling and mobility equipment in the homes through different avenues, such as grants, insurance, and Medicare and Medicaid systems. This effort would include informing policy and decision makers about the additional benefits to patients with the use of safe patient handling and mobility equipment.
- 6) Provide practical assist devices, such as the pivot disc and gait belts, through the establishment of standard practices.
- 7) Follow developed and currently developing guidance from professional organizations, including AIHA, NIOSH, the Association of Safe Patient Handling Professionals (ASPHP), and the American Nurses Association (ANA).

References

- Agbonifo N, Hittle B, Suzarez R, Davis K. (2017), Occupational exposures of home health care workers. *Home Healthcare Now*, 35(3):150-159.
- Barling J, Rogers AG, Kelloway EK. (2001), Behind closed doors: In-home workers' experience of sexual harassment and workplace violence. *Journal of Occupational Health Psychology*, 6(3):255-269.
- Barsade SG, O'Neill OA. (2014), What's love got to do with it? A longitudinal study of the culture of companionate love and employee and client outcomes in a long-term care setting. *Administration Science Quarterly*, 59:551-598.
- Barooah A, Boerner K, Gleason HP, van Riesenbeck I. (2019), Immediate aftermath of a client's death: the experience of home health aides. *Home Health Care Services Quarterly*, 38(1):14-28.
- Boerner K, Gleason H, Barooah A. (2016), Home health aides' experience with client death: The role of employer policy. *Home Healthcare Now* 2016, 34(4): 189-195.
- Brigham CJ, (1994), Five-Step Plan to Help Reduce the Risks of Patient Transfer Injuries, *Health Facilities Management*, 7(5), 54-56.
- Bureau of Labor Statistics. (2018a). TABLE R9. Number of nonfatal occupational injuries and illnesses involving days away from work by occupation and selected natures of injury or illness, private industry, 2018. (Accessed 2-16-2021), <https://www.bls.gov/iif/oshcdnew2018.htm>
- Bureau of Labor Statistics. (2018b). TABLE R66. Number of nonfatal occupational injuries and illnesses involving days away from work by occupation and number of days away from work, and median number of days away from work, private industry, 2018. (Accessed 2-16-2021), <https://www.bls.gov/iif/soii-data.htm>.
- Bureau of Labor Statistics. (2018c) TABLE R41. Number of nonfatal occupational injuries and illnesses involving days away from work by occupation and age of worker, private industry, 2018. (Accessed 2-16-2021), <https://www.bls.gov/iif/soii-data.htm>.
- Bureau of Labor Statistics. (2018d). TABLE R11. Number of nonfatal occupational injuries and illnesses involving days away from work by occupation and selected sources of injury or illness, private industry, 2018. (Accessed 2-16-2021), <https://www.bls.gov/iif/soii-data.htm>.
- Bureau of Labor Statistics. (2018e). TABLE R10. Number of nonfatal occupational injuries and illnesses involving days away from work by occupation and selected parts of body affected by injury or illness, private industry, 2018, <https://www.bls.gov/iif/soii-data.htm>.



In partnership with



- Bureau of Labor Statistics. (2018f). TABLE R12. Number of nonfatal occupational injuries and illnesses involving days away from work by occupation and selected events or exposures leading to injury or illness, private industry, 2018, <https://www.bls.gov/iif/soii-data.htm>.
- Bureau of Labor Statistics. (2018g). TABLE R98. Incidence rates for nonfatal occupational injuries and illnesses involving days away from work per 10,000 full-time workers by occupation and selected nature of injury or illness, private industry, 2018, <https://www.bls.gov/iif/oshcdnew2018.htm>.
- Bureau of Labor Statistics. (2018h). TABLE R100. Incidence rates for nonfatal occupational injuries and illnesses involving days away from work per 10,000 full-time workers by occupation and selected events or exposures leading to injury or illness, private industry, 2018, <https://www.bls.gov/iif/oshcdnew2018.htm>.
- Bureau of Labor Statistics. (2018i). TABLE R99. Incidence rates for nonfatal occupational injuries and illnesses involving days away from work per 10,000 full-time workers by occupation and selected sources of injury or illness, private industry, 2018, <https://www.bls.gov/iif/oshcdnew2018.htm>.
- Bureau of Labor Statistics. (2018j). TABLE R97. Incidence rates for nonfatal occupational injuries and illnesses involving days away from work per 10,000 full-time workers by occupation and selected parts of body, private industry, 2018, <https://www.bls.gov/iif/oshcdnew2018.htm>
- Bureau of Labor Statistics (BLS), (2021). Home Health Aides and Personal Care Aides, Occupational Outlook Handbook, <https://www.bls.gov/ooh/healthcare/home-health-aides-and-personal-care-aides.htm>, (Accessed 6-08-2021).
- Bureau of Labor Statistics (BLS, 2021): <https://www.bls.gov/ooh/healthcare/home-health-aides-and-personal-care-aides.htm#tab-1>
- Bureau of Labor Statistics (BLS, 2021): Hourly pay for home healthcare workers: <https://www.bls.gov/ooh/healthcare/home-health-aides-and-personal-care-aides.htm#tab-1>
- Campbell CL, McCoy S, Burg MA, Hoffman N (2014). Enhancing home care staff safety through reducing client aggression and violence in noninstitutional care settings: A systematic review. *Home Health Care Mgmt. Prac.*, 26(1): 3-10.
- Czuba LR, Sommerich CM, Lavender SA. (2012), Ergonomic and safety risk factors in home health care: Exploration and assessment of alternative interventions. *Work* 42:341-353.
- Davis, K. G., Freeman, A. M., Ying, J., & Huth, J. R. (2021). Workers' compensation costs for healthcare caregivers: Home healthcare, long-term care, and hospital nurses and nursing aides. *American Journal of Industrial Medicine*. 64(5), 369-380.
- Denton, M. A., Zeytinoglu, I. U., Webb, S., & Lian, J. (1999). Occupational health issues among employees of home care agencies. *Canadian Journal on Aging*, 18(2):154-181.
- Franzosa E; Tsui EK; Baron S. (2018), Home health aides perceptions of quality of care: Goals, challenges and implications for a rapidly changing industry. *New Solutions*. 27(4):629-647.
- Galinsky T, Waters T, Malit B. (2001), Overexertion injuries in home health care workers and the need for ergonomics. *Home Health Care Services Quarterly*, 20(3):57-73.
- Galizzi M, Miesmaa P, Punnett L, Slatin C, The PHASE in Healthcare Research Team (2010). *Industrial Relations*, 49(1): 22-43.
- Geiger-Brown J, Muntaner C, McPhaul K, Lipscomb J, Trinkoff A. (2007), Abuse and violence: during home care work as predictor of worker depression. *Home Health Care Services Quarterly*, 26(1):59-77.
- Genworth, (2021), Cost of Care Survey, Accessed 4/19/2021, <https://www.genworth.com/aging-and-you/finances/cost-of-care.html>
- Hanson GC, Perrin NA, Moss H, Lahamar N, Glass N. (2015), Workplace violence against homecare workers and its relationship with workers health outcomes: a cross-sectional study. *BMC Public Health*, 15: 11.
- Hansell AK, Knaster ES, Phillips LE (2018). Injury among home workers in Washington State. *New Solutions*, 27(4); 543-558.



In partnership with



- Health and Human Services, (2020), U.S. federal poverty guidelines used to determine financial eligibility for certain federal programs. (Accessed on 4/20/21) <https://aspe.hhs.gov/poverty-guidelines>
- Henriksen K, Joseph A, Zayas-Cabán T. (2009), The human factors of home health care: A conceptual model for examining safety and quality concerns. *Journal of Patient Safety*, 5(4): 229-236.
- Hittle B, Agbonifo N, Suarez R, Davis KG, Ballard T. (2016), Complexity of occupational exposures for home health-care workers: nurses vs. home health aides. *Journal of Nursing Management*, 24:1071-1079.
- Holly, R, (2020), Home Health Turnover Rate Hits 22.18%, <https://homehealthcarenews.com/2020/10/home-health-turnover-rate-hits-22-18/> (accessed 4/2/2021)
- Howard N, Marcum J. (2020), Comparison of BRFSS data between home-based care providers and health care support workers in clinical environments in Washington State. *Workplace Health & Safety*, 68(2):92-102.
- Karlsson ND, Markkanen PK, Kriebel D, Gore RJ, Galligan CJ, Sama SR, Quinn MM (2019). Home care aides' experiences of verbal abuse: a survey of characteristics and risk factors. *Occup. Environ. Med.*, 76: 448-454.
- Luz C, Hanson K. (2015), Filling the care gap: personal home care worker training improves job skills, status, and satisfaction. *Home Health Care Management & Practice*, 27(4):230-237.
- Markkanen P, Quinn M, Galligan C, Chalupka S, Davis L, Laramie A. (2007), There's no place like home: A Qualitative study of the working conditions of home health care providers. *Journal of Occupational and Environmental Medicine*, 49(3): 327-337.
- Marquand A, Chapman SA (2014). The national landscape of person care aide training standards. San Francisco (CA): University of California San Francisco, Health Workforce Research Center on Long-Term Care. Available at https://healthworkforce.ucsf.edu/sites/healthworkforce.ucsf.edu/files/Report-The_National_Landscape_of_Personal_Care_Aide_Training_Standards.pdf.
- Merryweather AS, Thiese MS, Kappelusch JM, Garg A, Fix DJ, Hegmann KT. (2018), Occupational factors related to slip, trip and falls among home healthcare workers. *Safety Sciences*, 107: 155-160.
- Michigan Department of Licensing and Regulatory Affairs Bureau of Health Care Services Revised, 2014
- Michigan Commission on Law Enforcement Standards, (2020), General Information on How to Become A Law Enforcement Officer, Accessed 4/19/21, <https://www.michigan.gov/mcoles/0,4607,7-229-41624-150154--,00.html>
- Michigan Mortuary Science, (2020), Michigan mortuary science licensee licensing guide, Accessed 4/19/2021, https://www.michigan.gov/documents/lara/mortuary_science_licensing_guide_511740_7.pdf
- Michigan Occupational Safety and Health Administration (MIOSHA), 2020. MIOSHA Goals for FY 2019-2023, Accessed 4/19/21. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.michigan.gov%2Fdocuments%2Fflara%2Fflara_miosha_goals_fy19-23_635499_7.doc
- Muramatsu N, Yin L, Lin T-T. (2017), Building health promotion into the job of home care aides: Transformation of the workplace health environment. *International Journal of Environmental Research and Public Health* 14: 384.
- National Institutes of Health (NIH) (2015): Workplace violence against homecare workers and its relationship with workers health outcomes: a cross-sectional study (nih.gov).
- National Institute for Occupational Safety and Health (NIOSH). (2020), NIOSH Hazard Review: Occupational Hazards in Home Healthcare. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2010-125.
- National Research Council (2011). Health Care Comes Home: The Human Factors. Committee on the Role of Human Factors in Home Health Care, Board on Human-Systems Integrations, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
- Olson R, Wright RR, Elliot DL, Hess JA, Thompson S, Buckmaster A, Luther K, Wipfli B. (2015), The COMPASS Pilot Study: A Total Worker Health™ intervention for home care workers. *Journal of Occupational and Environmental Medicine*, 57(4):406-416.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with



- Olson R, Thompson SV, Elliot DL, Hess JA, Rhoten KL, Parker KN, Wright RR, Wipfli B, Bettencourt KM, Buckmaster A, Marino M. (2016), Safety and health support for home care workers: The COMPASS randomized controlled trial. *American Journal of Public Health*, 106(10):1823-1832.
- Occupational Safety and Health Administration (OSHA), (2020), Safety Plans, Accessed 4/19/21. <https://www.osha.gov/stateplans>
- PHI (2017). U.S. Home Care Workers: Key Facts. Bronx, NY: PHI.
- Quinn MM, Markkanen PK, Galligan CJ, Sama SR, Kriebel D, Gore RJ, Brouillette NM, Okyere D, Sun C, Punnett L, Laramie AK, Davis, L (2016). Occupational health of home care aides: results of the safe home care survey. *Occup. Environ. Med.*, 73: 237-245.
- Sherman MF, Gerson RRM; Samar SM; Pearson JM; Canton AN; Damsky MR (2008). Safety factors predictive of job satisfaction and job retention among home healthcare aides. *Occup. Environ. Med.*, 50: 1430-1441.
- Suarez R, Agnofio N, Hittle B, Davis KG, Freeman A. (2017), Frequency and risk of occupational health and safety hazards for home healthcare workers. *Home Health Care Management & Practice*. 29(4):2017-215.
- Wears RL, Berg M. (2005), Computer technology and clinical work: still waiting for Godot. *Journal of the American Medical Association*, 293:1261-1263.
- Wipfli B, Olson R, Wright RR, Garrigues L, Lees J. (2012), Characterizing hazards and injuries among home care workers. *Home Healthcare Nursing*, 30(7):387-393.
- Wueller SE, Bonauto DK. Exploring the relationship between employer recordkeeping and underreporting in the BLS Survey of Occupational Injuries and Illnesses (2014). *Am J Ind Med*, 57: 1133-1143.
- Zoeckler JM. (2018), Occupational stress among home healthcare workers: Integrating worker and agency-level factors. *New Solutions*, 27(4):524-542.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

In partnership with

