

Inclusion Ergonomics for the Differently-abled Workforce

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Workforce Demographics:



- Shift in **AGING** % of workforce
- Shift in **LENGTH OF TIME** workers continue to work

In 16 years, 1 in 5 people will be 65 years and older (20%)

By 2050, 25% of population will be over age 65

GOAL: To retain great knowledge/ skill set
AND the body it comes with!

As Our Workforce Ages:



Productivity requirements for a shifting age demographic, as new technologies continue to evolve.

- **Visual:** Age related, diabetes related
- **Mobility:** Aging knees, injured returning vets, wheelchairs, cardiovascular issues
- **Arthritis:** Osteoarthritis of Hands - keyboarding, holding tablets, books, files, swiping

As Our Workforce Ages:



INCLUSIVE Ergonomics can benefit **ALL** workers, including those who are **Differently-abled**.

Universal Design – Designing new facilities with all workforce demographics in mind, before problems arise.

(Ron Mace- Center for Universal Design – 1997)

Inclusion Ergonomics:

To make the work site accessible for the entire workforce, from new hire until retirement.

2013 Workforce (BLS)

- 139 million in US were employed
 - 74.9% full time (35 + hours/week)
 - 25.1 % part time
- Gender
 - Male 53.4%
 - Female 46.6%



Inclusion Ergonomics:

Definitions:

- Accessible – Universal design
- Assistive – Technologies and devices to help individuals with disabilities perform their job.

Inclusion Ergonomics is making all people feel VALUED.



Aging Workforce Stats:



Definition:

- Anyone older than me
- US DOL says it's over 55 years
- Age Discrimination in Employment Act
 - Older than 40 years old

Numbers:

- In 2013- 22% of all workers were 55 and older
- By 2018- 25% of all workers

Aging Workforce:



Why:

- We are living longer and healthier
- Working for additional income
- Remain employed to keep/get health benefits
- Rise in Soc Sec retirement age and delayed retirement credit
- Defined Contribution pension plans (401K)
- Current financial concerns, retirement savings

Aging Workforce:

What happens to us as we age?

- **Workers' visual acuity**
- **Hearing (App)**
- **Balance and Physical strength**
- **Bone density and joint mobility**
- **Manual dexterity**
- **Reaction and movement time (drivers)**
- **Endurance**



Aging Workforce:



Two Body Parts of Concern w/Aging:

- Shoulder
- Lower Back (Less resiliency in ligaments, tendons and muscle)

» Ades & Toth 2005

MSDs in Older Workers:

- More 'severe' for older vs. younger workers
- Recuperation, lost work time, etc.

General Ergo for Aging Workers:



- Substitute **MECHANICAL** for manual strength
- Reduce the highly repetitive tasks
- Allow adequate recovery time
- Reduce static and stressful postures
- Job rotation



Remember, aging well at work is combination of:

- **Ergonomics** (Correct work environment)
- **Health of the Employee** (Health promotion)

Accommodating All as We Age:



- We'll look at several common ailments of aging
- Ergonomic recommendations for inclusion

NOTE:

- Session is not intended to be medical advice
- Not to discuss if ailment is real or not

Accommodating All as We Age:



- Look at several common conditions of aging

Back Conditions	Arthritis	Diabetes
Migraine Headaches	Chronic Fatigue/ Fibromyalgia	PTSD
Gastrointestinal Disorders Crohn's/IBS)	Vision Impairments	Multiple Sclerosis
ALS (Lou Gehrig's)		

- What they are and impact on work
- Ergonomic recommendations for inclusion

NOTE:

- » Session is not intended to be medical advice
- Not to discuss if ailment is real or not

Back Conditions:



Resource: (National Institute for Health)

- Stats are 8 of 10 will have low back pain at some point
- LBP can come on suddenly or gradually
- Pain lasting longer than 3 months is considered chronic

CAUSE:

- Tension, spasms, sprains, ligaments, muscle tears, joint issues, arthritis, obesity, AGING, degeneration of spine

IMPACT

- BLS, 2013 – Back injuries account for nearly one half of all musculoskeletal disorders in the workplace

Back Conditions:

Resource: (National Institute for Health)



LIMITATIONS:

- Usually cause difficulty lifting, carrying, moving, sitting, standing, walking, climbing, etc.

General Accommodations:

- Ergo evaluation to modify worksite to make accessible
- Parking close to door
- Accessible entrance/automatic door openers

Back Conditions:

Resource: (National Institute for Health)



Office Accommodations:

- Height adjustable desk and ergonomic chair
- Move workstation close to commonly used office equipment
- Low task chair for accessing low files
- Rolling ladder to access high files
- Provide a cart to move mail, files and supplies
- Provide a Lazy Susan carousel or desktop organizer to access frequently used materials.

Back Conditions:

Resource: (National Institute for Health)



Industrial (Non-Office)

- Use overhead or vacuum lifting devices
- Modify work area to make adjustable
- Place frequently used tools at WAIST height
- Provide sit/lean stools and anti fatigue mats in standing area
- Make wheelchairs, scooters, golf carts available if walking long distances is required
- Provide compact lifting device to push and pull supplies and tools from storage (ELF cart)

Back Conditions:

Resource: (National Institute for Health)



Medical:

- Spring-bottomed linen cart
- Cart tuggers in laundry delivery
- Provide patient lifting/transfer devices (make accessible!)
- Powered beds for transporting patients
- Adjustable exam tables
- Height adjustable desk and ergo chairs

Back Conditions:

Resource: (National Institute for Health)



Examples:

- **Systems IT required to move, lift, carry computers**
 - **Solution:** Compact, adjustable height lifting device (ELF, scissor) with straps to secure load.
- **Maintenance worker required to lift manhole covers**
 - **Solution:** Truck mounted jib and manhole cover lifter
- **Clerical worker with scoliosis**
 - **Solution:** Ergo evaluation and Sit/Stand workstation
- **Mechanic needs to access engine compartment**
 - **Solution:** Tire lift, mechanics low task chair, specialty creeper

Back Conditions:

Resource: (National Institute for Health)



Examples:

- **Public Works required to turn large wheel valves**
 - Solution: Specialty tool designed to increase torque on wheel valve handles
- **Employee with “standing restrictions”**
 - Solution: Sit/Lean stool and anti fatigue mats
- **Mailroom worker with push/pull restrictions**
 - Solution: Motorized cart
- **Truck Driver with limited drive time restrictions**
 - Solution: Suspension seat and vehicle cushion designed to reduce vibration

Arthritis:

Resource: (Arthritis Foundation, 2011)

- One in five adults have arthritis (20%)
- By 2030, 25.9% are projected, more women than men
- More than 100 types of arthritis. Cause unknown.

About:

- Includes inflammatory and non-inflammatory diseases that affect body's joints, connective tissue, supporting tissues such as tendons, cartilage, blood vessels and internal organs.

Arthritis:

Resource: (Arthritis Foundation, 2011)

5 most common types of Arthritis

- **Osteoarthritis** – Most often hands, thumbs, knees, hips
- **Fibromyalgia** – Tender points, fatigue, stiffness, flu-like
- **Gout** – Common in big toe, knees, wrist, fingers, elbow
- **Rheumatoid** – Most common in wrist and finger joints
- **Lupus** – Pain and muscle fatigue

Arthritis:

Resource: (Arthritis Foundation, 2011)

Possible Accommodations:

- **Help with Daily Living**
 - Make sure facility is accessible (auto door openers, no knobs)
 - Move workstation closer to bathroom
 - Allow access to a mini-refrigerator in office
- **Fatigue/Weakness**
 - Schedule periodic rest breaks away from desk
 - Allow a flexible work schedule, use of leave time, work at home
 - Ergonomics evaluation and workstation design
 - Reduce walking distance or provide a scooter/mobility aid

Arthritis:

Resource: (Arthritis Foundation, 2011)

Possible Accommodations:

- **Fine Motor Impairment**
 - Ergonomic evaluation/design
 - Alternative computer access (Talk to Text software)
 - Alternative phone access
 - Provide arm supports
 - Provide writing GRIP aids
 - Page turner and book holder
 - Ergonomic keyboard and trackball mouse
 - Option to dictate
 - Speech recognition software

Arthritis:

Resource: (Arthritis Foundation, 2011)

Possible Accommodations:

- **Gross Motor Impairment**
 - Provide parking close to worksite (invisible disease)
 - Accessible entrance/automatic door openers/no knobs
 - Accessible restrooms/break rooms
 - Adjustable desk height if wheelchair or scooter is used
 - Make sure materials/equipment are within easy reach
 - Move workstation closer to other work areas, office equip
 - Heated cushion for chair
 - Sit/Stand workstation

Arthritis:

Resource: (Arthritis Foundation, 2011)

Possible Accommodations:

- **Photosensitivity**
 - Install low wattage overhead lights
 - Provide task lighting
 - Replace fluorescent light with full spectrum/natural light
- **Sleep Issues**
 - Allow a flexible work hours and frequent breaks
- **Temperature Sensitivity**
 - Modify work site temp, dress code
 - Allow use of fan, AC, heater (redirect air conditioner vents)
 - Allow work from home in extreme weather

Arthritis:

Resource: (Arthritis Foundation, 2011)

Examples:

- **Machine operator w/arthritis, trouble turning control switches**
 - **Solution:** Small tabs were replaced with larger cushioned knobs and he was given gloves with non-slip dot gripping.
- **Drafter w/knee arthritis has trouble accessing worksite.**
 - **Solution:** Reserved parking space close to bldg, first floor office, push pad activated power doors.
- **Social worker trouble w/reading case summaries, manipulating paperwork and taking notes.**
 - **Solution:** Page turner, book holder, writing aids, option to dictate reports to staff

Arthritis:

Resource: (Arthritis Foundation, 2011)

Examples:

- **Clerk w/arthritis from lupus with pain in back, neck and hands from sitting for long periods.**
 - **Solution:** Speech recognition software, ergo eval and chair, easily adjustable sit/stand workstation.
- **Admin Assist w/rheumatoid w/typing limits from pain and stiffness in hands from cold temps.**
 - **Solution:** Space heater, additional window insulation, speech recognition software.

Diabetes:



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Resource: (CDC, 2007)

- Disease where blood glucose levels are above normal
- Type I – Juvenile onset (5 to 10%) – Genetic
- Type II – Adult onset (90 – 95%). Cause can be genetic, AGE, obesity, family history, gestational diabetes, physical inactivity.

Impact:

- Can cause serious health complications including heart disease, blindness, kidney failure, and lower-extremity amputations. Diabetes is the sixth leading cause of death in the United States

Diabetes:



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Resource: (CDC, 2007)

Possible Accommodations:

- **Hypo/Hyper Glycemia**
 - Allow for storage of medication (insulin/food)
 - Provide an area to test sugar levels
 - Provide area to administer insulin
 - Provide appropriate container for sharps/needles
- **Neuropathy (Nerve Damage)**
 - Ergo eval for tasks requiring FINE finger dexterity
 - Eliminate the need to use sharp objects
 - Provide anti-fatigue mats or padded carpeting
 - Allow sit/stand workstation

Diabetes:



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Resource: (CDC, 2007)

Possible Accommodations:

- **Vision Impairment**
 - **Magnification** – consider external magnification device or computer screen magnification software.
 - **More Magnification** – consider tactile graphics/keyboard or assistive technologies (screen reading software).
 - **Blurring/Haziness** – Try high contrast settings and themes
 - **Provide digital voice recorder**
 - **If Photosensitive** – consider alternative lighting
 - **Lamps or fluorescent light filters**

Diabetes:



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Resource: (CDC, 2007)

Possible Accommodations:

- **Kidney Disease**
 - Provide easy access to the restroom
- **Other**
 - Avoid temperature extremes
 - Educate coworkers on identification of hypo/hyperglycemia emergencies

Diabetes:



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Resource: (CDC, 2007)

Examples:

- **HR specialist having trouble balancing between reading text and computer screen due to diabetic retinopathy**
 - **Solution:** Task lighting, glare filter for monitor, CCTV with split screen to view text and computer monitor at same time.
- **Cafeteria worker has difficulty standing for long periods.**
 - **Solution:** Anti fatigue mats, sit/stand/lean stool, freq breaks.
- **Data Entry Clerk having trouble with vision.**
 - **Solution:** Installed additional lighting in file room and purchased a glare filter for monitor (Cost: \$30)

Migraine Headaches:

Resource: (National Headache Foundation, 2005)

- Form of vascular headaches
- Symptoms include aura before, flashing lines, vision loss, speech trouble, weakness, nausea, vomiting.

Impact:

- 28 million Americans have migraine headaches
- 157 million lost workdays/year due to migraines
- More common in women:
 - Estrogen levels, menstrual cycles, pregnancy, menopause

Migraine Headaches:

Resource: (National Headache Foundation, 2005)

Preventing Migraines

- Use computer glare guards for computer monitors
- Replace fluorescent lighting with full spectrum lighting
- Use Air Purification device

Migraine Headaches:

Resource: (National Headache Foundation, 2005)

Possible Accommodations:

- **Attendance**
 - Modify attendance policies
 - Provide flexible scheduling options or allow work from home

- **Concentration**
 - Reduce visual and auditory distractions with sound absorption panels or environmental sound machines
 - Move to a work area that's quieter
 - Provide scheduled, uninterrupted time to work

Migraine Headaches:

Resource: (National Headache Foundation, 2005)

Examples:

- **Employee in cubicle has migraines triggered by noise level. She was in high traffic area, near copy machine.**
 - **Solution: Moved her to an area with less traffic. Gave her an environmental sound machine.**
- **Worker with migraine headaches triggered by heavy perfume fragrance.**
 - **Solution: Moved worker and asked fellow staff to voluntarily refrain from wearing fragrance. Provided sensitivity training to all staff.**

Chronic Fatigue/Fibromyalgia:

Resource: (CDC, 2011 and Arthritis Foundation, 2011)

- **CFS – Disorder characterized by profound fatigue that is not improved by bed rest.**
- **Fibromyalgia – Type of arthritis with profound fatigue**
- **Function at substantially lower level of activity**
- **Weakness, muscle pain, impaired memory, insomnia**

Impact:

- **5 million Americans over 18 have fibromyalgia**
- **Occurs mostly in women, 80 to 90 % of time**

CFS/Fibromyalgia:

Resource: (CDC, 2011)

General Accommodations:

- **Provide written job instructions when possible**
- **Prioritize job assignments**
- **Allow self-paced workloads**
- **Provide sensitivity training to coworkers**
- **Ergo eval to minimize stress to the body**
- **Provide scooter/mobility aid if walking is necessary**

CFS/Fibromyalgia:

Resource: (CDC, Arthritis Foundation, 2011)

Possible Accommodations:

- **Fatigue**
 - Ergo eval to reduce/eliminate physical exertion
 - Alternative computer access, telephone access
 - Arm supports, writing and grip aids
 - Page turner and book holder
 - Schedule periodic rest breaks away from workstation
 - Allow flexible work schedule, leave time, work from home
 - Provide parking close to work site
 - Install automatic door openers
 - Move workstation close to other work areas, office equipment, break rooms and restrooms.

CFS/Fibromyalgia:

Resource: (CDC, Arthritis Foundation)

Possible Accommodations:

- **Attendance/ Sleep Disorder**
 - Provide flexible scheduling options or allow work from home
- **Concentration**
 - Reduce visual and auditory distractions with sound absorption panels or environmental sound machines
 - Provide scheduled, uninterrupted time to work
- **Temperature Sensitivity**
 - Use of fan/air conditioner or heater at workstation and redirect vents.

CFS/Fibromyalgia:

Resource: (CDC, Arthritis Foundation, 2011)

Possible Accommodations:

- **Photosensitivity**
 - Install low wattage overhead lights
 - Provide task lighting
 - Replace fluorescent light with full spectrum/natural light
- **Sleep Issues**
 - Allow a flexible work hours and frequent breaks
- **Temperature Sensitivity**
 - Modify work site temp, dress code
 - Allow use of fan, AC, heater (redirect air conditioner vents)
 - Allow work from home in extreme weather

CFS/Fibromyalgia:

Resource: (CDC, Arthritis Foundation)

Examples:

- **Teacher w/CFS was exhausted by early afternoon**
 - **Solution:** Provided a teacher's aid, prep period moved to afternoon, excused from afternoon yard duty.
- **Risk Manager with severe bouts of irritable bowel syndrome, depression and fatigue as a result of fibromyalgia.**
 - **Solution:** Moved office closer to restroom, installed automatic entry doors, allowed flex time for counseling appointments
- **School Psychologist with fatigue**
 - **Solution:** Scheduled all appointments in the morning and allowed to do the paperwork in the afternoon.



Post Traumatic Stress Disorder:

Resource: (National Center for Post Traumatic Stress Disorder, 2007)

- Anxiety disorder that occurs after someone experiences a traumatic event that causes intense fear, helplessness or horror.
- Person continually re-experiences event, avoids individuals, thoughts, situations associated with event

Impact:

- 30% of men and women who spent time in war zones
- Women are twice as likely to have PTSD



Post Traumatic Stress Disorder:

Resource: (National Center for Post Traumatic Stress Disorder, 2007)

Possible Accommodations:

- **Manage Stress**
 - Flexible work schedule, rest breaks away from desk, EAP
- **Concentration**
 - Arrange office so desk faces the door
 - Allow them to use a headset to listen to music
- **Interaction with Coworkers**
 - Educate all staff on sensitivity
 - Don't mandate employee to attend work related social functions
 - Encourage all employees to move non-work related conversations out of work areas

Post Traumatic Stress Disorder:

Resource: (National Center for Post Traumatic Stress Disorder, 2007)



U.S. Department
of Veterans Affairs

Examples:

- **Office worker veteran with PTSD is easily frightened when approached unsuspectingly. Works in a cubicle.**
 - **Solution:** Placement of a monitor-mounted mirror so he could see the entrance behind him. Placement of a sensor mat at the entrance of cubicle which made an audible alert when someone steps on it.
- **Office worker who was stalked and harassed by a former employee now has a panic disorder. She is fearful of answering her office phone.**
 - **Solution:** Use of telephone with caller ID function and/or call blocking, a change in ringtone or frequency of telephone ringer to reduce panic reaction, routed calls through a switchboard, and disabled employee's district extension in phone book.

Gastro/Crohn's/IBS:



American College of Gastroenterology
Advancing gastroenterology, improving patient care

Resource: (American College of Gastroenterology)

- Disorders that affect structures in digestive system.
- Constipation, diarrhea, hemorrhoids, gastroenteritis, colitis and irritable bowel disorders.
- Crohn's Disease, Gastroparesis, Ulcerative Colitis, Irritable Bowel Syndrome, Gluten Allergy, Spastic Colon, Diverticulitis

Impact:

- Affects millions in the workforce
- Symptoms include 'when you got to go...you got to go'

Gastro/Crohn's/IBS:



American College of Gastroenterology
Advancing gastroenterology, improving patient care

Resource: (American College of Gastroenterology)

Possible Accommodations:

- **Allow to use restrooms as needed**
 - Move workstation closer to restroom to deal with urgency
 - Change in job assignments to job with better flexibility for breaks
 - Work from home during flare ups
- **Meeting physical demands of job**
 - Restructure job to remove marginal job functions that are physically demanding

Vision Impairments:

Resource: (American Foundation for Blind, 2006)

- Vision impairments result from conditions that range from the presence of some usable vision, low vision, to the absence of any vision, total blindness.
- **With AGE:**
 - Myopia - Nearsighted
 - Presbyopia - Close objects become blurry
 - Cataracts – Clouding of the eye lens
 - Glaucoma/Diabetes – Damage to optic nerve (Retinopathy)

Impact:

- 10 million Americans are blind or have ‘low vision’

Vision Impairments:

Resource: (American Foundation for Blind, 2006)

Possible Accommodations:

- **Low Vision**
 - Closed Circuit TV (CCTV), hand/stand/portable magnifier
 - Information in large print (at least 16 Font...18 if possible)
- **Computers**
 - Increased font size for text/emails
 - Screen magnification software
 - Large print keyboard labels for navigation
 - Flicker free monitor
 - Anti-glare guard and use of computer glasses to reduce glare

Vision Impairments:

Resource: (American Foundation for Blind, 2006)

Possible Accommodations:

- **Writing**
 - Felt tip pens (BOLD and FAT) or lighted pen
 - Paper with form and guide lines
- **Phone:**
 - Large print/color labels on phone keys
 - Optical magnifier
- **Working with Money**
 - Hand or stand magnifier
 - Task lighting or headlamp

Vision Impairments:

Resource: (American Foundation for Blind, 2006)

Examples:

- **Custodian with low vision had trouble seeing carpet when vacuuming.**
 - **Solution: Light system installed on industrial vacuum and custodian given a headlamp.**
- **Clerical w low vision trouble distinguishing keys on keyboard.**
 - **Solution: Glare guard for monitor and large print keyboard labels.**
- **Customer Service Rep has trouble reading screen.**
 - **Solution: Screen reading software so all information present on screen and inputted information was read back aloud.**

Multiple Sclerosis:

Resource: (National Multiple Sclerosis Society)

- Chronic disease of central nervous system.
- Symptoms include numbness in limbs, loss of vision, fatigue, loss of coordination, muscle weakness, slurred speech, visual difficulties.

Impact:

- 400,000 people 'know' they have it
- Age of onset is between 20 and 50 years of age
- MS is twice as common in women

Multiple Sclerosis:

Resource: (National Multiple Sclerosis Society)

Possible Accommodations:

- **Ergonomic Evaluation**
 - Provide arm supports, writing and grip aids
 - Provide Page turner and book holder
 - Speech amplification, speech enhancement
- **Computers**
 - Increased font size for text/emails
 - Screen magnification software
 - Anti-glare guard and use of computer glasses to reduce glare
- **Other**
 - Move workstation closer to bathroom

Multiple Sclerosis:

Resource: (National Multiple Sclerosis Society)

Examples:

- **Benefits worker having difficulty reading files from her MS.**
 - **Solution:** Provided a stand magnifier and added task lighting to desk.
- **Social Worker having trouble with heat sensitivity.**
 - **Solution:** Provided employee with a private office where temperature could be lower than rest of facility.
- **Teacher with MS having difficulty communicating with students because his speech was soft and slurred when tired.**
 - **Solution:** Provided a personal speech amplifier so he would not have to project his voice. Was allowed to schedule his classes so he could take periodic breaks.

ALS/Lou Gehrig's:

Resource: (ALS Association)



- Amyotrophic Lateral Sclerosis (ALS)
- Progressive neurodegenerative disease that attacks nerve cells in the brain and spinal cord.

Possible Accommodations:

- Weak Muscles in hands, arms, legs
 - Ergonomic evaluation and workstation design to include ergonomic seating and forearm supports
 - Flexible work schedule
 - Elimination of physical exertion

ALS/Lou Gehrig's:

Resource: (ALS Association)



Possible Accommodations:

- **Twitching/Cramping of muscles (hands/feet)**
 - Ergonomic evaluation and equipment
 - Footrests
 - Speech recognition software
 - Alternative input devices
 - One-handed, alternative or expanded keyboards
- **Impairment of Arms/Legs**
 - Adjustable workstation for wheelchair or scooter
 - Accessible parking
 - Ramps
 - Stair and chair lift

Goal of Inclusion Ergonomics:

- To recognize the shift in demographics
 - Aging workforce
 - People are staying in the workforce longer
 - As we age, disease sets in
- We want to retain employees' great knowledge and skill set which means accommodating the body it comes with!

Resources:

- **Job Accommodation Network**
 - www.askjan.org
- **US Department of Labor**
 - www.PEATworks.org
 - Partnership on Employment and Accessible Technology
- **Microsoft Accessibility**
 - www.microsoft.com/enable/centers
- **American Disability Association**
 - www.ADA.gov
- **MIT Assistive Technology Information Center (ATIC)**
 - <http://web.mit.edu.atic.www>

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