## The ABC's of Office Ergonomics



#### TRUE LEAN <sup>™</sup>



#### Toyota - University of Kentucky Partnership since 1994

University of Kentucky College of Engineering

Institute of Research for Technology Development Lean Systems Program



#### Agenda

- What is ergonomics?
- Why is an ergonomics process necessary...magnitude now?
- The tsunami we're heading for in space and time...77 million!!!
- Identifying risk factors of poor ergonomics...F.A.R.E
- Let's walk through a seated evaluation in the proper order
- Let's walk through a standing workstation
- Let's evaluate a workstation
- Q&A

iberty Mutual.

INSURANCE

\$1.6B

Such as repeating motions or micro-tasks on a manufacturing assembly line.

#### Liberty Mutual 2019 Workplace Safety Index reveals costs of poor ergonomics...



33% of the cost of the top 10 disabling workplace injuries is due to poor ergonomics

# Three of the top 10 causes involve poor ergonomics



Poor ergonomics remain a top cause of disabling workplace injuries - year after year after year

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# Our aging workforce makes the need for good ergonomics even more pressing



- As we age, we become more susceptible to ergonomics illnesses
- Of the 77 million Baby Boomers, 73 million are still in the workplace
- In 2021, 29% of Baby Boomers aged 65-72 were still working or looking for work

#### Every 8 seconds in the US, a Baby Boomer reaches retirement age (67)

- 164.6 million workers in US workforce.
- 2.2 million boomers retiring annually.
- 19,381, 500 boomers will retire in the next 9 years, 2031.
- This has accelerated since Covid-19...a moment of clarity

# The U.S. labor force is declining by about 5,900 Boomers daily on average

Labor force status of Baby Boomers, in millions



Note: Annual averages are shown. The labor force consists of those working or looking for work. Baby Boomers are U.S. adults born between 1946 and 1964.

Source: Pew Research Center analysis of 1998-2018 Current Population Survey basic monthly files (IPUMS).

#### PEW RESEARCH CENTER

Todays a crisis, future employers are looking at a catastrophe... <sup>True Lean™</sup>

# By 2031, the U.S. labor market will be like Japan's - too few workers to fill needed jobs



- At 3.5% unemployment today, US companies struggle to find workers
- US construction industry is short 480,000 skilled workers and 600,000 workers overall

#### Even with automation and AI, we won't have enough people to fill US jobs by 2031

# Global study found errors in about one-third of evals



"Greater effort is needed to ensure that practitioners possess a better knowledge of the techniques used to assess risk factors... Practitioners must consider complexity, required training level, and suitability..."

Diego-Mas, J-A, Alcaide-Marzel, Jorge, Poveda-Bautista, R. (2017). 59 Errors using observational methods for ergonomics assessment in real practice. Human Factors, 59 (8), 1173-1187

## Let's take a quick look at the history of Lean

- First published in 1991
- Based on 5-year, \$5 million MIT study on future of the automobile
- Toyota modified Henry Ford's process into first true "lean" production method: Toyota Production System
- New method requires two-way communication, and increases quality while reducing time and costs



#### Lean now transcends manufacturing



#### A Lean approach to ergonomics dispels a powerful misperception



- Lean systematically identifies root causes rather than symptoms
- Lean principles can be modified and implemented:
  - by any individual
  - to improve any organization

Ergonomics is the science of fitting the job to the person...
Ergonomics is accommodation!

#### To assess risk for illness due to poor ergonomics, think FARE



Illnesses, or health issues, are due to repetitive exposure to noxious stimuli. This is based on dose/response relationship.

### Force comes in two forms: push/pull and static





#### The further the deviation from neutral posture, the more risk





#### Neutral posture is the position your body would assume floating in outer space

#### Repetition damage is usually from micro injuries over time.



### Repetition



#### How much repetition is too much? It depends.

#### Lighting, noise, temperature and vibration have an impact



## Environmental Influences



#### Sitting, order of operations, conducting and evaluation



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 How should work surface be laid out and what are the variables that effect height?

#### #2 - Chair

# •What are the features of an ergonomic chair and how should it be adjusted

# Proper adjustment of monitor and "E"

# •What to look for and how to adjust desk height...

# •This has all changed, remote work changed the world...

- So, Covid 19 sent the workforce home, guess what went with them?
- Workers Compensation
   Liability!



#### Standing, order of operations - conducting and evaluation

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- This ones a good one  $\ensuremath{\mathfrak{S}}$
- The biggest difference is feet involvement
- Blood pooling
- Proper body alignment
- Shear hazard
- Dust bunnies
- Cords length





#### Finding the right products and installation/assembly

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#### Products

## Installation/Assembly

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#### Thank you!!!



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