

How to Get From Point A to B

Workforce Trends & Their Impact on PT Practice: Aging, Obesity, Co-morbidities

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A DIVISION OF ONE CALL CARE MANAGEMENT





Workforce Trends and Their Impact on PT Practice: Aging, Obesity, Co-morbidities

An Align Networks Production

Getting from A to B Process

Aging Population Workforce & Injury Trends

U.S. population and workforce trend for the aging population.

Work injury recovery and disability trends for the aging workforce.

Anatomical and physiological changes in the human body with age with respect to Workplace productivity and safety.

Why people are working longer.

The most common injury for the aging workforce.

What we as Physical Therapists can do to address these issues.

A

B

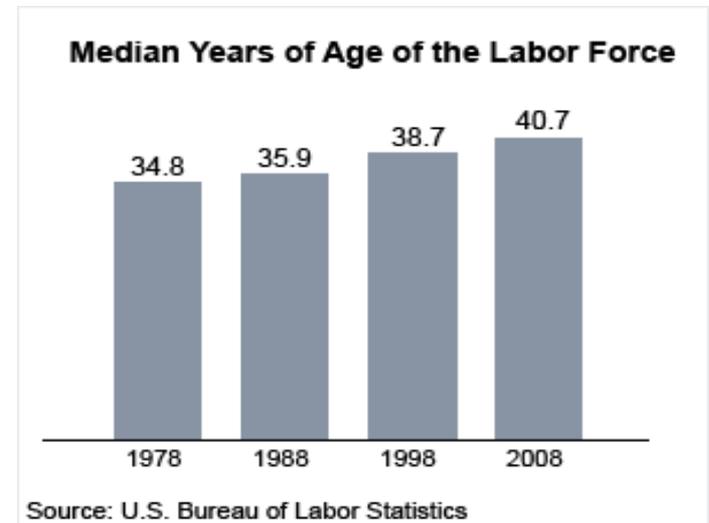
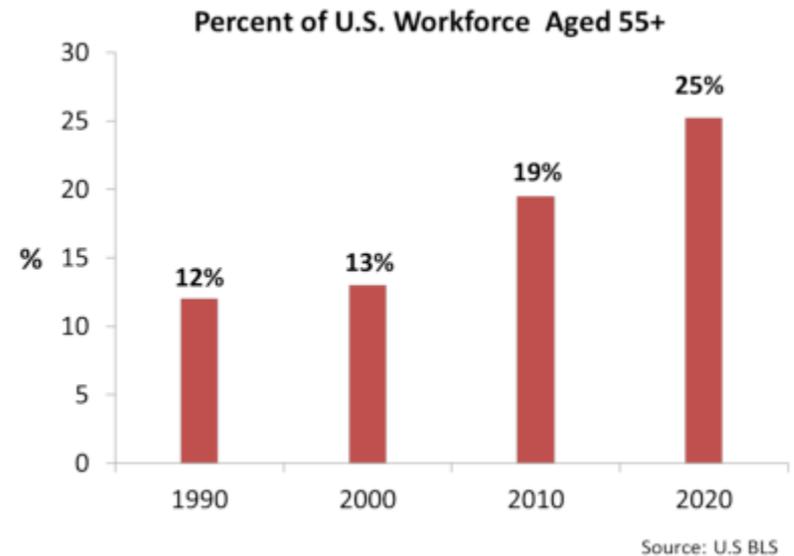


Population & Workforce Trends

Well documented that U.S. population trends indicate greater a proportion of workforce over age 55

- Percent population over 65 years highest ever in history, reflecting baby boomers
- Administration on Aging reports the older population (65+) numbered 40 Million in 2009 or 12% of the U.S. population. In 2020, expected to grow to 72 Million, 25% of our population
- Median age of our labor force is 41 years of age, increasing incrementally
- One fifth of men in workforce are veterans, median age of veterans is 50, non-vets is 39

ref: U.S. Bureau of Labor Statistics, 2012



Population & Workforce Trends

- Poll by American Assoc. of Retired Persons reports that 79% of seniors (age 50+) plan to work full or part time after “retirement”



Population & Workforce Trends

- Why are more people working longer? Past “retirement”?
 - Personal financial security: increases in cost of living, shrinking pensions, lack of retirement savings
 - Economy: concerns over stability of Medicare & Social Security



Lifestyle Trends

Why are more people working longer? Past “retirement”?

- Living longer, more active lifestyles!



Aging Workforce How They Get Injured

Research indicates the most common injury type for this workforce group is.....

FALLS!

- Balance deficits, muscle weakness, vision loss, side effects from medicine



Aging Workforce What Gets Injured

Research trends indicate the most frequent injuries by body part and condition are:

- Most frequently injured body parts:
 - Ankles, Wrists, Arms, Hips
- Injury Types:
 - **Fractures**, strain, sprain, soft tissue injuries
 - Women more likely than men to sustain fractures of wrists, forearms in older population
 - Higher incidence of multiple injuries, co-morbidities

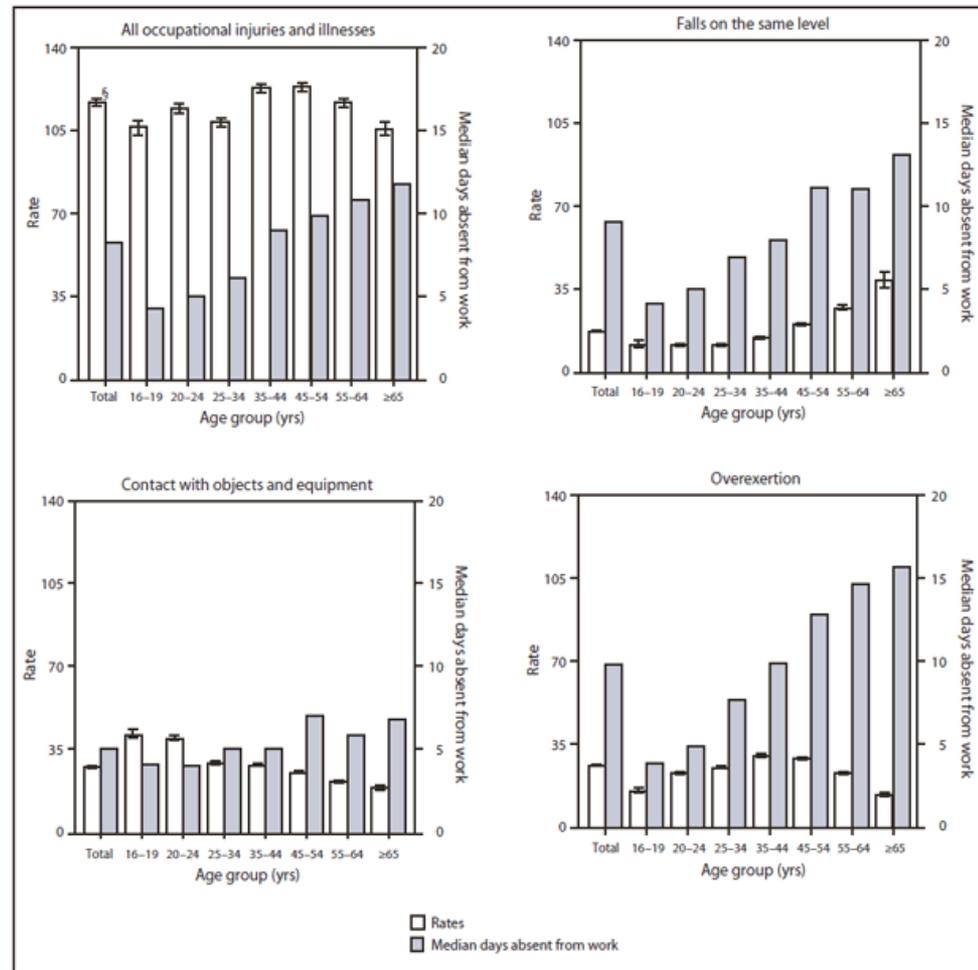


Ref: U.S. and state government researchers (CDC, BLS and several state agencies) 2009

Aging Workforce Disability Trends

Research indicates these “Lost Work Day” Trends:

- When injured, aging workers stay out of work longer than cohorts
- Longer durations of work absences steadily increases with age
- Highest rates of all age groups of fatal workplace injuries
- Less likely to receive retraining
- Anxiety, depression, fear with loss of job, income, injury, unable to ever return to normal level of function

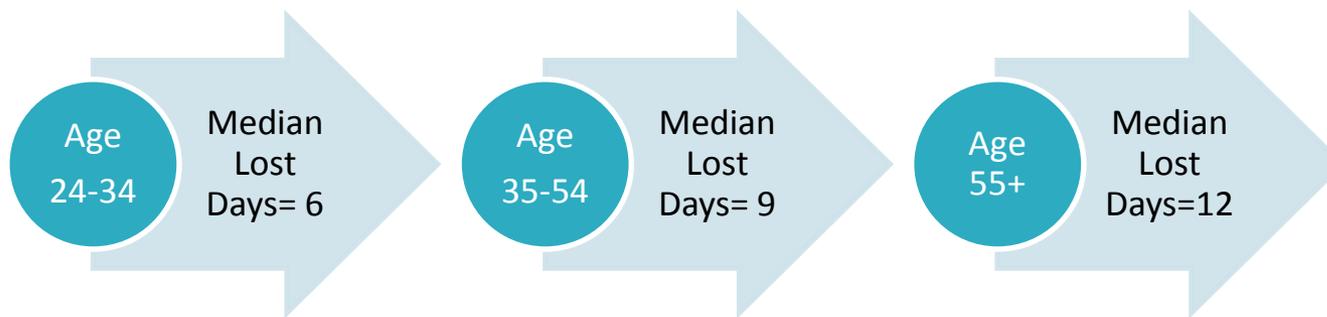


- Ref: CDC 2009-2012

Aging Workforce Recovery Trends

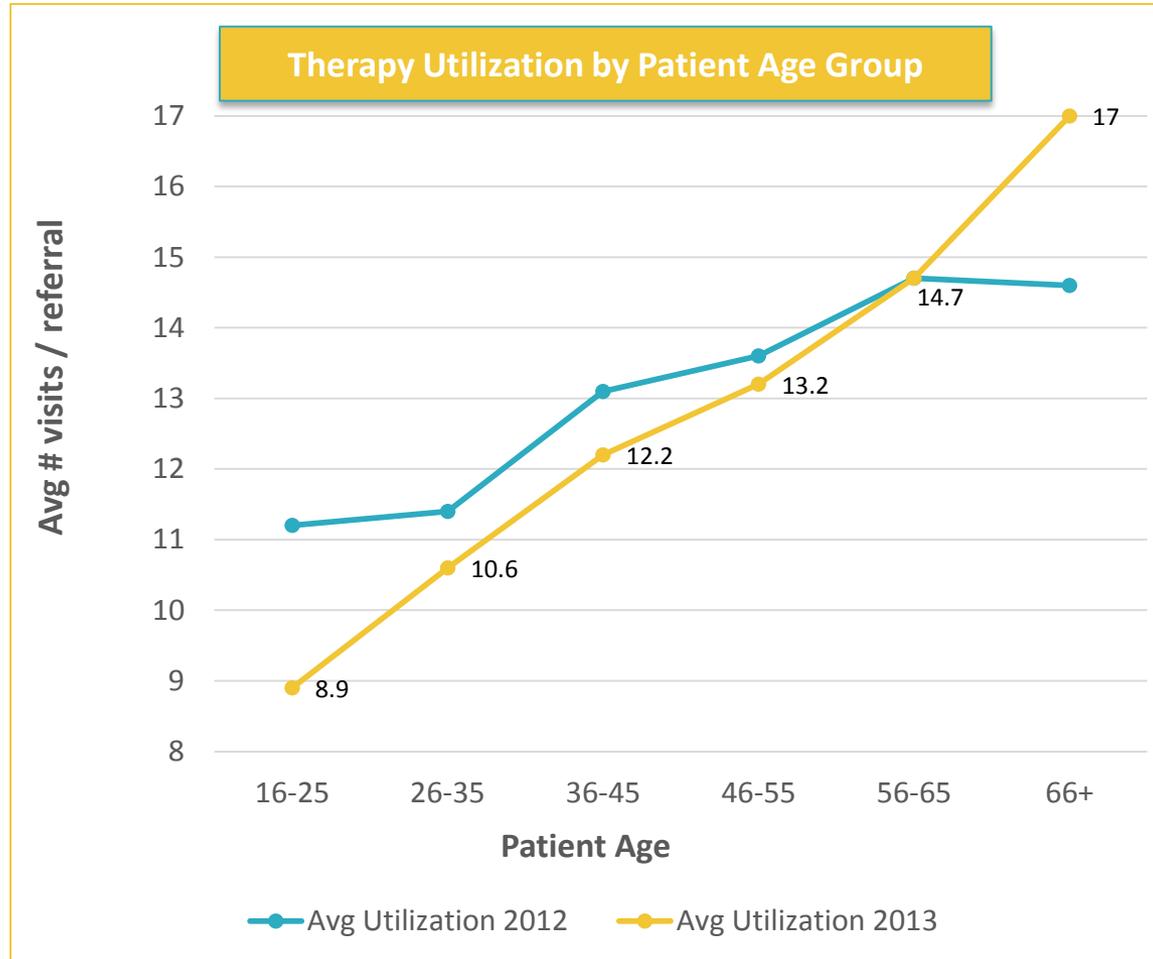
Research indicates recovery times following injury are longer with this age group:

- Median number lost work days after injury increases with age



- Longer recovery times for older population
- Ref: National Institute for Occupational Safety and Health, *Morbidity & Mortality Weekly Report*
- Extended Physical Therapy durations, above recommended clinical guidelines for a condition, may need additional therapy visits to address slow healing, additional physical deficits, balance, mobility, strength, co-morbidities and other complications
- Ref: U.S. and state government researchers (CDC, BLS and several state agencies) 2009-2013

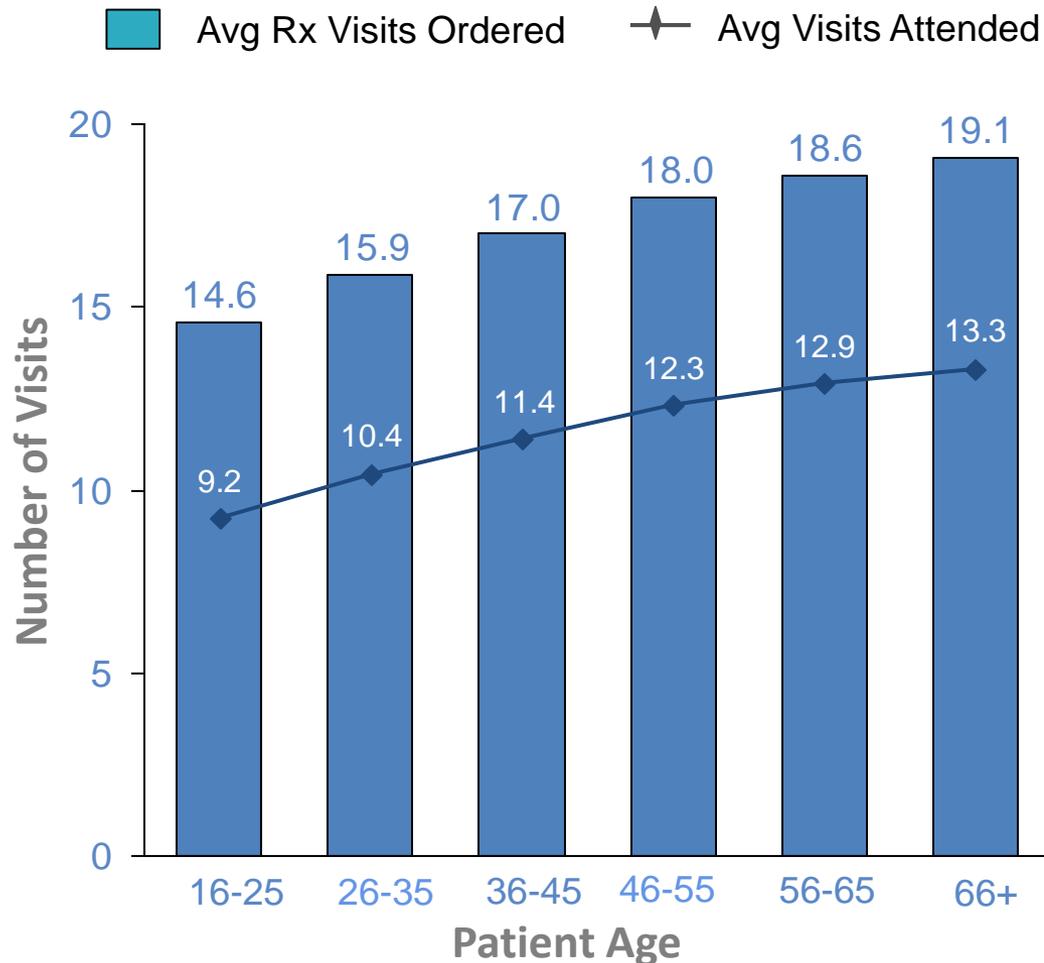
Advanced Age Utilization Trends



*Ref: Align Networks Data, Prospective Referrals with Applicable Guidelines Large Employer A

Drivers of Therapy Utilization

Rx Visits Ordered & Attended by Patient Age



*Ref: Align Networks Data, Prospective Referrals with Applicable Guidelines ("Unknown" & "Other" injuries excluded), Client mix, 2013 Data

The Aging Human Body

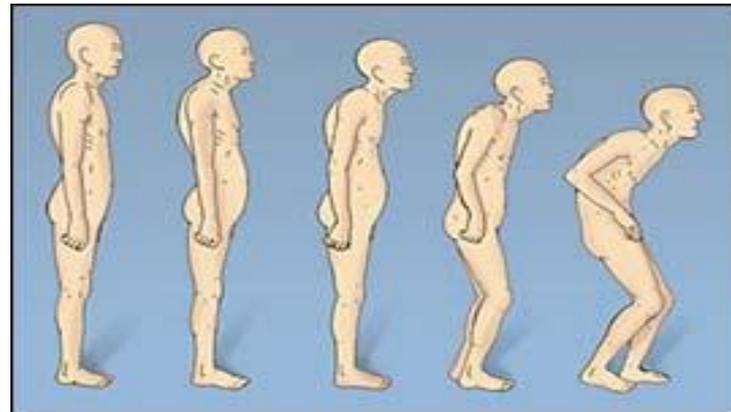
- Focus on how these changes affect work productivity and safety
- Our workforce is getting older, work-related injuries can be directly related to changes in human body: strength, balance, vision, hearing, reaction time, range of motion and memory
- Changes can increase a worker's risk for work-related injuries and accidents, particularly falls



The Aging Human Body

With regards to work & deficits a Physical Therapist can address, primary areas of concerns are:

- 1) **Bones & Joints**
- 2) **Eyes**
- 3) **Metabolic/Co-Morbidity**
- 4) **Vascular Changes**
- 5) **Dehydration**
- 6) **Functional Abilities**



Ref: National Institute of Health, 2009, MedlinePlus: *Winter 2007 Issue: Volume 2 Number 1 Pages 10 - 13*

The Aging Bones & Joints

Weight bearing and movable joints at highest risk for age-related degenerative changes

- Osteoporosis
 - Risk factor increases over age 40
 - Higher fracture risk: Spine, Hip, Wrists
- Arthritis
 - Loss of ROM, flexibility, strength

Impact on Work:

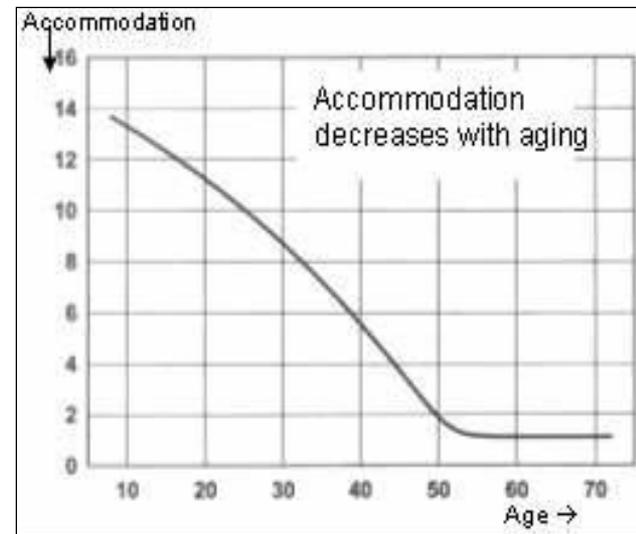
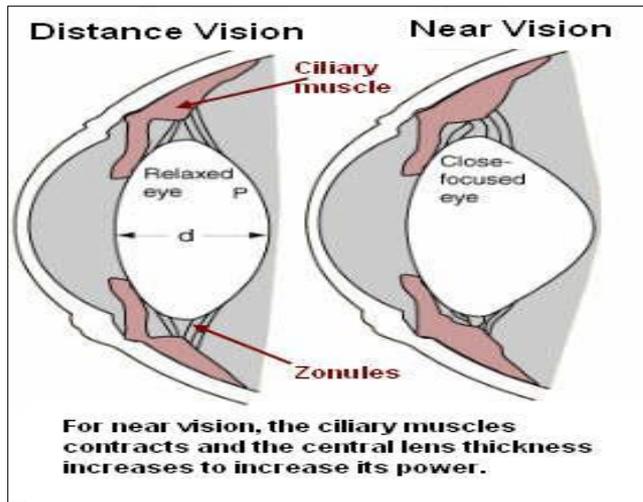
- Higher fall risk
- Painful, slower movement
- Lower productivity
- Poor Postures
- Higher risk for CTDs,
- Slower tissue recovery rates



The Aging Eyes

Visual accommodation weakens at age 40, macular degeneration & cataracts age 50

- Loss of visual accommodation, acuity & contrast : age 40+
- Presbyopia: loss of ability to see close objects; corrective lenses, bifocals: age 60+
- Retinal damage, diabetics
- Loss of lateral visual field



Aging makes the ciliary muscles lose strength, lens loses its elasticity: presbyopia -an age related vision problem.

- Ref: 2010-06-24 23:01 — Thiruvellan: Healthyojas.com

Age Related Vision Changes

Age Related Vision Loss:

- Poor/awkward postures to accommodate, increased muscle strain, injuries, degenerative joint/discs diseases
- Increased eye strain/dryness/headaches
- Reduced ability to see safety warnings
- Higher injury risk due to limited vision

Impact on Work:

- Safety/injury risk
- Lower productivity
- Increase in error rate



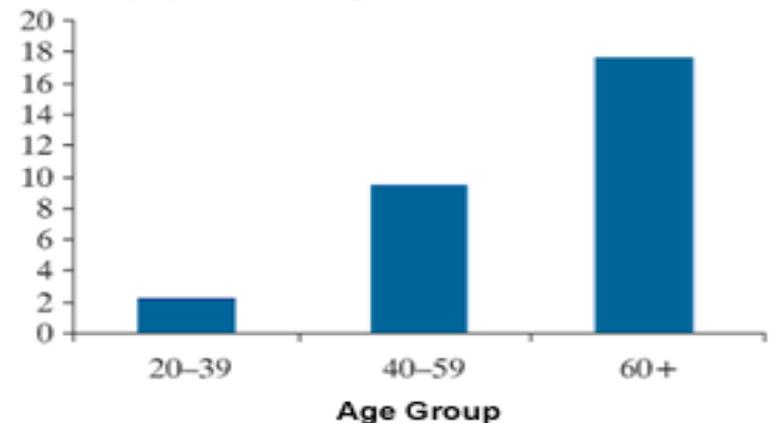
Age Related Metabolic Changes

- Higher incidence of metabolic related co-morbidities & associated diseases: muscle weakness, fatigue, dizziness, side effects of meds
- Metabolic Conditions/Diabetes: higher risk type 2 diabetes, heart disease, stroke
 - 40 percent of adults ages 40 to 74 have pre-diabetes signs
 - Weight gain, higher body fat/BMI, related health effects

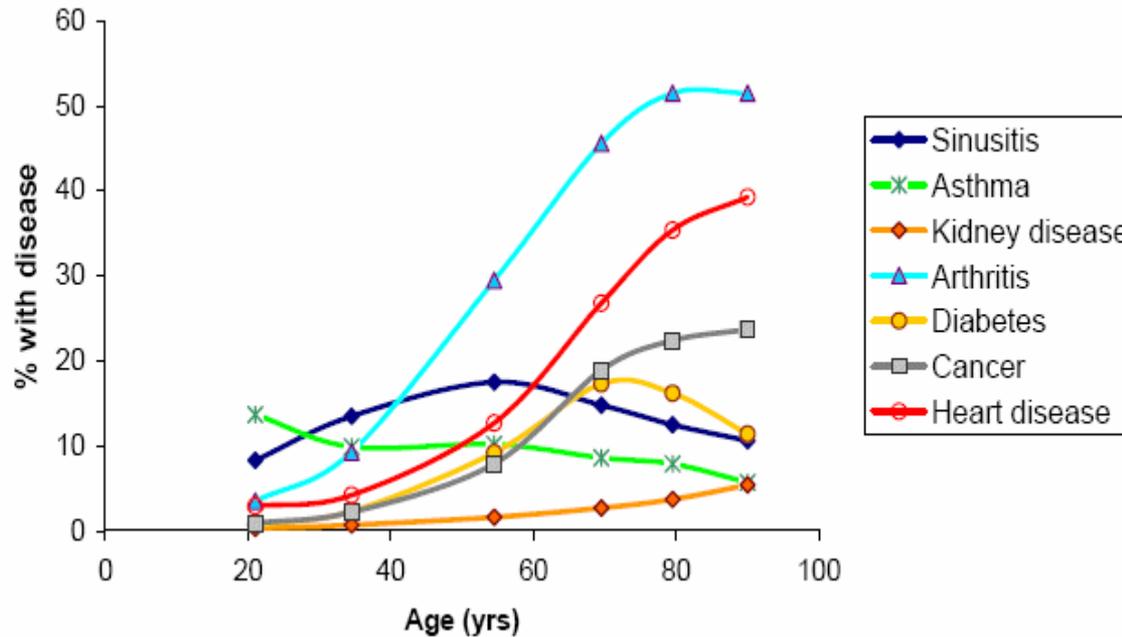
Impact on Work:

- Fatigue, weakness, higher musculoskeletal injury risk
- Delayed healing post injury
- More lost work days post injury

Percent of population diagnosed with diabetes



Age Related Medical Co-Morbidities



- Prevalence of selected chronic conditions, expressed in percentages, as a function of age for the US population (All forms of cancer and heart disease are featured.)
- Importance of trends of arthritis, diabetes, heart disease for P.T. Practice Implications
- Ref: National Center for Health Statistics, Data Warehouse in Trends for Health & Aging: CDC, 2002-2003

Age Related Vascular System Changes

Aging causes several changes to our vascular system:

- Arteries stiffen, higher blood pressure
- Diminished ability to regulate heart rate; diminished peripheral blood flow
- Oxygen exchange – 40% lower at 65 yrs
- Respiratory system – 25 % less at 65 yrs, 50% less at 70 yrs
- Cardiovascular system – 15-20 % less at 65 yrs

Impact on Work:

- De-conditioned, poor activity tolerance, slower recovery rate, fatigue



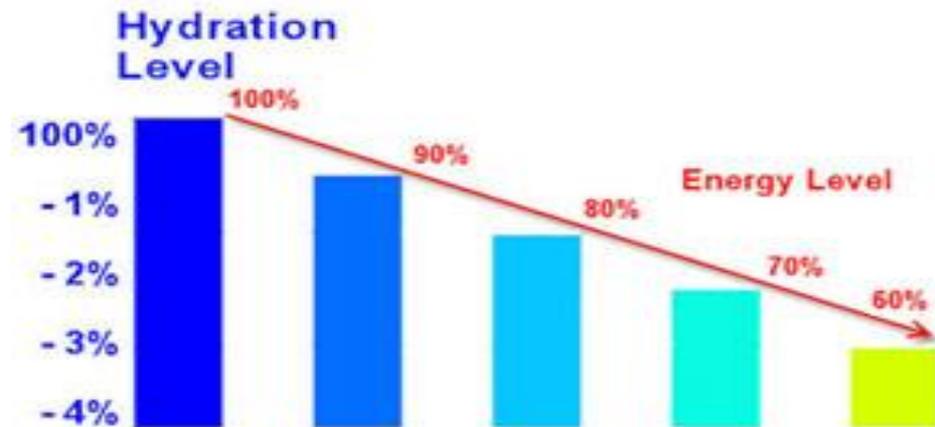
Age Related Dehydration

Percent body water composition:

- Newborn: 90%
 - Young adult: 70%
 - Elderly person: 50-60%
- Dehydration leads to light-headedness, dizziness, muscle weakness, loss of attention, fatigue

Impact on Work:

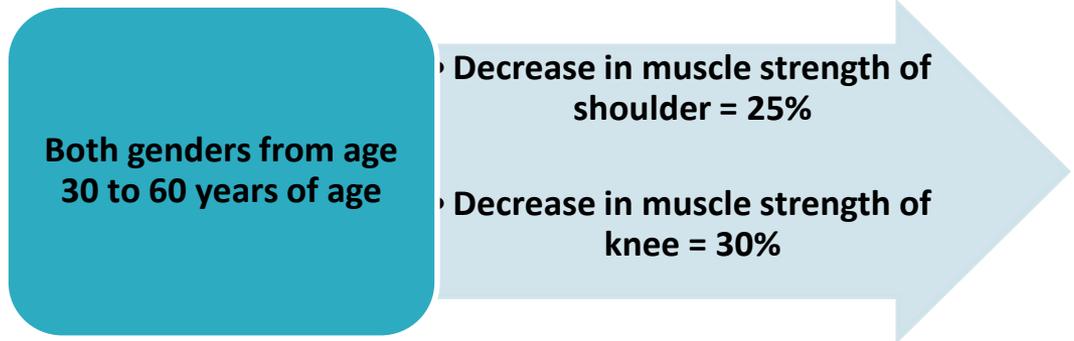
- Slower musculoskeletal recovery times, higher injury risk
- Use of PPE or extreme heat can worsen
- Reduced productivity



Age Related Functional Changes

Diminished muscle strength, flexibility coordination, reflexes, balance, loss of range of motion, general de-conditioning

- Strength - 25-30 % lower at 60 yrs
- Flexibility - 18-20 % decrease at 65 yrs
- Reaction time & speed – decreases
- Manual dexterity & tactile feedback – motor skills deteriorate
- Co-morbidities with pathophysiological affects: diabetes, heart disease, circulatory problems, nervous system etc.
- Medications: dizziness etc.



Impact on Work:

- Safety & injury risk: falls!
- Less physically demanding jobs

Sarcopenia Higher Fall Risk

Sarcopenia:

- From Greek language, meaning “poverty of flesh”
- Defined as age related loss in muscle size and strength
- Decrease in lean muscle mass often accompanied by increase in fat, body weight may remain unchanged
- Direct correlation to muscle loss (sarcopenia), loss of strength and an increase for fall risk
- By age of 80, more than half of the body’s muscle has been lost, nearly 1/3 of this population has a fall requiring medical treatment

- **Loss of strength due to loss of 30% of muscle mass from age 30 to 65, by age 80, loss of 50% of muscle mass**

- **Contributes to loss of functionality**

- **Can be reversed with physical activity/strength training**



Ref: Industrial Medicine and Acute Musculoskeletal Rehabilitation:
Acute Musculoskeletal Injuries in Aging Workforce, 2007

Impact of Aging Grip Strength

Average Grip Strength:

Age Range	Male (avg. Lbs)	Female (avg. Lbs.)
30-40	120	76
41-50	110	64
51-60	106	58
61-70	90	52
70+	70	45

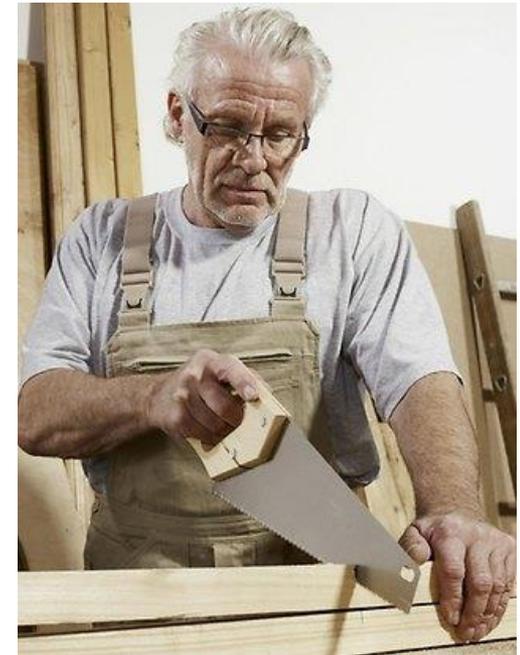
- Grip Strength Diminishes with Age: -40% loss through age ranges



- Ref: Grip and Pinch Strength, Normative Data for Adults: V. Mathiowetz MS, OTR, et al. Arch Phys Med & Rehab 66: 69-72, 1985

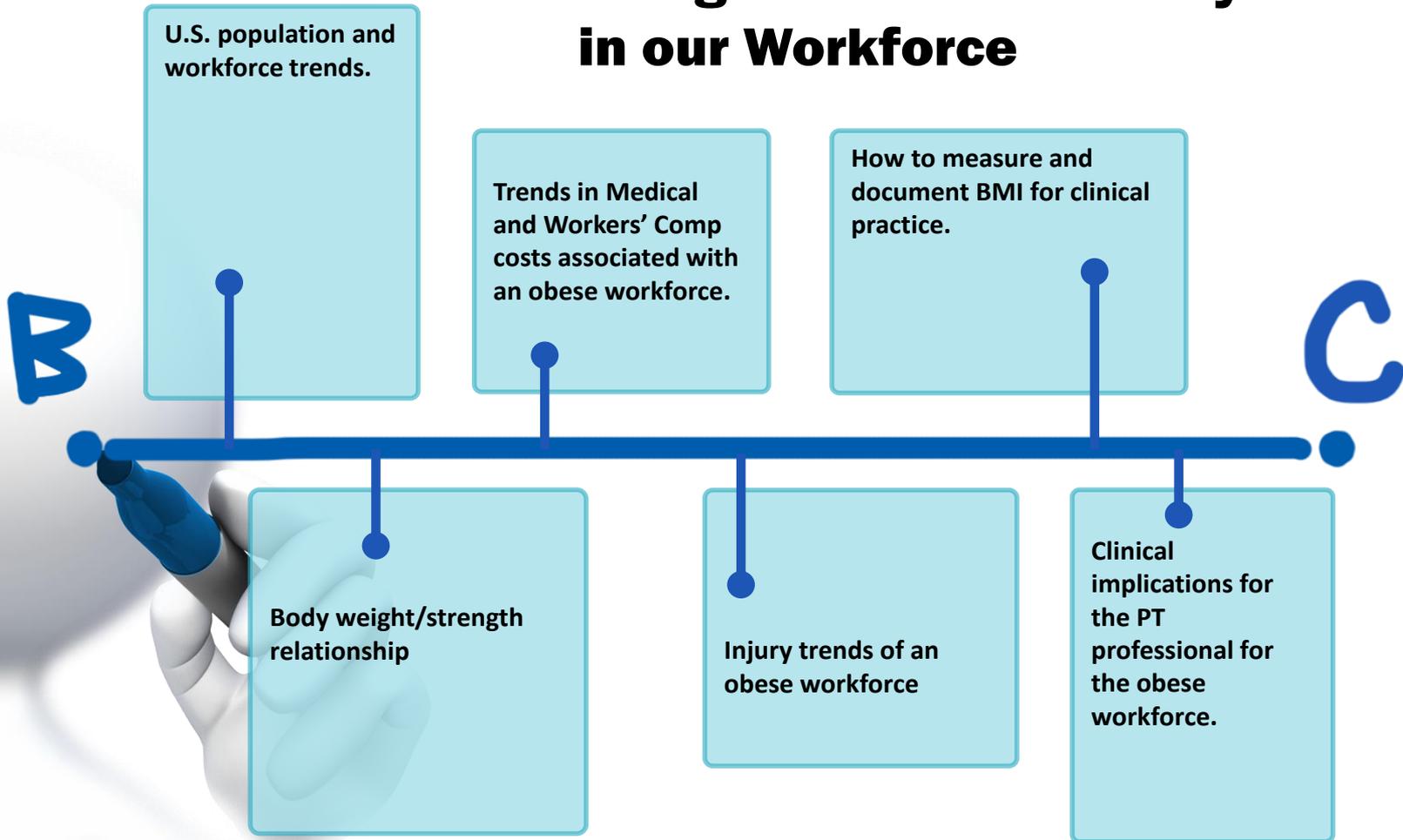
Injury Risk Factors - Aging

- **Injury risk factor concerns can be magnified with aging workforce**
- Changes in the body's natural recovery time, higher rates of co-morbidities affecting healing, CTDs develop at faster rates
- Degenerative changes in body alters the muscle physiology, resulting in less efficient muscle use and recovery times
- Sarcopenia, reductions in strength, grip strength and force potential results in higher effort to accomplish same task
- Reduced cardiovascular efficiency results in diminished recovery time from work load



Getting from B to C Process

Trends of Weight Gain and Obesity in our Workforce



Trend: Workforce is Getting Heavier

- Another undeniable megatrend for our population & workforce; it is getting heavier
- **Obesity**- a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems.
- In June of 2013 the AMA declared Obesity as a disease and no longer a comorbidity

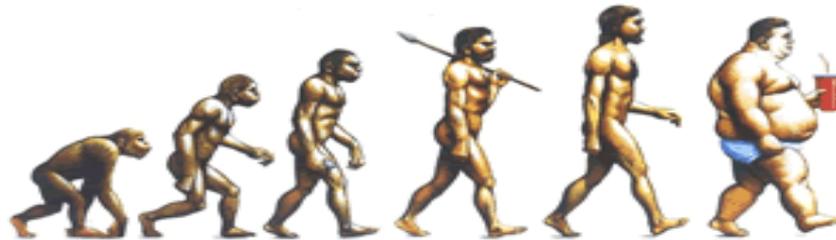


Trend: Obesity at Epidemic Proportions

USA Obesity Rates Reach Epidemic Proportions

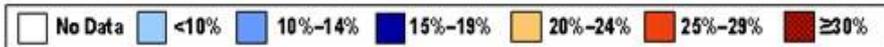
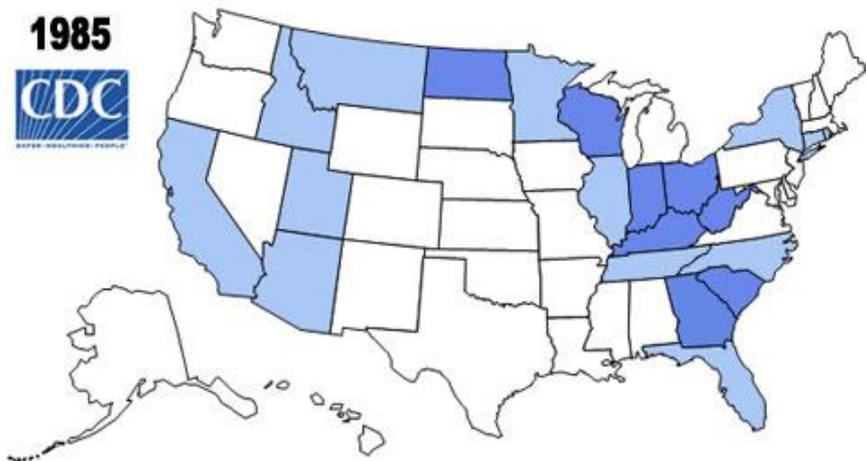
- 78% of American's not meeting basic activity level recommendations
- 25% completely Sedentary
- Currently 33% of U.S. population is obese
- 2030 forecast = 42% of U.S. population!

**The shape of things
to come**

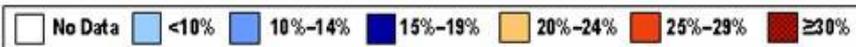
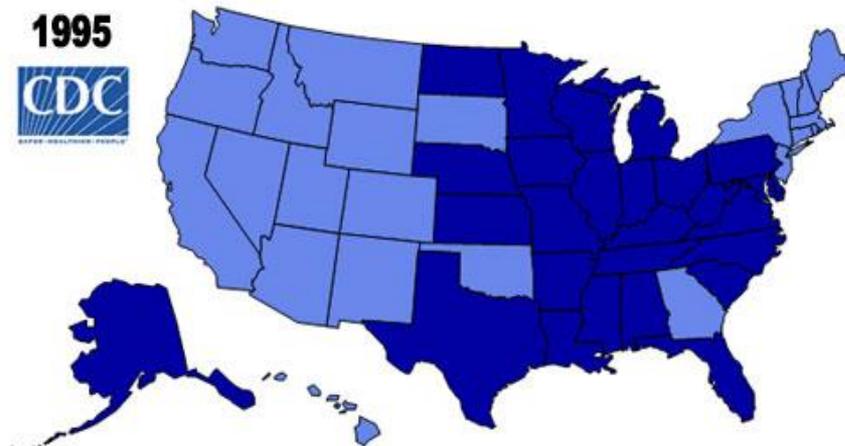


Trend: Obesity at Epidemic Proportions

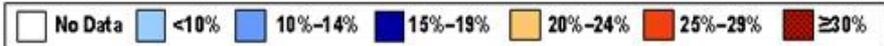
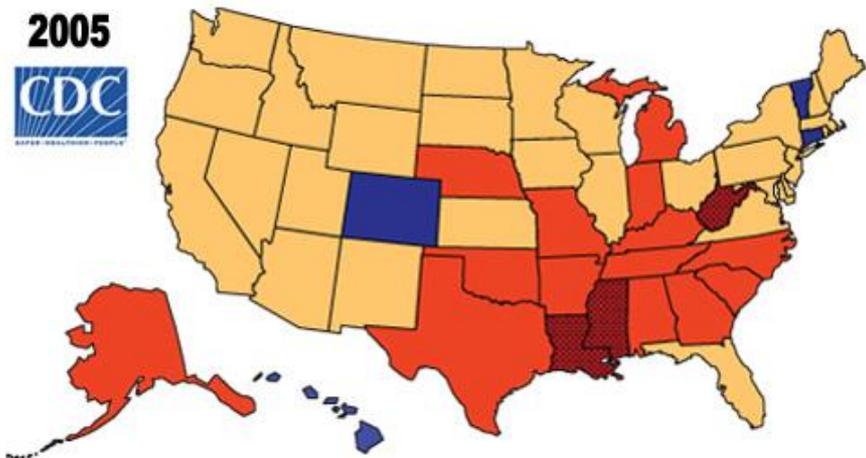
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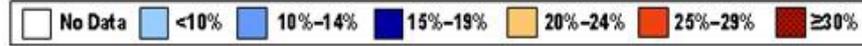
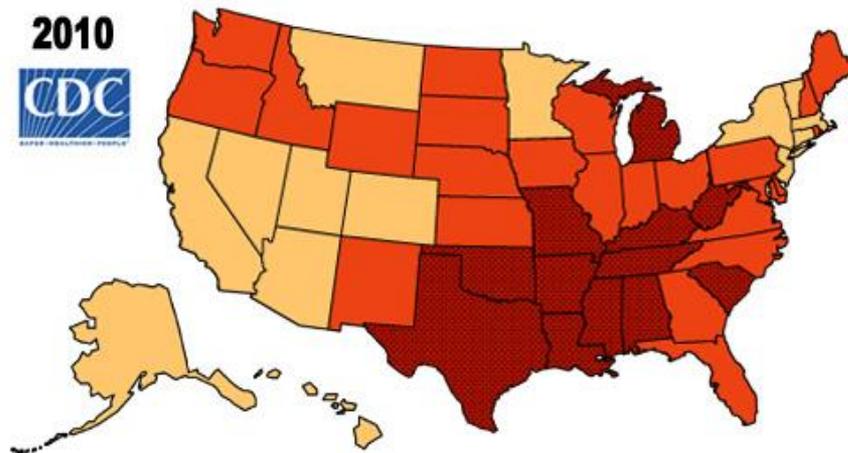
1995



2005



2010



Defining BMI & Obesity

First: How is obesity measured?

- Height and weight
- Body Mass Index (BMI) Chart:
- **“Obese” classification = BMI 30+**
- **“Morbidly Obese” classification = BMI 40+**

$$\text{BMI} = \left\{ \frac{\text{WEIGHT (pounds)}}{\text{HEIGHT (inches)}^2} \right\} \times 703$$



		Weight in Pounds													
		120	130	140	150	160	170	180	190	200	210	220	230	240	250
Height in Feet and Inches	4'6	29	31	34	36	39	41	43	46	48	51	53	56	58	60
	4'8	27	29	31	34	36	38	40	43	45	47	49	52	54	56
	4'10	25	27	29	31	34	36	38	40	42	44	46	48	50	52
	5'0	23	25	27	29	31	33	35	37	39	41	43	45	47	49
	5'2	22	24	26	27	29	31	33	35	37	38	40	42	44	46
	5'4	21	22	24	26	28	29	31	33	34	36	38	40	41	43
	5'6	19	21	23	24	26	27	29	31	32	34	36	37	39	40
	5'8	18	20	21	23	24	26	27	29	30	32	34	35	37	38
	5'10	17	19	20	22	23	24	26	27	29	30	32	33	35	36
	6'0	16	18	19	20	22	23	24	26	27	28	30	31	33	34
	6'2	15	17	18	19	21	22	23	24	26	27	28	30	31	32
	6'4	15	16	17	18	20	21	22	23	24	26	27	28	29	30
	6'6	14	15	16	17	19	20	21	22	23	24	25	27	28	29
	6'8	13	14	15	17	18	19	20	21	22	23	24	25	26	28

Healthy Weight
 Overweight
 Obese

Defining BMI & Obesity

Second: BMI measurements are not a perfect science, but it is a start

- Can we as PT professionals become better at documenting???



Body Weight Injury Rates

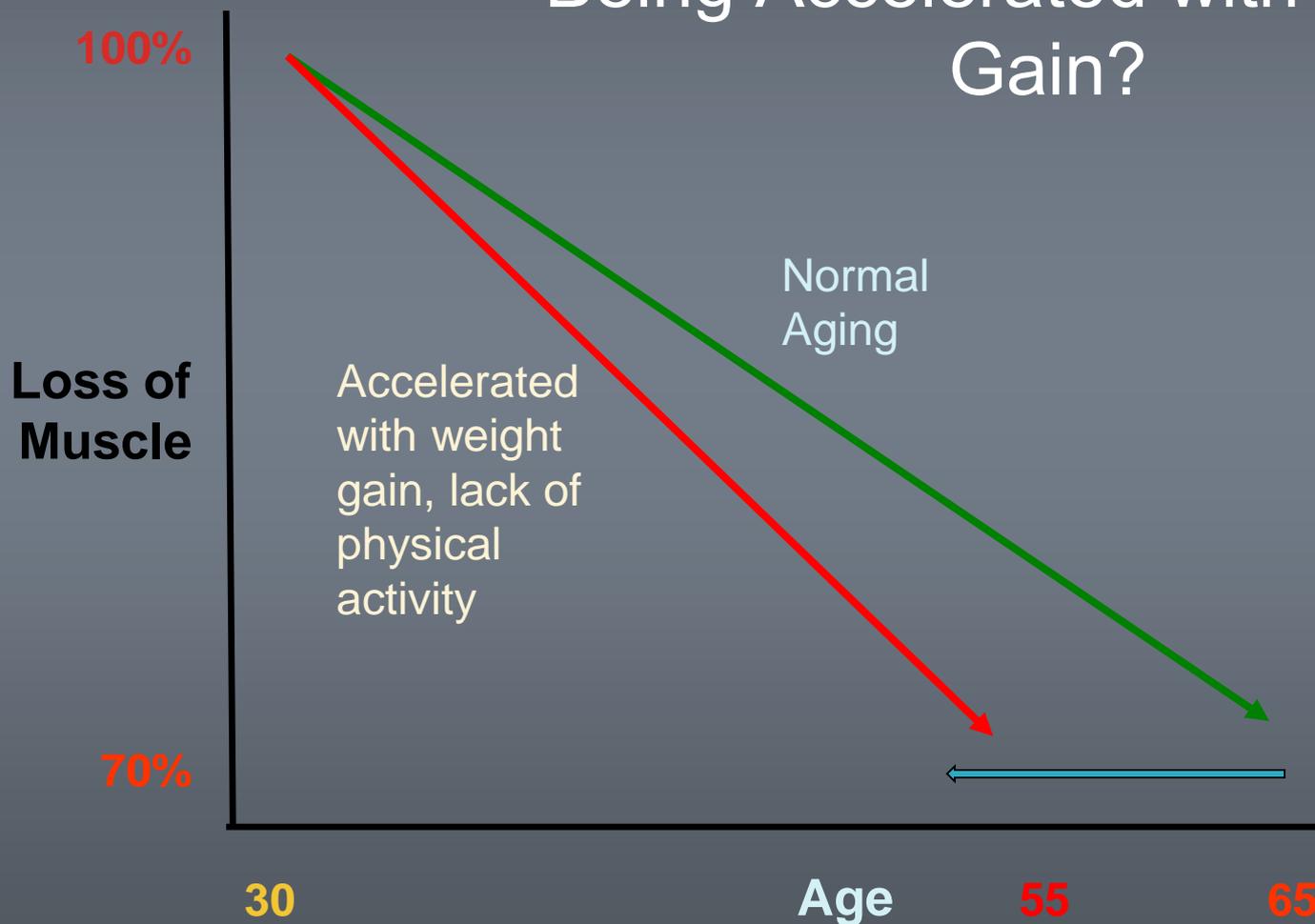
- Workplace injury rates increase with obese population—more susceptible to injury, de-conditioned, poor muscle tone/response
- Research shows that obesity results in twice as many strains and sprains compared to the normal weight individual with 7 times the cost
- Higher musculoskeletal injuries, especially to lower back, knees, hip and wrist, followed by shoulder
- Larger differences in claims rates by ergonomic/occupational job type also noted: higher injury rates for physically demanding jobs versus sedentary jobs



Ref- Obesity and Workers' Compensation: Results from the Duke Health and Safety Surveillance System: T. Ostbyte MD, PhD; J Dement PhD; K Krause MA: Archive of Internal Medicine, American Medical Association: 2007: 166: 766-773.

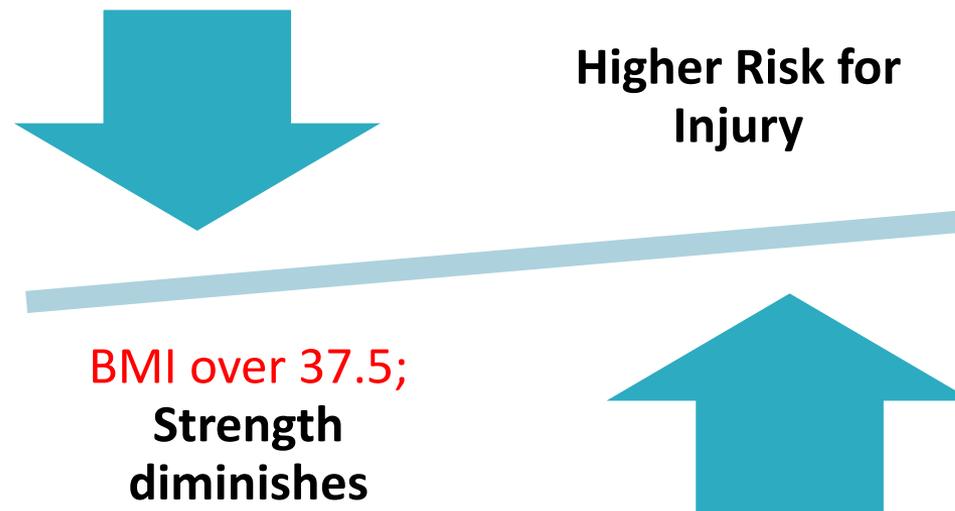
Body Weight Accelerated Strength Loss

Is the Loss of Muscle Mass
Being Accelerated with Weight
Gain?



Body Weight Strength Relationship

- Suggested: a worker's strength must be proportionate to the worker's body weight to allow the worker to safely perform the essential functions of the job
- As body weight increases so does strength up to a BMI of about 37.5 (severe obesity category of 35 to 39.9)
- After that point, strength no longer keeps up with increases in body weight; at this point a worker is at a greater risk of injury, disease, disability
- For BMI's greater than 50: negative relationship between strength and weight
- Helps to explain why the severe and morbidly obese worker is at greater risk for injury, disease and disability claim



Obesity: Work Comp Insurers Take Notice

2013 Annual Meeting of the National Council of Self-Insurers

- Add workers' compensation as insurance issue being driven by rapid and sustained rise of obesity
- Workers are getting older, that older workers are getting more obese; disability claims costs for obese workers **5.9 times higher than for non-obese workers**
- Leaders in workers comp insurers will address the 'quality of care' given to the obese worker: Workers' comp insurers will align themselves with **specialized service provider networks that look at diet, exercise, behavior as ways to treat obesity and develop best practices in weight maintenance in terms of productivity**



Ref: (Summary of an article by Philip Edmundson, Chairman and CEO of William Gallagher Associates Insurance Brokers Inc. The article appeared in Business Insurance magazine, 2013.)

Trend: Impact of Obesity on WC Claims

Moderately Overweight, BMI 25-29.9:

- 7% more WC claims
- Missed 3.5x more work days
- Medical costs 1.5x higher
- Indemnity costs 2x greater

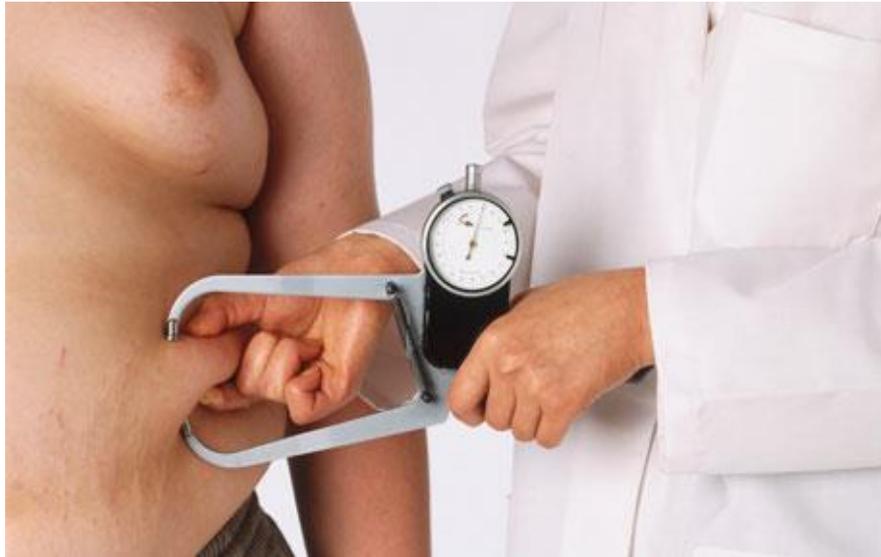


Morbidly Obese, BMI 40+:

- 45% more WC claims
- Missed 8x more work days
- Medical costs 5x higher than normal weight workers
- Indemnity costs 8x greater

Ref: Article: *Impact of Obesity* (workforce.com/Duke University Study 2007); Archives of Internal Medicine, 167(8), 766

Trend Impact of Obesity on Biomechanics



Obesity & Impact on Work: contributes to work-related injuries and delayed healing:

- Poor level of fitness / General de-conditioning
- Higher incidence of metabolic/diabetes, heart disease & vascular system co-morbidities, cancers, arthritis & lower back pain
- Ultimately affects healing rates, may warrant extended therapy durations
- Corbeil et al, suggests obese individuals have a higher fall risk; two physical consequences of obesity— an increased mass to stabilize over the base of support and an anterior position of the body's center of mass relative to the ankle joint—and potential health-related factors, such as muscular atrophy/weakness or aging, are likely to exacerbate the risk of falling in an individual who is obese.*

*Ref: Corbeil P, Simoneau M, Rancourt D, Tremblay A, Teasdale N. Increased risk for falling associated with obesity: mathematical modeling of postural control. IEEE Trans Neural Syst Rehabil Eng. 2001;9:126–136.

Obesity: Co-existing Clinical Complications

With this heavier workforce, clinically in PT practice we tend to also see and need to address these diseases and complications:

- 80% of type II diabetes related to obesity
- 70% of Cardiovascular disease related to obesity
- 42% breast and colon cancer diagnosed among obese individuals
- 26% of obese people having high blood pressure
- 30% of gallbladder surgery related to obesity
- More pressure on weight bearing joints: higher incidence of arthritis
- Decrease in cardiovascular endurance
- **Co-morbidities can lead to impaired function, disability**



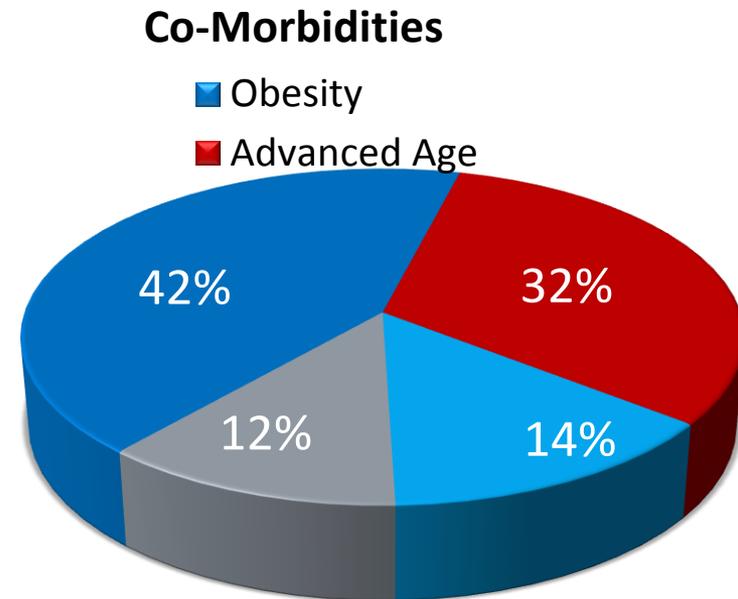
Ref: Mann GV. The influence of obesity on health
N Engl J Med. 1974;291:178-185.

Co-morbidities Let's Take a Look

- 90% of patients seen in outpatient P.T. have at least 1 medical co-morbidity
- 60% have 2+ co-morbidities
- Presences of medical co-morbidities in 55+ group even higher
- Co-morbidities can directly influence medical, therapy care and outcomes
- Osteoporosis is 1 of the common underlying co-morbidities in older workers

- Clinically, identify potential co-morbidities, address modifications of exercise prescription, goals, treatment plan

- Ref: Industrial Medicine and Acute Musculoskeletal Rehabilitation: Acute Musculoskeletal Injuries in Aging Workforce, 2007



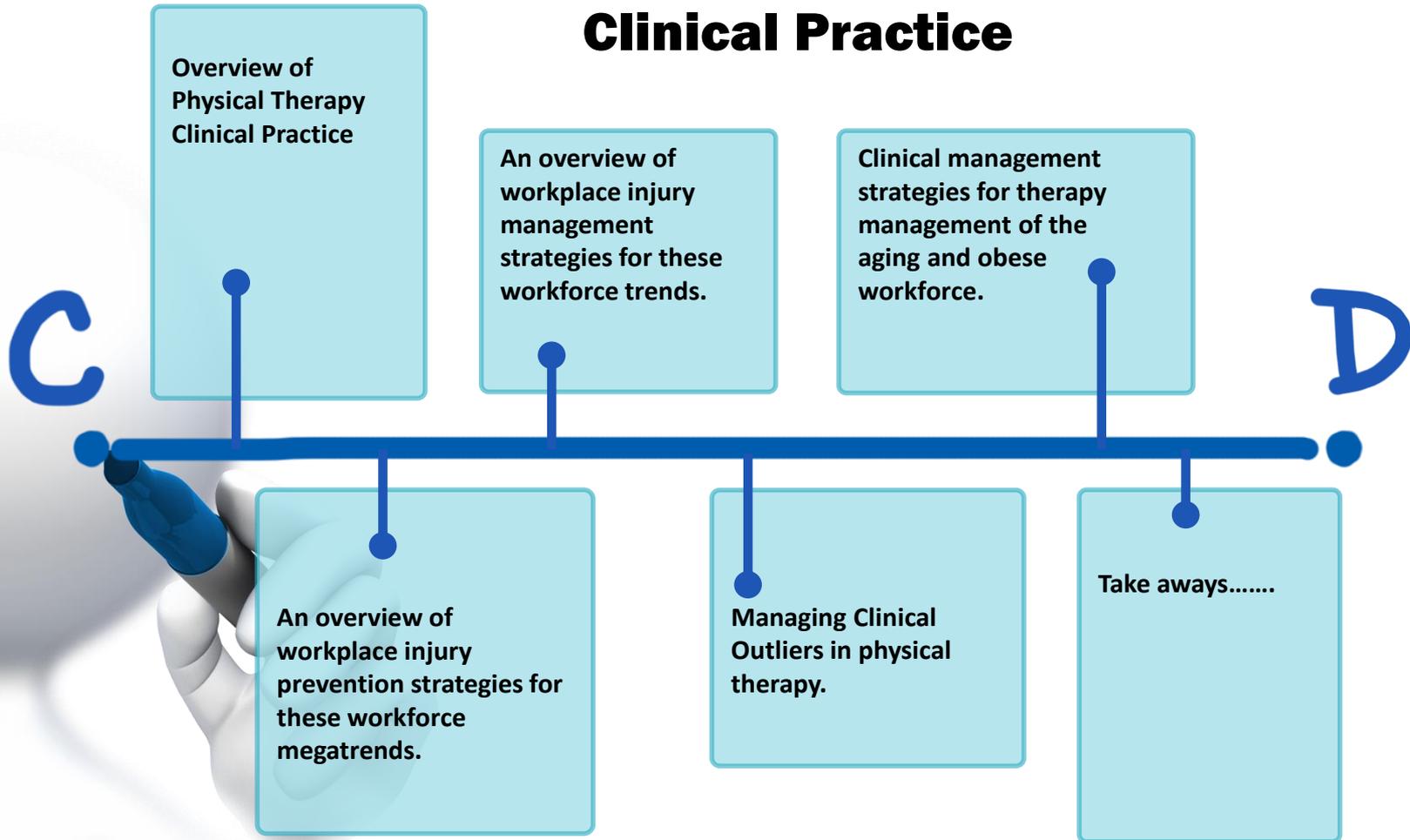
Injury Risk Factors - Obesity

- **Injury risk factor concerns can be magnified with obese workforce**
- Changes in the body's natural recovery time, higher co-morbidity rates affecting healing process, diabetes etc, CTDs develop at faster rates
- Changes in body mechanics alters the muscle physiology, resulting in less efficient muscle use and recovery times: lower spine
- Reduced cardiovascular efficiency results in diminished recovery time from work load



Getting from C to D Process

Clinical Practice



Clinical Implications Injury Prevention

P.T.s can be a resource in injury prevention for all workforce groups.

Injury prevention is a lifestyle choice.

- Educate & encourage overall healthy lifestyle, general wellness:
 - Regular check-ups: dental, eye exam, physician exam
 - Proper diet & hydration
 - Regular exercise program
- Community safety: reduce risk for falls
 - Choose well lit walk-ways, slip resistant floor surfaces, remove trip hazards



Clinical Implications Injury Prevention

Injury Prevention at the Workplace:

- Reduce risk for falls
- Pre-work screening program/Fit for Duty Programs: match demands of body to work
- Recall workforce likely has reduced strength (sarcopenia or reduced strength to BMI ratio), reduced mobility slower reaction times, higher fall risk, less efficient muscle force production, faster muscle fatigue, compromised CV systems etc.
- Considers physical abilities/limitation, work demands, work goals
- Important when hiring prospective employees with advanced age or overweight
- Proven success for proper hiring practices, reduced medical and workers' compensation claims/costs for these workforce populations



Clinical Implications Injury Prevention

Teach ergonomic solutions for the workplace (IW takes ownership):

- Ergonomic Analysis/Accommodations: adjust work area to changes in body: modify grip/handles, adjust for vision changes, shelf height
- Posture, body mechanics, joint protection, work cycles
- Address M.O.I.: overexertion, postures to avoid end range, adequate work cycles, longer recovery times etc.

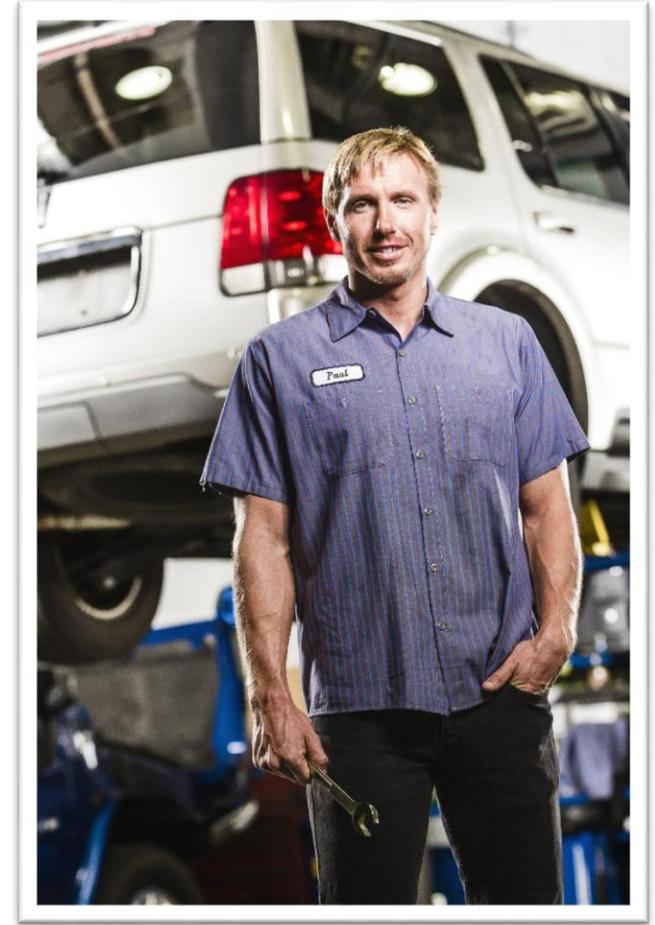


Ex: Bifocals Ergo Accommodation:

Lower Computer monitor for bifocal user to reduce neck muscle/ligament strain

Clinical Implications P.T. Management

- PT Professionals are the KEY healthcare professionals equipped to rehabilitation high risk workers back to health, back to work
- **We are only as good as our outcomes**
- By mindfully clinically managing injured workers with injuries and advanced age or obesity complications we can effectively facilitate RTW, encourage healthy lifestyle
- Have thorough understanding of I.W.'s job duties, request job description, document work specific goals
- Communicate effectively and often between all stakeholders (IW, CM, ADJ, MD)



P.T. Management: Functionally Based

- Focus on active, functional treatments
- *Passive modalities without active treatment procedures is not considered 'skilled therapy', therefore passive modalities are to be used only as an adjunct to active treatment regimes*
(ref: A.P.T.A. Standards of Practice)
- Clinical standards include modifying the treatment plan and treatment intervention based on the medical necessity of the individual patient: modality usage should diminish as healing occurs

CPT Analysis for this Claim

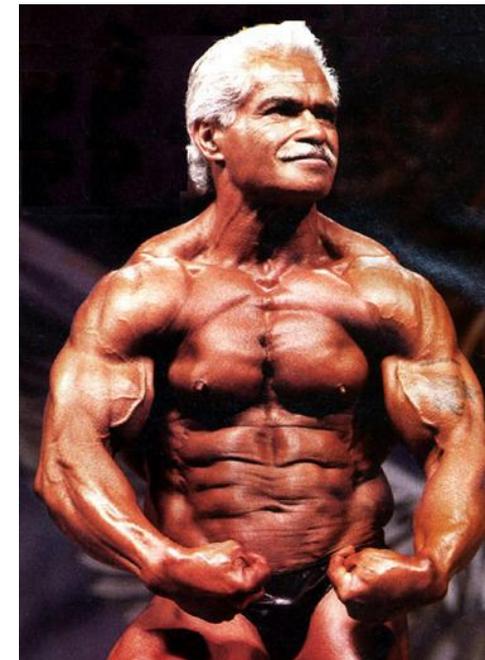
Current Treatments		Best Practice Treatments	
97010 Hot or cold packs therapy	Unsupported	97140 Manual Therapy	Supported
97110 Therapeutic exercises	Supported	97110 Therapeutic Exercise	Supported
97116 Gait training therapy	Inconclusive	97530 Therapeutic Activities	Supported
97140 Manual therapy	Supported		

- Supported (Evidence Base Supported) -Inconclusive (Insufficient Evidence) -Unsupported (Evidence Base Contraindicated)

Ref: Align Networks CPT Analysis

P.T. Management: Aging Patients

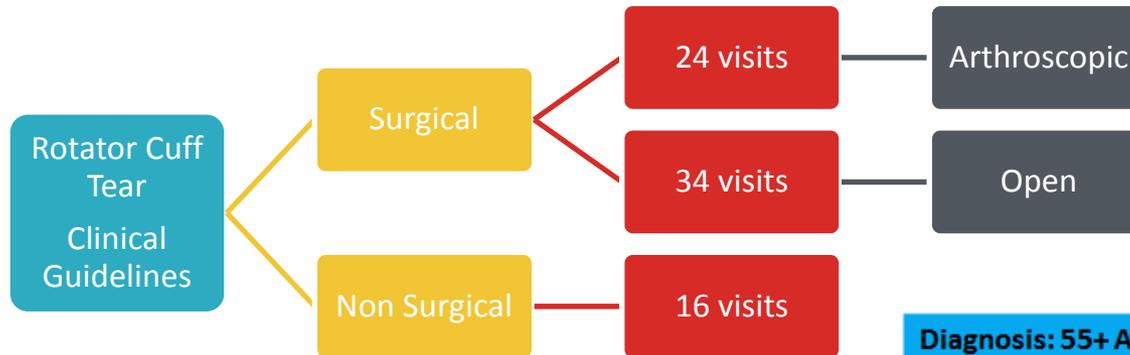
- Understand effects vision, hearing, cognitive loss:
 - More auditory/visual prompts/cues
- Exercise prescription: address bone, joint degenerative changes, loss of muscle strength, balance, slower tissue recovery times, metabolic & cardiovascular changes
- Many older individuals may be exercise intolerant due to co-morbidities, side effects from meds



- Sarcopenia can largely be prevented with a structured strengthening exercise program; research indicates structured P.T. exercise programs with eccentric training and high velocity concentric training more effective than traditional exercise regimens (provided next section)

P.T. Management: Best Practice

- Utilize Clinical Guidelines/ Benchmarks (ODG, APTA, industry, Payor specific) as a tool and goal for treatment utilization

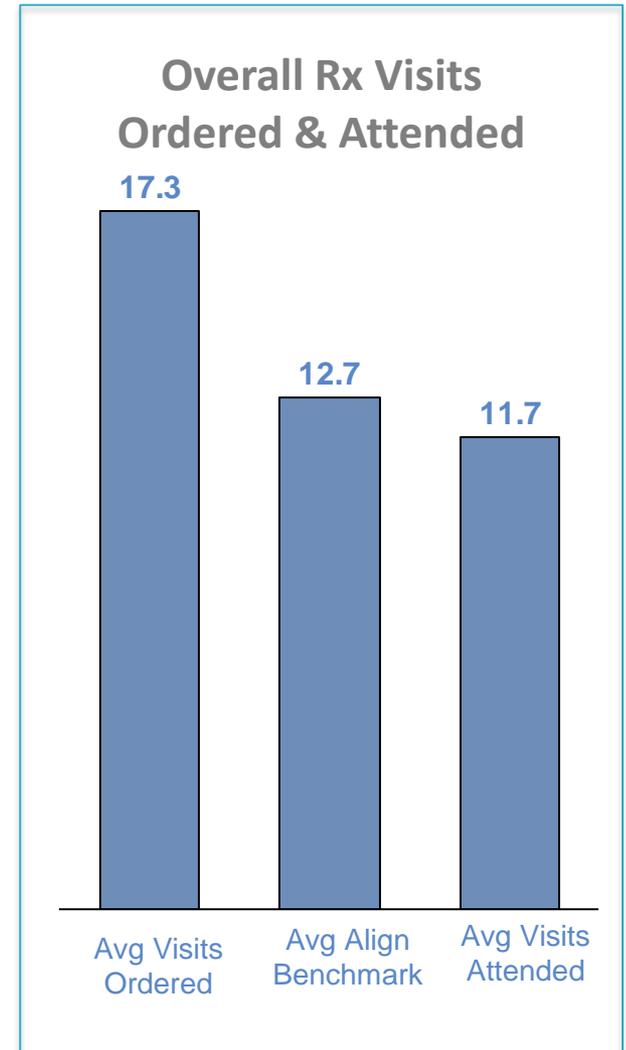


- Guidelines reflect “what gets best results right now”
 - Continue to evaluate treatment parameters, data analytics
- Consider using Clinical Practice guidelines include modifiers to consider specific patient/workforce group, condition, age

Diagnosis: 55+ Age Group	Clinical Guideline
Lumbar Strain/Sprain/Pain/Contusion	14
Lumbar Radiculopathy	12
Sciatica	14
Herniated Disc (HNP) -Surgical	16
Spondylosis/Spondylolisthesis	15
Lumbar Fusion-Surgical	26
Degenerative Disc Disease	14

P.T. Management: Be Proactive

- Apply concepts, clinical guidelines from evidence based practice research:
 - Develop & track outcomes
 - Manage clinical outliers, age-related factors
- Modify treatment plan, goals based on:
 - Co-morbidities etc.
 - Return to work requirements
 - Other clinical evidence of delayed healing



P.T. Management: Obese Patients

- Altered center of gravity:
 - Increased balance considerations
- Joint protection
 - Increased strengthening exercises
 - Aquatic therapy
- Encourage healthy living
- Modify treatment plan, goals based on:
 - Exercise tolerance
 - Co-morbidities
 - Return to work requirements
 - Clinical evidence of delayed healing



Clinical Implications RTW

Identify candidates, advanced age, obese workers, who may be appropriate for alternate Industrial Rehab programs after skilled therapy intervention has peaked:

- Independent gym programs
- Functional capacity evaluations (FCE)
- Onsite therapy visits
- Ergonomic evaluations
- Fit for duty exams
- Work Hardening/Conditioning/Transitional Work Programs



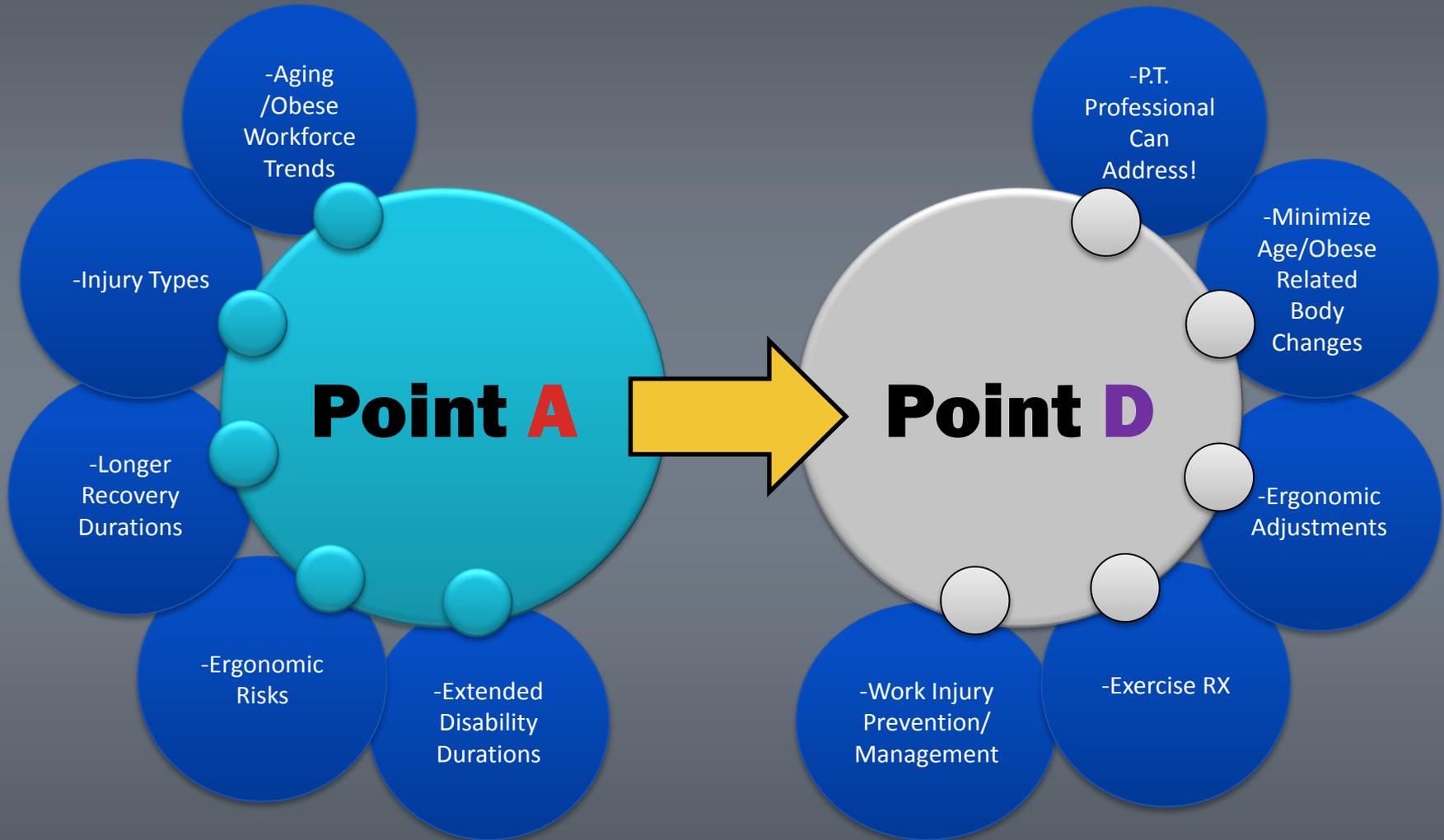
Work Injury: Improving Outcomes

How P.T. Professionals & Insurance Industry can continue to work together to improve results, keep these workforce groups healthy, productive, safe and happy:

- P.T. professionals to communicate & document to help case managers and claims adjusters better manage W.C. claim: ***we are their eyes and ears!***
- Focus on safety, preventing re-injury with ***Stay at Work, Return to Work*** focus
- If adjuster and case manager can help us to understand their goals, specific work factors (job description); so as therapists, we can create more focused treatment plans, goals, outcome metrics
- Work directly with injured worker, involve them in treatments, get their buy in, confidence; will improve RTW outcomes
- Collaborative plan (MD, Carrier, Case Manager, P.T. professional) produces better results, higher patient satisfaction, lower costs



Take Aways



Questions? Need More Information?

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