Diabetes
The Epidemic That Pools Cannot Ignore

Michelle Despres, PT, CEAS II
VP, National Product Leader
Let’s Talk About:

- Trends
- Impact
- Risks
- Costs
- Solutions
• How does diabesity affect your workforce?
Trends
Co-Morbidity Trends

- Injured Workers:
  - 90% in outpatient P.T. have at least 1 medical co-morbidity
  - 60% have 2+ co-morbidities
- Higher in 55+ age group
- Can directly influence medical, therapy care and outcomes

Clinically:
- Need to identify potential co-morbidities
- Address with modifications of:
  - Exercise prescription
  - Goals
  - Treatment plan

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

Co-Morbidities

- Obesity: 42%
- Advanced Age: 32%
- Metabolic Disorder: 14%
- Heart Disease: 12%
Diabetes Trends

- 70% Americans overweight
- Diabetes affects nearly 30 million Americans (9.3% population)
- Diabetes + Obesity =
  - Increased medical costs
  - Increased injury frequency
  - Higher indemnity costs
  - Slower recovery
  - Heightened risk for re-injury
  - Absenteeism

Ref: Centers for Disease Control and Prevention. Obesity and Overweight: Fast Stats
Young People Trends

- 17.5% of children (ages 3-19) are obese
- 200,000+ Americans under age 20 are diabetic
- This is our future workforce

Ref: Carrol, Navaneelan, Bryan et al. Prevalence of Obesity Among Children and Adolescents in the United States and Canada. NCHS Data Brief. Number 211, August 2015
Ref: Centers for Disease Control. 2014 National Diabetes Statistics Report
Obesity
What percentage of the population do you think is obese (BMI 30+)?
Obesity at Epidemic Proportions

- 78% of Americans do not meet basic activity level recommendations
- 25% completely sedentary
- Currently 1/3 of U.S. population is obese
- 2030 NIH forecast = 51% of U.S. population!
- In June of 2013 the AMA declared obesity as a disease and no longer a comorbidity
Obesity History
2013: Percent of adults aged 18 years and older who are obese †

BMI = 30+

Ref: Centers for Disease Control and Prevention. Nutrition, Physical Activity and Obesity: Data, Trends, and Maps
Defining BMI & Obesity

- How is obesity measured?
- Height and weight
- Body Mass Index (BMI) Chart:
  - “Obese” = BMI 30+
  - “Morbidly Obese” = BMI 40+

According to this BMI chart... I am too short.
Obesity Costs

- Today: $200 billion a year (>10% of healthcare costs)
- 2020: account for 20% of all healthcare costs
- Morbidly Obese (BMI 40+)
  - 45% higher claim volume
  - 8x more missed work days
  - 5x higher medical costs
  - 8x greater indemnity costs

Ref: Cawley, Meyerhoefer. The Medical Care Costs of Obesity: An Instrumental Variables Approach.
Obesity: Physical Impact

• Poor level of fitness/general deconditioning
• Higher incidence of:
  – Diabetes
  – Heart disease
  – Cancers
  – Arthritis
  – Low back pain

Body Weight Strength Relationship

- **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)
- After BMI 37.5 strength no longer keeps up with increases in body weight
- Worker is at a greater risk of injury, disease, disability
- For BMI’s greater than 50: negative relationship between strength and weight
- The severe and morbidly obese worker is at greater risk for injury, disease and disability claim

Ref: Why Decreased Muscle Mass is a Risk Factor: A Costly Risk Factor That Can Be Reversed (White paper) Tom Gilliam PhD: IPCS and Move It or Lose It, 2013, with permission
Obesity: Work Impact

- CTD’s develop at a more rapid rate
- Extended disability durations
- Altered body mechanics to perform tasks
- Fall risk

“Of the baseline personal risk factors, obesity contributed the most to the risk of absence from both low back and non-low back MSD (musculoskeletal disorders).”

Obesity Risk Factors

- 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

Diabetes
What percentage of adults have diabetes and are not aware?
Diabetes Statistics

- Nearly 30 million Americans have diabetes (9.3%)
- 1 in 4 do not know
- 86 million (1 in 3) adults are pre-diabetic
- 2012: $245 billion in total medical costs and lost work wages

Diabetes Costs

• Medical costs for diabetics averages 2.3x higher than non-diabetic workers

• Indirect costs:
  – Absenteeism
  – Reduced productivity
Metabolic Syndrome

Group of characteristics that place an individual at risk for CVD and type 2 diabetes. 3 of 5 indicate possible MetS.

<table>
<thead>
<tr>
<th>National Characteristics</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Elevated Waist Circumference</td>
<td>40 in / 102 cm</td>
<td>≥ 35 in / 88 cm</td>
</tr>
<tr>
<td>2. Triglycerides</td>
<td></td>
<td>≥ 150 mg/dL</td>
</tr>
<tr>
<td>3. HDL</td>
<td>&lt; 40 mg/dL</td>
<td>&lt; 50 mg/dL</td>
</tr>
<tr>
<td>4. HTN</td>
<td></td>
<td>SBP ≥ 130 and/or DBP ≥ 85 mm Hg and/or pharmacological treatment</td>
</tr>
<tr>
<td>5. Elevated fasting blood glucose</td>
<td></td>
<td>≥ 100 mg/dL and/or pharmacological treatment</td>
</tr>
</tbody>
</table>

* International waist circumference is lower for Non-Hispanic white males, Mexican American males, and all females

Ref: American Physical Therapy Association. Practice and Patient Care
Complications of Diabetes

Risks:

- Adhesive capsulitis
- Wound healing complications
- Less severe injury escalating into serious injury
  - Substantial increases in permanent total disability (PTD)
- Diabetic nerve pain delays recovery
- Associated with ~20% MSD claims

Ref: Collins & Lacy, P.C. The Impact of Diabetes & Other Obesity-Related Conditions on Workers’ Compensation Claims
Ref: Giusani, Tharp, Reardon. Comorbidity in Worker’s Compensation: Preventing and Identifying Comorbidity to Reduce the Impact on Workers’ Compensation Claims
Diabetic Precautions to Exercise

- Carry fast acting carbohydrate
- Carbohydrate should be ingested if glucose levels are < 70 mg/dL
- Vigorous exercise can cause hyperglycemia after exercise
- Fluid ingestion should occur before, during, and after exercise
- Proper foot wear/vigilant foot inspection should be performed
- Exercise should be avoided prior to going to bed
- Rotate insulin injection sites away from active muscles

Ref: American Physical Therapy Association. Practice and Patient Care
Diabetes: Work Impact

- Physical limitations (1 in 2 adults):
  - Stooping
  - Bending
  - Kneeling
- 1 in 3 report limitations on standing for 2 hours

Ref: Centers for Disease Control. Age Adjusted Percentage of Adults with Diagnosed Diabetes Reporting Mobility Limitation, by Task, United States, 1997-2011.
Diabetes: Work Impact

- **Truck Drivers:**
  - Intra vs interstate driving
  - Need exemption for insulin users
- **Firefighters:**
  - A1C must be below 8%
- **Law Enforcement:**
  - Individualized assessment
  - Case by case
- **Pilots:**
  - Insulin use is a disqualifying condition
  - Special Issuance Procedures:
    - May apply for 3rd class medical certificate
    - Private/recreational operations
    - Student pilot
    - Flight instructor
    - Sport pilot

Ref: American Diabetes Association
Case Study: 55 y/o Male, DX Type 2 Diabetes

55y/o overweight worker with no symptoms attends DOT physical

**DOT Physical:** No previous health issues. “Healthiest couch potato around.” Blood sugar read over 500.

**DOT Guidelines:**
- No driving until personal physician treats
- Unable to work, CDL was temporarily revoked

**Factors impacting outcomes:** aging worker, weight gain over years, now type 2 diabetic

**History:** Worked with this company over 30 years at time of diagnosis. First 16 years was as a local/regional delivery driver. Very healthy, lean, fit as job was physically demanding. For remaining 24 years drove tractor-trailer type trucks, pulling double trailers and crossing state lines that was primarily sedentary with duties that were somewhat physically demanding at beginning, middle, and end of shift to change trailers.

**Outcome:** Controlled with oral medications; educated about diet and monitoring of blood glucose. Resumed driving, continued driving through until his retirement at age 65. Has successfully managed type 2 diabetes with this approach for nearly 10 years.
Diabetes + Obesity = Diabesity
Diabesity Related Risk Factors

• More low back injuries
• Poor level of fitness
• General de-conditioning
• Decreased flexibility
• Presence of co-morbidities
  – Arthritis
  – Joint issues
  – Cancers
• Slower healing rates
• Extended therapy durations
Diabetes: Worker Impact

- Changes in physiology & biomechanics
  - Low back alignment and center of gravity changes increase risk of low back injuries
- More musculoskeletal injuries:
  - Low back
  - Hips
  - Knees
  - Wrists
  - Shoulders
- Higher rate of claims
- More claims require PT
Solutions
58y/o obese worker with diabetes developed herniated nucleus pulposus (HNP).

Physical Therapy: 12 visits ordered (3x 4 weeks)

Guidelines:
- ODG: 10v over 8 weeks
- MDA: 12v over 6 weeks
- Align: 10v over 5 weeks

Factors impacting outcomes: aging worker, obese, diabetic

Outcome: Objective progress, compliance, and responsiveness but slower pace than average. He required 4 additional visits for a total of 16 to make a full recovery and RTW within a medium-heavy PDL job.

Proactive Management Strategy: Clinical oversight allowed for communication between all relevant stakeholders and determined care was appropriate beyond the guidelines but collaboration achieved a number that was most appropriate for the individual.

Additional Intervention: Treating providers and case management team able to emphasize nutrition, weight loss, and healthy living. Upon RTW the worker joined an employee wellness program and has improved his overall health. Thus, helping to mitigate risk of future injury.
Solutions: Prevent Injuries

Pre-work screening / Fit for Duty Programs
• Match demands of body to work
• Considers:
  – physical abilities/limitation
  – work demands
  – work goals
• Proven success for proper hiring practices
• Goal: reduced medical and workers’ compensation claims/costs
Solutions: Prevent Injuries

- On-site wellness
- Off-site wellness
  - Source community discounts
  - Raise awareness
  - Customized stretching
  - Company wide & break room
Solutions: Reference Clinical Guidelines

- Provide a reference or benchmark
- Body part and injury specific
- Co-morbidities may affect visit count/duration
- Consider when setting reserves
<table>
<thead>
<tr>
<th>ACOEM</th>
<th>ODG</th>
</tr>
</thead>
<tbody>
<tr>
<td>American College of Occupational &amp; Environmental Medicine&lt;br&gt;Provides diagnostics, tests, medical treatment algorithms&lt;br&gt;General treatment recommendations for PT/OT&lt;br&gt;Use of physical modalities&lt;br&gt;Exercise prescription&lt;br&gt;<em>Does not offer specific PT/OT visits or utilization patterns</em>&lt;br&gt;<strong>Ex: Ankle Sprain Physical Therapy Guidelines:</strong> Specific exercises for stretching, ROM, strengthening&lt;br&gt;Home application of cold, then heat&lt;br&gt;Visits for HEP, education</td>
<td>Official Disability Guidelines&lt;br&gt; Evidence-based, expected utilization, disability durations&lt;br&gt;Actual experience data:&lt;br&gt;Of 10,000 diagnoses, 80% were total lost day conditions&lt;br&gt;Therapy recommendations for number of visits, duration&lt;br&gt;Specific to condition/body part&lt;br&gt;<strong>Ex: Ankle Sprain Physical Therapy Guidelines:</strong> Allow for fading of treatment, 9 visits over 8 weeks&lt;br&gt;Include HEP</td>
</tr>
<tr>
<td>MDA</td>
<td>APTA</td>
</tr>
<tr>
<td>Medical Disability Guidelines&lt;br&gt;Evidence-based, disability durations, medical management&lt;br&gt;Includes literature references, Comprehensive description of recommended treatments&lt;br&gt;<strong>Ex: Ankle Sprain Physical Therapy Guidelines:</strong> PRICE, Rehabilitation program should be started early&lt;br&gt;Carefully designed rehab program: ROM, strengthening, proprioception, muscle reaction time, postural control&lt;br&gt;Include HEP, Up to 16 visits within 8 weeks</td>
<td>American Physical Therapy Association&lt;br&gt;Clinical Practice Standards &amp; Code of Ethics:&lt;br&gt;Best Practice model, Physical Examination, Tests &amp; Measures&lt;br&gt;Modality, Procedure, Intervention Guidelines; Documentation Guidelines&lt;br&gt;<strong>Recommendations visits &amp; duration per condition:</strong> Wide range = continuum of care&lt;br&gt;<strong>Ex: Ankle Sprain Physical Therapy Guidelines:</strong> Detailed exercises for stretching, ROM, strengthening&lt;br&gt;Detailed interventions, tests/measures, treatment, goals; 3-36 visit recommended</td>
</tr>
</tbody>
</table>
Solutions: Job Site Analysis

• Physical/functional job descriptions
• Ride-along assessments
• Personalized solutions
Solutions: Ergonomics

- Fit work to worker
  - Adjust work area
  - Modify as needed
- Educate worker:
  - Posture
  - Body mechanics
  - Joint protection
  - Work Cycles
- Address:
  - Mechanism of injury
  - Overexertion
Solutions: Physical Therapy

- Increased balance considerations
  - Altered center of gravity
- Fall prevention strategies
- Postural education
- Joint protection
  - Aquatic therapy
  - Increased strengthening exercises
- Encourage management of diabetes
- Customized treatment plans
  - Exercise tolerance
  - Co-morbidities
  - Delayed healing
- Know job requirements
- Body mechanics, energy conservation, & alternate approaches to accomplishing challenging tasks
Solutions: Work Conditioning

- Level II RTW program may be needed if:
  - Endurance remains deficient
  - Strength insufficient for job tasks
  - Body mechanics need retraining
- Out of work for extended periods
- Reached skilled PT goals but unable to resume full duty
- Best for medium PDLs and above
Solutions: Functional Capacity Evaluations (FCEs)

- Objective measure of work capacity
- Establishes safe RTW levels
- Job specific or general capabilities
Solutions

**ADJUSTER/CM**

How can claims staff help improve outcomes?
- Goals
- Job descriptions
- Focused plans

**EMPLOYER**

How can employers support the prevention of injuries and follow through post injury?
- Job descriptions
- Injury patterns
- Ergonomics
- Wellness

**INJURED WORKER**

How do we improve injured worker buy in and participation?
- Treatment involvement
- Buy in
- Confidence

**PHYSICAL THERAPIST**

How can medical providers drive RTW/SAW?
- Communicate
- Document
- Eyes and ears

Collaborate: Focus on safety, preventing re-injury with *Stay at Work, Return to Work* focus
Thank you!

Michelle Despres, PT, CEAS II
VP, National Product Leader
mdespres@alignnetworks.com