The Proof Is in the Data: Applying Predictive Analytics to Reduce Workers’ Compensation Risk

(CLMO22)

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Learning Objectives

At the end of this session, you will:

• Understand the drivers of case costs and how to identify appropriate data points
• Apply techniques to existing data to identify high-risk claims.
• Select strategies to mitigate costs and optimize injured employee outcomes.
What does predictive modeling mean to you?
Predictive Analytics in Everyday Life

• Analytics in everyday life:
  • Soccer moms
  • NASCAR dads
  • Amazon, NetFlix, Google, Online/Catalog Retailers, Banks & Credit Cards

• What might be some typical types of claimants or accidents/injuries that we “know” will be those claims that will be bad
Predictive Analytics in Claims

• Analytics data in Claims
  • First Report of Injury or First Notice of Loss
  • Claim System
  • Managed Care data – Bill Review, Utilization Review, Pharmacy data
  • Settlement Information
How Do Predictive Analytics Work?

- Use your claim and managed care data
- Create specific algorithms
- Review data looking for patterns, issues or targets
- Gain insights on claims and patient populations
- Influence claim progression by alerting to the use of specific actions
- Change or improve clinical pathways for injured workers
What Can Predictive Analytics Do?

• Improve decision making
• Predict or anticipate changes
• Manage risk
• Reduce claim costs
• Reduce claim durations
• Improve operational efficiency and effectiveness
• Help resources to work together
Definitions

• Predictive analytics
• Predictive modeling
• Data mining
• Big data
• Data warehouse
• Algorithms
Simply Put…

“Early intervention is the next best thing to prevention.”

Composition of Today’s Workforce
Mega Trends: Let’s Take a Look

- 90% of injured workers 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, need to 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

Co-Morbidities

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

• 2015: 1/5 U.S. labor force 55+
• Strength declines over time due to age
• Co-morbidities: HBP, obesity, type II diabetes
• Wealth of benefits:
  • Ethic of personal responsibility
  • Can-do attitude
  • Experience
  • Knowledge
  • Loyalty
• Administration on Aging reports:
  • Older population (65+) = 40 Million in 2009 (12% of the U.S. population)
  • 2020, expected to grow to 72 Million (25% of our population)

Aging Workforce: Injuries

- **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**

- **Higher incidence of multiple injuries, co-morbidities**

- **Sprains, strains, joint dislocation, carpal tunnel syndrome, tendonitis**

Ref: U.S. and state government researchers (CDC, BLS and several state agencies) 2009
Age Related Changes in the Human Body

• **Primary areas of concern are:**
  • Bones & Joints
  • Eyes
  • Vascular Changes
  • Dehydration
  • Functional Abilities

Ref: National Institute of Health

MedlinePlus: Winter 2007 Issue: Volume 2 Number 1 Pages 10 - 13
Aging Workforce: Sarcopenia

- 4th vital sign (Dr. Turpelek, Cleveland Clinic)
- From Greek language, meaning “poverty of flesh”
- Age related loss in muscle size and strength
- Decrease in lean muscle mass often accompanied by increase in fat
  - Body weight may remain unchanged

Ref: Industrial Medicine and Acute Musculoskeletal Rehabilitation:

Acute Musculoskeletal Injuries in Aging Workforce, 2007

- 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
Co-Morbidities: Obesity

- 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

Predictors of Worker Outcomes (WCRI)

• **Education**
  • Not working: No HS diploma = 20% vs College degree = 11%
  • 56% of injured workers had no education beyond high school
  • 15% of injured workers have college degrees

• **Co-Morbidities**
  • Not working: 54% have co-morbid conditions (HTN, Diabetes, Heart Conditions)
  • Not working: 13% have no co-morbidities

• **English Language Proficiency**
  • Interviewed in Spanish: difficulty navigating health care system
  • 20% “very dissatisfied” with care
  • 26% “big problems” getting desired care

• **Fear of Being Fired**
  • 27% with fear have worse outcomes
  • Worse outcomes include: less recovery of physical health, more not working, longer disability duration, earning less, “big problems” getting desired care, & higher level of dissatisfaction with care

Source: WCRI Predictor of Worker Outcomes webinar 10/16/2014
The Impact
Drivers of Utilization (Aging)

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

• Research indicates recovery times following injury are longer with this age group:
  
  - Longer recovery times for older population
  - Higher wages account for additional higher costs among older workers (indemnity)
  - 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
Ref: National Institute for Occupational Safety and Health, Morbidity & Mortality Weekly Report
Obesity Costs

• Obesity Today: $200 billion a year (>10% of 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.
Claim Influence
High Potential Exposure Claims

• Small percentage of claims = disproportionately high costs
• Not just the “big” cases (lumbar fusion) that turn costly
• Includes those that seem innocent at first but analytics help flag
• Extended medical treatment
  • Diagnostic tests
  • Physical therapy
  • Pharmaceutical products
  • Indemnity
  • Surgery
  • Permanent disability

Ref: Milliman. A More Efficient Process for Worker’s Compensation Claim Analytics. 10-2012
Data Drives Outcomes

- Many data points are captured but is this info then utilized?
- What data can be collected?
- Many intervention options
- Early identification and action are key
What Injuries Cost You The Most?

- Surgical shoulder + age
- Surgical knee + age
- Diabetes, osteoarthritis, metabolic syndrome
- Obesity
- Smoking
Predictive Modeling Reduces WC Costs

- York: 33% reduction in costs associated with back claims
- According to a Towers Watson survey in 2011:
  - 5% reduction (Liberty Mutual Vantage Comp)
  - 15% reduction (Aon’s Early Claim Intervention model from *Business Insurance* magazine)
  - 4-8% reduction in annual loss and expense rations (Deloitte Consulting article in *Insurance & Technology*)
- Sedgwick: avg. incurred costs decreased 6-8% (2014)
- CCMSI: 5-10% reduction (2016)

Ref: Brechtel, Skip. CCMSI. 2016
Let’s Look at a Successful Program

The science behind the crystal ball.
TeamComp and Predictive Analytics

• What is it?
  • TeamComp is York’s way of managing workers’ compensation claims
    • York’s way of leveraging and integrating medical bill review results and claims data to achieve superior claim outcomes
  • Strategic use of predictive analytics to drive improved results
  • Proprietary predictive models and algorithms
  • Goal – create actionable business intelligence to claim outcomes, drive more efficient/effective use of managed care, and reduce loss costs and expenses
    • Includes capability to identify changing market conditions

• Key measures of success
  • Average claim costs
  • Average medical costs
  • Average number of disability/lost time days
  • Average number of days claim open to close
TeamComp and Predictive Analytics

• Key Considerations
  • Sample of Current Team Comp Alerts
    • Diagnosis specific code alerts - back sprain/strain, carpal tunnel, head trauma, other severe injury codes
    • Physical Therapy thresholds
    • Length of time between medical treatments
    • Medical dollars cost exceeded threshold for medical only or indemnity claims
    • Medication codes - schedule II drugs, multiple medications, pain management injections
    • Number of providers on claim exceeds pre-determined threshold
    • Duration of treatment or disability
    • Physician dispensed medications
    • Claim status change - Med Only to Lost time
    • Equipment or Supply cost thresholds
    • Implantable Devices
    • Psychosocial factors
    • Claim profiles
TeamComp and Predictive Analytics

The three A’s of Team Comp

• Alert
  • Triggers and scores
  • Clinical triage and adjuster review

• Action
  • Adjuster review
  • Claim strategy
  • Clinical assignments

• Accountable
  • Claim manager and vice president review
  • Senior leadership tracking
  • Quality assurance review
TeamComp and Predictive Analytics

- TeamComp Case Study 1 – Back Injuries
  - Pre and Post Team Comp Data
  - Claims valued at 24 months open/closed before and after start – 4 years total study
  - Significant outcomes on key measures
  - Earlier identification of at risk claims
  - Involving medical management resources more effectively to influence outcomes
  - Alternative/earlier treatment options lead to lower surgery, medical equipment and treatment costs

REAL WORLD CLIENT RESULTS UTILIZING TEAMCOMP*

<table>
<thead>
<tr>
<th></th>
<th>Average Total Paid</th>
<th>Average Lost Time Days</th>
<th>Average Medical Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical Data</td>
<td>$14,301</td>
<td>64</td>
<td>$7,923</td>
</tr>
<tr>
<td>Using TeamComp</td>
<td>$9,605</td>
<td>42</td>
<td>$5,631</td>
</tr>
</tbody>
</table>

* A 32.8% DECREASE in average total paid.
* A 34.4% DECREASE in average lost time days.
* A 28.9% DECREASE in average total medical.

* Isolation of back injury claims displayed
TeamComp and Predictive Analytics

• TeamComp Case Study 2 – Med Only to Lost Time Claims
  • Med Only claims = 78% of claims but only 6% of dollars spent
  • Most Med Only claims do not get the appropriate level of attention
  • At 90 Days – 95% of Med Only claims remain as Med Only
  • Remaining 5% that convert will cost 40 times more than the other Med Only claims
  • It is critical to manage these claims effectively to minimize potential loss costs

A 71% DECREASE in average total paid.

A 59% DECREASE in average medical costs.

A 73% DECREASE in average lost time days.

19 MONTHS OF DATA: COST OF CLAIMS THAT CHANGED FROM MED-ONLY TO LOST TIME
Implementation

You have the data, now what?
Stakeholder Solutions

- More experienced adjuster
- Increased level of managerial review
- Direct to nurse case manager
- Retain expert legal counsel
- Engage appropriate medical professionals
- Use a team approach

Additional Support

• Outpatient PT network (Align) is developing an early intervention/high risk identification program
  • Notify ADJ/CM of potential high profile claim based on demographics and program criteria.
  • Additional clinical oversight
    • Scrutinize evaluation
    • Standardized functional outcomes measures
    • More aggressive oversight
• Increased stakeholder communication frequency
Intervention Strategies

Example:
Chronic pain and Failed Back Syndrome:

- Drug utilization review program
- IME or peer review
- PBM contacts physician to elicit change in regimen
- Cognitive Behavioral Therapy or Functional Restoration to develop coping strategies and improve functional ability

Integrating Claims Management Process

• Predictive modeling must integrate with operations
• Establish feedback loop
• Monthly review between predictive analytics team and claims examiners
• Claims handlers must explore innovative ways to drive resolution

Exceptional Outcomes

- Minimize risk of exploding claims
- Control costs
- Maximum medical recovery
- Return to work
- Claim settlement/closure
Key Takeaways

• Make decisions
  • More accurately
  • More consistently
  • More timely
• Data is an asset – we collect it and we need to use it
• Data can be a tool to guide and assist in decision making
  • Past
    • What happened?
    • Why and how did it happen?
  • Present
    • What is happening now?
    • What should we do next?
  • Future
    • What has the potential to happen?
    • What are the best or worst outcomes?
    • How do we plan?
Resources for Additional Knowledge

• Books
  • Big Data @ Work – Thomas Davenport
  • Keeping Up with the Quants – Thomas Davenport
  • Data Science for Business – Foster Provost & Tom Fawcett

• Articles
  • “A Predictive Analytics Primer” by Thomas Davenport. Harvard Business Review
  • “Big Data in Healthcare” Health Affairs July 2014
  • “A Decision Support Tool for Predicting Patients at Risk of Readmission” Decision Sciences October 2014
Questions?

Idea?
Thank You!

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