Comparison of interventional outcomes of occupational musculoskeletal disorders

RAMAZZINI PRESENTATION
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Musculoskeletal Disorders (MSD)

- Most common workplace injury in Australia
- Multifactorial causes
- Health effects
- Work Injury is a major factor contributing:
  * Absenteeism
  * Disability
  * Unemployment
Australian Work Health and Safety Strategy 2012-2022

- MSD 1 of 6 national priority work related disorders (Safe Work Australia, 2013)

<table>
<thead>
<tr>
<th>Priority</th>
<th>Targets by 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of work related fatalities</td>
<td>↓20%</td>
</tr>
<tr>
<td>Incidence rate of claims ≥1 week off work</td>
<td>↓30%</td>
</tr>
<tr>
<td>Incidence rate of claims for MSD ≥1 week off work</td>
<td>↓30%</td>
</tr>
</tbody>
</table>
COSTS

- 2008-09: $60.6 billion (Safe Work Australia, 2013)
- 4.8% of GDP

Costs in occupational MSD implications:
- Economy, employer, employee
- Direct costs: health care bills and income replacement
- Indirect costs: lost productivity and reduced QOL (Illes, Wyatt & Pransky, 2012)
Return to work

- Medical intervention goal is to facilitate injured worker to be productive in workforce

- GPs see about 96% of injured workers in Australia (Mazza et al., 2015)

- Limited studies have focused on MSDs, management and RTW

- Successful RTW rates from occupational injuries range from 29-100% with median of 67% worldwide (Kong et al., 2012)
Outcome measures

- Continually evolving to meet needs of employees, employers and stakeholders
- Measuring return to work is a complex process. (Iles et al. 2012)

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurer</td>
<td>↓ liability</td>
</tr>
<tr>
<td>Employer</td>
<td>effective management/rehab systems</td>
</tr>
<tr>
<td>Injured worker</td>
<td>Work contribution</td>
</tr>
</tbody>
</table>

- Outcome data from work related injuries are often from secondary administrative databases which limits types and accuracies of outcomes. (Feuerstein et al. 2000)
Comparison of interventional outcomes of occupational musculoskeletal disorders

- Investigate the relationship between timing of intervention and management for workplace musculoskeletal injury and return to work outcomes.

  - Hypothesis: Early intervention in MSD leads to early RTW compared to late intervention
**STUDY DESIGN**

**Study period**
1st July 2013 to 30th June 2015
24 months

**Type**
Cross sectional study
Ethical approval Bellberry Ltd

**Setting**
Work injuries attending GP clinic in North West Sydney

**MSD**
Work related Injuries to muscles, tendons, nerves, trauma related soft tissue injuries, lacerations and fractures

**Inclusion criteria**
Claims initiated during the study period
Claims with multiple injuries

**Intervention**
Early: within 4 weeks of injury
Late: after 4 weeks of injury

**Conservative**: Observation, Dressing, Pharmacotherapy, Physiotherapy, Suture repair under LA

**Nonconservative**: Image guided injection +/- surgery

**DATA**
Status at final certification.
*PID
*PMD
**Ongoing

*Conservative > Non conservative
*Non conservative
*ED referral
****Lost to follow-up

**Injury Certification Intervention**
DATA

- Demographic (gender, age)
- Occupation
- Injury information (medical diagnosis*, injury management, dates of initial and final workers compensation certificates, duration of modified duties, status at final certification)
  *Injury types: categorised by common anatomical location and pathology.
  *Cases lost to follow up included in the data analysis
**RESULTS**

*Age*
- 30-39y (35%)
- >50 (23%)

*Anat. Distribution*
- Back (30%)
- Wrist/hand (22%)

*Path. Distribution/Age*
- 30-39y (35%)
- Mech. back (30%)

*Occupation*
- Blue collar 56%
- Office sales 26%

**WRMSD** (n=246)
- Female (38%)
- Male (62%)

**CONSERVATIVE** (n=231)
- Early intervention (90%)
- Late intervention (10%)

**NON CONSERVATIVE** (n=31)
- Early intervention (84%)
- Late intervention (16%)

**STATUS**
- Preinjury 196 (80%)
- Permanent modified 8 (3%)
- LTF 19 (8%)
- Ongoing 23 (9%)
Time to final certification and intervention

**Figure 1**

Time intervention to resolution vs intervention delay

**Figure 2**

Time to resolution vs intervention delay
<table>
<thead>
<tr>
<th>DAYS</th>
<th>Min</th>
<th>1st Qu.</th>
<th>Median</th>
<th>Mean</th>
<th>3rd Qu.</th>
<th>Max</th>
<th>NA’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>0.00</td>
<td>0.00</td>
<td>3.00</td>
<td>17.86</td>
<td>14.00</td>
<td>230.00</td>
<td>19</td>
</tr>
<tr>
<td>Modified duty</td>
<td>0.00</td>
<td>14.00</td>
<td>36.00</td>
<td>71.28</td>
<td>104.00</td>
<td>536.00</td>
<td>0</td>
</tr>
<tr>
<td>Length of claim</td>
<td>2.00</td>
<td>29.0</td>
<td>92.0</td>
<td>153.1</td>
<td>216.0</td>
<td>898.0</td>
<td>21</td>
</tr>
</tbody>
</table>
Table 1: Grand Cox model

<table>
<thead>
<tr>
<th></th>
<th>Coef</th>
<th>exp(coef)</th>
<th>se(coef)</th>
<th>z</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>late.intervention</td>
<td>-0.692</td>
<td>0.50066</td>
<td>0.3172</td>
<td>-2.18</td>
<td>0.029</td>
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<tr>
<td>Sex2M</td>
<td>-0.043</td>
<td>0.95763</td>
<td>0.16244</td>
<td>-0.27</td>
<td>0.789</td>
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<tr>
<td>Occ Office/sales</td>
<td>0.086</td>
<td>1.0898</td>
<td>0.17127</td>
<td>0.5</td>
<td>0.615</td>
</tr>
<tr>
<td>Occ Professional/manager</td>
<td>0.297</td>
<td>1.3464</td>
<td>0.21767</td>
<td>1.37</td>
<td>0.171</td>
</tr>
<tr>
<td>PathFracture</td>
<td>-0.031</td>
<td>0.96955</td>
<td>0.62569</td>
<td>-0.05</td>
<td>0.960</td>
</tr>
<tr>
<td>PathMechanical back</td>
<td>0.666</td>
<td>1.94581</td>
<td>0.65191</td>
<td>1.02</td>
<td>0.307</td>
</tr>
<tr>
<td>PathMeniscal Tear</td>
<td>-0.817</td>
<td>0.44179</td>
<td>0.75913</td>
<td>-1.08</td>
<td>0.281</td>
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<tr>
<td>PathMuscle tear/Hemia</td>
<td>-0.838</td>
<td>0.43273</td>
<td>0.79851</td>
<td>-1.05</td>
<td>0.294</td>
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<tr>
<td>PathOther</td>
<td>1.265</td>
<td>3.54324</td>
<td>0.63741</td>
<td>1.98</td>
<td>0.047</td>
</tr>
<tr>
<td>PathSoft tissue/Sprain</td>
<td>1.046</td>
<td>2.84597</td>
<td>0.55356</td>
<td>1.89</td>
<td>0.058</td>
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<tr>
<td>PathTendinopathy</td>
<td>-0.188</td>
<td>0.82826</td>
<td>0.5537</td>
<td>-0.34</td>
<td>0.733</td>
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<tr>
<td>AnatArm</td>
<td>0.071</td>
<td>1.074</td>
<td>0.40547</td>
<td>0.18</td>
<td>0.860</td>
</tr>
<tr>
<td>AnatNeck</td>
<td>-1.197</td>
<td>0.30188</td>
<td>0.45458</td>
<td>-2.63</td>
<td>0.008</td>
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<tr>
<td>AnatBack</td>
<td>-1.299</td>
<td>0.27262</td>
<td>0.43589</td>
<td>-2.98</td>
<td>0.002</td>
</tr>
<tr>
<td>AnatWrist/hand</td>
<td>-0.429</td>
<td>0.65077</td>
<td>0.29639</td>
<td>-1.45</td>
<td>0.147</td>
</tr>
<tr>
<td>AnatHip.groin</td>
<td>0.495</td>
<td>1.64075</td>
<td>0.66245</td>
<td>0.75</td>
<td>0.454</td>
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<tr>
<td>AnatOther</td>
<td>0.119</td>
<td>1.12673</td>
<td>0.58834</td>
<td>0.2</td>
<td>0.839</td>
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<tr>
<td>AnatKnee.leg</td>
<td>-0.288</td>
<td>0.74962</td>
<td>0.37859</td>
<td>-0.76</td>
<td>0.446</td>
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<tr>
<td>AnatShoulder</td>
<td>-0.285</td>
<td>0.75191</td>
<td>0.33915</td>
<td>-0.84</td>
<td>0.400</td>
</tr>
<tr>
<td>Age</td>
<td>-0.027</td>
<td>0.97333</td>
<td>0.00723</td>
<td>-3.74</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Likelihood ratio test = 76.9 on 20 df, p = 1.33e-08
n= 222, number of events = 199
(24 observations deleted)
Figure 1: Kaplan-Meier curve

<table>
<thead>
<tr>
<th>late.intervention=FALSE</th>
<th>N</th>
<th>Observed</th>
<th>Expected</th>
<th>(O-E)^2/E</th>
<th>(O-E)^2/V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>201</td>
<td>185</td>
<td>168.5</td>
<td>1.61</td>
<td>10.9</td>
</tr>
<tr>
<td>late.intervention=TRUE</td>
<td>21</td>
<td>14</td>
<td>30.5</td>
<td>8.90</td>
<td>10.9</td>
</tr>
</tbody>
</table>

Chisq=10.9 on 1 degrees of freedom, p=0.000951

P value ≤ 0.001
REJECT NULL HYPOTHESIS
Discussion

- Delay in acceptance of claims liability (hernia, pre-existing injuries, prior surgery and absence of work related identifiable cause)
- 4 out 5 cases with MSD were able to return to PID.
- Survival curves: late intervention group had longer survival time > longer periods of work absence.
Limitations

BIAS

*Selection
- single clinic, NTD expertise
- under reporting

*Information
- treatment providers
- absence days
- treatment duration
- return to work policies
Future

○ THIS STUDY PROVIDES A BASIS:
  + health promotion initiatives in workplace
  + training and education for health providers

○ FUTURE STUDIES:
  + Longitudinal study in multicentre setting
  + Impacts of rehabilitation types include costs of injury management
Conclusion

• Early intervention in occupational MSD has a higher chance of return to preinjury duties

• Effective communication and consultation among stakeholders in injury management is vital for a timely injury intervention within first 28 days of injury.
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- Dr Alun Pope  
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References


