

# Comparison of interventional outcomes of occupational musculoskeletal disorders

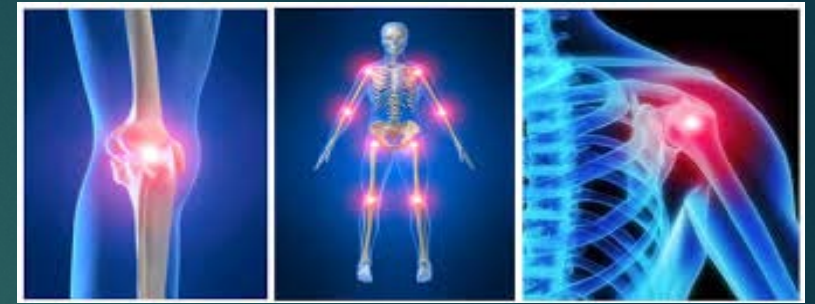
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# Musculoskeletal Disorders(MSD)



- 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)

Priority	Targets by 2022
No. of work related fatalities	↓20%
Incidence rate of claims $\geq$ 1 week off work	↓30%
Incidence rate of claims for MSD $\geq$ 1 week off work	↓30%

# 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 focussed 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)

Perspective	Outcome
Insurer	↓ liability
Employer	effective management/rehab systems
Injured worker	Work contribution

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

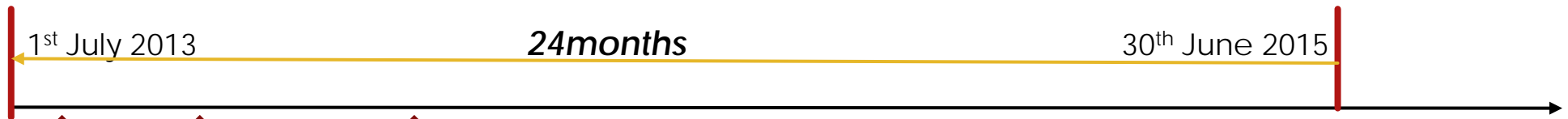


# Comparison of interventional outcomes of occupational musculoskeletal disorders

- 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



**Injury Certification**

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

**DATA**

**Status at final certification.**

\*PID  
 \*PMD  
 \*\*Ongoing

**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



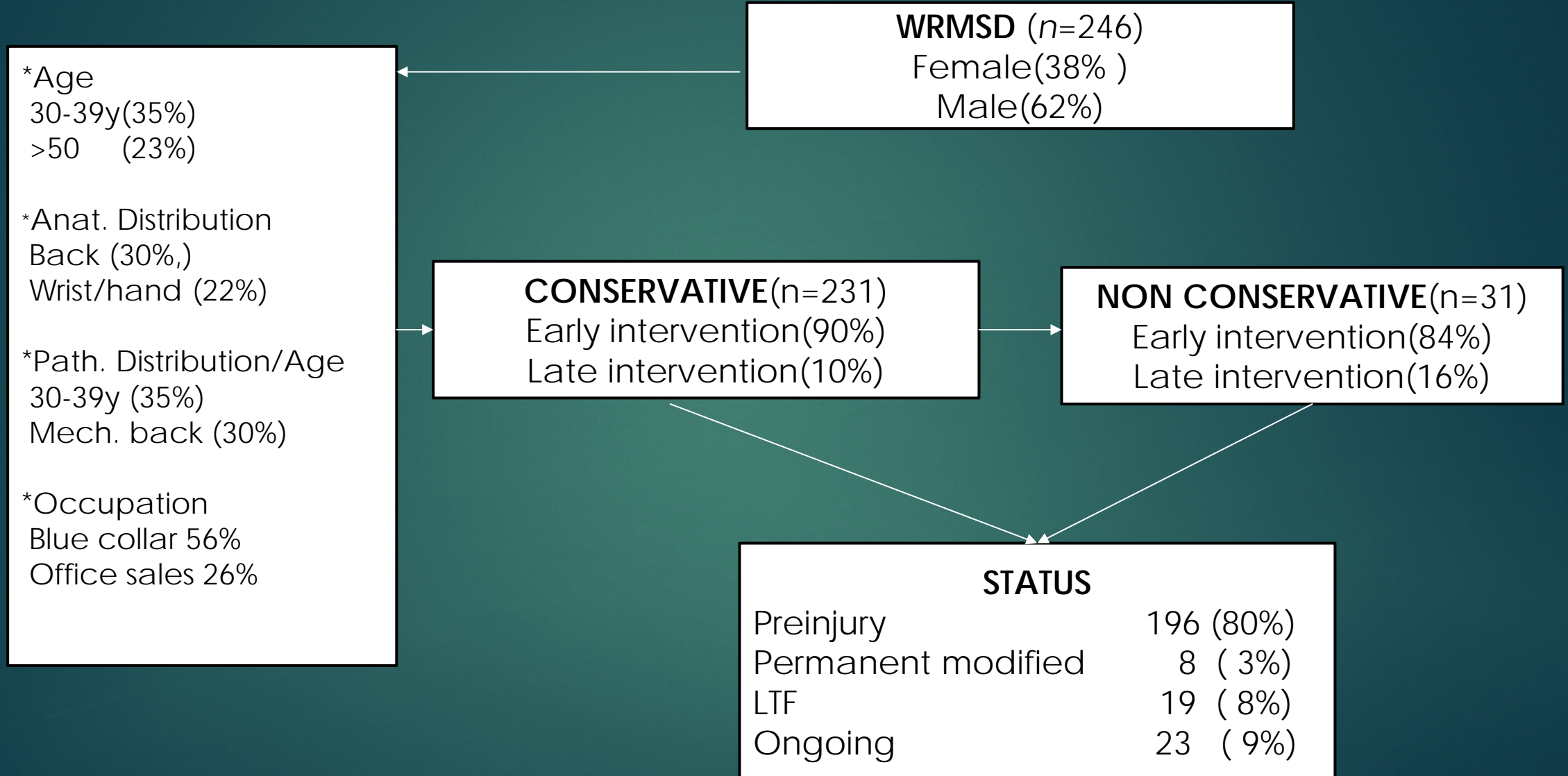
# DATA

- 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





# Time to final certification and intervention

FIGURE 1

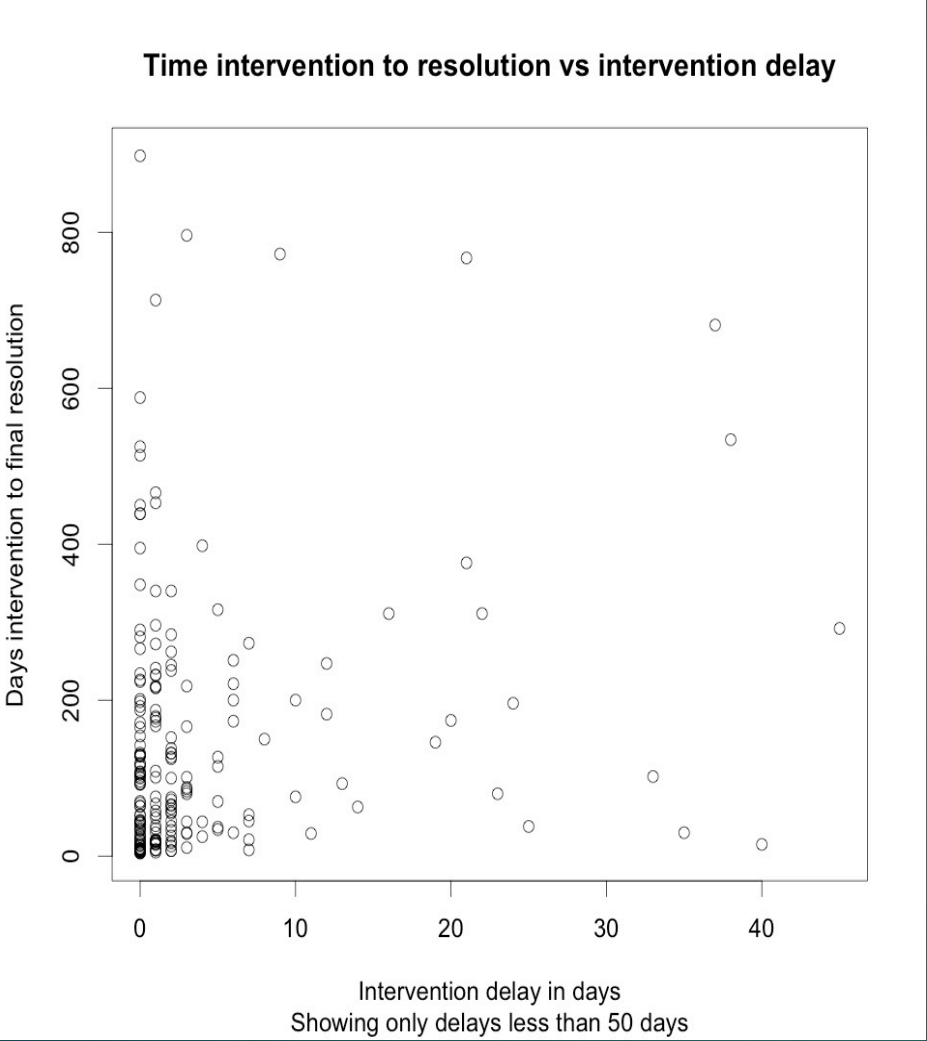
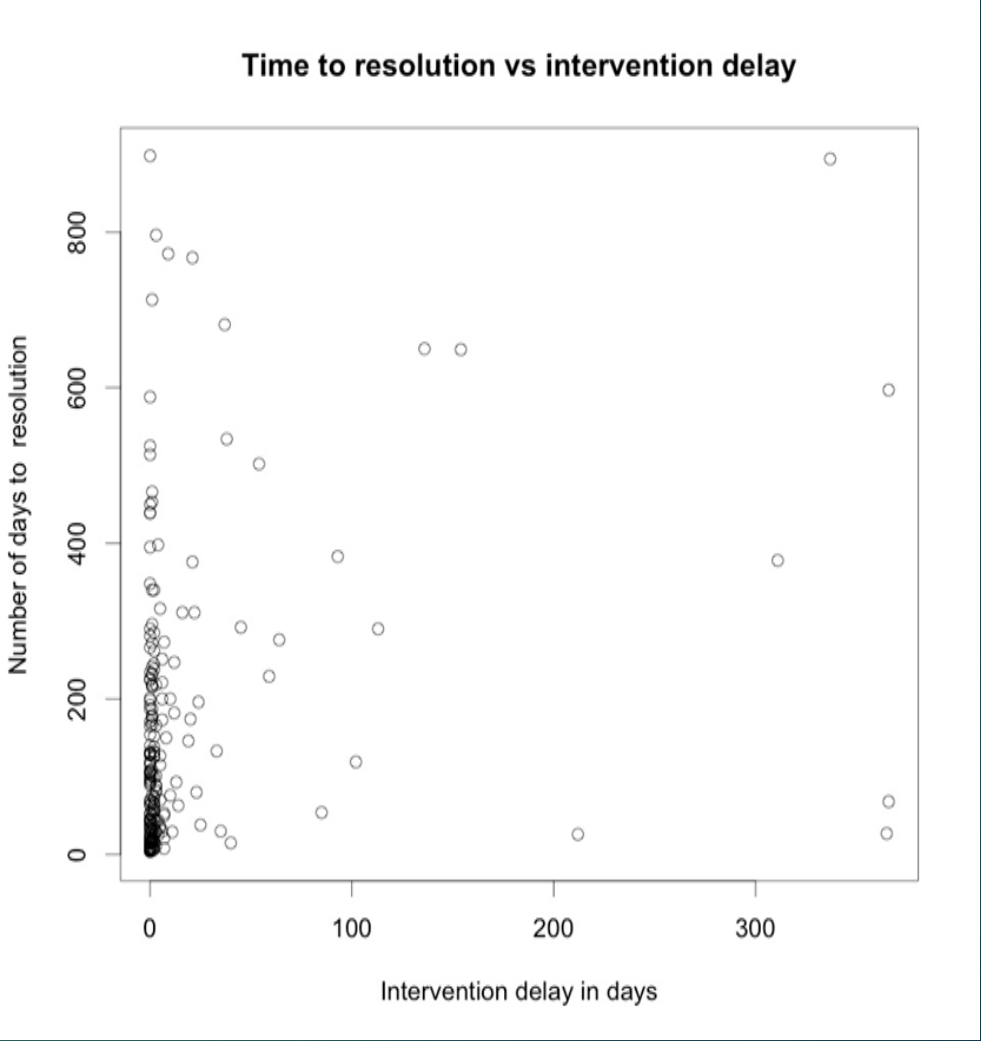


FIGURE 2



<b>DAYS</b>	<b>Min</b>	<b>1<sup>st</sup> Qu.</b>	<b>Median</b>	<b>Mean</b>	<b>3<sup>rd</sup> Qu.</b>	<b>Max</b>	<b>NA's</b>
Absent	0.00	0.00	3.00	17.86	14.00	230.00	19
Modified duty	0.00	14.00	36.00	71.28	104.00	536.00	0
Length of claim	2.0	29.0	92.0	153.1	216.0	898.0	21



Table 1:Grand Cox model

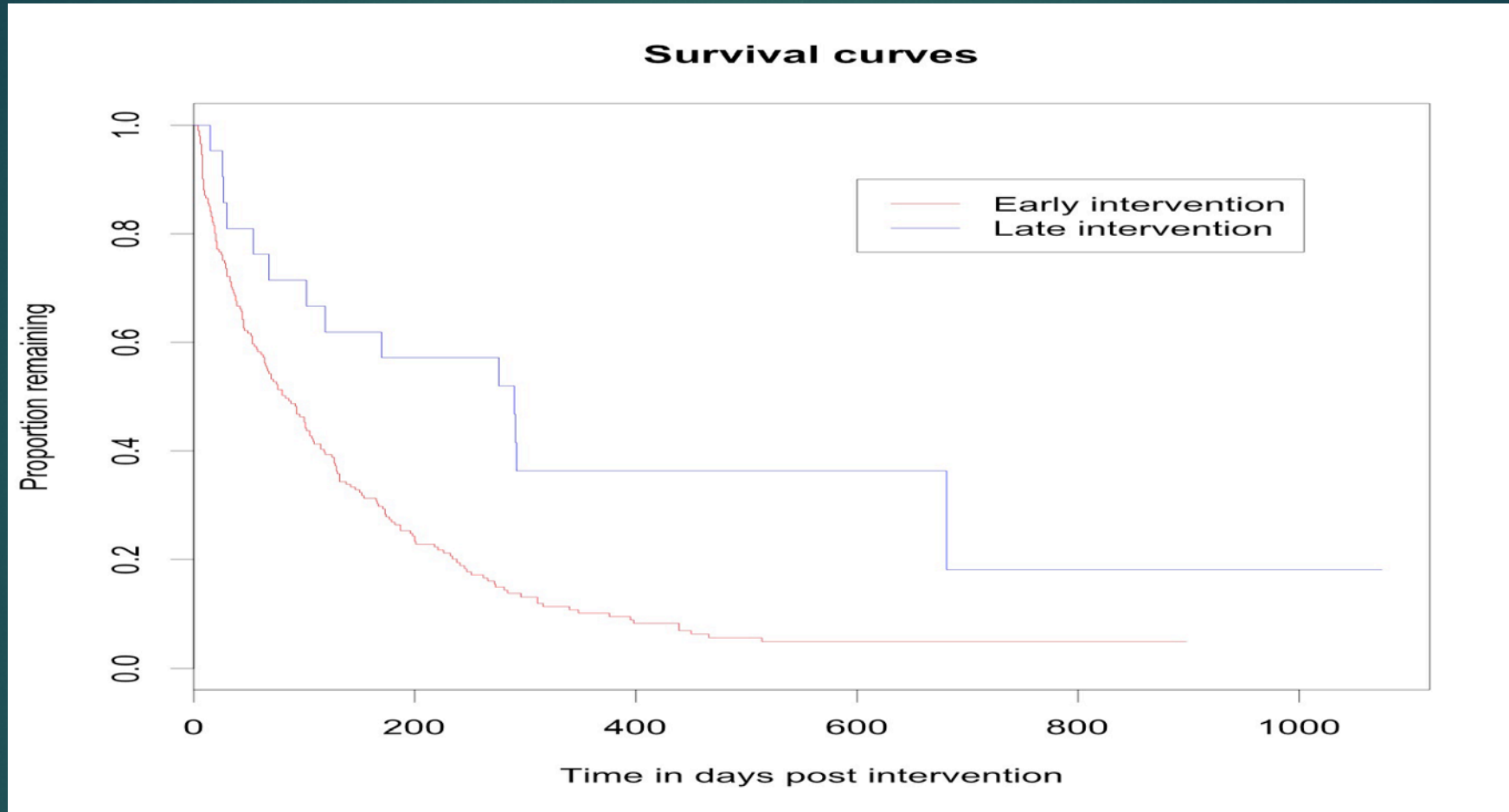
	Coef	exp(coef)	se(coef)	z	p
late.interventionTRUE	-0.69182	0.50066	0.3172	-2.18	<b><u>0.02918</u></b>
Sex2M	-0.04329	0.95763	0.16244	-0.27	0.78986
OccOffice/sales	0.08599	1.0898	0.17127	0.5	0.6156
OccProfessional/manager	0.29743	1.3464	0.21767	1.37	0.17181
PathFracture	-0.03092	0.96955	0.62569	-0.05	0.96058
PathMechanical back	0.66568	1.94581	0.65191	1.02	0.3072
PathMeniscal Tear	-0.81691	0.44179	0.75913	-1.08	0.28188
PathMuscle tear/Hernia	-0.83764	0.43273	0.79851	-1.05	0.29418
PathOther	1.26504	3.54324	0.63741	1.98	<b><u>0.04718</u></b>
PathSoft tissue/Sprain	1.0459	2.84597	0.55356	1.89	0.05884
PathTendinopathy	-0.18842	0.82826	0.5537	-0.34	0.73363
AnatArm	0.07139	1.074	0.40547	0.18	0.86025
AnatNeck	-1.19772	0.30188	0.45458	-2.63	<b><u>0.00842</u></b>
AnatBack	-1.29968	0.27262	0.43589	-2.98	<b><u>0.00287</u></b>
AnatWrist.hand	-0.4296	0.65077	0.29639	-1.45	0.14722
AnatHip.groin	0.49515	1.64075	0.66245	0.75	0.45479
AnatOther	0.11932	1.12673	0.58834	0.2	0.83929
AnatKnee.leg	-0.28819	0.74962	0.37859	-0.76	0.44653
AnatShoulder	-0.28514	0.75191	0.33915	-0.84	0.40049
Age	-0.02704	0.97333	0.00723	-3.74	<b><u>0.00018</u></b>

Likelihood ratio test=76.9 on 20 df, p=1.33 e-08

n= 222, number of events= 199

(24 observations deleted)

Figure 1:Kaplan-Meier curve



	N	Observed	Expected	$(O-E)^2/E$	$(O-E)^2/V$
late.intervention=FALSE	201	185	168.5	1.61	10.9
late.intervention=TRUE	21	14	30.5	8.90	10.9

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

P value  $\leq 0.001$   
**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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# References

- Berecki-Gisolf, J., Clay, F. J., Collie, A., & McClure, R. J. (2012). Predictors of sustained return to work after work-related injury or disease: insights from workers' compensation claims records. *J Occup Rehabil*, 22(3), 283-291. doi:10.1007/s10926-011-9344-y
- Driscoll, T. R., & Hendrie, L. (2002). Surveillance of work-related disorders in Australia using general practitioner data. *Australian and New Zealand Journal of Public Health*, 26(4), 346-351. doi:10.1111/j.1467-842X.2002.tb00183.x
- Feuerstein, M., Marshall, L., Shaw, W. S., & Burrell, L. M. (2000). Multicomponent Intervention for Work-Related Upper Extremity Disorders. *Journal of Occupational Rehabilitation*, 10(1), 71-83. doi:10.1023/A:1009493813003
- Howard, K. J. (2009). Effects of presenteeism in chronic occupational musculoskeletal disorders: stay at work is validated. *J Occup Environ Med*, 51(6), 724-731. doi:10.1097/JOM.0b013e3181a297b5
- Iles, R. A., Wyatt, M., & Pransky, G. (2012). Multi-Faceted Case Management: Reducing Compensation Costs of Musculoskeletal Work Injuries in Australia. *Journal of Occupational Rehabilitation*, 22(4), 478-488. doi:10.1007/s10926-012-9364-2
- Jezukaitis, P., & Kapur, D. (2011). Management of occupation-related musculoskeletal disorders. *Best Practice & Research Clinical Rheumatology*, 25(1), 117-129. doi:10.1016/j.berh.2011.01.010
- Kong, W., Tang, D., Luo, X., Yu, I. T. S., Liang, Y., & He, Y. (2012). Prediction of Return to Work Outcomes Under an Injured Worker Case Management Program. *Journal of Occupational Rehabilitation*, 22(2), 230-240. doi:10.1007/s10926-011-9343-z

- Kulin, J., & Reaston, M. (2011). Musculoskeletal disorders early diagnosis: A retrospective study in the occupational medicine setting. *Journal of occupational medicine and toxicology (London, England)*, 6(1), 1-1. doi:10.1186/1745-6673-6-1
- Mazza, D., Brijnath, B., Singh, N., Kosny, A., Ruseckaite, R., & Collie, A. (2015). General practitioners and sickness certification for injury in Australia. *BMC Fam Pract*, 16, 100. doi:10.1186/s12875-015-0307-9
- Oakman, J., & Chan, S. (2015). Risk management: Where should we target strategies to reduce work-related musculoskeletal disorders? *Safety Science*, 73, 99-105. doi:10.1016/j.ssci.2014.11.026
- RACP. (2015). Australian Consensus Statement on the Health Benefits of Work. Retrieved from <https://www.racp.edu.au/.../afoem-pos-australian-consensus-statement-on>
- SafeWorkAustralia. (2013). Key Work Health and Safety Statistics, Australia 2013. Retrieved from <http://www.safeworkaustralia.gov.au>
- Widanarko, B., Legg, S., Stevenson, M., Devereux, J., Eng, A., Mannetje, A. t., . . . Pearce, N. (2011). Prevalence of musculoskeletal symptoms in relation to gender, age, and occupational/industrial group. *International Journal of Industrial Ergonomics*, 41(5), 561-572. doi:10.1016/j.ergon.2011.06.002
- Woolf, A. D., Vos, T., & March, L. (2010). How to measure the impact of musculoskeletal conditions. *Best Practice & Research Clinical Rheumatology*, 24(6), 723-732. doi:10.1016/j.berh.2010.11.002