

Evaluating the health and work-life balance of operational personnel in an Australian Ambulance Service: Influences, associations and impacts

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Introduction

Initial review of literature indicated that ambulance personnel have ↑ risk of psychological stress, musculoskeletal problems, mortality rate, fatal accidents, accident injuries and a higher early retirement on medical grounds than the general working population (Sterud, Ekeberg et al. 2006)

- * Nature of the organisation – shift work, increasing workload (Pek, Fuge et al. 2015) with increasing demands on paramedics to move to the next case, yet maintain quality in patient care and reporting
- * The sedentary nature of work e.g. Emergency Medical Dispatchers, managers and ? paramedics.
- * Exposure risks to health such as lifting communicable diseases, unstable mental health patients, occupational violence.
- * Little capacity for workplace physical activity programs and nutritional strategies are often limited

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Ambulance Work & Health

(EMS) environment ≈ poor physical health and work exhaustion. (Blau, Bentley et al. 2012)

- * Stress & shift work ≈ ↓ physical health (Aasa, Brulin et al. 2005)
- * ↓ Low social support network ≈ sig. ass. headaches, sleep disorders & GI symptoms (Aasa, Brulin et al. 2005)
- * Manager/supervisor support ≈ job satisfaction and psychological well-being (Regehr 2007)
- * ↑ work demands, ↓ decision latitude ≈ anxiety, depression & risk of physical illness (Aasa, Barnekow-Bergkvist et al. 2005)
- * ↑ level of fatigue ≈ ↑ risk of sick leave and work disability (van der Ploeg and Kleber 2005)
- * Dissatisfaction with current assignment ≈ ↑ risk of back problems (Studnek and Crawford 2007)

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Shift Work & Health (General)

- * Comorbid associations with shift work (SW):
 - * metabolic syndrome, gastro intestinal disorders, cardiovascular issues, increased rates of certain types of cancer, issues with reproductive health, sleep disorders, mood and anxiety disorders (Culpepper 2010)
- * White female night SW - ↑ obesity, caffeine and calorie intake, more likely current smokers & ↓ sleep durations than never night shift workers (Ramin, Devore et al. 2015)
- * 17 to 19 hours without sleep, performance of some participants was worse than those with 0.05% Blood Alcohol Content (BAC) and response speeds were up to 50% slower (Ann Williamson 2000)

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Shift Work & Health (Paramedic)

Operational shift working paramedics (metro & rural) ↑ risk of fatigue, depression & ↓ quality sleep (Courtney, Frands et al. 2010, Courtney, Frands et al. 2013)

- * 10% of participants ↑ sleepiness, 29% had nodded off whilst driving & 68% ↓ sleep quality (Archer 2012)

There is some evidence to indicate that shift work is not one of the factors considered by paramedics to affect their health:

- * Predictors of job satisfaction, emotional exhaustion, psychological distress & musculoskeletal pain did not include shift work (Sterud, Hem et al. 2011)
- * Focus group * 2 → a list of 29 Ambulance stressors none of which included shift work (Sterud, Hem et al. 2008)
- * Main risk factors associated with health symptoms and stressors had to do with the social aspects of the work environment (van der Ploeg and Kleber 2003)

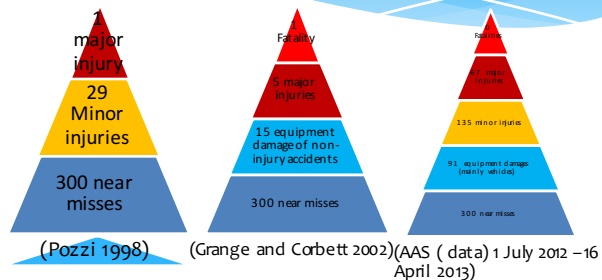
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Epidemiology of WHS in Ambulance

- * Injuries that occur at work have been associated with self-reported poor physical health & ↓ physical exercise (Sterud, Ekeberg et al. 2006, Studnek and Crawford 2007, Studnek and Ferketich 2007, Sterud, Hem et al. 2011)
- * Obesity, lack of back strength and flexibility have been associated with back injury (Crill and Hostler 2005)
- * Between 11% and 32% of occupational injuries and accidents in the Emergency Medical Services are not reported (Weaver, Wang et al. 2012)
- * Many personnel may fail to recognise that an event has occurred (Matthew D. Weaver 2012).
- * That the causes of injury accidents are the same as those of near misses (Grange and Corbett 2002, McKinnon 2012)

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Ratio of Near Misses to Injuries



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An AAS Injury Rates (IR) 2012/13

Age Profiles	16-24	25-34	35-44	45-54	55-64	Total
Male IR	38.7	26.4	23.4	23.3	16.1	23.7
Females IR	30.1	30.7	31.3	51.7	28.0	33.8
Overall IR	33.6	28.3	26.0	28.8	18.4	27.1
Male LTI	8.0	7.4	9.7	9.5	8.1	8.8
Female LTI	10.0	9.8	10.6	13.9	16.0	10.8
Overall LTI	9.2	8.5	10.4	10.4	8.7	9.7

LTI (Lost time injury)

Data reported as Injuries/100

Types of Injuries: back 37%; wrist 10%; psychological system 9%; shoulder 9%; knees 6%; abdomen and pelvic area 4%; ankles 3%; multiple/others/undefined 22%

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Injury Rates (Literature)

- Musculo-skeletal and mental health injury rates have been reported to be 13 times higher than nurses (Roberts, Sim et al. 2015)
- Overall injury rates in Australia have been reported to be 7 times higher than the national average (Maguire, O'Meara et al. 2014)

LTI Injuries per 100	Location	Significant Associations	Author/s
8.1	U.S.	↑ call volume Urban environment Past back problems	(Studnek, Ferketich et al. 2007)
8.0 Av	Australia	Not reported	(Maguire, O'Meara et al. 2014)
9.7	Australia	Not reported	Work Cover QLD 2013
19.6	U.S.	Not reported	(Maguire, Hunting et al. 2005)

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Occupational violence

Confusing picture:

- * Reported as percentages and actual numbers
- * Reported over study period, annually, lifetime of paramedic
- * Different outcome measures
- * 90% (Pozzi 1998), 80.3% (Suserud, Blomquist et al. 2002), 5% (Mock, Wrenn et al. 1998), 4% (Mechem, Dickinson et al. 2002), verbal violence 4 times per shift (Brough 2005), 206 in 2012/13 (AAS 2013)

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Job Satisfaction and Health

Job satisfaction strongly related to mental health, less so physical health – meta-analysis of 485 studies (only 4 related to physical health) (Faragher, Cass et al. 2005)

- * Norwegian police ↑ levels of MSD associated with job pressure & lack of support (Berg, Hem et al. 2006)
- * Job insecurity negatively associated with job satisfaction (Millán, Hessels et al. 2013)
- * Job insecurity significantly & negatively associated with job & organisational attitudes, mental and physical health (Bohle, Quinlan et al. 2001, Sverke, Hellgren et al. 2002)
- * Job insecurity related to health indicators physiological in nature (Sverke 2006).
- * Mental Health related to physical health (Aasland, Off et al. 1997, Elmer, MacDonald et al. 2003, Berg, Hem et al. 2006, Ortega, Lee et al. 2010, Malinauskienė, Leisyte et al. 2011)

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Culture, Leadership and Health

Leader fitness - strong influencer in ↓ occupational & behavioural causes of obesity (Dobson, Choi et al. 2013)

- * Frequent advice & training - the one aspect of safety environment that had the most robust link with observance to safe workplace based actions (Eliseo, Murray et al. 2012)
- * A 10 fold difference - injuries reported in organisational reporting systems & rates estimated on retrospective questionnaires from clinical populations (Elder and Paterson 2006)
- * A culture of health which incorporates supportive leadership, a favourable work environment & health related policies, vision, an organisational approach that promote employee health ≈ worksite safety culture (Aldana, Anderson et al. 2012)
- * Organisational stressors & leadership are associated with mental health and safety (Donnelly and Siebert 2009)
- * Moderate or high psychological distress increased the OR for workplace accidents (OR=1.8), workplace failures (OR=2.6) and decreased the odds ratio of workplace success (OR=0.8) (Hilton and Whiteford 2010)

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How Healthy are Paramedics?

↑levels of overweight & obesity, ↑incidence of poor health & fitness status & ↓nutritional behaviour (Parker and Hubinger 2003)

- * 25.8% obese, 45.4% overweight & 75.3% did not meet the (CDC) guidelines for physical activity (Studnek, Bentley et al. 2010)
- * Low Cardio Respiratory Fitness was inversely associated with abnormal HR recovery, chronotropic insufficiency, exaggerated blood pressure response, and ECG abnormalities (Baur, 2012).
- * Those with depressive/anxiety symptoms - prevalence of disturbed sleep 3.4 times ↑ than no symptoms (Sterud, Hem et al. 2008)
- * 22% PTSD, 10% depression & 22% anxiety (Bennett, Williams et al. 2004) - this is higher than other reports
- * Overweightness (41.9%) and obesity (42.7%), one or more health conditions (59.6%) (Patterson, Suffoletto et al. 2010)
- * ↓intake of fruit & vegetables, 70% had poor exercise habits, ↑50% had poor hydration throughout a work day, average BMI was 28.2 kg/m² (DCS 2010)

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Obesity

	(Gamble et al. 1999)	(Galeano 1996)	(Parker & Hubinger 2003)	(Studnek et al. 2010)	(Pek, 2015)	(Poston, Haddock et al. 2011)
Overweight	52%	48%	45%	45.5%	45.7%	79.45%
Obese	10%	15%	25%	25.8%	28.7%	Firefighter/paramedic

- Obesity in Australia – 63% of population & ↑ faster than anywhere else in the world (AIHW 2014)
- Obesity in U.S. – 71% of population (CDC 2014)

People who are obese have a higher risk: mortality, hypertension, ↑LDL & ↓HDL cholesterol, ↑triglycerides, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnoea, some cancers, ↓ quality of life, mental illness, body pain and difficulty with physical functioning

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Obesity & Stress

Stress is known to be prevalent amongst paramedics (Ciohessy and Ehlers 1999, Akerstedt, Knutsson et al. 2002, Kirby, Shakespear-Finch et al. 2011)

- * During acute stress eating is ↓, but as a person starts to recover from this stress reaction eating sensations are promoted leading to ↑ food intake
- * In chronic stress, ↑ levels of eating hormones are constant & for a ↑ period of time (Foss and Dyrstad 2011)

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Obesity & Work

Obesity has been linked to increased absenteeism, disability, injuries and claims (Schmier 2006)

- * Obese employee at greater risk of a workplace injury (Pollack 2007)
- * Predictive of higher worker related health care costs and absenteeism (Burton, Chen et al. 1998, Bungum, Satterwhite et al. 2003)
- * Obese younger workers have work limitations similar to middle age workers (Hertz 2004)
- * These limitations have been linked to less effective CPR (Russo, Neumann et al. 2011) and ↑ fatigue (Brachet, David et al. 2010)
- * Irregular physical activity, unhealthy diet, shift work, noise exposure, PTSD & ↑ demand & ↓ decisional latitude are all described as occupational risk factors for high blood pressure and obesity (Kales, Tsismenakis et al. 2009)

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Obesity & Sleep

Food intake after 8:00PM may lead to an increase in the risk of obesity (Baron, Reid et al. 2011)

- * Mid-point of sleep after 5:30AM, had higher fast food, full sugar soft drinks and lower fruit and vegetable consumption (Baron, Reid et al. 2011)
- * Short sleep duration is linked to greater risk of obesity, higher percentage of body fat, increased mortality and greater weight gain over time (Grandner, Hale et al. 2010).
- * Sleep restriction showed a significant effect on overall sweet snack consumption and the greater the sleep restriction the greater were the odds of choosing a sweet snack (Heath, Roach et al. 2012).

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Fatigue

Workers who worked in jobs with an overtime schedule had a 61% higher injury hazard rate compared to jobs with no overtime

- * Working at least 12 hours per day was associated with 37% increased hazard rate and working 60 hours per week was associated with a 23% increased hazard rate
- * Every additional 5 hours per week over 40 hours was associated with an average increase of 0.7 injuries per 100 hours worked
- * Every additional 2 hours per day over 8 hours was associated with an average increase of 1.2 injuries per 100 worker hours
- * These workers are not concentrated in more hazardous industries (Dembe, Erickson et al. 2005)

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Fatigue – Extended shift hours

Potential Negative Effects	Impact	Potential Positive Effects	Impact
↑ accidents on & off the job	W&P	↓ travel time	P
↓ length & quality sleep	P	↓ cost	P
Sleepiness	P	↑ time with family	P
↓ alertness	P	↑ time for socialising	P
↑ fatigue	P	↑ time for domestic duties	P
Adverse effects on performance	W&P	↑ satisfaction with working hours	P
Prolonged exposure to stress & toxins	P	Fewer handovers	W
Adverse effects on health	P	↓ overtime	P ±
↑ Absenteeism	W		
Communication problems with managers	P		
Problems driving home	P		

(Knauth 2007).

Legend for Impact: Work = W; Personal = P.

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Mental Health

The way employees see their effort and the reward aspects of work and there is an imbalance, then those aspects are associated with poor mental health

- * A relationship between over commitment (work-life balance), especially in females, was observed to have a strong association with poor mental health (Ariai, Wild et al. 2011)
- * ↑ BMI with comorbidities → physical and emotional well-being were affected (Doll, Petersen et al. 2000)
- * Suggested that chronic stressors may have more to do with the way paramedics are treated rather than the emergency work (Murray 2013)
- * In a study of Swedish police, (11.9%) ↑ scores for psychiatric symptoms. Independent variables ≈ symptoms: lack of support from a superior or the organisation, self-perception of bad quality work; inadequate work schedule; over commitment; age in decades and physical environment complaints
- * Strong predictors of mental health are sleep, high work demands and the need for recovery (Sterud, Ekeberget al. 2006)

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Rates of Mental Health

	Australia	QAS	UK Amb. Bennett 2004	Germany	Netherla nds	USA (NCS)	USA (NCS- R)	USA (Bentley, 2013)
Depression	6.3	5.51	9	10.7	5.8	10.3	6.7	6.4-7.1
PTSD	1.3	0.0016	22	-	-	-	3.5	Stresse d 5.9
Anxiety	5.6	6.9	23.5	14.5	12.4	17.2	18.1	6.0

- Higher psychological distress will lead to higher rates of workplace accidents and failures
- Moderate physiological stress has a greater impact in terms of workplace accidents and failures:
 - the OR of moderate and high physiological stress are the same
 - moderate physiological stress is double that of high physiological stress (Hilton and Whiteford 2010)

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Mental & Physical Health

Significant association with reduction of depression and anxiety disorders associated with regular physical activity (Goodwin 2003)

- * Exercise (both resistance and aerobic training) - positive relationship with ↓ in the onset of Dementia and slowed the decline in Alzheimer's (Rolland, Abellan van Kan et al. 2008) & improved psychological well-being and cognitive functioning (Sofi, Valecchi et al. 2011)
- * Experienced paramedics exhibit greater levels of resilience than paramedic students & this resilience is significantly correlated with general health and well-being (Gayton and Lovell 2012)
- * Sense of Cohesion (SOC) was related to low levels of expressed anger and that this was in turn related to good health-related quality of life (Julkunen and Ahlström 2006)
- * Physical activity can enhance positive moods with higher levels of interest, excitement, enthusiasm, and alertness when compared to people with low levels of physical activity (Pasco, Jacka et al. 2011)

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Risk Factors Associated with Injuries & Ill health in Ambulance

Higher incidence of early retirement on medical grounds than any other group of health care workers (male officers 55.9/1000; manual workers 24.8/1000; nursing 5.9/1000; non manual 2.6/1000) (Rogers 1998)

- * Preemployment Risk factors: conceptual, intuitive and anxious personalities; hypermobile joints; self limited weight lifting played less sport; or exercised less (Broniecki, Esterman et al. 2011)
- * Smoking and more than 15 units of alcohol were factors in lower aerobic capacity as personnel aged (Punakallio, Lindholm et al. 2012)
- * Assessment of male and female emergency care students - males stronger than females in all measured strength parameters (Davies, Naidoo et al. 2008)
- * Lack of exercise interventions, appropriate testing and continuing fitness for duty assistance by ambulance services (Davies, Naidoo et al. 2008, Tullar, Brewer et al. 2010, Broniecki, Esterman et al. 2012)
- * Paramedics who felt they were unable to have adequate breaks appeared to be more likely to endure an injury (Broniecki, Esterman et al. 2012)

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Contradictions

Literature review of workplace manual handling and assisting patients reported no causal relationship between assisting patients and lower back pain (Roffey, Wai et al. 2010)

- * Systematic review of the literature - training alone as not being effective in reducing musculoskeletal injuries (Tullar, Brewer et al. 2010)
- * The provision of assistive devices alone will not improve the risk of manual handling injuries (Verbeek, Martimo et al. 2012)
- * No statistical significance between the rate of physical exercise and injury rate and no association between those who had recent manual handling training and injury rate or claim rate (Broniecki, Esterman et al. 2012)

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Help Seeking Behaviour

Factors that influence help seeking behaviour have been described as gender, marital status and education, with females being much more likely to seek help (Doherty and Kartalova-O'Doherty 2010)

- * Musculoskeletal pain was consistently associated with help seeking - only 3.4% of ambulance personnel had visited an occupational health practitioner compared to 24% of the general population
- * Anxiety and depressive symptoms were less than the general population and were not associated with more help-seeking behaviour
- * Symptoms of disturbed sleep were significantly associated with visiting a psychologist/psychiatrist (Sterud, Hem et al. 2008)

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Worksite Wellness Programs Continuous, Multi-faceted & preventative

Health Promotion - 97% identified unhealthy lifestyle behaviours, of which 74% had made positive lifestyle changes in relation to previous maladaptive lifestyle behaviours (Devaney and Noone 2008)

- * Repeat engagement in Health Risk Assessments is a critical issue for improvement (Chih-Wen, Hagen et al. 2009)
- * Interventions targeted at individuals after having measured where they are at, rather than at an organisational level based on anonymous health surveys (Scott, Mannion et al. 2003, Blake and Lloyd 2008)
- * Making people aware of their health status alone can empower people to make positive changes (Rula and Hobgood 2010)
- * A meta-analysis of organisational wellness programs concluded that participation was associated with reduced absenteeism and increased job satisfaction (Parks and Steelman 2008)

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Effectiveness of Worksite Physical Activity Programs

Element	RCT	NCT	Conclusion
Physical Activity	5	3	Strong evidence of a positive effect
Cardio respiratory Fitness	3	6	Inconclusive evidence
Muscle Flexibility	4 (low quality)	4	Inconclusive evidence
Muscle Strength	1	4	Inconclusive evidence
Body weight	6	4	Inconclusive evidence
Body Composition	1	4	Inconclusive evidence
General health	3	3	Inconclusive evidence
Fatigue	2 (low quality)	0	Limited evidence
Musculoskeletal Disorders	5	2	Strong evidence exists of a positive effect
Blood Pressure	1	3	No evidence
Blood Serum Lipids	1	3	No evidence

(Proper, Koning et al. 2003)

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Physical Activity & Health

Metropolitan paramedics reported 14% less physical activity than participants in a 12 country study using the same questionnaire (Courtney, Francis et al. 2010)

- * A similar study on rural paramedics found that they exercised less than comparative community groups (Courtney, Francis et al. 2013)
- * Physical fitness was identified, amongst others, as causal to all injuries & musculoskeletal injuries in particular (Broniecki, Esterman et al. 2012)
- * Swedish study of three groups of ambulance officers with metabolic syndrome, obesity and those who exercised regularly – if you exercised regularly, had a good diet, were not overweight and had good job satisfaction, the risk of cardiovascular disease can be prevented if not minimised (Svedin, Norrlander et al. 2012)
- * Emergency Medical Technicians - 75.3% of individuals did not meet the CDC guidelines for physical activity (Studnek, Bentley et al. 2010)

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Nutrition & Health

When considered in terms of shift work and poor sleep timing, food selection and meal timing may be a causative factor in obesity and cardiovascular disease rates (Hegg-Deloye, Brassard et al. 2008, Lomangino 2013)

- * Eating quickly has been related to overweightness in Japanese men and women if combined with eating until full - there is a substantial impact on being overweight (Maruyama, Sato et al. 2008)
- * Consumption of fast and take away food has been implicated in weight gain through high energy densities and glycaemic loads and large portion sizes (Rosenheck 2008)

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Absenteeism

Little literature on Absenteeism in Ambulance:

- * Tennessee Health & Safety Officials, which included emergency responders, who had poor to fair self-reported health status had most absenteeism due to health conditions (Rogers on 2005)
- * Absence is influenced by real and perceived conditions at work, anticipated job demands, management attitudes and social norms in the peer group and community (Böckeman and Ilmakunnas 2008, Wegge, Schmidt et al. 2007)
- * Overweightness ≈ difficulty in getting along with co-workers & morbid obesity was associated with ↑ numbers of sick days (Pronk, Martinson et al. 2004)
- * Smokers had a 33% ↑ in the risk of absenteeism against never smokers and a 19% ↑ in this risk as against previous smokers (Weng, Ali et al. 2013)

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Absenteeism – like professions

- * Among nurses with workload >30% above optimal, self-certified sickness absence was 1.44 times higher and certified sickness absence was 1.49 times higher (Rauhala, Kivimäki et al. 2007)
- * Nurse burnout and job stress increased absenteeism (Davey, Cummings et al. 2009)
- * Stress and ill health especially in relation to low job control (Söderfeldt, Söderfeldt et al. 2000, Malinauskienė, Leisyte et al. 2011)
- * Absenteeism by chronic condition was between 0.9 to 5.9 hours in a 4 week period and work impairment ranged from 17.8% to 36.4% decreased ability to perform at work (Collins, Baase et al. 2005)

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Presenteeism – Sickness Presence

Those who present for work with poor health and perform below par have been associated with poor mental and physical health (Cooper and Dewe 2008, Claes 2011)

- * In a 4 week period - work impairment ranged from 17.8% to 36.4% decreased ability to perform at work. The cost of work impairment alone was 6.8% of total labour costs
- * The costs associated presenteeism greatly exceed the combined costs of absenteeism and medical treatment (Collins, Baase et al. 2005)
- * Absenteeism associated with arthritis was 8.5 days per year but when considered with presenteeism was estimated to be 17.8 days per year (Wang, Beck et al. 2003)

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Where to now?

Two Papers being developed for publication

- 'The development of a cross sectional study on the health status and worklife balance of ambulance personnel'
- 'The health status of ambulance personnel: a review of the literature'

* Presentation/s

* Australian Health Survey 2011-13 data

* Analysis

* Workers Compensation & absenteeism data

* Analysis

* Focus group re recommendations and policy

* Write up

* Thesis submission October 2017

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Prediction

- * The health of ambulance personnel will worsen despite the move towards a younger workforce.

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A QUESTION FOR YOU

- * Who should be doing something about the health of ambulance personnel?

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QUESTIONS FROM YOU

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