

Obesity and the workplace

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Commercial in Confidence

The stereotype



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BNSF Railway Collision, Red Oak, Iowa

- On 17 April 2011 a coal train collided with the rear of a standing maintenance train
- Two locomotives and 12 cars derailed, there was a diesel fuel fire and both crewmembers on the striking train were killed
- The NTSB determined the probable cause of the accident to be “the crew of the striking train...had fallen asleep due to fatigue resulting from their irregular work schedules and their medical conditions”
- Medical records indicated that engineer had BMI of 35.7 and type 2 DM and the conductor had a BMI of 37.5 and HT requiring 2 medications



Metro North Derailment New York 2013

- Manhattan-bound train derailed on a 30mph curve travelling at 82mph
- 4 deaths and 75 people injured
- Medical protocol at time of crash required only vision and hearing testing
- Found to have BMI of 36.4 and a history of snoring and sleepiness
- Severe OSA diagnosed and treated



Union Pacific Railroad and BNSF Railway Chaffee Collision

- 25 May 25 2013
- 13 cars from the BNSF train and 2 locomotives and 11 cars from the UP train derailed and struck a highway bridge support resulting in collapse of the bridge, 2 motor vehicle accidents, injury to 5 motor vehicle occupants and 2 crew members from the UP train
- NTSB determined the probable cause of the accident to be “likely because of fatigue-induced performance degradation.”
- NTSB concluded that a contributing factor to the UP engineer’s fatigue was undiagnosed OSA. He was aged 58 with a BMI of 35 and a 16 year history of diabetes treated with insulin



Prevalence of people in the workforce who are overweight and obese

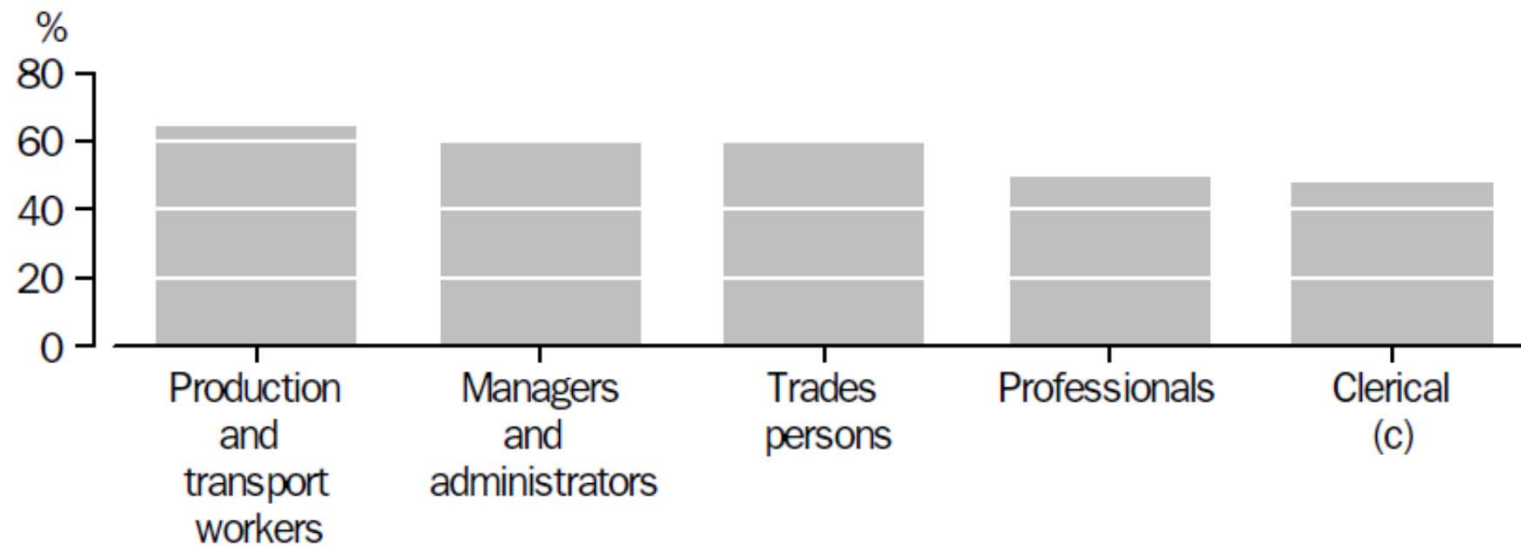
	2004/5*		2011/12#	
	Obese	Overweight and obese	Obese	Overweight and obese
Employed	17.4%	54.0%	26.3%	62.3%
Unemployed	18.9%	49.7%	25.6%	52.4%
Not in labour force	21.8%	52.8%	30.5%	65.1%

* Persons aged 18-64

Persons aged 18 and over

Reference: ABS Australia Health Surveys 2004-5 and 2011-12

Selected occupations 2004-05



Selected occupations 2007-08

	Machinery operators Drivers	Managers	Technicians Trade	Labourers	Clerical	Professionals	Community workers	Sales
Male %	74.6	72.8	64.8	60.3	70.4	65.5	59.5	57.8
Female%	66.6	52.0	49.4	58.0	51.7	47.1	53.5	50.6
Total %	73.9	65.8	62.3	59.5	56.4	56.2	55.1	53.3

Reference: ABS Overweight and obesity in adults in Australia: A snapshot. 2007-08

Train drivers

	Drivers		Recruits	
BMI	2004	2009	2004	2009
25-29.9	41%	38%	38%	30%
≥30	40%	47%	31%	45%

Reference: Mina R et al. The Australian national standard for rail workers five years on. Occupational Medicine 2012; 62: 642–647

Work-related contributing factors to increased obesity

- Fewer workers in primary industries due to industrial innovation
- Increased automation and labour-saving technology in production industries
- Increased proportion of workers who are sedentary
- Increasing hours of work

Hours of work

- The percentage of male workers who are overweight or obese increases with number of hours worked

2004/5		2007/8	
<25 hours	≥49 hours	<25 hours	≥49 hours
48%	70%	47%	75%

- The percentage of women who are overweight or obese is similar regardless of the hours worked (average 51% in 2007/8)

References: ABS Overweight and obesity in adults 2004-05

ABS Overweight and obesity in adults in Australia: a snapshot 2007-08

Hours of work

- Systematic review of 39 studies found a positive association between long work hours and weight gain, especially amongst men
 - 10/14 studies reported positive association between long work hours and at least 1 weight-related outcome (BMI, weight gain)
 - 4/4 studies showed positive association between working overtime and BMI or weight gain in men
 - 2/4 studies showed positive association between working overtime and BMI or weight gain in women

Solovieva S et al. Psychosocial factors at work, long work hours and obesity: a systematic review. Scand J Work Environ Health 2013; 39(3):241-258

Hours of work

- Possible mechanisms of increased weight
 - Being sedentary
 - Less time for exercise
 - Eating higher calorie food
 - Increased alcohol intake
 - Reduced sleep
 - Increased hours of work are associated with reduced fruit and vegetable intake

Sitting at work

The percentage of workers who are overweight and obese and who at work are mostly:

	Sitting	Standing	Walking	Labouring
Males	72%	59%	65%	64%
Females	51%	48%	52%	65%

Reference: ABS Overweight and obesity in adults in Australia: A snapshot. 2007-08

Impact of obesity on workers compensation

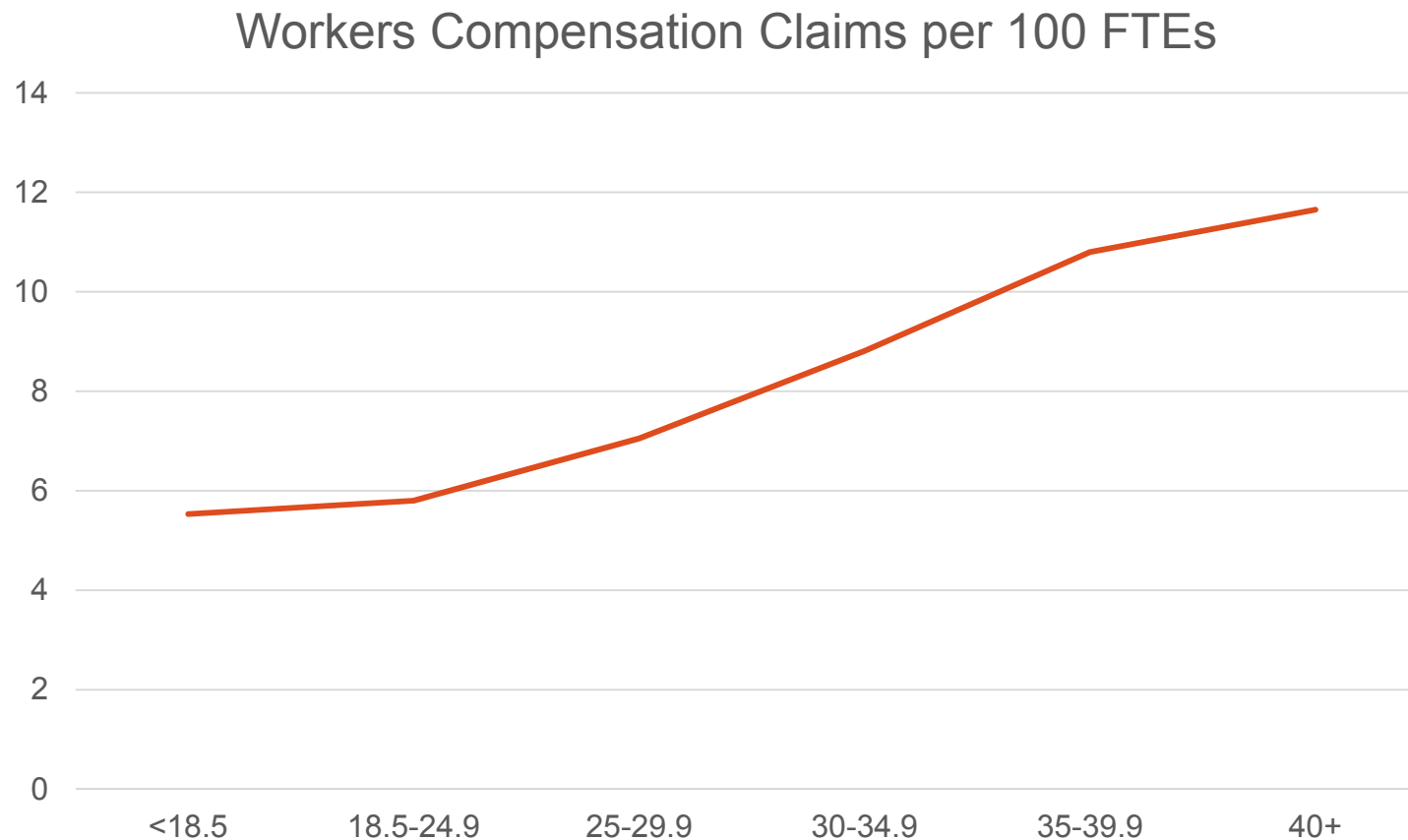
- 2006 review of 8 studies found that workers who are obese have more injuries and have higher health care costs compared to workers who are not obese

Schmier J et al. Cost of obesity in the workplace. Scand J Work Environ Health 2006; 32(1):5-11

- 2007 systematic review of 12 studies found that the risk of injury was increased in some studies but that overall there was insufficient evidence. More studies with sufficient statistical power needed

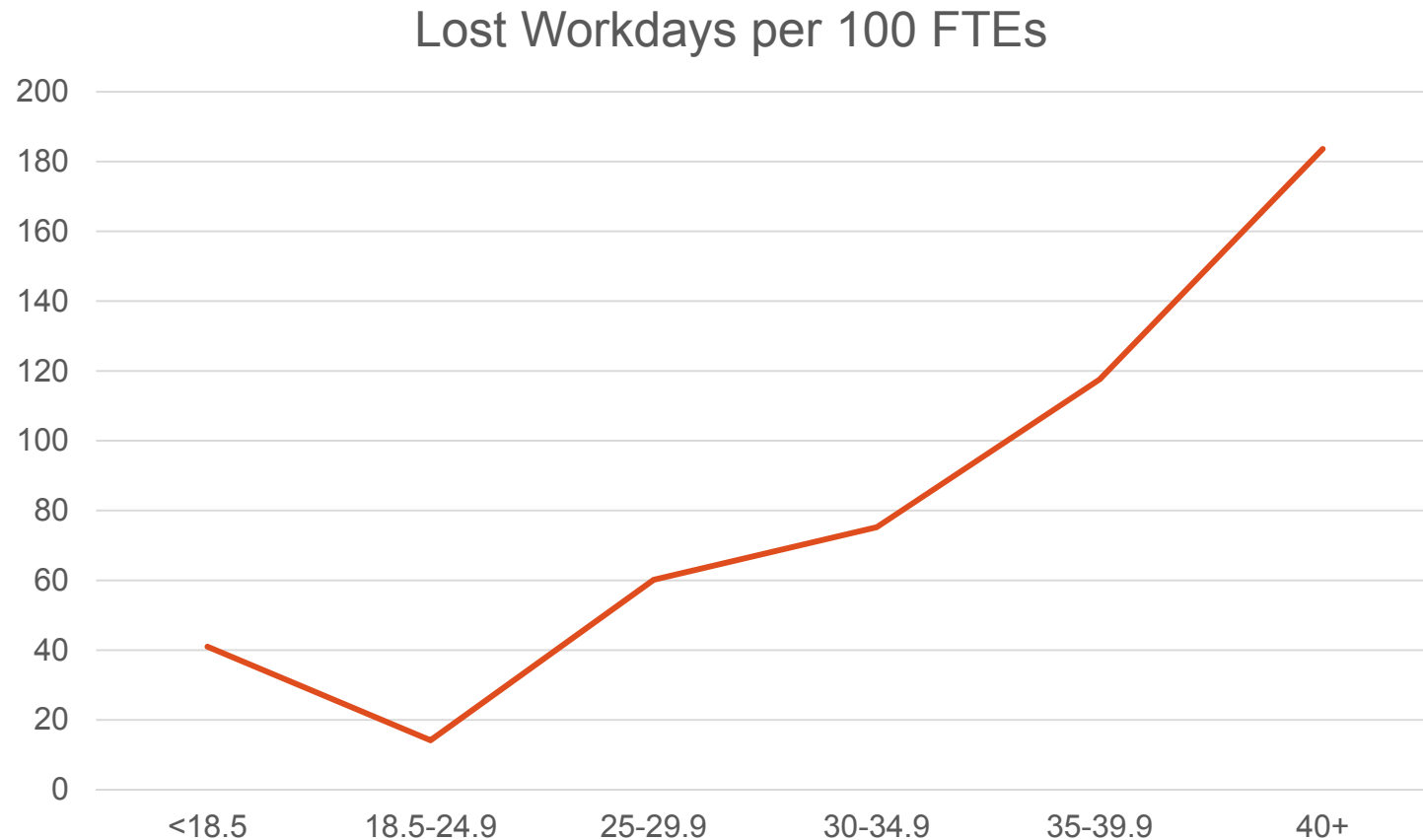
Pollack KM et al. Obesity and workplace traumatic injury: does the science support the link? Injury prevention 2007; 13:297-302

Impact of obesity on workers compensation



Reference: Østbye, T et al. Obesity and workers compensation. Arch Intern Med 2007; 167:766-773

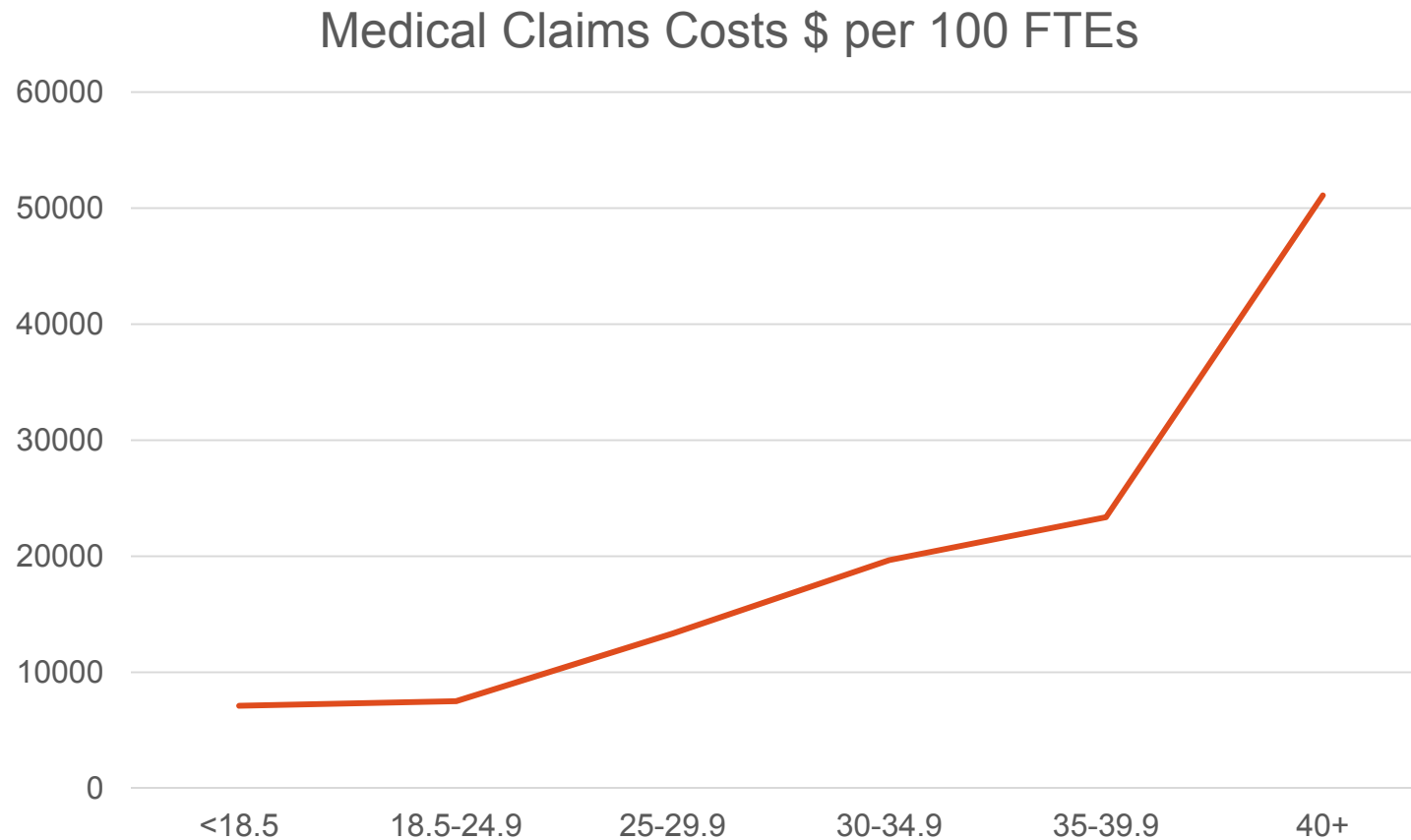
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Impact of obesity on workers compensation

- 2013 study found an odd ratio 1.25 (95% CI 1.12-1.39) $P < 0.001$
 - Control for confounders such as industry, work hours, occupational hazards, demographic characteristics

Lin T et al. Does obesity contribute to non-fatal occupational injury? Evidence from the national longitudinal survey of youth. Scand J Work Environ Health 2013; 39(3): 268-275

Impact of obesity on workers compensation

- Employees who are obese may be at increased risk of occupational injury due to
 - Compromised gait and mobility
 - Increased fatigue caused by physical activity
 - Fatigue due to sleep apnoea
 - Poor ergonomics
 - Side effects of medications used to treat conditions associated with obesity
 - Other pre-existing medical conditions associated with obesity

Exit from employment

- 2013 meta-analysis of 28 studies found an increased likelihood of exit from paid employment through disability pension, but not early retirement or unemployment
 - Overweight RR 1.16
 - Obese RR 1.53

Robrooek SJW et al. The contribution of overweight, obesity and lack of physical activity to exit from paid employment: a meta-analysis. Scand J Work Environ Health 2013; 39(3): 233-240

Impact of obesity on absenteeism

- Obesity is associated with over 4 million days lost from the Australian workplace
- Employees with obesity are 17% more likely to be absent from work because of personal injury or illness

Reference: National Health Survey 2001

- Average duration of absenteeism for overweight and obese employees is 3.2 days, versus 2.8 days for employees with normal weight

Reference: ABS 2006

Sick leave

- 2008 review of 13 sick leave and 12 disability studies found that people with obesity miss more workdays due to short-term absences and longer-term disability

Trogon JG et al. Indirect costs of obesity: a review of the current literature. Obesity reviews 2008; 9:489-500

Sick leave

- 2008 systematic review of 36 studies
 - a clear trend towards greater sick leave among obese compared with normal weight workers, especially for spells of longer duration
 - US studies showed that workers with obesity had 1-3 extra days of absence per person
 - European studies showed that workers with obesity had about 10 days extra absence per person
 - For overweight workers the data were conflicting, indicating either increased or neutral level of sick leave compared with normal weight

Neovius K. Obesity status and sick leave: a systematic review. *Obesity Reviews* 2009; 10: 17–27

Sick leave

- 2009 review of 13 studies found
 - Inconclusive evidence of a relationship between overweight and short or long-term sick leave
 - 4 studies found a significant relationship between overweight and long-term sick leave
 - 3 studies did not observe significance
 - Strong evidence of a positive relationship between obesity and long term sick leave (>7 days)

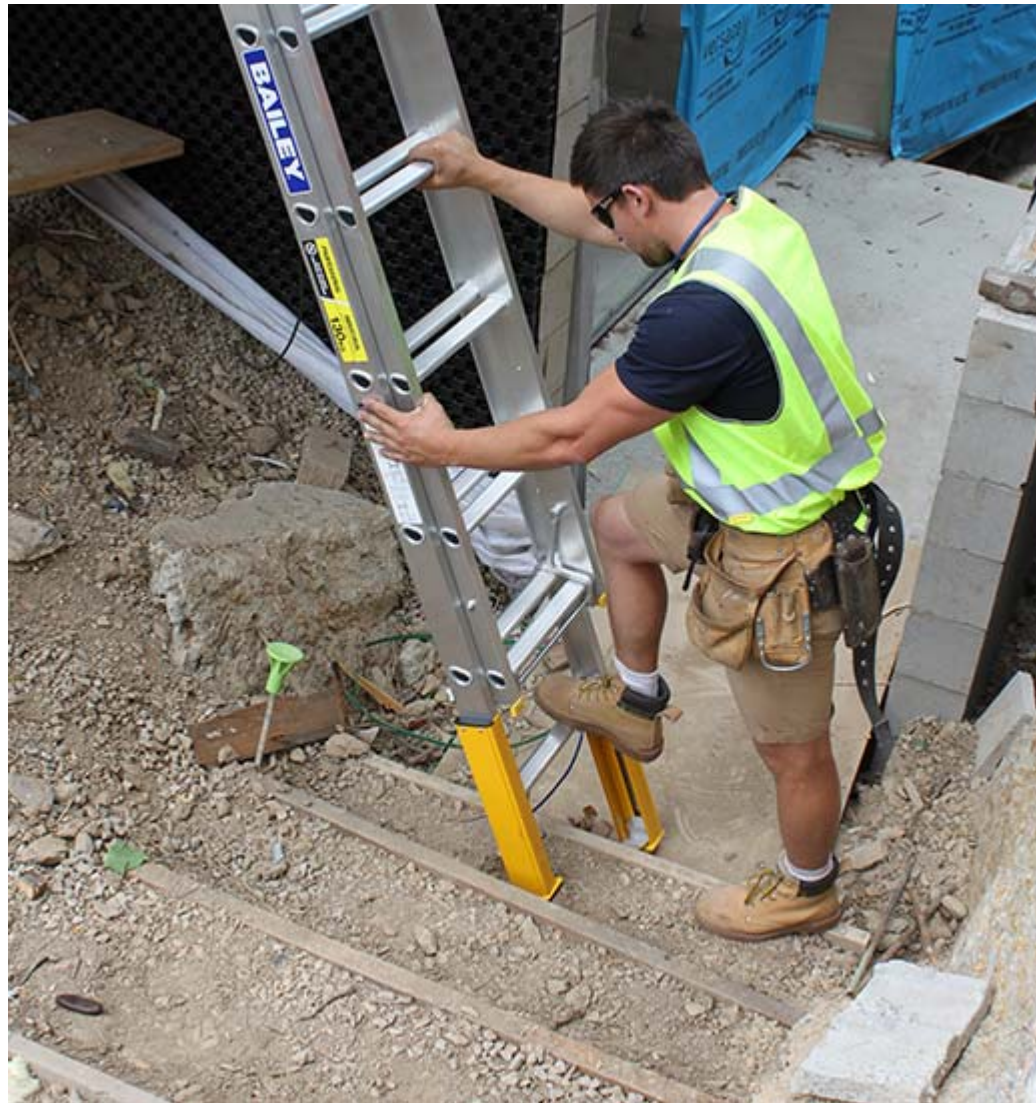
van Duijvenbode DC et al. The relationship between overweight and obesity and sick leave: a systematic review. International J Obesity 2009; 33: 807-816

Workplace considerations

- Weight capacities for ladders, hoists, seats, harnesses, anchor points
- Personal protective equipment sizing eg respirators, hazmat and chemical spill suits
- Confined/narrow spaces
- Physically demanding work
- Emergency evacuation plans

Equipment

Ladder
130kg



Equipment



Step ladder 150kg

Access platform 150kg



Equipment



Mobile scaffold 225kg



Access platform 250kg

Commer

Equipment

Mast boom
225kg



Medical standards – Airline pilots

- BMI >30 and age over 40 years or BMI >35
 - The result of a fasting BSL (with follow up OGTT if fasting BSL ≥ 5.5 mmol/L)
 - A sleep study should be performed if:
 - symptoms of OSA
 - history of congestive heart failure, atrial fibrillation, treatment refractory hypertension, type 2 diabetes, nocturnal dysrhythmias, stroke, pulmonary hypertension
 - Epworth sleep score >8
 - neck circumference >42cm for men and > 40cm in women
 - history of aircraft or motor vehicle accident

Medical standards - Pilots

- BMI >40
 - Assessment by the DAME using the CASA cardiovascular risk profile, and if necessary, a cardiovascular assessment by a cardiologist or consultant physician, including results of resting ECG and interval stress ECG detailing:
 - Clinical status
 - Presence and control of risk factors e.g. hypertension, smoking, hyperlipidaemia and the result of a fasting BSL (with follow up OGTT if BSL is >5.5mmol/L)
 - Risk of any acutely disabling cardiovascular event
 - A sleep study should be performed.
 - An operational check
 - ability to fully utilize all controls to full extent of travel
 - ability to exit aircraft expediently in the event of emergency
 - accurate assessment of weight and balance calculations in the aircraft
 - Must be repeated at renewal if BMI increases by ≥ 2.5

Medical standards – Rail category 1 & 2

- Sleep study is required if:
 - BMI ≥ 40
 - BMI 35.0-39.9 plus:
 - type 2 diabetes
 - hypertension treated with 2 or more medications
 - history of habitual loud snoring or of an witnessed apnoeic event

Medical standards - driving

- The treating doctor should not rely solely on subjective measures of sleepiness such as the ESS to rule out sleep apnoea
 - BMI >35
 - Neck circumference >42cm in men and >41cm in women
 - Narrow oropharynx
 - Type 2 diabetes
 - Difficult to control hypertension

Workplace interventions for obesity

- Adults spend a third of their waking hours at work
- A substantial proportion of daily calories are consumed at work
- Worksites provide access to two thirds of people aged ≥ 16
- Workplaces have existing communications channels
- Some workplaces have canteens and vending machines

Interventions

- 2005 CDC task force reviewed 20 studies:
 - Recommended combined nutrition and physical activity interventions
 - Didactic nutrition education
 - Self-directed materials
 - Specific dietary prescription
 - Group or supervised exercise

Katz DL et al. Public health strategies for preventing and controlling overweight and obesity in school and worksite settings 2005;54(RR10); 1-12

Interventions

- 2009 review of 43 studies found evidence of modest weight reduction from workplace health promotion programs that aim to improve nutrition and/or physical activity
 - Net loss of 1.3kg at 6-12 month follow up
 - 0.47 BMI

Laurie M et al. The effectiveness of worksite nutrition and physical activity interventions for controlling employee overweight and obesity: a systematic review. Am J Prev Med 2009; 37(4): 340-357

Interventions

- 2010 meta-analysis of 22 studies found:
 - Moderate quality evidence that workplace physical activity and dietary behaviour programs significantly reduce:
 - body weight by 1.19kg
 - BMI by 0.34 kg/m²
 - body fat (from sum of skin folds) by 1.12%
 - Low quality evidence that workplace activities targeting physical activity reduce:
 - weight by 1.08kg
 - BMI by 0.50kg/m²
 - waist circumference by 1.31cm

Verweij LM et al. Meta-analyses of workplace physical activity and dietary behaviour interventions on weight outcomes. Obesity reviews 2010; 12:406-429

Features of successful interventions

- Multi-dimensional
- Employee input
- Incentives
- Spouse inclusion
- Health coaching
- Leadership support
- Communications



Transport
Sydney Trains