Project Report –
Coal Services Health and Safety Trust

Project Title:	Reducing the impact of back pain in miners
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HMRI Research Program:	Public Health
Principal Investigator:	Dr Christopher Williams
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Background information

Persistent (chronic) low back pain and musculoskeletal problems are a significant issue in the mining industry. Low back pain is the single highest reason for workers compensation claims. Misunderstanding about the nature of pain (i.e. focus on damage, posture), environmental and social factors are major contributors to the development of persistent pain and disability after a person experiences an episode of back pain. In addition, lifestyle risks such as high BMI and smoking, as well as fatigue and psychological distress, contribute to the onset and persistence of low back pain. It is likely these factors also influence subsequent lost work time.

Workers in the mining industry have higher rates of significant back and musculoskeletal pain. The industry has also reported higher prevalence of lifestyle health risks. The combination of these factors is likely to lead to higher impact of the co-occurring problems. The co-occurrence of lifestyle factors and low back pain problems leading to poorer health outcomes has been shown in other population groups (e.g. primary care, tertiary care).[1,2].

Better understanding of these relationships can point towards targeted prevention strategies that could prevent health and physical function decline of employees. Such targeted prevention strategies would also likely reduce work absenteeism, lost productivity and compensation costs. To date, however the impact of the interrelationship between back pain and lifestyle risk has not been assessed in the mining industry, nor are there programs available to address the combined influences on back pain and lifestyle risks in this population.

Project aims

The project had two main aims:

1. To asses if factors related to poor lifestyle are linked to persistent low back (and associated poor outcomes –e.g. return to work, work restrictions) in the mining industry using data captured by Coal Services Health.

2. Develop screening and prevention initiatives (informed by the above aim 1) to be piloted for reducing persistent (chronic) back pain and subsequent poor return to work outcomes.

Aim 1: Summary of Activity

Factors related to low back pain in miners and poor return to work outcomes

We aimed to use data captured by Coal Services Health in preplacement and periodic medical checks to test assumption from our previous work. There are regarding factors related to chronic low back pain (defined as pain in the lower back lasting longer then 3 months) in miners and poor return to work outcomes (defined as extended time off work due to pain, and extended time on restricted duties, due to pain).

We liaised with Coal Services Health to understand and pilot assumptions for the data captured in pre-employment and periodic medical checks. Initially we aimed to validate and update a prediction model that we had developed in an external dataset, to screen for risk of developing persistent low back pain. This model identified that higher pain intensity, leg pain, emotional distress, compensation status and a person's perception that their pain would be prolonged, all predicted poorer outcomes from an episode of low back pain.

We aimed to update this model by testing the addition of lifestyle factors. However, the coal services data variables did not fit this model. As a consequence, we proposed in a progress report (December 2016) two revised analyses. These aimed to test hypothesised factors linked to log term back and musculoskeletal problems, and poor return to work outcomes in the coal industry.

These models aimed to provide individual and joint effects of comorbidities (BMI, cardiovascular disease risks, smoking, alcohol use, fatigue, and respiratory illness), and back pain on persistent back and musculoskeletal problems, work impairment and use of health service for pain in miners. The second model aimed to determine relationships between other factors (mental health, stress, exposure in work duties (e.g. vibration, manual loads), previous injuries and compensation) and the joint effects reported in model one.

There were significant resources used to procure the data, clean the data for analysis and complete the analysis. This activity endured over more than 24 months, however a dataset with some significant limitations was accepted for use December 2017. Due to problems with the data provided, we were not able to assess the longitudinal assumptions proposed.

Here we detail another analysis with the data provided. We detail below the analysis methods and results following based on cross-sectional data from 16,147 people. We assess the individual and joint effects of lifestyle factors and work duties on any low back pain, chronic low back and effects on work loss or impairment. A summary of the limitations of the data provided, which lead to this approach, are provided in Appendix A.

<u>Aim 1:</u> Factors related to low back pain in miners and poor return to work outcomes

Methods:

Analysis population

The analyses included all workers assessed in periodic medical checks by Coal Services Health (dates have been withheld and so cannot be provided). We included observations with data on the presence or absence of pain. We removed duplicate observations based on the variable 'Reference'. As date of assessment was not interpretable we included observations with the most complete data (that is we included only one observation per reference number). We excluded pre-placement medical checks as medical history data (i.e. containing previous injuries or pain) were not provided, and dates of assessment were not interpretable. For these reasons longitudinal data could not be assessed.

Participant demographics and baseline characteristics

We produced descriptive statistics of the available sample for the following characteristics from the order 41 periodic assessment form: age (nearest year of age), gender (m/f), work type (underground/open cut) and typical duties (Q13 Musculoskeletal Questionnaire); stress or shift work (hazard exposure); time in current job; respiratory illness (Standard Respiratory Questionnaire); lifestyle risks (smoking, BMI); psychological health (K10 Psychological Health Questionnaire), symptoms of fatigue (Epworth Sleepiness Scale), alcohol consumption. We provide a detailed summary of musculoskeletal problems reported including prevalence of any significant pain (by location), any treatment, duration of time off work or on restricted duties, as well as the prevalence of spinal pain and/or low back pain.

Outcome and exposure variables

The outcomes of interest were the presence of any significant low back pain based on self-report in detailed in the musculoskeletal questionnaire of the order 41 form. We also created additional outcome variables based on time duration of symptoms (chronic low back pain = greater than 3 months of pain), and the length of time of work absence or restricted duties. For work absence and duty restrictions, we defined three levels of outcomes based on three thresholds of work absence and restrictions: any time off work or restricted duties for low back pain, a month or more off work or restricted duties, and 3 months or more of time off work or restricted duties for low back pain.

Based on the data available we selected the following variable as primary risk factors (exposures) of interest: smoking (current, smoked for >1-year, smoking years), BMI, fatigue (Epworth Sleepiness Scale), psychological distress (K10 Psychological Health Questionnaire).

We dichotomised continuous exposure variables for ease of interpretation using published recommended thresholds. We considered a BMI of >24.9 as overweight, a BMI of >32.9 as obese, a K10 score of > 24 as moderate distress, and an Epworth score of > 10 as fatigue.

Based on evidence from previous studies, we also assessed the impact of these factors in workers conducting certain occupational duties (lifting > 20kg, heavy plant drivers, exposure to sustained posture and vibration). For this, we used occupational exposures from the Musculoskeletal Questionnaire reported as: 'never', infrequent', half the time', frequently', 'constantly'. We considered exposure for 'half the time' or more as a significant exposure.

Main analyses:

To examine effects of factors associated with low back pain and work outcomes, we built separate logistic regression models for each hypothesised risk factor. We examined the single and joint effects of each factor on each low back pain or work outcome (e.g. smoking x overweight → low back pain or work loss). Here we are interested in estimating additive interaction (not multiplicative) because of its relevance to public health implications (explained in Vanderweele et al.[3] and Ahlbom et al.[4]).

We assessed factors using logistic regression. Low back pain outcomes or work outcomes were dependent variables. Lifestyle risks or work duties were independent variables. We created dummy codes to test for the multiple risk levels for each interaction of the joint effects. We estimated unadjusted effects for model.

For example: Logit(outcome) = smoking + overweight + covariates

In addition, we coupled lifestyle risk factors with certain occupational exposures. Here we included only occupational exposures which were observed as associated with pain or work outcomes in univariate analysis. As previous, we estimated additive interactions to estimate the risk of outcome from combined exposures (e.g. smoking + exposure to vibration → low back pain or work outcome). Again, we used unadjusted regression models where the dependant variables were low back pain or work outcomes. Based on prior analyses (Table 4) we used 'one month off work' and 'one month on restricted duties' as relevant thresholds for poor work outcomes from low back pain.

Handling of missing data and outliers: We retained complete observations for each analysis. We removed any observation with impossible variables. For example, there were 198 observations with BMI scores over 60 (range, 15% of which over 130 – see appendix B). For BMI we removed observations over 70. Sensitivity analysis on varying thresholds of BMI removal were completed.

Results:

Table 1 shows characteristics of the sample. We include data from 16,147 people. The sample included data from mostly males, with a mean age of 45 years, who had employment in open cut mines. Of those who reported the variable, their current employment for less than 5 years (38%). There was a high rate of lifestyle factors: 82% of miners were assessed as overweight or obese, with a mean BMI of 29.13; 19.6% were current smoking and 35% reported having smoked (at some stage) for at least one year. The mean number of years smoked was 15 (SD10.1).

The prevalence of any significant pain, defined as lasting for a week or longer, was 25%. Most pain locations were lower back pain (33%), followed by knees pain (14%); 3% of responders reported pain in more than one location. Of all types of pain, the majority of respondents reported their pain had lasted for less than 1 month (37%); for low back pain, 42% lasted for less than one month. Time off work and time on restricted duties were not different between low back pain and other pain locations. Overall, there was a 7.9% prevalence of lower back pain, and 4.8% prevalence of chronic low back pain.

Table 1: Characteristic variables of data provided

Variable	***N of sample***	***Result % (n)****
Gender (m)	16098	93.92% (15119)
Age; mean years (SD)	16125	44.9 (11.9)
		Range 18 to 86 years
Work type	12089	
Open cut		59.10% (7134)
Underground		40.99% (4955)
*Shift work^*	16147	56.44% (9114)
*Stress^*		32.37% (5227)
Type of duties (more than half the time)	5,267	
Lift >20kg		40.14% (2114)
Drag hoses or cables		48.68% (2562)
Drive heavy plant		58.70% (3084)
Operate power tools		31.20% (1637)
Extended fixed posture		65.66% (3452)
Extended use of keyboard or screens		31.34% (1643)
Exposure to vibration		74.90% (3953)
Time in current job	5092	
0-5 years		38.18% (1944)
5-10 years		27.22% (1386)
+10years		34.60% (1762)
Any previous respiratory illness`	16127	26.40% (4,257)
BMI; mean (SD)	16127	29.13 (4.8)
range		16.14 to 66.12
Normal BMI (18.5 to 24.9)		17.05 (2750)
Overweight		44.54 (7183)
Obese		38.21 (6162)
Psychological Health; mean (SD)	15986	11.12 (2.8)
Moderate distress (>24 K10)		0.68% (109)
Sleepiness scale; mean (SD)	16097	3.37 (2.8)
Fatigue (>10 Epworth)		2.23% (359)
Smokers (y)	16016	19.61% (3140)
Smoked (min 1 year)	13742	35.09% (4822)
Mean years smoked; mean (SD)	3631	15.1 (10.1)
Drink alcohol (y)	328	98.48 (323)
Average consumption per week; mean (SD)		15.17 (16.6)
Significant pain (any)	16127	24.52% (3960)
Treatment for pain	3866	82.33% (3183)

Pain location	3960	
Lower back		32.88% (1271)
Neck		10.63% (411)
Upper back		2.04% (79)
Shoulder		14.39% (556)
Wrist		2.61% (101)
Hips		3.39% (131)
Knees		13.92% (538)
Ankles		4.66% (180)
Other		15.47% (598)
More than one pain site		3.08% (497)
Duration of pain	2758	
< 1 month		37.06% (1022)
1-3 months		17.44% (481)
3-6 months		8.39% (231)
6-12 months		13.74% (379)
>12 months		23.39% (645)
Time off work from pain (y)	4426	34.68% (1535)
< 1 week		29.90% (479)
1-4 weeks		30.34% (486)
1-3 months		23.03% (369)
>3months		16.73% (268)
Restricted duties (y)	3718	31.15% (1158)
< 1 week		14.33% (173)
1-4 weeks		42.17% (509)
1-3 months		25.27% (305)
>3months		18.23% (220)
Spinal pain (low back, neck, upper back)	16127	10.72 % (1729)
Low back pain		7.88% (1271)
Chronic back pain (>3months duration)		4.67 % (753)

*% (n) unless stated otherwise. ^ missing responses imputed as 'no'

Factors associated with significant pain, low back pain and chronic low back pain:

Table 2 and 3 show the univariate associations between pain outcomes and lifestyle risks or work duties.

Smoking and pain

Smoking exposures were not consistently associated with 'significant pain'. In addition, there telling to be a dose response relationship between smoking exposures and low back pain. Current smoking was associated with a 19% increase in chronic low back pain (OR1.19, 95%CI 1.00 to 1.42; p=0.05), smoking for greater than 1 year was associated with a 54% increase

in chronic low back pain (OR1.54, 95%CI 1.31 to 1.81; p>0.0001), and there was a 2% increased risk for each year smoked (OR 1.02, 95%CI 1.01 to 1.03, p>0.0001).

BMI and pain

Analysis of continuous data showed BMI was associated with 'significant pain' (OR1.02, 95%CI 1.01-1.02, p<0.0001) but not low back pain outcomes, that is a 2% increase in significant pain for each unit increase in BMI. Analysis of categorical exposures of BMI revealed overweight and obesity was associated with >30% increase in significant pain, but the association was not significant for low back pain.

Fatigue and distress and pain

Fatigue and distress were both consistently associated with significant pain, low back pain and chronic low back pain. For every point increase on the K10 there was between a 9% and11% increase in significant pain, low back pain or chronic low back pain. For every point increase on Epworth Sleepiness scale there between a 9 and 10% increase in significant pain, low back pain or chronic low back pain. For people with moderate distress, and fatigue there was greater than two-fold increase in the odds of pain outcomes.

Table 2: Univariate factors associated with reporting 'significant pain'

Outcome	*Exposure*	*n*	*OR*	*95%CI*	*P*
Significant pain	Current smoker	16016	1.04	0.95-1.13	0.42
	Smoked> 1 year	13742	1.37	1.27-1.49	<0.0001
	Years smoked	12551	1.02	1.01-1.02	<0.0001
	BMI	16127	1.02	1.01-1.02	<0.0001
	BM>25	16127	1.36	1.24-1.51	<0.0001
	BMI category	16127			
	Normal*		0.73	0.67-0.81	<0.0001
	Overweight		1.35	1.21-1.50	<0.0001
	Obese		1.33	1.19-1.50	<0.0001
	Work type (underground)	12077	1.88	1.73-2.04	<0.0001
	Work duties**	5260			
	Lift >20kg		0.91	0.87-0.96	0.001
	Fixed posture		1.35	1.29-1.41	<0.0001
	Drive heavy plant		1.21	1.16-1.25	<0.0001
	Vibration		1.81	1.58-2.06	<0.0001
	Distress	15970	1.11	1.09-1.12	<0.0001
	Moderate distress		2.56	2.07-3.16	<0.0001
	Sleepiness score	16079	1.10	1.09-1.12	<0.0001
	Fatigue		2.26	1.54-3.31	<0.0001
	Alcohol#	NA	NA	NA	NA

*Referent category; # data insufficient
**Use of key boards/screens, drag hoses and cables power tools non-significant

Table 3: Univariate factors associated with low back pain

Outcome	*Exposure*	*n*	*OR*	*95%CI*	*P*
Low back pain	Current smoker	16016	1.13	0.98-1.30	0.08
	Smoked> 1 year	13742	1.45	1.28-1.65	<0.0001
	Years smoked	12551	1.02	1.01-1.03	<0.0001
	BMI	16127	1.00	0.99-1.01	0.43
	BM>25		1.19	1.02-1.39	0.02
	BMI category				
	Normal*		0.88	0.75-102	0.1
	Overweight		1.15	0.98-1.37	0.08
	Obese		1.33	0.93-1.31	0.25
	Work type (underground)	12077	1.51	1.32-1.73	<0.0001
	Work duties**				
	Lift >20kg	5260	0.88	0.84-0.93	<0.0001
	Fixed posture		1.21	1.15-1.26	<0.0001
	Drive heavy plant		1.09	1.05-1.14	<0.0001
	Vibration		1.49	1.28-1.74	<0.0001
	Distress	15970	1.09	1.07-1.11	<0.0001
	Moderate distress		2.85	1.74-4.54	<0.0001
	Sleepiness score	16079	1.09	1.07-1.11	<0.0001
	Fatigue		2.26	1.69-3.01	<0.0001
	Alcohol#	NA	NA	NA	NA
Chronic LBP (>3 months)	Current smoker	16016	1.19	1.00-1.42	0.05
	Smoked> 1 year	13742	1.54	1.31-1.81	<0.0001
	Years smoked	12551	1.02	1.01-1.03	<0.0001
	BMI	16127	1.00	0.99-1.02	0.47
	BM>25		1.17	0.99-1.38	0.07
	BMI category				
	Normal* <25		0.90	0.76-1.06	0.22
	Overweight 25-30		1.12	0.94-1.34	0.19
	Obese>30		1.07	0.89-1.28	0.45
	Work type (underground)	12077	1.57	1.35-1.81	<0.0001
	Work duties**				
	Lift >20kg	5260	0.87	0.83-0.93	0.001
	Fixed posture		1.17	1.12-1.24	<0.0001
	Drive heavy plant		1.07	1.02-1.11	<0.0001
	Vibration		1.49	1.26-1.76	<0.0001
	Distress	15970	1.09	1.07-1.10	<0.0001
	Moderate distress		2.98	1.69-5.24	<0.0001
	Sleepiness score	16079	1.09	1.07-1.11	<0.0001
	Fatigue		2.21	1.55-3.16	<0.0001
	Alcohol#	NA	NA	NA	NA

*Referent category; # data insufficient
**Use of key boards/screens, drag hoses and cables power tools non-significant

Work duties and pain outcomes:

Driving heavy plant, maintaining fixed posture and exposure to vibration were associated with increased pain. This association was consistent across all pain outcomes (significant pain as per Table 2; and low back pain or chronic low back pain, as per Table 3). The occupational exposure 'regularly lifting >20kg 'was associated with reduced low back pain (between 9% and 13% reduction for significant pain and chronic low back pain respectively). Other occupational

exposures were not associated with low back pain or work outcomes. These include dragging heavy cables, working with arms above chest height, climbing stairs, ramps or ladders, walking on uneven ground, operating power tools, or using keyboards or screens for extended periods.

Table 4 shows lifestyle factors associated with poor work outcomes for low back pain. Smoking and moderate distress were consistently associated any poor work outcome (including time off work and time on restricted duties). There exposures had increasing odds with longer time off work but these were not statistically different (based on overlapping confidence intervals). For example, for smoking there was 62% increase in any time off, 77% increase in one month off, and 89% increase in more than three months off work. Similarly, for moderate distress there was 43%, 145% and 161% increase in odds of any time, one month and more than three months off work. While still significantly associated with work duties restrictions, there was no such trend for smoking and distress. There was inconsistent, and mostly non-significant associations between BMI or fatigue and work outcomes for low back pain.

Table 4: Factors associated with poor work outcomes for low back pain (n=16217)

Outcome	*Exposure (OR, 95%CI)*			
	Smoking	BMI>25	Moderate Distress	Fatigue
Any LBP with any time off work	1.62 (1.32-1.99)	1.47 (1.11-1.92)	1.43 (0.71-2.55)	1.90 (1.21-2.98)
Any LBP > 1 month off work	1.77 (1.25-2.51)	1.39 (0.87-2.20)	2.45 (1.07-5.59)	1.85 (0.86-3.98)
Chronic LBP > 3 months off work	1.89 (1.32-2.71)	1.31 (0.82-2.07)	2.61 (1.14-5.97)	1.96 (0.91-4.21)
Any LBP with any restricted duties	1.41 (1.13-1.75)	1.29 (0.97-1.70)	1.86 (1.03-3.35)	1.61 (0.98-2.69)
Any LBP > 1 month restricted duties	1.66 (1.27-2.16)	1.12 (0.81-1.55)	2.05 (1.04-4.02)	1.94 (1.10-3.41)
Chronic LBP > 3 restricted duties	1.51 (1.30-1.77)	1.20(0.99-1.46)	1.69 (1.08-2.63)	2.36 (1.71-3.24)

Combined impact of lifestyle risks and duties:

When coupled with certain occupational exposures, smoking consistently exhibited an increased risk on low back pain and work outcomes (Table 5). Heavy plant drivers who were smokers, have higher than 80% increase in low back pain (OR1.81, 95%CI1.35-2.40) or chronic low back pain (1.82, 95%CI 1.35-2.44). Similar high risk was observed in smokers who are exposed to sustained fixed posture (OR1.70, 95%CI 1.15-2.51 and OR 1.84, 95%CI 1.21-2.80 respectively).

There was an increased association between time off work for more than one month and driving heavy plant, or exposure to sustained fixed posture, if those individuals also smoked. Combinations of BMI and occupational exposures were not associated with poorer outcomes, with the exception of vibration and BMI. While combined vibration and smoking was consistently associated with low back pain and poorer work outcomes, the estimates were similar to that of prolonged exposure to vibration alone. Combinations of fatigue and occupational exposures were not associated with poorer outcomes.

Table 5: Health Behaviour and work duties influence on LBP and work outcomes

Exposure	*Outcome (OR, 95%CI)*			
	LBP	Chronic LBP	More than 1 month off for LBP	More than one month restricted duties for LBP
Heavy plant driver and smoker	1.81 (1.35-2.40)	1.82 (1.35-2.44)	2.11 (1.05-4.22)	1.75(0.97-3.14)
Fixed posture and smoker	1.70 (1.15-2.51)	1.84 (1.21-2.80)	2.61 (1.09-6.28)	1.64 (0.72-3.71)
Vibration exposure and smoker	1.50 (1.30-1.74)	1.50 (1.29-1.75)	1.77 (1.24-2.52)	1.89 (1.43-2.50)
Vibration exposure and BMI>25	1.29(1.13-1.48)	1.27 (1.10-1.47)	1.45 (1.02-2.07)	1.64 (1.24-2.16)

*Combinations of Heavy plant driver, fixed posture and BMI>25 or fatigue all non-significant

Impact of combinations of lifestyle factors on low back pain and work outcomes:

Table 6 shows the associations between combinations for lifestyle factors with low back pain, or work outcomes. **There were sizable additions to the odds of reporting low back pain and poorer works outcomes, in people with multiple lifestyle risks.** For example, someone with high BMI who smoked had a 207% increase risk of having more than 1 month off work for back pain (OR 3.07, 95%CI 1.46-6.46). Smokers who reported moderate fatigue had more than 3 times the risk of chronic back pain, and 4 times the risk of having more than one month off work from back pain compared someone with one or no lifestyle risks (3.08, 95%CI 1.92 to 4.95; 4.06, 95%CI 1.46 respectively). For models involving the combination of three risks there was an increase in the association with time off work and restricted duties but these were not statically significant increases compared to models with two risks factors.

Table 6: Multiple interaction effects controlled for age, gender, work type (n=13742)

Exposure	*Outcome (OR, 95%CI)*			
	LBP	Chronic LBP	More than 1-month off work for LBP	More than 1-month restricted duties for LBP
Smoking + BMI	1.72 (1.38-2.15)	1.69 (1.34-2.15)	3.07 (1.46-6.46)	2.26 (1.34-3.82)
Smoking+ fatigue	2.88 (1.82-4.55)	3.08 (1.92-4.95)	4.06 (1.46-11.31)	4.13 (1.86-9.02)
Smoking + distress	2.05 (1.05-4.00)	2.16 (1.07-4.34)	3.52 (0.85-14.67)	3.01 (0.93-9.70)
BMI + fatigue	2.44 (1.76-3.39)	2.57 (1.83-3.63)	2.79 (1.18-6.63)	2.47 (1.31-4.59)
BMI + distress	2.59 (1.25-5.36)	2.69 (0.91-7.96)	1.77 (1.13-2.83)	1.93 (1.26-2.94)
Smoking + BMI + fatigue	3.00 (1.87-4.80)	3.13 (1.92-5.09)	4.62 (1.60-13.3)	3.64 (1.64-8.10)
Smoking + BMI + distress	2.69 (1.34-5.41)	2.79 (1.34-5.79)	7.33 (1.50-35.95)	4.57 (1.31-15.97)

Smoking, fatigue and distress (+/- BMI) event rate too low for robust (n=6);

Implications and interpretation of the work:

We found a consistent link between lifestyle risk factors and low back pain using data from periodic assessments of coal miners. Smoking, BMI, fatigue (as observed with the Epworth sleepiness scale) and psychological distress were associated with either low back pain or poor work outcomes from low back pain (or both). **The findings indicate that these lifestyle factors may be useful targets in the prevention of low back pain, and its impact on lost work time and productively.**

Our analysis showed that based on the sample analysed, lifestyle risks are particularly prevalent in coal industry. There appears to be a high prevalence of smoking (20%) in the industry relative to the national average of 13%. The prevalence of overweight and obesity was also over 80%, compared to the national average of approximately 63% (risk prevalence reported by the Australia Institute or Health and Welfare). These factors are widely known to contribute to poorer health and well-being with links to other chronic health problems. **Based in these data alone** a **focus on preventative health initiatives to reduce the prevalence of smoking and overweight and their subsequent impact on poorer health in the coal industry is warranted.**

We found that smoking in particular was consistently associated with poorer low back pain and poorer work outcomes. The associations observed indicated a dose response relationship, meaning that longer duration of smoking was associated with poorer outcomes. While the data analysed were cross-sectional, which limits the ability to confirm casual relationships, a dose response relationship would increase the likelihood of such a causal relationship. Moreover, we found that smoking combined with certain occupational exposures (heavy plant driver, fixed posture, vibration) were associated with increased low back pain and time off work. **The results combined indicate that reducing smoking in groups exposed to the occupational factors may be one prevention direction which could improve both smoking and low back pain outcomes industry wide.**

Fatigue and distress while low in prevalence were strongly associated with low back and poor work outcomes from low back pain**.** These risk factors were consistently associated with more than twice the odds of low back pain and longer duration off work. When adding smoking to these risks there was notable increase in low back pain, and higher risk of longer time off work. To date the impact of smoking, fatigue and sleep on work outcomes from low back pain has not been well assessed. While the current analysis also support a focus on sleep to improve return to work from low back pain, these do not allow us to determine if fatigue is a consequence of or a cause of low back pain. Our previous work however has shown that targeting sleep may be an important factor in the preventing the chronic low back pain, and also that back pain leads to poor sleep and fatigue.[6] **It appears that a targeting sleep and smoking may have additional benefit.**

The association between lifestyle factors and low back pain is well noted in main stream literature. Like many previous studies, these current analyses could only assess cross-sectional relationships. While there is little good evidence that causal relationships run in one direction or the other, the pattern of our results across multiple lifestyles and occupational exposures and for across multiple outcome measures, strongly suggests that these may all be linked. This cluster of adverse health risk indicators comes with an increased risk of disability, work loss and development of chronic diseases all of which have implications for the coal industry.
Our findings point to the need for preventive interventions targeting poor health and back pain, and for interventions aimed at reducing pain and lifestyle issues in already injured workers. Specifically, consideration of pain may be of value in industry initiatives that aim to reduce lifestyle risks (such as fatigue, smoking or BMI), and similarly addressing lifestyle risks in workers who report back pain may be important in improving outcomes from injury and optimising return to work. **A coordinated approach between prevention and worker compensation efforts, with modifications to existing health promotion approaches about low back pain would arguably be a useful next step**.

Limitations of the findings and recommended directions:

The data presented indicate that a shift in thinking should occur around the prevention of low back pain and work loss from low back pain in the coal industry. **Instead of a sole focus on preventing injury through OH&S risk mitigation strategies, which focus on mechanical factors and ergonomics, organisations may be better served to support workers to change lifestyles behaviours associated with low back pain.** Interestingly, our analysis found that some previously believed manual tasks were associated with less low back and time off work (i.e. regularly lifting>20kg). It could be that such tasks are protective of low back pain, but incorrect health promotion and training about these lead to harmful beliefs about the nature of lifting and subsequent back pain in the industry.

Our analyses show that two key targets for preventing low back pain in the coal industry might be smoking and fatigue (or sleep) management. Specifically prevention could be targeted at workers regularly undertaking occupation exposures (heavy plant drivers, people working in sustained postures, and those exposed to vibration).

The results of these analysis and recommendations should be considered in light of some limitations. As previously mentioned we could only assess cross-sectional data. Due to the way the data were provided we had to make assumptions about certain variables; other variables could not be used due to large amount of missing data.

There are potentially some simple data management solutions, that could significantly improve the utility of the data routinely captured. These include: machine generated data exports and data manipulation, rather than manual handling of data; exporting data to more reliable formats (not excel), development of data dictionaries outlining detailed information of datasets (including variable names, labels, response options and time points of measurement); information on data integrity checks and completeness of data. These steps would allow assessment of data quality prior to expending significant resources to export, as well as highlight any errors or omissions in the collection of data. There would also be utility to inform quality improvement initiatives with either clinical staff or data managers to maximise the quality of the data.

While the analyses were robust to sensitivity assessment and did not change based on the varying outcomes created, the outcome thresholds we used may not be the industry preference. We aimed to provide assessment of a comprehensive list of outcomes, however the greater the number of analyses, the higher the change of type 1 errors (i.e. false positive or finding a result by chance). Where possible, we abided by our prespecified protocol. The consistency in our findings across multiple outcomes is also reassuring.

One important next step (as per our previously stated aims, and pending data handling fixes) would be to test the causal assumptions of the current analyses using longitudinal data. This would further support the development of prevention interventions that targets known causes of poor outcomes related to low back pain. The use of longitudinal data would also allow assessment of other mechanisms by which the observed interactions (e.g. smoking and occupational exposures) might act on back pain or work outcome. Our team has advanced skills in causal mediation analysis to support this.

Aim 2: Summary Of Activity

Development of screening and prevention initiatives:

We consulted with Coal Services Health to develop preferred actions for piloting screening and prevention initiatives, based on findings of Aim 1. Based on these consultations we developed a protocol for the pilot and prevention program. The pilot initially aimed to work with Coal Services staff in a capacity building framework to support implementation of support services that cater for lifestyle risks linked with low back pain in the coal industry. We proposed to conduct consensus processes, academic detailing, structured training workshops, and implementation support to refine existing programs for clients attending Coal Services Health.

Despite this plan, our engagement with Coal Services Health was ceased due to unknow circumstances. Correspondence from CHS staff involved in consultations suggested they were advised to discontinue liaising with the project team. Despite attempts to initiate discussions with other CSH staff involved, we could not engage CSH in further activity. As a consequence, we have provided details of two proposed models of care:

i) Targeted prevention activity conducted pre-placement and periodic assessments, and
ii) A framework to be used by clinical staff involved in the management of injured workers (i.e. low back problems).

Details of models of care:

Below we detail the two strategies for screening, discussing and addressing lifestyle risks in the context of low back pain. Without in-depth engagement from CSH we have adapted approaches from our previous work. The approaches have been piloted in numerous settings. We have made adaptation based on knowledge of the industry, however further adaptations and training would be necessary for industry providers should these be taken up. We are happy to consult further about this process.

Model of Care 1: *screening for and addressing lifestyle risks at pre-placement and periodic assessments to prevent low back pain and extended time off work from a back pain episode*

Based on our findings from aim 1, we suggest the use of lifestyle assessments in pre-placement and periodic assessments can be leveraged to discuss low back pain prevention, and the risks of chronic back pain, and extended time off work from back pain. This approach also considers the high prevalence of smoking and other lifestyle risks in the industry as a necessary target to prevent future chronic health problems.

We believe the following approach (Table 7) could easily be incorporated into the existing framework of pre-placement and periodic assessments, with little effort and minimal additional time. Clinical staff could be trained to deliver the content and resources to anyone in the following identified risk groups:

- a previous episode or existing back pain, with a lifestyle risk;
- smokers, especially
  - if sleep problems or fatigued (i.e. shift work),
  - heavy plant drivers, exposed sustain fixed posture or vibration

We have detailed a tested protocol for a brief education session and provided resources specific to low back pain and lifestyle risks to facilitate discussion and self-management (Appendix B).

Our previous work has shown that by establishing associations to more proximal health outcome (e.g. back pain), a person's readiness to change (i.e. attempt quitting) is enhanced, compared to more distance health reasons to quit (e.g. cancer). See Figure 1.

Targeting smoking reduction across the entire coal industry is another preventive approach that could provide multiple benefits, including reducing the impact of low back pain. This approach could utilise health promotion strategies and draw on the links between smoking and low back pain to influence quitting. Relevant promotional concepts could include messages such as 'quit for your back', 'be good to your lungs, be good to your back' or 'stub out back pain'. In addition to targeting smoking rates, we believe this approach would help reshape the erroneous concept of back pain in the coal industry (i.e. that back pain is an 'injury' event that can be prevented by lowering exposure to mechanical factors). Broadening the concept of back pain to included health behaviours such as smoking and fatigue will help shift knowledge towards the many known determinates of why pain might persists after an injury. This conceptual shift aims to support self-management of back pain when it inevitably occurs throughout life, and away from the misconception that when back pain arises your back is buggered.

Table 7: Education for prevention of back pain and related lifestyle factors

Component	**Strategy or concept and purpose**
Education	Correct erroneous beliefs about the cause of back pain, (i.e. provide information about the nature of the condition, that persistent low back pain is multifactorial with multiple influences and not usually the result of pathological tissue damage or lifting heavy things). Describe that while back pain can be common, the back is strong. It is not a fragile body part as commonly believed. Describe the broader influences of back and musculoskeletal health including lifestyle habits like getting enough exercise, eating healthy, quitting lifestyle habits that influence pain and poor health (esp. smoking, reducing alcohol), preventing weight gain or maintaining healthy weight, and prioritising good sleep hygiene and fatigue management.
Behaviour change techniques	Incorporated to facilitate intentions to change and adopt healthy lifestyle habits for back pain prevention: - intention formation (by encouraging commitment from the participant to consider reasons or motivations to change behaviour, and confirming that monitoring of lifestyle behaviours will occur in future assessments); - set graded tasks and specific behaviour goals for change; - prompting barrier identification (by discussing patient specific potential barriers to behaviour change) - prompting self-monitoring of behaviour and outcomes
Provide recourses	Additional information to guide prevention strategy, reinforces messages provided in education, provides links to further help and information.

Model of Care 2*: for injured workers to prevent chronic low back pain and extended time off work*

A comprehensive model of care could be implemented by practitioners who consult with injured workers (i.e. upon onset of low back pain). We have tested a novel model of care in physiotherapy outpatients focussed on managing lifestyle risks in patient with back pain. The model involves up to three physiotherapy consultations, one consultation with a dietitian, referral to telephone counselling (free government service), and provision of resources to support self-management.

Based on consultation with CSH, this format would fit within the physiotherapy schedule provided to injured workers. Below we provide description of the principles applied in consultation and resources specific to low back pain and lifestyle risks (Appendix B).

We have found the model has high acceptance in patients who are waiting for consultations with medical specialists (i.e. considering back surgery for back pain). We have also recently found **this model of care to be cost effective and supports reduced absenteeism from back pain**.

We believe the below principles could be provided and taught to injury claims consultants and return to work coordinators.

Table 8: Model of care implementation principles for injured workers

Physiotherapy consultations

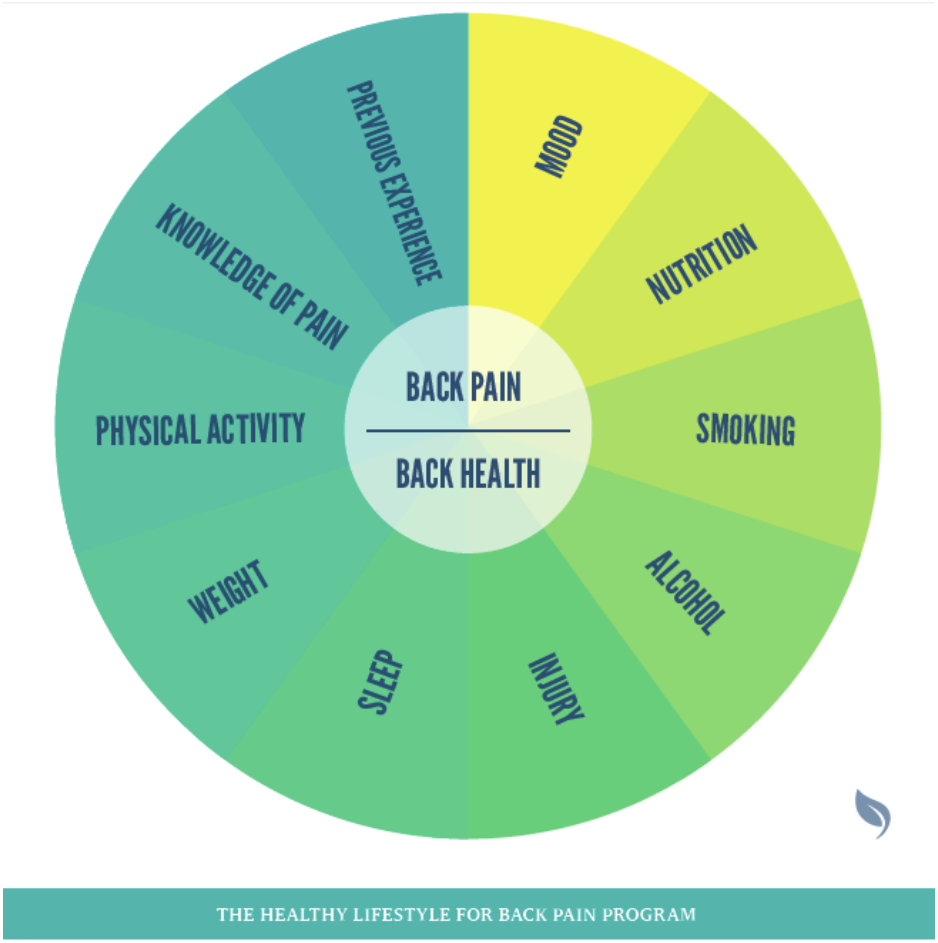
	Component and purpose	Content	Purpose
Initial appointment	Physical Assessment	- Back pain and care history - Physical assessment including assessing ROM, evaluate strength, flexibility, pain characteristics. - Collect anthropometric measurements (height, weight)	Develop rapport Meet patients expectations for physiotherapy care
	Psychoeducation - Understand condition	- Back pain biology, pain reoccurrences, concept that pain is multifactorial and does not equal damage, fluctuating nature of pain conditions - Acknowledgement that pain is real - Influence of lifestyle factors on back pain and consequences of being overweight, having a poor diet, inactivity and smoking - Introduce HELP to support adoption of healthy lifestyle behaviours - Promotion of support services the Get Healthy Service and Quitline	Correct erroneous pain beliefs, increase knowledge, provide context for behaviour change.
	Behaviour change strategies - Assess stage of change and motivations - Graded task assignment - Goal setting - Self-monitoring and feedback	- Exploration of patients stage of change and motivations through questioning and use of 10 point readiness to change scale - Acknowledge general barriers to lifestyle change and program adherence - Encouragement commitment to change - Identification of patient lifestyle goals - Graded exercises provision and physical activity tasks, e.g. aim to start walking 10 minutes 5 times a week. - Encouragement, support and facilitation of self-monitoring behaviours such as keeping activity, pain and diet diaries and attending follow up appointments	Facilitate behaviour change, initiate safe engagement in PA, initiate engagement in support services.
2nd appointment	Psychoeducation	- Reinforce back pain education and lifestyle messages in first consultation	Increase knowledge
	Behaviour change strategies - Self-monitoring and feedback - Problem solving - Graded task assignment - Goal setting	- Evaluate goals and progress by asking patient and assessing diaries - Identify and acknowledge barriers to change and negotiate strategies overcome - Encourage continued participation in the Get Healthy Service and Quit line services (if appropriate) - Continual encouragement of self-monitoring	Reinforce positive behaviour, support behaviour change and self-monitoring behaviours.

3rd appointment	Physical Assessment Psychoeducation	- Collect anthropometric measurements - Reflect on information provided previously and patient experience	Data collection Initiate self-reflection and reinforce positive behaviours
	Behaviour change - Assessing stage of change and motivations - Goal setting - Self-monitoring and feedback - Maintenance and relapse prevention	- Reassess motivation to change and/or motivation to sustain behaviour change - Encourage completion of the Get Healthy Service and or Quit line program - Goal setting for maintaining healthy lifestyle change - Negotiate strategies and problem solving for overcoming barriers to maintain changes	Initiate goal setting for continued self-management and maintaining or further improving lifestyle behaviours, reinforce positive behaviours, identify skills and strategies to prevent relapse of unhealthy habits.

Dietitian consultation

Occurs at week 3	Brief dietary assessment	- Assess patients diet using monitoring completed food diary or conduct brief diet history and eating behaviours	Build rapport
	Psychoeducation	- Reinforce HELP messages, the importance of a healthy lifestyle in pain management and the role of diet in weight management. - What are the five key food groups and AGHE, ADG recommendations - Concepts of energy balance and portion sizes	Increase knowledge
	Behaviour Change strategies - Assessing stage of change and motivations - Graded task assignment - Goal setting - Self-monitoring and feedback	- Exploration of patients stage of change and motivations through questioning and use of 10 point readiness to change scale - Acknowledge barriers to change and reassure small lifestyle changes make a difference - Identification of patient lifestyle and dietary goals - Negotiate and support strategies to improve dietary intake, reduce energy intake and ensure adequate consumption of core food groups - Encourage participation and continued dietary support from the Get Healthy Service - Encourage self-monitoring e.g. keep a food diary	Reinforce positive behaviour, initiate positive safe dietary changes, support behaviour change and use of support services.

Figure 1. Determinants of low back pain – form the Health Lifestyle for Low Back Pain Resource. See Appendix B



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Report prepared by: Dr Christopher Williams Date: 31-Jul-18

Report will be presented by: Libby Rodgers-McPhee

Report approved by:

Paul F. Foster

Laureate Professor Paul Foster

Acting Director, HMRI Date: 31-07-2018

Appendix A:

Data variables requested for Health and Safety Trust back pain project
We requested variables from the Pre-Placement Medical Assessment form – Order 41 and Periodic Medical Assessment form.

*An identifier variable (e.g. miner number) from both datasets was requested to link observations over time. We advised CSH that a dummy coded variable could be created to replace the miner number if this information was sensitive information that couldn't be shared.

Pre-placement: Data dumb of all clients
Part A Miner number*
1. DOB
2. Gender
3. Position
4. Date of assessment
Part B - all data variables from these sections:
5. Work history
6. Medical History
7. Alcohol
8. Physical activity
9.Standardised Respiratory Q
10. Clinical findings

Periodic assessment: Data dump of all data time point for all clients from 2008
Part A Miner number*
1. DOB
2. Gender
3. Position
4. Date of assessment
Part B - all data variables from these sections:
1. Medical History
3. Hazard Exposure
5. Standardised Respiratory
6. Musculoskeletal questionnaire
7. Epworth Sleepiness Scale
8. Alcohol Audit
9. K10
10. Clinical findings

Limitations of analysis due to data provided
1. Variables requested were not provided, including:

- No data for the following items were provided:
  - Work history
  - Medical history or clinical findings, including CVD risk scores
  - Alcohol audit
  - Physical activity
  - DOB
- Items from the Musculoskeletal Questionnaire were missing ('what do you think caused this pain..'; only numbness from Q4;
- All items from K10 and Epworth (only summary scores provided)
- Date of assessment and only 'dd/mm' – manually omitted year, so not possible to use data longitudinally
- Age provided for current age not age of assessment

2. Data appears to be manually transcribed, with numerous handling errors:

- 'Psychosocial' questions (shift work and stress) from the Hazard Exposure assessment had many missing, and 307 (approx. 5 percent) were completed as 'No' yet no response option for this exists in the order 41 form.
- Variables appear incorrectly labelled (i.e. 'injury or operation affecting test', 'Face', unknown variable, 'Surface' are unknown variable).
- Missing data (not at random)
- All data from 101921 – 127666 missing
- Impossible pain observations (Significant pain reported for 75 preplacement assessment there was apparently no assessment of this at preplacement)
- There were a high number of impossible BMI observations range impossible (range BMI 0.0321845 to 3518.519); See below frequency table of 198 people with BMI between 50 and 3519.

BMI frequency distribution > 50units

BMI	Freq.	%	Cum%
50.03874 |	1	0.51	0.51
//			
65.33266 |	1	0.51	73.23
//			
75.24859 |	1	0.51	76.26
//			
86.14614 |	1	0.51	78.28
//			
96.15385 |	1	0.51	80.81
//			
114.9425 |	1	0.51	83.84
129.3715 |	1	0.51	84.34
//			
163.966 |	1	0.51	86.87
186.2732 |	1	0.51	87.37
200.8715 |	1	0.51	87.88
//			
266.7296 |	1	0.51	90.91
269.1106 |	1	0.51	91.41
281.4815 |	1	0.51	91.92
//			
293.9983 |	1	0.51	93.43
303.9855 |	1	0.51	93.94
313.4685 |	1	0.51	94.44
345.2932 |	1	0.51	94.95
360.4896 |	1	0.51	95.45
608.7868 |	1	0.51	95.96
749.2196 |	1	0.51	96.46
2514.284 |	1	0.51	96.97
2688.272 |	1	0.51	97.47
2863.324 |	1	0.51	97.98
2869.964 |	1	0.51	98.48
3103.048 |	1	0.51	98.99
3217.993 |	1	0.51	99.49
3518.519 |	1	0.51	100.00
Total |	198	100.00	

HEALTHY LIFESTYLE PROGRAM FOR BACK PAIN

NSW GOVERNMENT

HELP

2

Everything you need for the

Healthy Lifestyle Program for Back Pain

The Healthy Lifestyle for Back Pain program is a collaboration between Hunter New England Population Health, the John Hunter Hospital and the University of Newcastle.

NSW GOVERNMENT

get healthy
Information & Coaching Service
1300 806 258

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

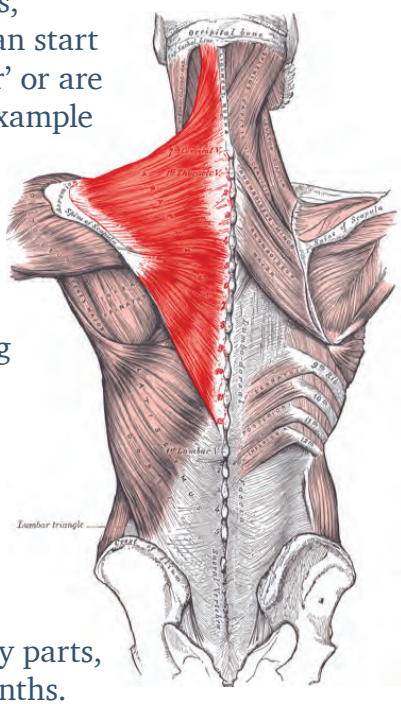
Quitline 13 7848

WHAT IS PAIN, AND WHAT CAUSES BACK PAIN?

Pain is a warning signal that alerts you when your body is in danger of being hurt, like an alarm.

BACK PAIN

Your back has many parts, including bones, muscles,ligaments and joints. Back pain can start if one or more of these parts sense 'danger' or are stressed more than they are used to, for example spraining some of the muscles.



There are many reasons for your back to be painful, but there are no tests that can pinpoint which part of your back you may have hurt. Research suggests that knowing what structure in your back hurts doesn't actually help treat your back pain.

IMPORTANT FACTS TO REMEMBER

- Your back is strong and like other body parts, can heal itself over a few weeks to months.
- Often the pain we feel is not an accurate sign of damage. Pain can be felt when nothing at all is damaged and continue after an injury has healed. But this does not mean the pain is 'all in your head'.

Pain is always real, no matter what the cause.

THE HEALTHY LIFESTYLE FOR BACK PAIN PROGRAM

CHRONIC BACK PAIN

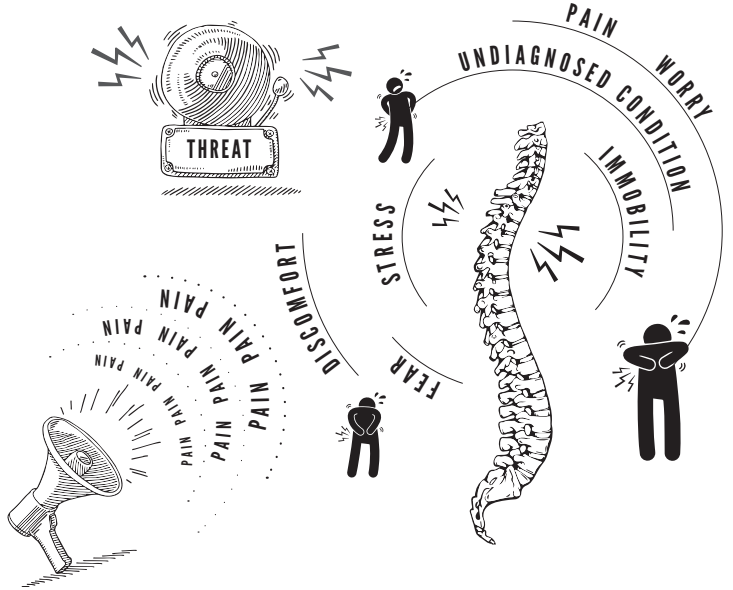
Pain that lasts for more than a few months is called chronic pain.

Chronic pain is complex and has many causes.

One cause is when your nervous system, your nerves and brain learns to be in pain. This happens when your body is constantly trying to protect itself, like an overly sensitive fire alarm causing false alarms.

This is called '**sensitisation**' of the nervous system. Other things that can bring about chronic pain and nervous system '**sensitisation**' are:

- emotional factors, such as our mood, anxiety, stress, and fear of damaging your back.
- Our lifestyle habits or the things we do day to day (such as physical activity) which affect how our body functions.



LIFESTYLE HABITS AND YOUR BACK PAIN

Lifestyle habits can contribute to your back pain and can cause your body to function differently. In fact, lifestyle habits such as not being active can have more influence on chronic pain than an injury.

Making small healthy changes to your lifestyle can help you manage your pain better in the long term.

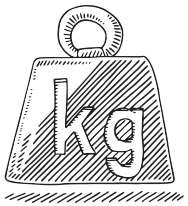
By making healthy changes to your lifestyle habits, we mean things like:

1. **Lose excess weight**
2. **Become more active**
3. **Enjoy a healthy diet, including reducing alcohol consumption**
4. **Quit smoking**

The HELP Physiotherapists and Dietitian will support you to improve healthy lifestyle habits. We work together with the Get Healthy Coaching Service and Quitline to provide additional support to help you make positive changes.

HELP also considers all of the things that may influence your pain like previous experiences, knowledge about pain, your sleep patterns, general mental wellbeing and your emotions in managing your back pain.

THINGS TO CONSIDER:
INFLUENCES ON YOUR BACK PAIN AND HEALTH



THE HEALTHY LIFESTYLE FOR BACK PAIN PROGRAM

WHAT IS INVOLVED IN THE HELP PROGRAM?

TODAY
- FIRST APPOINTMENT WITH PHYSIOTHERAPIST
- REFERRAL TO GET HEALTHY SERVICE AND / OR QUITLINE

2 WEEKS
- SECOND APPOINTMENT WITH PHYSIOTHERAPIST AND APPOINTMENT WITH DIETITIAN

6 WEEKS
- THIRD APPOINTMENT WITH PHYSIOTHERAPIST
- COMPLETE A HEALTH SURVEY

12 WEEKS
- FINAL APPOINTMENT WITH PHYSIOTHERAPIST
- COMPLETE A HEALTH SURVEY

6 MONTHS
- COMPLETE A HEALTH SURVEY
- COMPLETE GET HEALTHY SERVICE AND/OR QUITLINE

12 MONTHS
- COMPLETE A HEALTH SURVEY

If you can't attend appointments or telephone support, we ask that you still complete the 4 surveys over the 12-months (either by phone, online or paper).

This is important so that we can see if any parts of the program help your pain or health, and allows us to improve the program for others.

1. LOSE EXCESS WEIGHT

Excess body weight can reduce function and mobility, put stress on your joints and muscles, and increase inflammation throughout the body, which is known to lead to more pain. Research shows that being overweight increases back pain by 30%.

WHAT DOES LOSING WEIGHT DO FOR MY BACK?

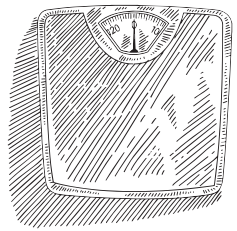
Losing as little as 5% of your body weight can help reduce back pain.

Losing weight = taking control = better health and well-being!

Weight loss also helps protect you from other chronic diseases such as diabetes and cardiovascular disease. Losing weight can also help give you more energy to do the things you like to do.

HOW DO I LOSE WEIGHT?

You can lose weight by making small long term changes to your diet and activity levels. The HELP program will support you to achieve a healthy body weight by providing expert guidance and Get Healthy coaching support for eating a healthy diet and increasing your physical activity levels.



2. BECOME MORE ACTIVE

Not being active enough can actually make back pain worse, as your back and joints can become stiff and sore to move if you don't use them. The nervous system also forgets what normal movements, such as what bending and twisting feel like which makes them harder to do. This can cause your body to feel pain or discomfort when it isn't in danger of being hurt.

It is safe to be active when you have back pain, even when it might hurt to move. Your back will become stronger and your nervous system will relearn how normal movements should feel.

HOW DO I BE MORE ACTIVE?

The physiotherapist and the health coaches from the Get Healthy Service will give you advice and support about how to become more active, including how to:

- Choose the right type and level of activity for you e.g. Try walking, house work, playing with the kids or joining a group.
- Pace yourself e.g. by doing some activity everyday despite the pain, start with 5 minutes and build up slowly to 30 minutes per day.
- Manage any flare ups in your pain.

3. ENJOY A HEALTHY DIET

A poor diet can lead to weight gain. A diet high in sugar and saturated fats can also contribute the pain you feel.

A healthy diet can help your pain by:

- Achieving weight loss
- Reducing inflammation in the body
- Maintaining overall health
- Creating more energy for activity
- Improving your mood and sleep quality

HOW DO I IMPROVE MY DIET?

As part of the HELP program you will see a dietitian at your second appointment. The Get Healthy Service coaches will also talk to you about your diet and provide advice on the best ways to improve it. Remember, small sustainable changes can make a big difference. You will be supported to consider the following changes:

- Plan your meals and shop ahead
- Reduce your portion sizes
- Choose water to drink
- Eat 2 serves of fruit and 5 serves of vegetables daily
- Limit nutrient poor energy dense foods and drinks such as soft drink, alcohol, sweets, pastries, takeaway foods, chips, desserts, processed meats
- Choose wholegrain breads and cereals
- Choose low fat dairy and meat or alternatives such as nuts and legumes
- Include healthy fats from foods like nuts, seeds, salmon, olive oil in your diet

Remember small sustainable changes can make a big difference.

4. QUIT SMOKING

Smoking has many negative effects on your body and can lead to fatal illness. Smoking also affects back pain. It can reduce blood flow to the structures of your back, slows recovery from injuries and impairs your nervous system. Research show that smokers have more than 50% greater risk of long term back pain than non-smokers.

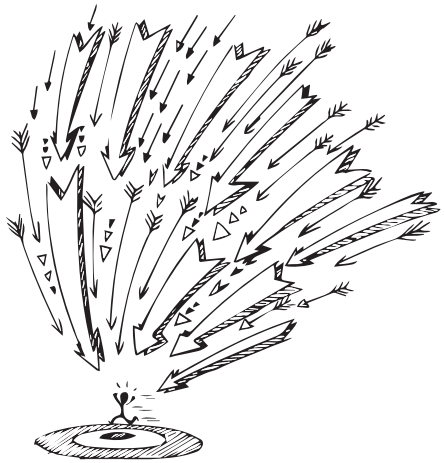
Quitting smoking improves your health and well-being and can immediately improve your back pain.

Your physiotherapist and the Quit line counsellor will give you advice and support to quit smoking.

OTHER FACTORS THAT INFLUENCE YOUR PAIN:

Your physiotherapist can also provide you with contacts and extra support resources if there are other things affecting your pain such as:

- Having trouble sleeping
- Your emotions
- Distress and anxiety



ENGAGE WITH SUPPORT SERVICES

THE NSW GET HEALTHY SERVICE

get healthy Information & Coaching Service 1300 806 258

The **NSW Get Healthy Information and Coaching Service** is a free service for addressing lifestyle habits that involve up to 10 coaching calls over a 6-month period with your own personal health coach. The coaches are either Dietitians or Exercise Physiologists. Together with your health coach you will be provided with support, and information and motivation to improve your overall health. Your HELP Dietitian and Physiotherapist will also help you along the way so that you get the most out of your Get Healthy Coaching support.

You will receive a registration call from the Get Healthy Service within one week of your first HELP appointment. Following your registration call, additional coaching calls will be organised at a day and time that suits you.

QUITLINE

Quitline 13 7848

Quitline is a confidential and free service to help people quit smoking. Quitline provides tailored information and assistance to people wanting to try to quit smoking. If you are a smoker and wish to quit smoking your Physiotherapist will discuss this with you and provide you with a referral to Quitline. Quitline will then contact you directly to support you to quit smoking.

DO I HAVE TO DO IT?

You do not have to participate in these free support services if you do not wish to. However, we strongly recommend participating in the support services as they are key part to gaining the maximum benefit from the HELP program. Both services are a proven way to improve your health, and make positive changes to your lifestyle.

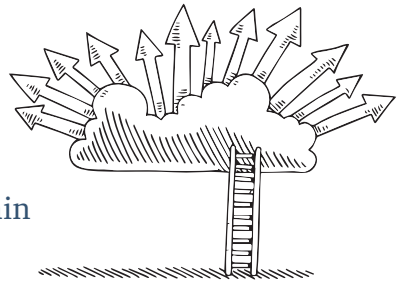
Aboriginal coaches or liaison officers are available when using the support services.

OTHER TOOLS FOR YOU TO USE

The rest of this booklet provides you with some tools to help you improve your lifestyle, achieve weight loss and quit smoking.

This includes:

- Making a plan
- Goal setting
- Monitoring your progress
- Identifying things that affect your pain

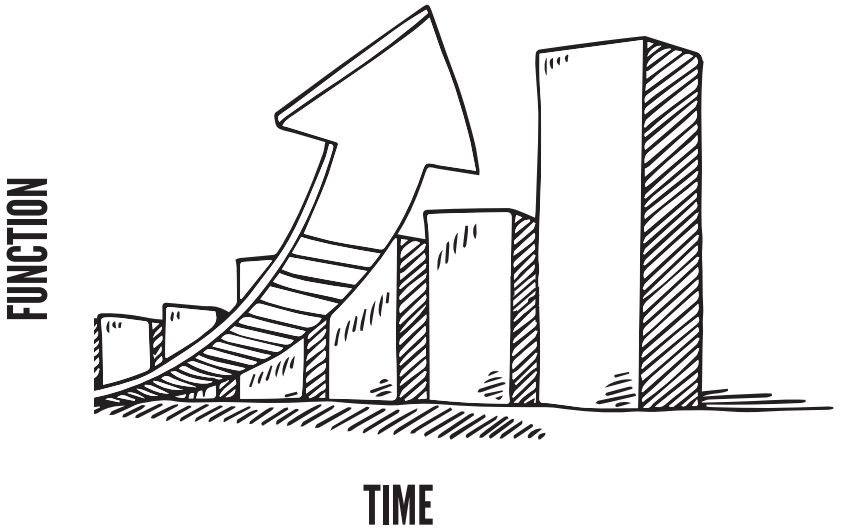


MAKING A PLAN TO BECOME MORE ACTIVE

When you have back pain, upgrading your activity slowly is the best approach. This means gradually taking steps to increase your physical activity.

Slowly increasing your physical activity may take weeks or months. Small steps minimizes the risk of flare ups of back pain and can maximize your function over time.

Keep this in mind when you set goals with your Physiotherapist. The included Activity Diary (page 22) can also help you monitor the upgrades in your activity levels over time.



GOAL SETTING

S **SPECIFIC** - EXACTLY WHAT DO YOU WANT TO ACCOMPLISH?

M **MEASURABLE** – HOW WILL YOU KNOW WHEN YOU HAVE MET YOUR GOAL?

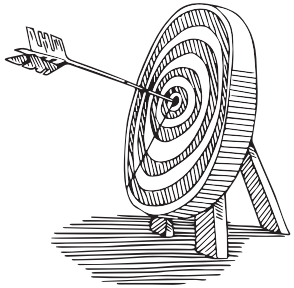
A **ACHIEVABLE** – MAKE SURE YOUR GOAL PUSHES YOU BUT IS ACHIEVABLE

R **REALISTIC** – IS YOUR GOAL AND TIMEFRAME REALISTIC?

T **TIMELY** – SET SOME DATES FOR COMPLETION OF YOUR GOAL

For example:

I would like to lose 5kg by the end of the 12 week HELP program by increasing my activity by 20 minutes per day and replacing unhealthy options such as sweets, biscuits and fast food with fruits and low-fat options.



Think of some things that are important to you in your life, and they can form the basis for your goals…

GOAL SETTING

FIRST APPOINTMENT GOALS

2 WEEK APPOINTMENT GOALS

6 WEEK APPOINTMENT GOALS

12 WEEK APPOINTMENT GOALS

MONITOR YOURSELF

PAIN DIARY

Monitoring your pain and lifestyle habits can be helpful to track your progress and change your behaviours. Monitor your pain daily. Record the date, your pain rating from 0 (no pain) to 10 (worst pain), and if there was a reason you might feel that pain. E.g. I was stressed about something at work/home.

DATE	PAIN LEVEL 1-10	REASON

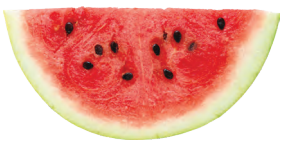
PAIN DIARY

DATE	PAIN LEVEL 1-10	REASON

FOOD DIARY

DATE	MEAL	WHAT AND HOW MUCH YOU ATE AND DRANK
	BREAKFAST	E.g. 2x weetbix with 1 cup low fat milk, ½ banana and 1 teaspoon honey
	LUNCH	
	DINNER	
	SNACKS	
	BREAKFAST	
	LUNCH	
	DINNER	
	SNACKS	
	BREAKFAST	
	LUNCH	
	DINNER	
	SNACKS	

FOOD DIARY



DATE	MEAL	WHAT AND HOW MUCH YOU ATE AND DRANK
	BREAKFAST	
	LUNCH	
	DINNER	
	SNACKS	
	BREAKFAST	
	LUNCH	
	DINNER	
	SNACKS	
	BREAKFAST	
	LUNCH	
	DINNER	
	SNACKS	

ACTIVITY DIARY

DATE	ACTIVITY	HOW LONG
	E.g. gardening (planting and moving soil)	1 Hour

ACTIVITY DIARY

DATE	ACTIVITY	HOW LONG