

**IN THE DISTRICT COURT  
AT WELLINGTON**

**I TE KŌTI-Ā-ROHE  
KI TE WHANGANUI-A-TARA**

**[2023] NZACC 157      ACR 306/19**

UNDER	THE ACCIDENT COMPENSATION ACT 2001
IN THE MATTER OF	AN APPEAL UNDER SECTION 149 OF THE ACCIDENT COMPENSATION ACT
BETWEEN	ANTHONY DROZDZAK Appellant
AND	ACCIDENT COMPENSATION CORPORATION Respondent

Hearing:            17 July 2023

Heard at:           Dunedin / Otepoti

Appearances:      Mr P Schmidt for the Appellant  
                         Ms A Douglass and Ms Gaskell for the Respondent

Judgment:         25 September 2023

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**RESERVED JUDGMENT OF JUDGE C J MCGUIRE  
(Work related gradual process injury – Section 30)**

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[1]     The issue on appeal is whether ACC’s decision dated 17 December 2018, declining cover for lumbar disc prolapse as a work related gradual process injury, was correct.

[2] Central to determining the issue on appeal is the following question:

Does Mr Drozdak's lumbar disc prolapse meet the criteria in s 30 of the Accident Compensation Act 2001, and in particular, has the identified characteristic of Mr Drozdak's employment – whole body vibration – caused or contributed to the cause of his spinal degeneration and therefore satisfies s 30(2)(b)(i) of the Act, namely - the particular property or characteristic caused or contributed to the cause of the personal injury.

## **Background**

[3] Mr Drozdak has worked for New Zealand Aluminium Smelters since 2002. Since 2003, his job tasks have included driving a 12 tonne Hyster forklift.

[4] Between 14 January 2015 and 23 September 2015 Mr Drozdak consulted the NZ Aluminium Smelters Occupational Health Physiotherapist Jo Wilson on eight occasions for treatments and advice arising from his work as a Hyster forklift driver. The treatments and advice notes included :

- 14 January 2015- Stretching the sciatic nerve and sacroiliac joints, including a home exercise programme.
- 22 January 2015- Mobilising his left L2/3 intervertebral joint.
- 29 January 2015- Needling a trigger point in his upper lumbar spine.
- 6 May 2015- Mobilising the right sacroiliac joint and needling the same trigger point as treated in January.
- 8 May 2015- Appellant not to drive Hyster 03 until cab mounts are repaired and full task rotation is in place during the shift day.
- 13 May 2015- More trigger point needling...also mobilisation of his left sacroiliac joint.
- 14 May 2015- Stretches to the sciatic nerve both sides. "Still getting intermittent leg and back pain. Associated with Hyster driving, and ? other causes ... As of 14/05/15, Tony to not drive Hyster 03 until the cab mounts are repaired, and full task rotation is in place during the shift day ..."
- 23 September 2015- Tony phoned to request copy of his physiotherapy notes, and stated the Hyster had been repaired, but as the machines age they develop a side-ways shake. He has been offered a position in Crew 3, line 3 where he will not be required to drive the Hyster at all.

[5] On 7 May 2018, as part of an internal assessment undertaken by Mr Drozdak's employer, Emily Hodgkinson, occupational therapist, conducted a worksite visit to assess the condition, lay out and seating in the six Hysters, as well as looking at the current maintenance plan for the year.

[6] Ms Hodgkinson reported that well designed seats were important to reduce employees' exposure to vibration, but that no seat would solve all the problems that led to vibration exposure. She made various recommendations, including that Hyster drivers be rotated more frequently and that they receive education about the importance of rest breaks. She concluded:

All these points require the operator's lumbar stabilisers to do a high volume of work during the shift. This combined with time in the posture (two-three hours sitting without a break) is likely to cause back pain.

[7] Ms Hodgkinson describes whole body vibration as follows:

Whole body vibration (WBV) is vibration transmitted to the whole body by the surface supporting it (i.e. via a seat or floor). It is commonly experienced by drivers, operators and passengers in vehicles and machines when travelling over uneven surfaces.

The transmission of vibration to the body is dependent on body posture. The effects of vibration are complex. Exposure to WBV causes motions and forces within the human body that may:

- Cause discomfort;
- Adversely affect performance;
- Cause health effects or aggravate pre-existing conditions.

Vibration arises from various mechanical sources with which humans have physical contact. Vibration energy can be passed on to operators from vehicles on rough roads; vibrating tools; vibrating machinery; or vibrating work platforms that may give rise to adverse health effects. It can be transmitted through the feet and legs, the hands and arms, but most commonly through the buttocks while seated in a vehicle. The magnitude and effect of vibration depends on the severity and length of exposures.

[8] An x-ray of Mr Drozdak's lumbar spine dated 10 May 2018 confirmed:

Lumbar spine alignment normal.

Mild narrowing of the L1-2 disc with minor disc osteophytes at this level and at L3-4. Remaining intervertebral discs appear normal.

Pedicles and posterior elements intact. Sacroiliac joints unremarkable.

[9] On 19 June 2018, Mr Drozdzak presented to Mr Bruce Hodgson, orthopaedic surgeon, who noted in his report:

Anthony's problem is coming from his back. I suspect he probably has changes at L3/4 and L4/5 and possibly a degree of stenosis causing the symptoms in his back, buttocks and lower limbs. He has worked on this type of machine for quite a period of time and I suspect some of the issues he is getting is coming from this type of work as well. ...

[10] On 24 July 2018, Mr Drozdzak saw Mr Hodgson again after an MRI scan was undertaken. At this time, 24 July 2018, Mr Drozdzak was 55 years old.

[11] The MRI report included:

**Clinical:**

Aching low back pain with bilateral leg symptoms ? L4/5 disc.

...

**Findings**

L1/2 disc level, there is mild background bulge and a small central protrusion with annular tear, but no nerve root compromise.

L2/3 disc level, appearances are satisfactory.

L3/4 disc level, there is mild diffuse disc bulge but no nerve root compromise.

L4/5 disc level, there is mild diffuse disc bulge and a focal right lateral annular tear. There is some moderate ligamentum flavum hypertrophy and small bilateral facet joint effusions. There is some mild central canal and right and left lateral recess narrowing and bilateral exit foraminal narrowing, but no mechanical nerve root compromise.

L5/S1 disc level appearances are satisfactory.

**Comment**

Mild multi-level disc changes as described.

[12] On 10 September 2018 and 31 October 2018, Mr Drozdzak completed two claimant questionnaires. He reported that he had sciatic nerve pain down both legs, lower back pain, and hip pain. He recalled that he first reported this in 2004, when he was working nine or 12 hour shifts four times per week. He reported at that time that he drives a Hyster for eight to nine hours per day. He reported that the new models of Hysters caused more vibration in the cab for the driver than the old models had.

[13] Mr Drozdzak provided a two minute video recording of himself driving a Hyster. This was played to the Court.

[14] On 19 September 2018, Dr Peterson lodged a claim for cover with ACC. Cover was sought for lumbar disc prolapse with radiculopathy. The accident description read “driving Hyster”.

[15] On 30 October 2018, Mr Hodgson undertook a follow up consultation and noted:

At this stage, I have told Anthony that he does not require any surgical intervention and that he is best to find alternative work. Clearly the work he does with the Hyster is causing increasing problems and will probably continue to do so.

Anthony is in a position where rather than doing something for his back such that he can work, he needs to look at the type of work he is doing.

[16] On 13 November 2013, Dr Peterson, workplace GP, completed the medical questionnaire for ACC. Dr Peterson stated that Mr Drozdzak’s diagnosis is backpain with a disc prolapse at L4/5. In relation to the cause of this condition, Dr Peterson reported that:

Prolonged operating of Hyster vehicle with associated jolting and vibrations may aggravate the back pain.

[17] On 13 November 2018, Mr Frisby, superintendent, NZ Aluminium Smelters, completed the employer cover questionnaire and work injury report. This report provided further information about Mr Drozdzak’s work tasks and confirmed that he drives a Hyster for up to 12 hours per shift, with breaks. The employer provided a “job dictionary and risk assessment” document relating to Mr Drozdzak’s position. This noted that operating a Hyster involves:

Exposure to whole body vibration for extended periods of time.

[18] On 17 December 2018, ACC issued its decision to decline cover for lumbar disc prolapse radiculopathy as a work related gradual process injury. Following an unsuccessful review, the appellant has brought this appeal.

## Expert Evidence

[19] On 12 December 2018, Dr Martin Robb, occupational medicine specialist, prepared a medical case review for ACC regarding whether Mr Drozdak's lumbar disc pathology met the criteria for a work related gradual process injury. Dr Robb interviewed Mr Drozdak and conducted a physical examination on 5 December 2018. In preparing his report for ACC, Dr Robb reviewed the following information:

- A range of clinical records for Mr Drozdak;
- The go-pro camera footage that Mr Drozdak brought with him to the consultation; and
- The relevant epidemiological literature.

[20] The first report notes that Mr Drozdak had worked full time at Tiwai since 2002. Previously, he was a forestry worker for 15 years. He has previously worked as a diver for one and half years and as an engineer for five to eight years in total. The current diagnosis was described as:

The diagnosis is mild multi-level degenerative disease in the lumbar spine, with a focal right side lateral annular tear at L4/L5, mild central canal and right and left lateral recess narrowing and bilateral exit foraminal narrowing, but no mechanical nerve root compromise at L4/L5.

[21] Dr Robb went on to say:

Anthony's employment involves considerable whole body vibration (WBV) most working days throughout the working shift and in my opinion, WBV in Anthony's job has contributed to his back pain. There is good epidemiological evidence that exposure to whole body vibration (WBV) while driving heavy machinery is a cause or aggravation of back pain, but overall no good evidence that WBV causes damage to the spine. It is likely that driving machinery in this job has continued to aggravate back pain.

[22] Dr Robb made reference to the 2016 Textbook of Orthopaedics and Trauma and a global review of the prevalence of low back pain in the adult population, published in 2012. He then says:

Based on medical literature, it is clear that degenerative disease of the lumbar spine is a multifactorial condition, with age related degeneration and genetic susceptibility being the primary aetiological factors.

[23] He says:

Although whole body vibration (WBV) may have aggravated Anthony's symptoms of low back pain, WBV is not accepted as a cause of lumbar spine degenerative disease. Anthony has mild degenerative disease in the lumbar spine and this is common in his age group. WBV is not found in Anthony's non-employment activities or environment to any material extent.

[24] Dr Robb then referred to a number of international studies and under the heading "Summary" at the end of his report is this:

In summary, although WBV can aggravate low back pain, there is no epidemiological evidence that it causes lumbar spine pathology. Mr Drozdak's condition has not arisen as a work related gradual process injury.

[25] On 20 September 2019, ACC received a report from Dr David McBride, occupational medicine specialist, dated 3 July 2019.

[26] Dr McBride recorded the following under the heading "History of Presenting Complaint":

He was first troubled with intermittent low back pain about ten years ago, with some discomfort in the right buttock. He sought relief through acupuncture. This pain persisted but he coped with it well enough until about two years ago, when both hip and groin pain troubled him with increased severity of the right buttock pain and radiation in the distribution of the sciatic nerve to the ankle region.

Pain is often absent on waking, but is precipitated by activity both at work and at home, without any appreciable pattern. The discomfort reached such severity that he sought advice from the smelter occupational physician, Dr Martin Peterson, in 2018, who referred him to Mr Hodgson, who recommended a steroid injection. He is still driving the machine, but when on other duties, such as tapping and sludging, the repetitive bending, reaching and stretching exacerbates the pain and he experiences back stiffness.

[27] Dr McBride reached the following conclusion:

It is likely that the jolting that occurs when driving the Hysters has significantly contributed to the spinal degeneration from which Mr Drozdak suffers. The combination of rough terrain, seating with little cushioning, solid tyres and driving extended shifts, sometimes facing backwards, would be very hard on the lower spine. The literature discussed above is consistent with this opinion, but the literature is less important than the specifics of the driving concerned. It is not surprising that other drivers have experienced similar pain when working shifts on the Hyster.

[28] On 9 October 2019, Dr Monigatti, occupational physician and principal clinical advisor to ACC, reviewed the reports of Dr Robb and Dr McBride and completed a memorandum for ACC.

[29] Amongst other things, he said:

Central to the issue is what happens in the lumbar spine as people get older. As the intervertebral disc ages, it no longer retains fluid efficiently. Dehydration occurs and the water content of the nucleus drops from 90 per cent to around 40 per cent. The disc loses the pressure needed to sustain axial loading and protrudes outwards and backwards to where the spinal cord and nerve roots are located, with a corresponding reduction in disc height. This is known as central disc protrusion. The bulging is symmetrical and classified as either broad based (involving up to 180 degrees of the disc circumference) or generalised (more than 180 degrees). In contrast, traumatic disc protrusions tend to be focal (i.e.. involving 90 degrees or less of the disc boundary) and a-symmetrical, occurring at the site where some layers of the annulus have given way in response to a sudden compressive force applied to them.

...

This degenerative process commences as early as the third decade and is universal by middle age. Genetics and early life experiences are the main drivers, although bending, twisting, and compression from weight gain can accelerate it. Most occupational physicians, like Dr Robb, accept that the substantial cause of degenerative disc disease in the lower back is constitution, not exercise or work.

...

Driving a vehicle like a Hyster that bumps and vibrates will cause pain in the degenerative spine, but as Dr Robb points out, there is no evidence that it actually causes the degeneration as asserted by Dr McBride. That is the majority medical view. Dr McBride thinks it is plausible that shock from driving the Hyster transmitted to the spine can cause the discs to fail eventually through desiccation and herniation. He asserts that the level of shock vibration in the Hysters is very high, so driving one would likely cause such injury.

This is an unverified hypothesis. It is true that the probability of causation for a particular individual can be modified by factors which identify how that person is different from those in the studied groups. Excessive exposure is one of them. For most exposure-injury relationships, the higher the exposure, the greater is the risk of injury. However, this applies only when a cause and effect relationship has been demonstrated in the first place. Otherwise it is just speculation.

...

It is important to recognise that spinal changes like these are very common in people in their mid-50s, regardless of what work they do, or whether they work at all.



[30] Dr Monigatti then refers to the two papers by the same authors, that Dr McBride cites in support of his view that Hyster driving contributed materially to Mr Drozdzak lumbar spine degeneration. The first is a systematic review and meta analysis by *Burstrom et al Whole body vibration and risk of low back pain and sciatica: a systematic review and meta-analysis. Int Arch Occup Environ Health. 2015 May;88(4):403-18*, of mostly cross-sectional studies. In a cross-sectional study, the condition of interest and the exposure status are measured simultaneously in a given population.

[31] Dr Monigatti then comments:

A cross-sectional study can assess the prevalence (i.e.. how common the condition is in people who do the job), but not the incidence (i.e.. how often it arises in the workers), so in most cases it is not possible to distinguish whether the exposure preceded or followed the disorder. For this reason, cross-sectional studies cannot be used to determine causation and have design limitations that lay them open to bias.

Burstrom et al acknowledged this when concluding that the review indicated a possible exposure-response relationship.

[32] Dr Monigatti also refers to the second cohort study by *Wahlstrom et al Exposure to whole-body vibration and hospitalisation due to lumbar disc herniation. Int Arch Occup Environ Health. 2018 Aug; 91(6):689-94*, referred to by Dr McBride.

Workers aged 30-49 years at the time of hospitalisation were the only group that Wahlstrom et al reported on specifically as having the highest relative risk. For the remainder, including those of Mr Drozdzak's age, the relative risk was 1.35 for the vibration exposed, and 1.23 for the non-exposed, which reduces the probability of vibration being the cause in a particular worker to around 10 per cent. In any event, as far as I can gather, he has not been hospitalised for lumbar herniation, so the study has no relevance to Mr Drozdzak's situation anyway. The cohort captured by the research was construction workers aged 30 to 49 hospitalised with lumbar disc herniation who were exposed to "moderate to high" vibration.

[33] Dr Monigatti concluded his report as follows:

I am not aware of any evidence in epidemiological literature to indicate an increased incidence or prevalence of lumbar spine degeneration in those who performed Mr Drozdzak's employment tasks, or work in that environment, that would point to a significantly greater risk of suffering that injury and in those who do not. Nor is there any reason to conclude that Mr Drozdzak works so differently from other Hyster drivers as to be not representative of that occupational group.

[34] In May 2021, Dr McBride completed a brief of evidence, as did Dr Robb on 23 February 2022, ahead of this appeal hearing.

[35] Following directions from the Court, both Drs McBride and Robb jointly completed an expert's report dated 12 July 2022. The report is as follows:

- (1) This report is produced pursuant to a joint instruction letter dated 3 March 2022.
- (2) Dr McBride and Dr Robb have communicated by email and Zoom to discuss their opinions in regard to Mr Drozdak's claim for a work related gradual process injury. Their opinions are summarised below:
  - (a) Both Dr McBride and Dr Robb agree that Mr Drozdak has worked as a Hyster driver at Tiwai Point since about 2003, a job which involves considerable whole body vibration (WBV) during the working day, as the machine drives over rough ground and has very poor suspension and solid rubber tyres.
  - (b) Both doctors agree that Mr Drozdak has a ten year history of intermittent but worsening problems with low back pain. MRI investigation has revealed mild multi-level degenerative disease in the lumbar spine, with a focal right sided lateral annular tear at L4/5, mild central canal and right and left lateral recess narrowing and bilateral exit foraminal narrowing, but no mechanical nerve root compromise at L4/L5.
  - (c) Both doctors agree that WBV in Mr Drozdak's job is likely to have aggravated lumbar back sprain.
  - (d) Dr McBride considers WBV, in particular shock vibration, can cause, or contribute to, spinal degeneration. Dr McBride considers that the WBV involved in Mr Drozdak's work as a Hyster driver is the cause of his spinal degeneration. Dr McBride believes that the epidemiological literature does

establish that spinal degeneration can be caused by workplace WBV. He says that opinion is divided on the subject and that different conclusions can be reached depending on which studies are included.

- (e) Dr Robb disagrees that whole body vibration in Mr Drozdak's job as a Hyster driver was the cause of his lumbar spine degeneration. In Dr Robb's opinion, the epidemiological literature does not support WBV as a cause of lumbar spine pathology. He considers that Mr Drozdak's condition of multi-level degenerative disc disease was not caused as a result of WBV in his job and that his condition results from age related degenerative disc disease which has been aggravated by WBV.
- (3) The reports relied on by both doctors will form part of the common bundle of documents produced for the appeal.
- (4) Both doctors acknowledge that they have read the code of conduct for expert witnesses in the High Court Rules 2016 and they agreed to be bound by it.

[36] At the hearing of this appeal on 17 July 2023, both Dr McBride and Dr Robb gave evidence and were cross-examined.

[37] Dr McBride makes these points in his evidence in chief:

- Although it is possible to find papers which argue that there is no relationship between work and spinal degeneration, the consensus of international opinion is that a person's occupation can contribute to spinal degradation.
- He accepts that individual genetic factors are very important and the genetic factors that contribute to spinal degeneration are becoming clearer, as is the fact that spinal degeneration is a complex multi-factorial process.

- He said it is not correct to say that genetic factors alone determine the rate at which your spine will degenerate. Other factors such as whether a person smokes, whether they are obese, whether they exercise, and the kind of work they do affects spinal degeneration. He annexes seven research papers that discuss spinal degeneration and the relationship between occupational loading and changes in the spine. He says that these papers are provided to establish that there is widespread academic support for his opinion on the issue.
- Persons who through exercise or work subject their spine to regular movement and heavy loads expose their spine to a greater level of wear and tear with the passage of time. As a result, the work that they do contribute to the wear and tear process, resulting in earlier degeneration of the spine. The consensus view is that heavy work, repetitive work, and vibration through the spine placed strains on the ligaments and discs at a rate greater than the recovery process will allow for, leading to earlier degeneration.
- Although one can have spinal degeneration without low back pain, generally low back pain reflects physiological changes in the spine associated with degeneration. This is because pain is an indication of local inflammation, and inflammation results in gradual changes in the spine that eventually result in changes to the discs. The structural integrity of the discs is slowly compromised, resulting in loss of disc height, bulging of the discs, and eventually disc prolapse and stenosis.
- Referring to Mr Drozdak's video, he said the jolting caused by driving over rough terrain would have exposed his back to small but sudden compression events dozens of times during the day. Over weeks, months and years, his back would have been exposed to thousands of such events.
- There is a known association between forklift driving and low back pain, as discussed in the peer reviewed academic studies attached.

- He says that the driving here, in terms of duration, vibration and shock is at the top end of the scale and that it is important that an occupational physician places greater weight on the reality of the driving situation than peer reviewed articles in such cases. Mr Drozdak's back was exposed to considerable vibration force over an extended period, with poor seating, a machine with solid tyres, on a surface that was rough and bumpy.
- He says therefore it is surprising that ACC has concluded that there is no contribution from the Hyster driving and that all the degeneration in Mr Drozdak's spine is due to genetic factors and aging.
- He notes that Dr Robb acknowledged the good epidemiological evidence linking vibration from driving heavy machinery to back pain and he says that this does logically lead to the conclusion that driving contributes to degeneration of the spine. His reason for saying this is that the pain in the spine arising from local inflammation reflects physiological changes that accelerate the natural degenerative process and eventually result in changes to the discs. He refers to a paper annexed to his brief entitled "*Magnetic Resonance Imaging Analysis of Work Related Chronic Low Back Pain: Comparisons of Different Lumbar Disc Patterns*" in the Journal of Pain Research<sup>1</sup>. He says those changes are evident in Mr Drozdak's spine by way of degenerative change seen on his x-rays.
- Dr McBride accepts that genetic factors are a major cause of the rate of degeneration of the spine and that this will also be true of Mr Drozdak. It is wrong however to say that this is the only factor and this is why we find higher rates of back pain in particular occupations, such as forklift drivers, farmers and freezing workers.

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<sup>1</sup> Magnetic Resonance Imaging Analysis of Work Related Chronic Low Back Pain: Comparisons of Different Lumbar Disc Patterns" in the Journal of Pain Research, 2018: 11 2687-2698

- He notes the relationship between heavy spinal load and degeneration observed in young athletes who competed in the 2016 Olympic Games and says this is persuasive evidence that even young, very fit people can overwork their spines, resulting in degeneration.
- It is Dr McBride's evidence that a person's work can be a factor in spinal degeneration and in the appellant's case, the Hyster driving has made a material contribution to the degeneration of his spine. The driving at issue is not found in his non-work activities.

### **Cross Examination by Mrs Douglass**

[38] Dr McBride agreed that the appellant had undertaken other physical manual work before his time at Tiwai Point, including as a tree feller between 1990 and 1995. Dr McBride agreed that there would have been some degeneration of the appellant's spine when he arrived at Tiwai Point in 2003 at aged 40, but said it was unusual to have an annular tear.

[39] Dr McBride said that he had met the appellant in 2019 but did not do a clinical examination of his spine. Referring to Dr Robb's medical case review of 12 December 2018, he agreed that Dr Robb did not identify any clinical signs of sciatica.

[40] Dr McBride agreed that the MRI scan of 24/07/2018 found no disc herniation, but there was a disc bulge.

[41] Dr McBride was referred to the report of Mr Hodgson, consultant orthopaedic surgeon of 24 July 2018 and agreed that there was nothing severe enough to warrant surgery at that time. Reference was made to other activities the appellant did during the day, including "tapping and sludging" and that the repetitive bending, reaching and stretching exacerbates the pain and that he experiences back stiffness. Dr McBride agreed that tapping and sludging was a task with the potential to cause problems with the appellant's back.

[42] Dr McBride agreed that there was no consistent pattern of pain that the appellant experienced when he was not driving. Dr McBride agreed that the other factors influencing back pain meant that it was not wholly related to driving, but rather multi-factorial.

[43] Dr McBride was referred to page 3 of Dr Robb's medical case review of 12 December 2018, where it said:

It does not seem to settle down during his two days off work between work shift cycles, and he does not think there is any particular aggravating factor. Pain seems to develop during his two days off to the same sort of severity as it does when he is riding the Hyster.

[44] However, in Dr McBride's opinion, the Hyster driving contributed to his back pain, even when he was not at work. Reference was made to the joint expert report of Dr McBride and Dr Robb, that both doctors agreed that the whole body vibration in Mr Drozdak's job is likely to have aggravated the lumbar back pain.

[45] Dr McBride acknowledged in his brief that genetic factors were a major cause of the rate of degeneration in the spine and that this will also be true of Mr Drozdak. He also acknowledged that the aging process was also a factor. Dr McBride said that pain and spinal degeneration is generally associated with an insult to the spine.

[46] Dr McBride agreed that you can have pain in the spine without a physical injury. He says he is not disputing that there is spinal degeneration. He says that pain in the spine reflects changes that accelerate the degenerative process.

[47] He acknowledges that Dr Robb says that age related degeneration brings with it pain, but he says that pain is also caused by injury to the discs. He believes there is an injurious process going on. He acknowledges that none of the studies say that pain does not cause degeneration. However, he says that recurrent vibration and the cumulative effect of it is what is important.

[48] Reference was then made to the medical literature referred to by Dr McBride. Dr McBride agreed with Counsel that the most informative medical literature on this and other issues are the systematic reviews and meta analysis. These types of medical literature give an overall picture of risk.

[49] Prior to working at the smelter, from 1990 to 1995, the appellant worked as a tree feller and from 1999 to 2003, as a fitter-welder. However, there is no evidence before the Court of any work related injuries whilst he worked in those physically demanding roles.

[50] Ms Douglass pointed out to Dr McBride that the research article referred to by Dr McBride being “*The Association Between Occupational Loading and Spine Degeneration on Imaging – A Systematic Review in Meta Analysis*”<sup>2</sup>, specifically did not include studies that evaluated whole body vibration, which the authors said were included in a separate review.

[51] Dr McBride acknowledged that he was not aware of this later separate review by the authors (that included whole body vibration) just mentioned.

[52] Ms Douglass put to Dr McBride that most of his articles were cross-sectional studies, whereas cohort studies are more able to establish causation. Dr McBride agreed with this proposition.

[53] Referring to the literature review article on whole body vibration authored by JE Bible et al “*Whole-body vibration: is there a causal relationship to specific imaging findings of the spine? Spine 2012;37(21): 1348-1355*”. Ms Douglass put to Dr McBride that the researchers had been extremely careful in their literature search, finding that only seven studies out of 700 met the criteria for this systematic review. She put to Dr McBride the conclusion of the study, which read:

Based on our results from this systematic review, no causality can be shown between WBV and abnormal spinal imaging findings. With the conflicting data available in the literature, WBV has not been established as a cause for objective spinal pathological changes on a scientific basis.

[54] Dr McBride did not agree that this was an important study.

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<sup>2</sup> The Association Between Occupational Loading and Spine Degeneration on Imaging – A Systematic Review in Meta Analysis” by Luciana Macedo and Michele Battie – *Musculoskeletal Disorders* (2019) 20: 489



[55] He also said regarding the *Battie MC et al Twin Spine Study: Contributions to the changing view of disc degeneration . The Spine Journal 9 2009; 47-59* that 45 twin pairs would not be enough to assess the risk of greater spinal degeneration. However, he agreed that the controls were “perfectly matched” and that no significant differences were found between the twins in terms of spine degeneration

[56] Dr McBride acknowledged that the authors conducted a second study, being a multi-disciplinary multi-national study of 600 subjects primarily in Canada, Finland and the United States using exposure discordant identical twins and again there was no tendency for greater disc degeneration seen amongst the drivers included in the study. Dr McBride commented that Mr Drozdzak’s exposure was heavy intermittent exposure. Dr McBride agreed that an annular tear in a man of the appellant’s age was unusual, but he acknowledged that they did occur.

[57] Ms Douglass referred to an article “*Genetic Factors in Intervertebral Disc Degeneration*” by *Feng et al, Genes Dis 2016;3(3);178-85* noting that in a large cohort study of 804 Chinese individuals showed a 4-fold increase in annular tears in patients aged from 30 to 39, and a 2.4-fold increase in disc degeneration and disc herniation in patients aged 40 to 49. She put to Dr McBride that people can have annular tears without an injury event. Dr McBride responded that occupational exposure is sufficient in the present case to cause the injury, namely is the annular bulge.

[58] In re-examination by Mr Schmidt, Dr McBride said the twins spine study on 45 pairs of twins was too small and said that none of them were given a risk assessment of the activities that they undertook.

[59] He said that the study by *Wahlstrom and Ors. Exposure to whole body vibration and hospitalisation due to lumbar disc herniation, Int Arch Occup Environ Health. 2018 Aug 91(6): 689-94* with 288,926 participants allowed good conclusions to be drawn and that the study further supports that occupational exposure to whole body vibration increases the risk of hospitalisation due to lumbar disc herniation.

[60] Reference was made to the study of *Abdalkader and Ors* entitled “MRI Detected Spinal Disc Degeneration Changes in Athletes Participating in the Rio de Janeiro 2016 Summer Olympic Games” *BMC Musculoskeletal Disorders*. 2019;20(1);489. There the conclusion is that disc degeneration could occur even in young athletes where there is spinal loading.

[61] In response to questions from the bench, Dr McBride confirmed that he placed the population study ahead of the twin study, given the need for a wide range of participants. He said that the identification of risks was the key epidemiological issue in his opinion. He said the numbers in the twin study were too small.

[62] In answer to further questions from Ms Douglass in respect of matters arising, Dr McBride said although the whole body vibration study by Bible and Ors considered 700 studies, but only included seven of those studies, this effectively made it a population study.

### **Evidence of Dr Robb**

[63] Dr Robb told the Court that he had been involved with the appellant’s claim for work related gradual process injury in two respects. Firstly, he was instructed by ACC as an independent medical expert to conduct a medical case review of the appellant’s claim file. As part of this review, he interviewed the appellant and conducted a physical examination on 5 December 2018. He also viewed a range of clinical records and some go-pro camera footage that the appellant brought with him to the consultation. He also undertook a systematic review of the relevant epidemiological literature.

[64] Following the filing of the appeal, he was asked to comment on the expert opinion of occupational physician, Dr McBride.

[65] He was also provided the opinion of occupational physician and medical advisor for ACC, Dr John Monigatti. He concurs with Dr Monigatti’s opinion at page 2 of his memorandum of 9 October 2019, where he said:

Driving a vehicle like a Hyster that bumps and vibrates will cause pain in the degenerative spine, but ... there is no evidence that it actually causes the degeneration as asserted by Dr McBride. That is the majority medical view.

[66] Dr Robb said the main issue is whether the appellant can establish that his work as a Hyster driver has caused or contributed to the cause of his lumbar spine degeneration. He notes that Dr McBride's view is that causation can be established, however he says that Dr Monigatti and himself disagree with Dr McBride on the basis that his view is not supported by the relevant epidemiological literature.

[67] He summarises the appellant's history as follows:

1. Mr Drozdak works as a forklift/Hyster driver. He began driving Hysters in 2002 when working at the Tiwai Smelter in Invercargill;
2. Mr Drozdak recalls first experiencing intermittent lower back pain sometime between 2008-2010. Mr Drozdak's lower back pain has been persistent since then and, around 2016, he also developed pain in both his hips and his groin;
3. Mr Drozdak first sought medical advice in early 2018 from his company doctor, Dr Peterson. On 10 May 2018, Dr Peterson arranged x-rays of the lumbar spine and both hips;
4. Following his x-rays, Mr Drozdak was referred to Mr Hodgson who arranged an MRI investigation on 24 July 2018.
5. Mr Hodgson prescribed a CT guided steroid local anaesthetic injection on the right side, which was carried out on 21 August 2018. The purpose of the injection was described as being "firstly as a diagnostic procedure and secondly to see if we can get rid of his symptoms".
6. On 30 October 2018, Mr Hodgson reviewed Mr Drozdak's condition and noted the CT injection had "not led to any significant improvement in his symptoms".

[68] In his first report, Dr Robb responded to a number of questions asked by ACC concerning the criteria in s 30 of the Act.

[69] In this report, Dr Robb diagnosed Mr Drozdak with mild multilevel degenerative disease in the lumbar spine, with a focal right-sided lateral annular tear at L4/5, mild central canal and right and left lateral recess narrowing and bilateral exit foraminal narrowing, but no mechanical nerve route compromise.

[70] In Dr Robb's view, no other diagnosis was appropriate based on the radiological investigation, as the MRI showed clear evidence of age-related spinal degeneration in the form of mild multilevel disc changes.

[71] He said that Dr McBride had confirmed this diagnosis as osteoarthritis of the lumbar spine, with disc degeneration and, in this respect, he and Dr McBride are in an agreement.

[72] He said that for the purposes of his first report, he reviewed the relevant epidemiological literature. In summarising that literature, he sought to provide a comprehensive and balanced account.

[73] He said that as is clear from his first report, the literature is somewhat mixed, but there is strong evidence refuting any causal relationship between whole body vibration and spinal injury. He referred to a study by *Drerup and Ors – Assessment of Disc Injury in Subjects Exposed to Long Term Whole Body Vibration, Eur Spine J 1999;8:458-467* which compared lumbar disc injury between a group with long term exposure to whole body vibration and a group with no exposure. That study found there was no significant difference between the two groups, indicating that whole body vibration does not cause spinal damage; despite there being evidence of a correlation between the two.

[74] In his view, the most comprehensive and well-designed study conducted on the subject was that of *Bible and Ors – Whole Body Vibration: Is there a Causal Relationship to Specific Imaging Findings of the Spine*<sup>3</sup>. This study concluded that the majority of studies did not find an association or causal relationship between whole body vibration and damage to the spine (as measured by spinal imaging results).

[75] He said that while he endorses Dr McBride's view that "it is important that an occupational physician place greater weight on the reality of the driving situation than peer reviewed articles in such cases", the nature of the s 30 criteria means epidemiological literature is highly relevant.

[76] Dr Robb said that his second report dated 30 June 2021 was for the purposes of reconsidering his first report in the light of the report of Dr McBride dated 3 July 2019 and his brief of evidence dated April 2021; both of which contradicted Dr Robb's first report.

[77] Dr Robb said that his second report summarises and responds to each of the journal articles annexed to Dr McBride's brief of evidence and it concludes:

None of the journal articles referred to by Dr McBride support his conclusion that whole body vibration in Mr Drozdak's job as a Hyster driver was a cause of his lumbar spine degeneration.

[78] He says that the criteria of a s 30 requires first that there is a personal injury; second, that the personal injury was caused by gradual process; and third, that the physical injury was caused in the circumstances described in ss (2). So, the critical issue identified by Dr McBride, Dr Monigatti and Dr Robb is whether Mr Drozdak's work as a Hyster driver caused his spinal degeneration.

[79] In his opinion, Mr Drozdak's spinal degeneration does not satisfy the s 30 criteria for a work-related gradual process. The degeneration cannot be said to have been caused in the circumstances described in s 30(2) because:

- (a) There is no evidence that whole body vibration caused, or contributed to the cause of, his spinal degeneration (as required by s 30(2)(b)(i)). Rather, the causative factors are genetics and the aging process; and
- (b) There is no evidence that the risk of suffering from age-related degenerative disease of the spine is significantly greater for those who drive Hysters (or other heavy machinery) – as required by s 30(2)(c).

[80] He says that he, Dr McBride and Dr Monigatti agree that Mr Drozdak's work as a Hyster drive (and associated whole body vibration) may have contributed to or exacerbated his lower back pain. However, the key issue and point in contention, is whether the personal injury identified – spinal degeneration – was caused by gradual process as a result of Mr Drozdak's employment as a Hyster driver.

[81] He disagrees with Dr McBride's statement in his brief of evidence that:

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<sup>3</sup> Whole Body Vibration: Is there a Causal Relationship to Specific Imaging Findings of the Spine – Spine (2012; 37 (21): 1348-55)

Epidemiological evidence linking driving to backpain does logically lead to the conclusion that driving contributes to degeneration of the spine.

[82] In Dr Robb's view, this inference is not supported by the epidemiological evidence and that, as explained in his second report, the whole body vibration in Mr Drozdak's job is likely to have aggravated lumbar back pain with underlying lumbar degenerative disease, but that he is unable to find any epidemiological data in the medical literature that supports work-related whole body vibration as a cause of lumbar degenerative disease.

[83] In particular, Bible and Ors literature review of 40 relevant articles concluded that no causality can be shown between whole body vibration and abnormal spinal imaging findings associated with a particular spinal disorder or damage to the spine.

[84] He notes that *Talmage "Commentary: the Spine and Vibration: Whole Lotta Shaking Going On"*<sup>4</sup> – referred to the Bible study findings, also commenting that the best study is in identical twin peers highly discordant for driving by Battie and Ors, who report no evidence of injury and added that the paradox is the present use of whole body vibration to treat spinal disorders<sup>5</sup>.

[85] Dr Robb says furthermore the nature of the relationship between Mr Drozdak's back pain and spinal degeneration is unclear. In his view, the pain may be symptomatic of his spinal degeneration, but it is also possible for a person to experience pain (e.g. "non-specific" chronic low back pain) without suffering any actual or threatened tissue or nerve damage. This type of pain may result from or be modulated by functional changes within the nervous system.

[86] He says that as outlined in his first report, degenerative disease of the lumbar spine is a multifactorial condition, with age-related degeneration and genetic susceptibility being the primary causative factors.

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<sup>4</sup> *Commentary: the Spine and Vibration: Whole Lotta Shaking Going On* - The Spine Journal 2013; 13:437-438

<sup>5</sup> The Battie and Ors study is referred to in Dr Robb's first report at page 9

[87] He notes that Dr McBride accepts that “genetic factors are a major cause of the rate of degeneration of the spine, and this will also be true of Mr Drozdak”<sup>6</sup>.

[88] Dr McBride is of the view that the s 30 criteria are not satisfied.

[89] Referring to the “twin” studies, Dr Robb says that the twins coming from the same egg and sperm and thus described as “identical” therefore rule out variables that you cannot control, being external influences that may affect the result.

[90] Dr Robb also commented that when having recourse to studies, it is best to try to avoid self-reporting, which he describes as notoriously inaccurate. In respect of the literature review of whole body vibration by Bible and Ors published in *Spine*<sup>7</sup> in 2012. He notes that the authors found 700 citations which were then screened by three independent reviewers on the basis of predetermined inclusion and exclusion criteria.

[91] Only seven studies met the inclusion criteria for this particular systematic review.

[92] He notes that the seven studies that were included were clinical studies with imaging evaluation (radiographs, computer tomographic scans, and/or magnetic resonance images) and documented whole body vibration exposure.

[93] He notes that the Bible study refers to the Battie research and the two complement each other. Dr Robb also referred to the review article by *Feng and Ors – Genetic Factors in Intervertebral Disc Degeneration (Genes and Diseases)*<sup>8</sup>. He said that that genetics plays its part in disc degeneration and the Feng study showed that those who had inherited the Trp2 allele were related to a four-fold increase in annular tears in patients aged from 30 to 39 years, a 2.4-fold increase in disc degeneration defined by magnetic resonance imaging (MRI) and disc herniation in patients aged between 40 and 49. This review article also says:

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<sup>6</sup> Dr McBride’s brief of evidence, April 2021 at (13)

<sup>7</sup> *Spine*, volume 37 no. 21

<sup>8</sup> *Genetic Factors in Intervertebral Disc Degeneration (Genes and Diseases)* (2016) 3, 178-185)

It has been found that one fifth of Chinese population bear the Trp2 allele. However, the Trp2 association was not replicated in a German study of 250 patients.

[94] Dr Robb said that disc tears are common feature of age-related degeneration and by the time each of us reaches 40, some of us will have disc bulges.

[95] He next referred to the research article of *LG Macedo and Anor – The Association Between Occupational Loading and Spine Degeneration on Imaging – A Systematic Review and Meta Analysis – BMC Musculoskeletal Disorders*<sup>9</sup>, and to a second study by *Macedo and Ors – The Association Between Whole Body Vibration Exposure and Spine Degeneration on Imaging: A Systematic Review – Journal of Back And Musculoskeletal Rehabilitation*<sup>10</sup>. Under the heading “Conclusions” in the latter study is this:

There is moderate to low quality evidence suggesting no association between whole body vibration exposures with spine degeneration on imaging. The results of this study currently do not support assertion that motorised vehicle and whole body vibration exposure accelerates degeneration and causes structural damage to the spine.

### **Cross Examination by Mr Schmidt**

[96] Dr Robb was asked about the research paper of *Wahlstrom and Ors – Exposure to Whole Body Vibration and Hospitalisation due to Lumbar Disc Herniation*. Dr Robb said he rejected the study because in our case we are not dealing with disc herniation.

[97] Dr Robb acknowledged that the repeated loading of the back can undermine the disc. Dr Robb agreed that occupational loading was very common in the construction industry. Dr Robb said that at Tiwai Point workers were not allowed to lift more than 20 kilograms. He said that whole body vibration is not spinal loading.

[98] Dr Robb was referred to the video of the appellant driving the Hyster and agreed they were harsh driving conditions. However, he said “I’ve seen far worse”.

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<sup>9</sup> The Association Between Occupational Loading and Spine Degeneration on Imaging – A Systematic Review and Meta Analysis – BMC Musculoskeletal Disorders (2019) 20:489



He nevertheless accepted that the video showed a lot of vibration and specific shocks. As for the twin spine study, he said that the research is not perfect, but in his view it was “the best we have”.

[99] He agreed that the appellant’s driving had led to his pain and said what is important is for employers to have springs and smooth ground to avoid the bumping from hard rubber tyres.

[100] He was referred to the research of *Abdalkader, MRI Detected Disc Degenerative Changes in Athletes Participating in the Rio de Janeiro 2016 Summer Olympic Games*<sup>11</sup>. He agreed that young Olympic athletes in the study had higher than expected degeneration in their spines. Dr Robb said you can overtax the back in a variety of ways and he described the findings of this article as “quite scary”.

[101] Dr Robb described this as a point in time study that does not give any background on the athletes. Dr Robb described the Wahlstrom study of a cohort of 288,926 Swedish construction workers as “very flawed” and said that a lot of construction workers are doing heavy lifting and are not just subject to whole body vibration. He said, in considering the scientific literature, he does not just look at the study itself, but asks “are the findings relevant?” and he says that the Bradford Hill criteria have to be worked through with each study. With disc degeneration, did the job cause the degeneration? Or was it there before? Was it age-related degeneration?

[102] He said that that is why he likes twin studies, because they rule out a lot of the confounding factors. He acknowledged however that the information in the twin study and in all of the studies was incomplete.

[103] He was referred to the review of *Patterson and Ors – Deleterious Effects Of Whole-Body Vibration On The Spine: A Review Of In Vivo, Ex Vivo, and Invitro Models*<sup>12</sup>. Dr Robb acknowledged that this study of whole-body vibration in animals was a good starting point for how it was likely to apply to humans.

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<sup>10</sup> The Association Between Whole Body Vibration Exposure and Spine Degeneration on Imaging: A Systematic Review – Journal of Back And Musculoskeletal Rehabilitation 35 (2022) 691–700

<sup>11</sup> BMC Musculoskeletal Disorders (2020) 21:45

<sup>12</sup> Deleterious Effects Of Whole-Body Vibration On The Spine: A Review Of In Vivo, Ex Vivo, and Invitro Models (Animal Models and Experimental Medicine 2021; 4:77-86)

[104] In re-examination by Ms Douglass, the *Wahlstrom* study was referred to again. He referred to the many confounding factors associated with construction workers doing heavy lifting. He also referred to the fact that to be included in the study, disc herniation had to have occurred. Dr Robb said that this was not relevant to Mr Drozdak because he has no disc herniation. Whereas he said that the *Battie* study of identical twins was just looking at the effects of whole-body vibration and he said it was “excellent” at identifying that whole body vibration was not established as a cause of spinal changes.

### **Appellant’s submissions**

[105] Mr Schmidt acknowledged that his written submissions filed in this case obviously pre-dated the evidence of the two expert witnesses, Dr McBride and Dr Robb. He submits that the appellant has been involved with the driving of the Hyster vehicle for a long period of time under very poor driving conditions, over rough terrain on solid tyres with inadequate seat cushioning.

[106] He submits that experts agree that heavy occupational loading can cause spinal degeneration. There is agreement also that individual heavy lifting can cause disc damage. He acknowledges that while low level vibration comes with standard driving, the experts agree that ordinary driving does not lead to spinal degeneration. He notes that Dr McBride says that when driving, whole body vibration, shunts and shocks and swaying shocks occur to the spine and lumbar discs.

[107] He submits it is wrong to say that peer review literature is all one way or all the other way and he acknowledges there is obvious disagreement in the papers under review. He also notes that there is a tendency to “point score” by the experts.

[108] He submits that both Dr McBride and Dr Robb agree that all studies have limitation and benefits. In the twin study, there are only 45 participants and we do not know what their occupational loading and driving conditions were.

[109] He submits that the *Wahlstrom* study is convincing because of the great number (288,926) of participants. It focussed on disc herniation, which is the end stage of the injury process. However, the research was aimed at identifying the effect of whole body vibration and spinal loading.

[110] He notes that the authors openly acknowledged the limitations of the paper.

[111] He submits there is bias on both sides of the debate as to what can be relied upon.

[112] Turning to the research of Patterson and Ors involving experimentation with mice, pigs, sheep and rabbits, he acknowledges the limitations of the study, but submits it can assist in the study of the human spine. The study does suggest a relationship between whole body vibration and disc degeneration, but he acknowledges that the whole body vibration has to be significant.

[113] He says the video of the appellant driving the Hyster should be given as much weight as the peer reviewed literature.

[114] He acknowledges that both Dr McBride and Dr Robb are experts in their field and it is up to the Court to draw robust conclusions from the facts established in this case.

[115] Here he says the driving of the Hyster was at “the worst end of the scale” and it was undertaken for hours each week over many years.

[116] He notes that both Dr Robb and Dr McBride agree that the driving contributed to the appellant’s back pain. He submits that overall, the peer reviewed literature recognises a relationship between back pain and spinal degeneration. The evidence is of tissue damage, which results in the degradation of the disc.

[117] He refers to the article of *Luoma and Ors – Low Back Pain in Relation to Lumbar Disc Degeneration*<sup>13</sup>. The study found an increased risk of low back pain (including all types) was found in relation to all signs of disc degeneration.

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<sup>13</sup> Luoma and Ors – Low Back Pain in Relation to Lumbar Disc Degeneration (Spine, Volume 25, 4, 487-492)

[118] Mr Schmidt submitted that where there is proper disagreement by experts, there is more scope for the Judge to draw conclusions from the driving conditions experienced by the appellant.

### **Respondent's Submissions**

[119] Mrs Douglass referred to the appellant's diagnosis in 2018 following a ten year history of intermittent lower back pain. She noted the annular tear at L1/2 and L4/5. There was no disc herniation nor disc prolapse. She submits that an annular tear is reflective of the degenerative condition and not an injury as such.

[120] She accepts that the appellant's job worsened his pain and she notes that Dr McBride conceded that spinal degeneration occurs with or without pain.

[121] She notes that causation is the issue and the question is whether whole body vibration has caused or contributed to the spinal degeneration of the appellant.

[122] She accepts that the NZAS Health work site assessment of 9 May 2018 properly defines whole body vibration as follows:

Whole body vibration (WBV) is vibration transmitted to the whole body by the surface supporting it (ie. via a seat or floor). It is commonly experienced by drivers, operators and passengers in vehicles and machines when travelling over uneven surfaces.

The transmission of vibration to the body is dependent on body posture. The effects of vibration are complex. Exposure to WBV causes motions and forces within the body that may:

- Cause discomfort;
- Adversely affect performance;
- Cause health effect or aggravate pre-existing conditions.

Vibration arises from various mechanical sources with which humans have physical contact. Vibration energy can be passed on to operators from vehicles on rough roads; vibrating tools; vibrating machinery; or vibrating work platforms and may give rise to adverse health effects. It can be transmitted through the feet and legs, the hands and arms but most commonly through the buttocks while seated in a vehicle. The magnitude of the effect of vibration depends on the severity and length of exposures.

[123] Ms Douglass also accepts that whole body vibration is associated with working as a Hyster driver.

[124] She notes the video footage of the appellant driving the Hyster but says there is very little evidence as to the extent of exposure to whole body vibration. In that regard we are essentially relying on what was documented by Drs McBride and Robb.

[125] She notes that Dr McBride said that exposure was intermittent with “no discernible pattern”. She notes that Dr Robb goes further, saying the extent of exposure to whole body vibration is not relevant.

[126] She says the question is: Is the appellant’s exposure at the really severe end of whole body vibration, as Mr Schmidt submits?

[127] She notes that the appellant has been at the smelter from age 40 to 55 and at that age range there would be some spinal degeneration. The ultimate question though is whether the whole body vibration was a material/active cause, or did it contribute to an injury. She notes that aggravation of the appellant’s spine condition is accepted by the experts but it is not causative of injury.

[128] She refers to orthopaedic surgeon, Mr Hodgson’s reports. In the last of which, on 30 October 2018, he recommended that the appellant needs to look at the type of work he is doing because the work he is doing with the Hyster is causing increasing problems and will probably continue to do so.

[129] However Mr Hodgson concluded that the appellant does not require surgical intervention. She submits therefore that cover for the appellant is excluded under s 24, as his condition is as a result of the aging process.

[130] She says that the expert evidence calls for judicial evaluation. The experts are agreed that the appellant has mild multi-level degenerative disease in the lumbar spine and she says the history of the complainant is relevant in this regard.

[131] She says that Dr McBride mainly refers to cross-sectional studies which are of lesser value than cohort and case controlled studies.

[132] She notes that the *Macedo* study, referred to by Dr McBride, specifically excludes whole body vibration and therefore should be ignored.

[133] She says the systematic review of Bible and Ors on whole body vibration, where 700 citations were reduced to seven to meet the inclusion criteria for the systematic review results in the study being robust. She also places significant emphasis on the Battie twin study.

[134] Both of these studies conclude that whole body vibration does not damage the lumbar spine.

[135] Likewise she says that the study by *Wahlstrom and Ors* of 288,926 Swedish construction workers too has limitations because it was focused on the risk of hospitalisation due to lumbar disc herniation. In this regard she says that the appellant is in a different category.

[136] She refers to her written submissions and notes that a study by *Schneider and Ors – Occupations Associated with High Risk of Self-Reported Back Pain*<sup>14</sup>. The authors found that workers in sedentary to light jobs (publishing, translation, librarian occupations and communications occupations) were among the highest reporters of back pain, with a one year prevalence of over 70 per cent. Transport occupations reported 68 per cent prevalence.

[137] She refers to the case of *Van Essen v ACC*<sup>15</sup> where Judge Powell found that Ms Van Essen's work tasks as a commercial cleaner were not causally linked with her back condition.

[138] She submits that the animal study of Patterson and others referred to above has not been appraised by the experts and Dr Robb says that they are looking at back pain in animals and she submits that this does not assist in the assessment of back pain in a forklift driver.

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<sup>14</sup> Schneider and Ors – Occupations Associated with High Risk of Self-Reported Back Pain (2006)  
15 European Spine Journal 821

<sup>15</sup> *Van Essen v ACC* [2018] NZACC 27

[139] She accordingly submits that the appellant has not established that his work activity caused or contributed to an injury to his back and that therefore the appeal should be dismissed.

### **Appellant's Submissions in Reply**

[140] In his submissions in reply, Mr Schmidt sets out again the factors agreed in the joint expert report of 12 July 2022 with agreement that since about 2003 the appellant's job has involved considerable whole body vibration during the working day as the machine drives over rough ground and has very poor suspension on solid tyres. Both doctors agree that the whole body vibration is likely to have aggravated lumbar back pain.

[141] He refers to Judge Henare's decision in *Adams v ACC*<sup>16</sup> where Judge Henare noted that the twin spine study did not require the District Court to reject other epidemiological studies illustrating a relationship between specific work tasks and spinal degeneration.

[142] Reference is also made to *Nicol v ACC*<sup>17</sup> which involved a forklift driver seeking cover for cervical degenerative change and cervical disc prolapse. In that case the regular twisting of the neck to look backwards was thought to be a factor, but the significance of vibration, jarring and poor suspension was also discussed. The court found that the particular driving environment caused or contributed to a weakening in the appellant's cervical spine.

[143] Mr Schmidt submits that these two cases acknowledge the importance of focusing on the specific work environment that the appellant was exposed to.

[144] He refers again to the Wahlstrom study showing increased risk of hospitalisation due to lumbar disc herniation for workers exposed to medium to high whole body vibration.

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<sup>16</sup> *Adams v ACC* [2023] NZACC 13

<sup>17</sup> *Nicol v ACC* [2003] NZACC 159

[145] Mr Schmidt submits that these studies and common sense should be the basis for a finding that significant work related whole body vibration has contributed to the degeneration found in Mr Drozdak's lumbar spine and that the requirements of ss 30(2)(b)(i) and (ii) are satisfied. Therefore he submits the appeal should be allowed.

## **Decision**

[146] First I would like to acknowledge the work of doctors McBride and Robb and that of counsel in this case. Their efforts have appropriately identified and articulated the important medical and legal issues at issue, in a most professional way.

[147] The appellant Mr Drozdak commenced working as a Hyster driver at Tiwai Point Aluminium Smelter in about 2003. The Hyster is a type of forklift vehicle. It is shod with hard rubber tyres and his work therefore involves considerable whole body vibration during the working day as the machine drives over rough ground and has very poor suspension and solid rubber tyres.

[148] Both doctors agree that Mr Drozdak has a 10 year history of intermittent but worsening problems with low back pain. MRI investigation has revealed multi-level degenerative disease in the lumbar spine with a focal right sided lateral annular tear at L4/L5, mild central canal and right and left lateral recess narrowing and bilateral exit foraminal narrowing, but no mechanical nerve root compromise at L4/5. Both doctors agree that whole body vibration in Mr Drozdak's job is likely to have aggravated lumbar back pain.

[149] The appellant's employment history shows that between 1990 and 1995 he worked as a tree feller and then briefly as a logging trainer in 1996 and 1997. From 1999 to 2003 he worked as a fitter/welder. However, there is nothing before the court to suggest that he sustained any injury whilst working in those roles.

[150] His file includes a physiotherapy notes summary from Jo Wilson, Occupational Health Therapist, for New Zealand Aluminium Smelters.



[151] The entry for 14 January 2015 says this:

Lumbar spine – driving Hyster machine “03” causes him hip pain. A work order to replace the seat to increase suspension in the cabs or the seats, was completed two weeks previously. Treatment was aimed at increasing movement in the lower back, stretching the sciatic nerve and sacroiliac joints, “in the pelvis”.

[152] The notes include an estimated 30 per cent of the time reversing whilst driving the Hyster.

[153] On 6 May 2015 the physiotherapist wrote:

“First work restriction certificate” – as of 8/05/15, Tony to not drive Hyster 03 until cab mounts are repaired, and full task rotation is in place during the shift day (training permitting).

[154] On 14 May 2015 the physiotherapist noted a work restriction:

As of 14/05/15, Tony to not drive Hyster 03 until cab mounts are repaired, and a full task rotation is in place during the shift day.

[155] The note on 23 September 2015 said this:

Tony phoned to request a copy of his physiotherapy notes, and stated that the Hyster had been repaired, but as the machines age they develop a sideways shake. He has been offered a position in crew 3, line 3 where he will not be required to drive the Hyster at all.

[156] On 9 May 2018 a work site assessment was carried out by occupational therapist, Emily Hodgkinson.

[157] In her assessment she defined whole body vibration as mentioned earlier in this judgment.

[158] Under the heading “overview” she said:

Well designed seats are important to reduce exposure to vibration. Problems with seats can be rectified with good seat selection and regular maintenance and repair. Training needs to be given to ensure correct adjustment for the individual. Different sized operators need to be able to adjust the seat height and distance from the controls. However no seat will solve all the problems that lead to vibration exposure.

[159] She also noted that the Hysters do not seem to have a regular maintenance schedule for the Hyster's anti-vibration equipment such as the cab mounts and tyres. She proposed that the workshops were to come up with a regular maintenance schedule.

[160] The photographs that formed part of her assessment showed seating in the Hyster vehicles in poor condition. She also noted:

Epidemiological studies of long term exposure to WBV have shown evidence for risk to the lumbar spine and the neck and shoulder. Results of epidemiological studies also show a higher prevalence rate of low back pain, herniated disc and early degeneration of the spine in excessive WBV-exposed workers.

[161] In his ACC claimant cover questionnaire dated 10 September 2018, in response to the question "Was there any change in workload or workplace layout prior to the onset or worsening of symptoms?" the appellant has answered "Yes" and added:

Company replaced Hysters four newer models and three models give very bad vibration and shock loading to driver. Hysters originally had air tyres and NZAS changed tyres to solid rubber as required for hot metal area and hence far more vibration in the cab for driver. As machine aged – vibration has worsened.

[162] The appellant saw orthopaedic surgeon Mr Hodgson on 19 June 2018. In his report of that date Mr Hodgson noted:

He told me he came to talk to me about his problematic back, but particularly his hips. He said:

Sitting in the Hyster vehicle, but it is also particularly bad if he is having to stand and clean pots. He will get a general ache and discomfort down the back of both thighs particularly into his calves and almost to his feet. He does not have paresthesia or numbness.

...

Today I thought he looked well in himself. He is of average height and slimmish, strong looking build. He walked with a normal gait pattern and undressed with ease.

[163] On 24 July 2018 the appellant had an MRI scan that had the following findings:

On the sagittal scans there is slight loss of normal lordosis.

Vertical body heights are well preserved. Moderate disc space narrowing is seen at L1/2 with associated disc dehydration. Disc dehydration is also noted at all other levels apart from L5/S1. On the Coronal images no paraspinal or SI joint abnormalities seen.

On transverse scans:

L1/2 disc level there is mild background bulge and a small central protrusion with annular tear but no nerve root compromise.

L2/3 disc level appearances are satisfactory.

L3/4 disc level there is mild diffuse disc bulge but no nerve root compromise.

L4/5 disc level there is mild diffuse disc bulge and a focal right lateral annular tear. There is some moderate ligamentum flavum hypertrophy and small bilateral facet joint effusions. There is some mild central canal and right and left lateral recess narrowing and bilateral exit foraminal narrowing, but no mechanical nerve root compromise.

L5/S1 disc level appearances are satisfactory.

**Comment**

Mild multi-level disc changes as described.

[164] The appellant saw Mr Hodgson again on 24 July 2018 and the MRI scan was reviewed. Mr Hodgson noted:

This has shown a central bulge of the L4/5 disc with foraminal narrowing on the left and right sides, perhaps a little more on the right than the left. The rest of the lumbar discs look satisfactory on axial views.

He does have a degree of irritation of the right L4/5 region, probably coming from the central bulge at L4/5 disc.

...

He did show me a video today of his work in the Hyster and certainly he has severe torsional stress when driving this, being thrown around on the seat, even when wearing a seatbelt.

[165] Mr Hodgson saw the appellant again on 30 October 2018 and included in his report was this:

At this stage, I have told Anthony that he does not require any surgical intervention and that he is best to find alternative work. Clearly, the work he does with the Hyster is causing increasing problems and will probably continue to do so. Anthony is in a position where rather than doing something for his back such that he can work, he needs to look at the type of work he is doing.

[166] On 12 December 2018, Dr Robb carried out a medical case review. Dr Robb noted at paragraph 4:

Anthony's employment involves considerable whole body vibration most working days through the working shift and in my opinion, WBV in Anthony's job has contributed to his back pain. There is good epidemiological evidence that exposure to whole body vibration (WBV) from driving heavy machinery is a cause or aggravator of back pain, but overall no good evidence that WBV causes damage to the spine. It is likely that driving machinery in his job has contributed to aggravate back pain.

[167] On 17 December 2018, ACC wrote to the appellant declining his claim for cover. On 3 July 2019, Dr McBride completed a report on the appellant. His conclusion was as follows:

It is likely that the jolting that occurs when driving the Hysters has significantly contributed to the spinal degeneration from which Mr Drozdak suffers. The combination of rough terrain, seating with little cushioning, solid tyres and driving extended shifts, sometimes facing backwards would be very hard on the lower spine. The literature discussed above is consistent with this opinion, but the literature is less important than the specifics of the driving concerned. It is not surprising that other drivers have experienced similar lower back pain when working shifts on the Hyster.

[168] On 9 October 2019, principal clinical advisor and occupational physician, John Monigatti, completed a memorandum for ACC in which he considered the case. He considered the work activities of the appellant and also the scientific papers cited by Dr McBride and said:

In my opinion the characteristics that cause lumbar spine degeneration are not present to a material extent in Mr Drozdak's employment tasks or environment, although they are likely to provoke pain from such degeneration.

[169] He also said:

Nor is there any reason to conclude that Mr Drozdak works so differently from other Hyster drivers as to not be representative of that occupational group.

[170] Following the decision at review that the evidence does not establish that the appellant's work tasks caused him lumbar spine degeneration, Dr Robb completed a medical case review on 30 June 2021 in which he analysed a number of research papers and said, under the heading "Summary":

None of the journal articles referenced by Dr McBride support his conclusion that whole body vibration in Mr Drozdzak's as a Hyster driver was the cause of his lumbar spine degeneration.

In my opinion, the best epidemiological evidence available is that represented by the systematic literature review (including the five retrospective cohort and two cross-sectional studies) by Bible et al which was designed to examine objective imaging findings in the human spine that may result from exposure to WBV. It is noted that medical literature offers conflicting and confusing conclusions regarding WBV exposure. Although mixed results conclusions are reached in the seven studies included in the review, Bible stated that the majority of studies did not find an association or causal relationship between WBV and any imaging finding, more specifically one that would favour a particular spinal disorder or irreparable damage to the spine.

...

Dr McBride's report does not therefore alter the conclusions in my report of 12 December 2018 in which I found Mr Drozdzak's condition did not meet the criteria in s 30 of the Accident Compensation Act 2001 for cover for work related gradual process injury.

### **The Research Evidence**

[171] In the research article – *MRI Detected Spinal Disc Degenerative Changes in Athletes Participating in the Rio de Janeiro 2016 Olympic Games, by Abdalkader and Ors*<sup>18</sup>.

[172] 108 athletes out of 11,274 underwent spine MRI. The results were that degenerative disc disease amongst those athletes was 40 per cent. 58 per cent showed some degree of degeneration of the cervical spine discs, with athletics, boxing and swimming the sports most affected.

[173] The conclusion of the report was as follows:

Athletes who underwent spine MRI during the 2016 summer Olympic Games showed a high frequency of degenerative disc disease of cervical and lumbar spines. Recognition of these conditions is important to develop training techniques that may minimise the development of degenerative pathology of the spine.

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<sup>18</sup> MRI Detected Spinal Disc Degenerative Changes in Athletes Participating in the Rio de Janeiro 2016 Olympic Games, by Abdal Kader and Ors (BMC Musculoskeletal Disorders (2020 21:45))

[174] There were more comments under the heading “Conclusion” at the end of the study, as follows:

The clinical significance of our paper is demonstrating that Olympic athletes have higher rates of moderate to severe degenerative disc disease of the cervical and lumbar spine than non-athletes, which may expose them to higher risk of long term sequelae of early DDD (degenerative disc disease) such as pain, instability, and neurologic damage. Athletes and coaches should be aware of these results. Safe techniques and developing preventive strategies to protect the spine is of utmost importance.

[175] In the body of the research article, under the heading “Discussion” is this:

At the level of the lumbar spine, nearly 39 per cent of the lumbar discs demonstrated some degree of degeneration, with two thirds of them classified as mild and one third as moderate or severe degeneration. Although lumbar disc degeneration is a common imaging finding in a-symptomatic and symptomatic young individuals, our studies showed that Olympic athletes have higher prevalence of moderate to severe disc degeneration than non-athletes. Even with the wide variation related to sample sizes, different age ranges, different clinical presentation, and different criteria and classification of degenerative changes, our results are in accordance with several prior studies that showed the greater rate of these degenerative changes of the lumbar spine in athletes.

...

L4-5 and L5-S1 were the most commonly affected levels. Athletics are where the most common athletes affected by DDD (degenerative disc disease), followed by weight lifting and diving, respectively. The higher rate of degenerative changes in these sports is believed to be secondary to the repetitive, strenuous and intense training required by the athletes to compete in the Olympic Games. For instance, athletics are consistently exposed to considerable axial loading, flexion, and rotation that stresses the lumbar spine. Divers are also exposed to repetitive axial compression forces to the top of the head that may be transmitted caudally to the lumbar spine. Weight lifters sustain an increased axial loading across the entire thoracolumbar spine associated with an increased loading during the repetitive flexion and extension bending movements. (Two research papers referred to.)

Furthermore, our study showed that women athletes demonstrated a tendency for a higher rate of DDD (degenerative disc disorder) in the lumbar region in contrast of what is reported in non-athletes at the same age groups where young men were more susceptible to disc degeneration than young women (three research papers referred to). This is likely related to the excessive mechanical stress and physical injury sustained by young elite women athletes.

In contrast of what our study noticed in the cervical spine where the degenerative discs were more frequently noted in athletes above 30 years of age, nearly 40-50 per cent of the degenerative lumbar discs were noted at an earlier age (ie. less than 30). This may be due to the fact that the lumbar spine is the recipient of the heaviest biomechanical stress and is likely to be involved by a degenerative disease earlier than the cervical spine.

Our results should be interpreted with caution and in the context of the patient's clinical condition since more than one third of normal healthy subjects aged 21-30 years have degenerative discs in one study.

...

[176] This study was described by Dr Robb as “interesting but not relevant” in the summary of medical literature, with comments by Dr Robb, produced to the Court.

[177] I beg to differ. At very least, the study shows that amongst the athletes involved aged 21 to 30, there was a significant increase amongst the athletes compared with the normal population of degenerative lumbar discs – 40-50 per cent compared with more than one third in normal healthy subjects in the same age group.

[178] The difference in this instance is not massive, but I conclude that it is statistically significant, and it supports the broad proposition that repeated stresses to the lumbar spine may at least in part be causative of the higher incidence of degenerative lumbar discs amongst Olympic athletes.

[179] Dr McBride, in his evidence, said that the epidemiological evidence linking driving to back pain does logically lead to the conclusion that driving contributes to the degeneration of the spine and he refers to the paper “*Magnetic Resonance Imaging Analysis of Work Related Chronic Low Back Pain: Comparisons of Different Lumbar Disc Patterns*” by Jiang and Anor<sup>19</sup>. The conclusion of the study was that more severe degenerative changes of lower lumbar discs (L4/5 and L5/S1) such as a higher degree of degeneration of disc, lower disc height and significant displacement of disc, were found in patients with work related chronic low back pain based on MRI analysis.

[180] While this conclusion is logical, I consider it of limited value in determining the causative reasons for the disc degeneration.

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<sup>19</sup> Magnetic Resonance Imaging Analysis of Work Related Chronic Low Back Pain: Comparisons of Different Lumbar Disc Patterns” by Jiang and Anor in the Journal of Pain Research, 2018: 2687-2698

[181] A further study referred to by Dr McBride from Hoy and Ors entitled “*Whole Body Vibration and Posture as Risk Factors for Lower Back Pain Amongst Forklift Truck Drivers*”<sup>20</sup>. While this article concludes that whole body vibration acts associatively with other factors to precipitate low back pain, the issue remains as to whether it is causative of injury. It is acknowledged however, as the article says, that lower back pain is more prevalent amongst forklift drivers than non-driving workers. The article also concluded that driving postures in which the trunk is twisted or bent forward and/or the neck extended backwards, associate with greater risks of lower back pain.

[182] Also referred to by Dr McBride was an article by R Motmans – “*Reducing Whole Body Vibration in Forklift Drivers. Work 2012;41:2476-81*”.

[183] The article concluded that a combination of a new driving surface, limiting the maximum speed and the introduction of an air suspension seat reduced whole body vibrations. This study was helpful in identifying measures to be taken to reduce whole body vibration to help prevent back pain, but is of limited value in terms of causation.

[184] Counsel for the appellant included “*Prevalence of Musculoskeletal Pain Among Professional Drivers: A Systematic Review*” (*Journal of Occupational Health 2020: 62*)<sup>21</sup>. The review found that there was a high prevalence of musculoskeletal pain in professional drivers and low back pain was the most frequently reported body region, followed by neck, upper back, shoulder, knee, hip/thigh, wrist, ankle, and elbow. It concluded:

Musculoskeletal pain is complicated in nature and therefore in-depth exploration of causal relationships between musculoskeletal pain and risk factors is necessary so that appropriate healthcare programmes can be initiated to prevent and treat musculoskeletal pain effectively

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<sup>20</sup> Whole Body Vibration and Posture as Risk Factors for Lower Back Pain Amongst Forklift Truck Drivers (*Journal of Sound and Vibration*, 284 (2005) 933-946)

<sup>21</sup> Prevalence of Musculoskeletal Pain Among Professional Drivers: A Systematic Review (*Journal of Occupational Health 2020: 62*)



[185] The conclusion is unsurprising. However, in terms of whether whole body vibration in connection with forklift driving is causative of lumbar disc prolapse the review is of limited value.

[186] Next there is the article by *Mansfield and Anor* – “*Symptoms of Musculoskeletal Disorders in Stage Rally Drivers and Co-Drivers*”<sup>22</sup>. That study concluded that most stage rally drivers and co-drivers reported symptoms of musculoskeletal injury.

[187] The article concluded that most stage rally participants reported symptoms of musculoskeletal disorders, 70 per cent of all participants reported discomfort in the lumbar spine and 54 per cent of participants reported discomfort in the cervical spine. Also, the prevalence of musculoskeletal injury in rally drivers and co-drivers is greater than that reported for many industrial workers. The concluding comment was:

Future work should focus on identifying the extent of vibration exposure in motorsport.

[188] Dr Rudd comments that the results of this study are as might be expected, but the study population was not forklift drivers.

[189] The results are not surprising, given the nature of the sport. The study is relevant for our purposes because the nature of stage rally driving includes whole body vibration with periodic “shock” impacts that take it beyond the ordinary realm of driving.

[190] The appellant also introduced to the Court three animal studies. The first was “*The Whole Body Vibration of Mice Induces Progressive Degeneration of Intervertebral Discs ... etc*” reported in *Osteoarthritis and Cartilage*<sup>23</sup> which exposed mice to four or eight weeks of whole body vibration and the study concluded that whole body vibration induced intervertebral disc degeneration was not reversed following cessation of vibration.

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<sup>22</sup> Symptoms of Musculoskeletal Disorders in Stage Rally Drivers and Co-Drivers from BJSportmed.com: 2001; 35: 314-320

<sup>23</sup> The Whole Body Vibration of Mice Induces Progressive Degeneration of Intervertebral Discs ... etc” reported in *Osteoarthritis and Cartilage* 25 (2017) 779-789, authored by McCann and Ors

[191] A further study by *Patterson and Ors* – “*Deleterious Effects Of Whole-Body Vibration On The Spine: A Review Of In Vivo, Ex Vivo, and Invitro Models*”<sup>24</sup> concluded that in quadrupeds, there was reduced vertebrae density and inflammation and degeneration of the intervertebral discs. The article noted that anatomical comparisons of the human spine with the rat, sheep and pig spine, have found that the lumbar region of the spine is similar enough for these species to be suitable models for the human spine. It found that the invertebral spine in particular undergoes mechanical change and reduced protein synthesis following whole body vibration.

[192] A further animal study by *Wade and Ors* “*Vibration Really Does Disrupt the Disc*”<sup>25</sup> concluded that in sheep vibration loading causes delamination and disruption of the inner and mid annular layers and limited diffuse tracking of nucleus material. The authors concluded that these subtle levels of disruption could play a significant role in initiating the degenerative cascade via micro level disruption, leading to cell death and altered nutrient pathways.

[193] The respondent’s criticism of those studies centres on their clinical relevance being studies on animals.

[194] Dr Robb referred to a research study by *Bible and Ors*<sup>26</sup>. This was a literature review of 700 citations, of which only seven met the inclusion study criteria for this systematic review. Its conclusion was that no causality can be shown between whole body vibration and normal spinal imaging findings and that with the conflicting data available in the literature, whole body vibration has not been established as a cause for objective spinal pathology changes on a scientific basis.

[195] One of the studies by *Bible and Ors* was that of *Battie and Ors* – “*Occupational Driving and Lumbar Disc Degeneration: A Case Control Study*”<sup>27</sup>. This was a study of 45 male monozygotic twin pairs. The authors contacted pairs who seemed to have very different exposures to occupational driving, or one of the other exposures of interest (occupational materials handling, sedentary work, or regular exercise).

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<sup>24</sup> Deleterious Effects Of Whole-Body Vibration On The Spine: A Review Of In Vivo, Ex Vivo, and Invitro Models (Animal Models and Experimental Medicine 2021; 4:77-86)

<sup>25</sup> “Vibration Really Does Disrupt the Disc” published in Spine Volume 41, No 15, 1185-1198

<sup>26</sup> Spine, Volume 37, number 21, 1348-1355

[196] The study found that occupational drivers and their co-twins reported similar amounts of low back pain. It found that driving exposure was not associated with accelerated lumbar degeneration or structural abnormalities as measured through disc signal intensity, annular tears, disc bulging, disc herniations, disc height, in place irregularities and schmorl's nodes or osteophytes.

[197] The authors noted:

Because of the high degree of control of extraneous and possible confounding factors and co-twin similarities in degenerative disc findings, this model is very efficient for detecting even small effect. Disc degeneration may be largely determined by genetic factors, further strengthening use of a case control study designed with monozygotic twin pairs with differing exposures to occupational driving.

[198] Given the degree of control of extraneous and possible confounding factors in the study, even though the cohort was relatively small at 45 male pairs, I conclude that this research is of high quality and is strong evidence that exposure to whole body vibration via driving is not a causal factor of disc degeneration.

[199] It needs to be said, however, that this study appears to have centred on "ordinary" motorised vehicles, including trucks, buses and cars.

[200] The authors acknowledged:

Furthermore, we did not have precise measurements of whole body vibration exposure. Such precision is not feasible when studying lifetime effects because of variations in vehicle models and the effects of maintenance and road conditions, amongst other factors, that typically vary over lifetime work histories. Elsewhere in the study it is noted that one driver changed from driving trucks to driving busses.

[201] The conclusion to be drawn from this study is that occupational drivers of trucks and buses and other road vehicles, notwithstanding long confined postures and whole body vibration are not exposed to higher rates of back related symptoms.

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<sup>27</sup> Occupational Driving and Lumbar Disc Degeneration: A Case Control Study" (The Lancet, Volume 360, 2 November 2002)

[202] Under the heading “Interpretations”, the authors went on to say:

Our inability to identify structural damage should be encouraging to those employed in occupations involving motorised vehicles and operation of heavy equipment.

[203] I conclude that this case control study is an important one and provides strong support for the proposition that in the ordinary course, driving motorised vehicles in an occupational setting on roads and subject to whole body vibration does not damage spinal discs.

[204] However, I do not see the study as providing definitive conclusions when consideration is given to the type of driving of the Hyster vehicle that the appellant was involved in.

[205] Dr Robb also referred to *Drerup and Ors – “Assessment of Disc Injury in Subjects Exposed to Long Term Whole Body Vibration” (European Spine Journal 1999: 458-467)*<sup>28</sup>.

[206] In this study, a cohort of 20 operators of heavy earth moving machinery was selected for investigation. The results of the stadiometric investigations revealed no significant difference from an age-matched cohort of healthy persons.

[207] Under the heading “Conclusions” is this:

It has been presumed that long-time exposure to whole body vibration could damage the intervertebral discs. Previously, however, this presumption could not be proven, since quantitative and objective evidence of injuries was lacking. For the first time, a combined stadiometric, MRI and QCT examination has been performed in subjects who have been exposed to long term whole body vibration and who showed clinical symptoms suggested of disc injuries due to vibration exposure. The results of stadiometric investigations reveal no significant difference from an age matched cohort of healthy persons. Despite radiological findings in isolated discs, the investigated parameters provide no evidence of lumbar discs of subjects exposed to long term whole body vibration differ on average from those of non-exposed subjects with respect to average water content, disc height and viscoelastic behaviour .

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<sup>28</sup> *Drerup and Ors – “Assessment of Disc Injury in Subjects Exposed to Long Term Whole Body Vibration” (European Spine Journal 1999: 458-467)*

[208] Dr Robb also refers to a brief article by *Talmage* “*Commentary: the Spine and Vibration: Whole Lotta Shaking Going On*”<sup>29</sup>.

[209] In his commentary he says:

With the Google search showing over one million sites discussing vibration and back pain, using vibration platforms to treat back pain patients without Food and Drug Administration device approval is yet another example of technology being introduced before the basic science and clinical studies have provided the evidence of safety and effectiveness to justify the treatment. Holguin et al are to be commended for helping provide the evidence.

For the time being, as evidence of the therapeutic benefit accumulates, it is at least time for physicians to stop attributing back pain in workers to vibration exposure on the job.

[210] So, consistent with the spectrum of views of the effect of whole body vibration on the spine, this commentary endorses its therapeutic benefits.

[211] A study that Dr McBride placed significant reliance upon, and on which Drs Robb and Monigatti also commented is that of *Wahlstrom and Ors - Exposure to Whole Body Vibration and Hospitalisation due to Lumbar Disc Herniation*<sup>30</sup>.

[212] That was a cohort study of 288,926 Swedish construction workers who participated in a national occupational health surveillance programme from 1971 until 1992. The aim of the study was to examine if exposure to whole body vibration increases the risk of hospitalisation due to lumbar disc herniation.

[213] The conclusion of the study was that it supported that occupational exposure to whole body vibration increases the risks of hospitalisation for lumbar disc herniation.

[214] Dr Robb is critical of it in that the methodology is poor in defining workplace factors undertaken by the construction workers and that conclusions as to causation cannot be drawn from these results.

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<sup>29</sup> *Commentary: the Spine and Vibration: Whole Lotta Shaking Going On* - The Spine Journal 2013, 437-438

<sup>30</sup> *Exposure to Whole Body Vibration and Hospitalisation due to Lumbar Disc Herniation* (International Archives of Occupational and Environmental Health (2018) 91: 689-694)

## Conclusions from the Research

[215] At first sight, the research looks confusing and contradictory. At one end of the research is the proposition that whole body vibration is therapeutic and at the other end of the scale is that it is damaging and causes injury to the body. What I draw from the studies is that ordinarily, whole body vibration does not damage the lumbar spine. However, as far as I can discern, the Battie study on twin pairs appeared to be dealing with “ordinary” occupational driving of cars, buses and trucks.

[216] The study done on the athletes at the summer Olympic Games in 2016 showed a significantly higher degree of lumbar disc degeneration than in the normal population. Athletics, boxing and swimming were the sports most affected by the degenerative disc disorder and the example was given of divers exposed to repetitive actual compression forces on the top of the head that may be transmitted caudally to the lumbar spine.

[217] It is noted that whole body vibration was not a factor in this study, rather the excessive loadings on athletes spines from their intense training regime.

[218] Next there is the article by *Mansfield and another* regarding stage rally drivers and co-drivers which concluded that most of this cohort reported symptoms of musculoskeletal injury.

[219] The conclusion drawn from this exhaustive analysis is that something over and beyond “normal” whole body vibration encountered in “ordinary” occupational driving activities is required to cause disc degeneration.

[220] This is where the focus then returns squarely to the work activities of Mr Drozdak.

[221] I think it reasonable to infer that the manufacturers of the Hyster vehicles fitted them with pneumatic tyres deliberately. It is obvious that the manufacturers were cognisant of the need to keep the driver free from discomfort and the photographs before the court of the driver’s seat show that (at least when it was new) the seat was

very well sprung to add comfort and reduce discomfort to the driver. However, the seat has degraded and the Hyster now runs on solid tyres. Also, the video showed the very rough and uneven surface that the vehicle was obliged to travel over at times.

[222] The video showed the driver being shaken and jolted quite violently.

[223] These conditions for driving the Hyster vehicle at the appellant's place of work are therefore markedly different from those experienced on a daily basis by occupational drivers and more akin to that of stage rally drivers.

[224] Mr Drozdak, it seems, first sought physiotherapy for low back pain/hip pain that the appellant had been experiencing for some two years as at 2015. The driving of the Hyster was plainly suspected as a source of his back problems and there is a physiotherapy note that he not drive the Hyster until the cab mounts are repaired.

[225] The MRI of his lumbar spine on 27 July 2018 identified an annular tear at L1/2 and disc bulges at L3/4 and L4/5.

[226] Orthopaedic surgeon, Mr Hodgson, in his report of 24 July 2018, noted:

He has severe torsional stress when driving this (the Hyster), being thrown around on the seat, even when wearing a seatbelt.

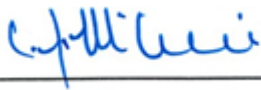
[227] For the foregoing reasons therefore, I find in this case, in the set of work circumstances relating to Mr Drozdak, he was, for the purposes of s30 (2) (a)(i) performing an employment task that had the particular characteristics, namely frequent higher than normal whole body vibration and violent jolts.

[228] I find that it is more probable than not that this work activity of driving the Hyster caused or contributed to the state of his lumbar spine as shown on the MRI scan of 24 July 2018. In other words his driving of the Hyster caused or contributed to the cause of the personal injury to his lumbar spine being the annular tear at L1/2 and disc bulges at L3/4 and L 4/5.

[229] I also find, for the same reasons, that for the purposes s 30 (2) (c) the risk of suffering personal injury was significantly greater for persons who performed his employment task than for those who did not.

[230] Accordingly, the appeal is allowed and the Respondent's decision of 17 December 2018 declining cover for lumbar disc prolapse as a work related gradual process injury is reversed.

[231] Costs are reserved.



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CJ McGuire  
District Court Judge

Solicitors: Schmidt and Peart Law, Auckland  
Alison Jane Douglass, Barrister, Dunedin