CHASNZ
WORK SHOULD NOT HURT

PainPal Literature Review & Evidence Base

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By Stephven Kolose and Chris Polaczuk
Work Should Not Hurt
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EXECUTIVE SUMMARY

PURPOSE

This report sets out the evidence base for PainPal, which is a purpose-built AI self-management tool designed to address the gap between the onset of musculoskeletal pain and formal clinical intervention. It draws on ACC claim data, international MSD research, established early intervention literature, and PainPal's own governance architecture to answer the question workers, employers, and procurement teams will ask is: why does this tool exist, and does it work?

WHAT WE REVIEWED

Published evidence on musculoskeletal disorder prevalence, cost, and intervention effectiveness was reviewed alongside ACC scaffolding sector claim data (2015–2025), presenteeism research, and occupational pain science literature. PainPal's design, safety architecture, and governance model were then assessed against this evidence base. A separate compliance assessment (CHASNZ, 2026) evaluating PainPal against seventeen international standards for information security, privacy, AI governance, and clinical safety was also drawn upon to substantiate governance claims made in this report.

WHAT THE EVIDENCE SHOWS

The case for early intervention is unambiguous. MSDs account for over 40% of all work-related ACC claims in New Zealand, and claim durations are worsening. Across all construction, the average MSD claim (strains/sprains, gradual process, and soft tissue injuries) results in 32 days off work, with 220,726 such claims recorded between 2015 and 2025 (CHASNZ Injuries & Days Lost dashboard). In high-exposure trades such as scaffolding, shoulder-specific claims average 91 days. A single MSD claim costs the worker approximately $3,030 (at an average ACC claim cost of approximately $1,668) and the business approximately $19,300 in direct costs. Presenteeism losses add a further layer that never appears in incident data. The strongest predictor of a claim becoming long-term is the delay between onset and first action, yet the current system offers workers nothing practical during that window. Generic AI platforms are already filling this gap by default, without occupational health calibration, red-flag detection, or human oversight.

WHAT PAINPAL DOES ABOUT IT

PainPal addresses the self-management gap directly. It provides confidential, evidence-based guidance at the point of need, screens every conversation against a deterministic Negative Constraint List for serious red flags, escalates to qualified Super Users within 24 hours, and operates under independent governance through the Independent Advisors Panel. **It is not a medical device, as confirmed by formal legal review.** It can be deployed at scale without device certification. Early testing data shows the safety architecture performing as designed, with approximately 190 early users generating only three red-flag lockouts, all assessed as appropriate. For a 50-worker operation, the conservative Return on Investment is 20:1, with annual net savings of $29,660–$49,100 against a subscription cost of approximately $1,500. The financial, operational, and workforce retention case for deployment is documented in this report with assumptions provided.

1. BACKGROUND

Industry has developed effective controls for acute hazards such as working at heights, moving plant, chemical exposure. Each has established frameworks, reporting lines, and proven controls. However, when it comes to the progressive burden of musculoskeletal pain, industry continues to fall short. This pattern is consistent across construction, manufacturing, agriculture, forestry, retail, and logistics.

The scale is considerable. Musculoskeletal disorders affect an estimated 1.71 billion people globally and account for roughly one-third of all work-related injuries (GBD 2019 Musculoskeletal Disorders Collaborators, 2020). Back pain alone is the leading cause of working years lost to disability worldwide. These figures have barely shifted in twenty years, not because the science is lacking, but because there has been no scalable way to deliver early support directly to the worker.

Three significant barriers stand between a worker and the support they need. Typically, workers first delay (they endure discomfort for weeks before reporting). Second, when they do seek guidance, what is available is either a generic brochure that does not speak to their job, or a clinical pathway that is disproportionate for a sore shoulder at week two. Third, the culture around them (e.g., production targets, crew dynamics, the unspoken expectation to push through) actively discourages early action.

This report draws on ACC data, international MSD research, and established early intervention literature to set out the evidence base for PainPal, a new tool designed to address self-management of musculoskeletal injuries in the workplace.

PainPal by BetterWorx Ltd is designed to address all three barriers. It is private, immediate, and targeted for industry. Workers use it before the problem becomes a claim.

1.1 THE COST OF INACTION

The evidence for early intervention is unambiguous. The ACC data confirms it. The question is why the sector continues to wait until it is too late? The following data from the construction sector illustrates the scale of the problem.

1.2 NEW ZEALAND ACC SCAFFOLDING SECTOR DATA

1. **56 to 91 days** average days off work per shoulder claim this is a 63% increase from 2015 to 2025
2. **+83%** total days lost to scaffolding shoulder injuries over the last decade
3. **10,248 days** lost in 2025 alone from a single injury type, in a single trade
4. **118,500 worker** shortfalls already facing the construction sector (Te Waihanga, 2022)

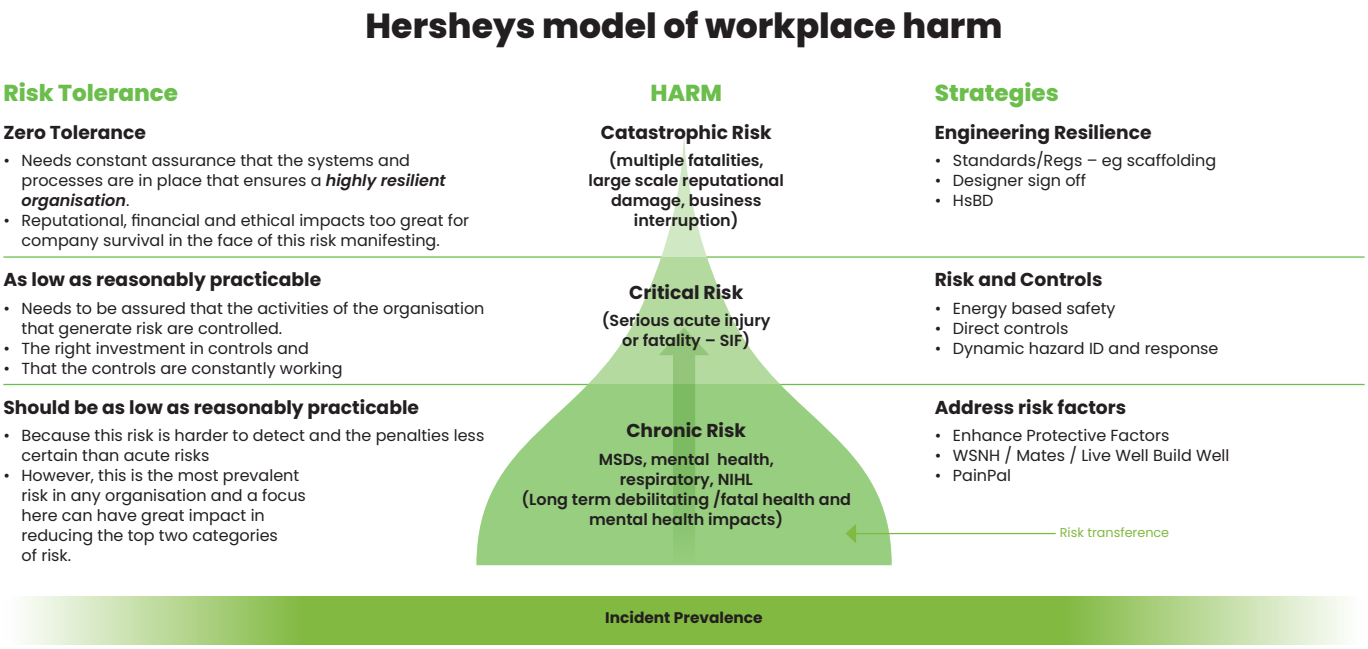


Figure 1. CHASNZ Herseys model of workplace harm including risk tollerance and strategies

Removing a skilled scaffolder from site for three months in that environment does not simply mean covering wages. It means redistributing a heavy physical workload to potentially less experienced crew, which increases secondary injury risk. It means project delays. It means depleting the replacement labour budget. And it results from a shoulder injury that was manageable at week two being left to deteriorate until week eight. The earlier it is detected, the better the outcome.

Across New Zealand, ACC reports that musculoskeletal injuries account for over 40% of all work-related claims annually, with average claim durations rising year on year (Accident Compensation Corporation, 2023). However, claim statistics tell only part of the story. Workers who remain on-site while managing pain and operating at 20 to 40% reduced output cost businesses significantly more than absences, and that productivity loss rarely appears in an incident report (Schultz & Edington, 2007). The delay between the first symptom and taking action is one of the strongest predictors of a long, expensive, career-damaging outcome (Loisel et al., 2001).

1.3 THE INJURY TIMELINE

A musculoskeletal claim does not begin the day the paperwork reaches a manager's desk. It begins weeks or months earlier (Figure 2) when a minor discomfort is ignored, it becomes a sore back that seems to clear up overnight, then somehow morphs into a shoulder ache that gets dismissed as normal wear and tear.

Figure 2. The preventable transition from minor discomfort to a long-duration injury occurs when workers lack access to real-time, practical guidance.

At that early-stage, the worker continues their day job. Same tasks, same loads, same positions. No guidance. No modification. By the time they report it, what started as a manageable early-stage complaint has become a clinical injury with a months-long recovery trajectory (Melloh et al., 2009).

Consider two examples. A forestry worker pushes through shoulder pain for two months, assuming it will resolve. When he finally gets scanned, there is a partial-thickness rotator cuff tear requiring surgical management and a recovery period that removes him from work entirely. A warehouse picker has lower back fatigue every afternoon for six weeks. It never feels severe enough to report. Then one morning the overnight recovery has not occurred, the pain is constant, and he is off work within a fortnight.

These are not instances of bad luck. They are the predictable consequence of a system that offers workers nowhere practical to go with early pain. **PainPal is designed to fill that gap.**

1.4 THE MULTIFACTORIAL NATURE OF MSDS

A single heavy lift does not cause a back injury. A single demanding shift does not cause a shoulder injury. MSDs develop over time through accumulated load, incomplete recovery, prior injuries that never fully resolved, and a psychosocial environment that can either moderate or amplify the progression (National Academies of Sciences, Engineering, and Medicine, 2001). MSD injuries result from multiple contributory factors (Figure 3) consisting of Organisational, Physical, Individual, and Psychosocial factors.

Many people know about organisational, physical, and individual factors, but the psychosocial contribution is larger than most workplaces acknowledge. Job pressure, low control over work, and inadequate management support are not peripheral health and safety concerns. Research consistently identifies psychosocial stressors as among the strongest predictors of a pain problem becoming a long-term disability (Linton, 2000). A worker who is stressed, sleep-deprived, and working under tight deadlines carries a materially different risk profile on a Tuesday morning than they did on a relaxed Friday afternoon the week before. Pain science supports this. Pain is the nervous system's threat response, not a direct readout of tissue damage (Moseley & Butler, 2015). A worker's psychological state directly influences how much pain they experience and how rapidly they recover.

Generic manual handling training delivered at induction does not help the worker making a real-time decision about whether to report a sore shoulder or continue working. PainPal does, because it responds to what is happening now, not what was covered at a toolbox talk six months ago.

1.5 THE SELF-MANAGEMENT GAP

Between the moment a worker first feels pain and the moment they enter a formal system (e.g., physiotherapy referral, ACC claim, or medical certificate) there is a gap. A substantial one. No real-time guidance on self-management. No practical advice on task modification. No tool to help them determine whether what they are feeling is serious or manageable.

This gap (Figure 4) is where the preventable cost of MSDs is generated. It is where minor complaints escalate into clinical injuries. It is where workers develop ingrained avoidance behaviours (e.g., guarding, compensating, or ceasing movement altogether) that research consistently shows lead to worse long-term outcomes (Melloh et al., 2009; Nicholas et al., 2011).

Current systems are not designed for this space. Incident-reporting frameworks are built for events that have already occurred. Passive ergonomic controls such as improved handle design, anti-fatigue matting, and task rotation reduce exposure at the systems level but do not support individual workers making decisions in real-time. Clinical pathways activate too late and cost too much for early-stage presentations. And the prevailing culture across construction, manufacturing, logistics, and agriculture previously discouraged workers from raising problems while they are still small.

WHAT CONTRIBUTES TO STRAINS AND SPRAINS IN BUILDING?

ORGANISATIONAL FACTORS

Work hours: Working longer days can be counterproductive as it can make you fatigued and cuts into the all-important work-life balance. Keeping work hours manageable and building in time to plan, organise and tidy your site will be more productive in the long run.

Lack of help: Building projects often take place with the minimal amount of workers and depends on a small team to complete everything. Getting more workers in when needed can significantly reduce risk of sprains and strains.

No breaks: Taking short breaks throughout the day and a longer break to eat, rehydrate and rest in the middle of the day helps maintain a good rate of productivity and reduce risk of sprains and strains. Longer holiday breaks, where workers can completely rest, are essential for good mental health.

Work planning: Many sprain and strain risks can be addressed at the planning stage of a projectConsider MSDs prevention during your ongoing planning and review each day. Use the factors in this model to guide your planning.

PHYSICAL FACTORS

Site layout: Having a well-organised site is more than just good housekeeping, it will involve planned clear access and storage for different stages of the build. Setting up work areas to get tools and tasks off the ground and space to use handling equipment also require consideration

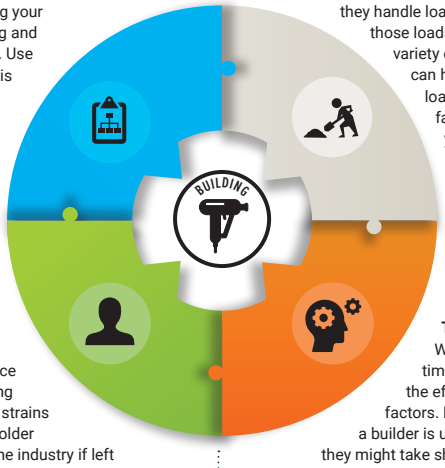
Loads: Builders are prone to back and shoulder sprains and strains because of the way they handle loads and how heavy those loads are. There's a variety of equipment that can help with moving loads, but you need to factor their cost into your overall project costs.

Repetition: You need to identify repetitive tasks and minimise their risk through planning, changing up postures or tasks and factoring in sufficient rest breaks.

Environment: Weather and site conditions can increase the risk of sprains and strains in a number of ways including:

- increasing fatigue in hot weather
- dehydration in hot weather
- slips trips and falls when it's rainy.

Building sites also pose their own risks depending on how you access them, building design and layout.



INDIVIDUAL FACTORS

Fitness and recovery: A long, injury free career in building requires a commitment to keeping fit and flexible outside of work hours. Builders need to learn the importance of rest and recovery as well as develop strategies and habits to integrate this into their life outside of work.

Lifestyle: A good diet, staying hydrated and not smoking can go a long way to minimizing the risk of sprains and strains.

Age and gender: The building workforce in general is aging and sprains and strains can force these older workers out of the industry if left unmanaged. Plus, focusing on sprain and strain prevention will help promote and increase women's participation in the industry.

PSYCHOSOCIAL FACTORS

Time pressure: Working under a time crunch magnifies the effects of other risk factors. For example, when a builder is under time pressure, they might take short cuts, ignore good technique or not take adequate rest breaks.

Communication and relationships: By managing client expectations, working and planning together as a team and having an open approach to making work easier for everyone on site, you can avoid many of the risks linked with sprains and strains. As a manager, it's important to lead by example and show that sprains and strains are an important concern at work.

Stress and tension: Stress can create muscle tension and effect your ability to recover and rest. Remember that good mental health, including finding ways to minimise or deal with stress, goes hand-in-hand with good physical health.

Figure 3. MSD risk increases as multiple physical, behavioural, and psychosocial factors accumulate. At BetterWorx these are framed as Contributory Factors (CHASNZ, n.d.).

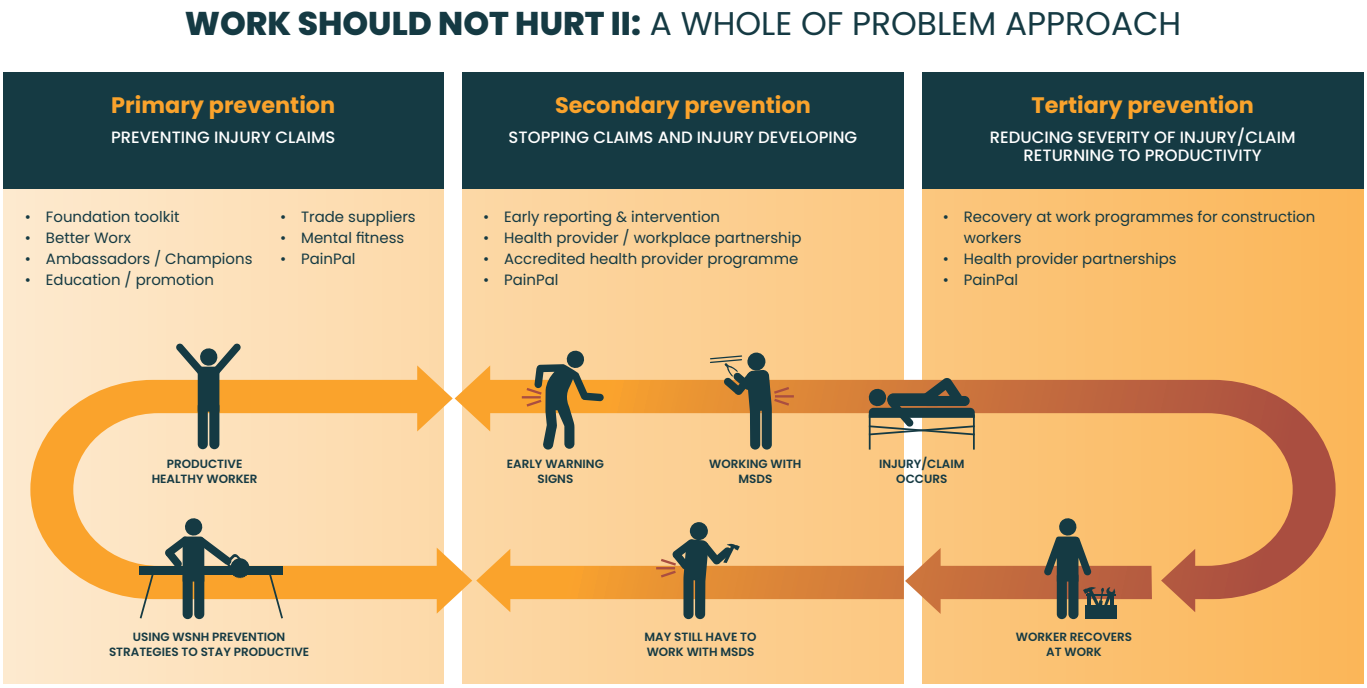


Figure 4. A whole of problem approach. Self management tools such as PainPal can be used in all stages.

2. PAINPAL BY BETTERWORX

PainPal is a purpose-built AI self-management tool for workers in physically demanding roles. It provides practical, evidence-based guidance on managing pain at the early-stage before it escalates, before it enters the formal system, before it becomes a claim (Figure 5).

Workers engage with it privately on their phones or laptops. The conversation is completely confidential: no employer access, no judgement, no paperwork trigger. PainPal asks what they are feeling, where, for how long, and what makes it better or worse. It provides specific, job-relevant guidance on how to modify their work, what self-management strategies will help, and when the appropriate course of action is to seek professional support.

PainPal was built from the ground up by CHASNZ/ BetterWorx, an organisation with deep, practical knowledge of what demanding work looks like across construction, and applicable to many settings across manufacturing, agriculture, forestry, retail, and logistics. Every piece of guidance in PainPal reflects real occupational context and has been reviewed against accepted ergonomics and pain science evidence.

Figure 5. PainPal provides real-time, on-demand support directly to workers at the point of need.

PainPal is not a medical device. A formal legal review conducted by Hudson Gavin Martin (August 2025) assessed PainPal against the relevant New Zealand legislation and confirmed it does not meet the definition of a medical device under the Medicines Act 1981. PainPal does not diagnose, prescribe, or treat. It provides self-management guidance, ergonomics-based advice, and encouragement to continue working. The Australian Therapeutic Goods Administration's position on general health and wellness software, which exempts such tools from device regulation, supports this classification. This legal standing means PainPal can be deployed at scale without the regulatory burden of medical device certification, while still operating under a robust safety and governance framework.

Critically, there is a qualified expert behind the platform. When a worker's situation calls for more than AI self-management can safely provide, a human expert is accessible through the system. These experts have extensive experience in workplace ergonomics, rehabilitation, and occupational health research. The 'human-in-the-loop' is not a fallback but is a core design feature.

2.1 PAINPAL VS GENERIC AI AND WHY THESE MATTER

Workers are already using ChatGPT, Gemini, Grok, Co-Pilot and similar platforms when they have a health question. This is occurring on every site, in every warehouse, in every manufacturing plant across the country. It is their choice, but it represents a significant unmanaged risk.

2.1.1 LIMITATIONS OF GENERIC AI

General-purpose AI platforms are capable tools. They were not built for occupational health guidance, and their architecture reflects this. The core problem is hallucination, which is generating advice that sounds authoritative but is factually incorrect or dangerously inappropriate for the situation. The World Health Organization has explicitly flagged this risk in AI-generated health content (WHO, 2024), and published research confirms it applies to musculoskeletal and clinical questions specifically (Thirunavukarasu et al., 2023; Ayers et al., 2023).

In a health context, a confidently incorrect answer is not a minor inconvenience. It can instruct a worker to continue loading a shoulder that has a partial tear. While not the intended use of these tools, this reflects a lack of occupational health calibration rather than a failure of the underlying technology. It can dismiss symptoms that are red flags for something serious. It can advise rest when graduated activity is what the evidence supports. To the best of the authors' knowledge, none of those major platforms have been calibrated to recognise severe physical warning signs in a worker's description (Table 1). Few have emergency escalation built in. A worker describing severe nerve damage symptoms, loss of grip strength, or numbness down the arm may receive generic advice about stretching.

2.1.2 PAINPAL'S SAFETY ARCHITECTURE

PainPal is not a language model with a health-themed prompt. It is a governed system (Figure 7), built on a formally curated knowledge base with every piece of guidance reviewed, validated, and maintained by professionals who understand occupational health, ergonomics, and what works in the workplace. The safety architecture is deterministic, not probabilistic.

The moderation process operates as follows:

1. Negative Constraint List (NCL). PainPal continuously screens every conversation against a set of physical and psychological red-flag criteria: suspected fracture, unremitting night pain, severe nerve damage symptoms, and indicators of psychological crisis. These are not probability-based; they are caught by a hard-coded screening layer that runs on every single input.
2. Static signposting. When a red flag is detected, AI coaching stops immediately. The worker is shown a pre-approved, static message directing them to the appropriate service:111 for physical emergencies, 1737 for mental health crisis. This message cannot be overridden, and the AI cannot resume coaching until the situation has been reviewed.
3. 24-hour Super User review. Every red-flag trigger sends an internal alert to designated Super Users are qualified professionals who operate under a formal service level agreement to review the trigger within 24 hours. This is not a passive audit log. It is an active safety net with accountability behind it. Early deployment data supports this architecture: approximately 190 users generated only three red-flag lockouts across all conversations, and in all three cases PainPal's screening was assessed as appropriate by the reviewing Super User.

4. Independent Advisory Panel (IAP). Clinical experts, digital health specialists, and privacy professionals sit on an IAP that independently reviews anonymised audit logs on a regular cycle. This is the governance layer that maintains system accountability over time, not just at launch.

This safety architecture aligns with international standards for AI governance. A separate compliance assessment (CHASNZ, 2026) evaluated PainPal against seventeen international standards across four governance pillars: information security and cybersecurity, privacy and legal compliance, AI governance and trustworthy AI, and clinical and health sector governance. PainPal's Negative Constraint List, Super User oversight, and IAP governance were found to substantially address the requirements of ISO/IEC 42001 (AI management systems), ISO/IEC 24028 (trustworthiness in AI), and ISO/IEC 23894 (AI risk management). No generic AI platform currently operating in the health advice space offers an equivalent governance structure.

Of seventeen standards reviewed, nine demonstrated substantial operational alignment with formal documentation in progress. The compliance gap identified was primarily one of documentation and formalisation, not missing capability.

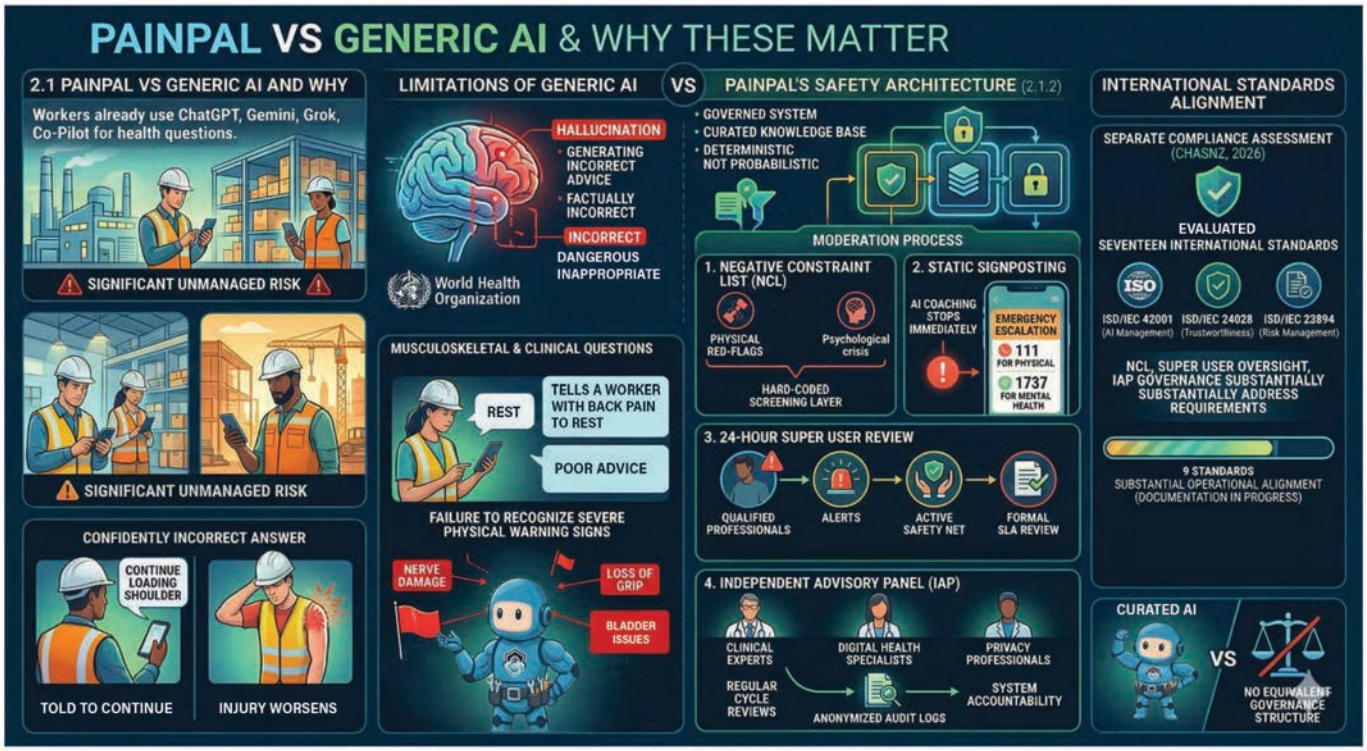


Figure 6. Unlike general-purpose AI, PainPal is a governed system with safety constraints and escalation pathways.

Table 1. PainPal vs other AI platforms

What matters	ChatGPT	Gemini	Claude or Copilot	Grok	PainPal
Knowledge base	Open internet	Open internet	Open internet	Open internet	Curated occupational health evidence
Hallucination risk	High	High	High	High	Mitigated by constrained knowledge base
Diagnosis prevention	No	No	No	No	Hard-coded prevention
Red-flag detection	None	None	None	None	Deterministic Negative Constraints List screening
Emergency escalation	None	None	None	None	Static signposting to 111/1737
Human oversight	None	None	None	None	24-hr Super User SLA + IAP governance review
Worker privacy	Platform dependent	Platform dependent	Platform dependent	Platform dependent	Guaranteed explicit consent required

Note. AI platform assessments based on published documentation and peer-reviewed evaluations (Thirunavukarasu et al., 2023; Ayers et al., 2023; WHO, 2024).

2.2 PSYCHOSOCIAL DIMENSIONS OF MUSCULOSKELETAL PAIN

Pain is not a simple alarm signal from damaged tissue. It is the nervous system's interpretation of threat, shaped by stress levels, sleep quality, workload, and how safe a worker feels in their environment (Moseley & Butler, 2015) (Figure 7). This is not a peripheral observation but rather established clinical evidence with direct implications for pain management in the workplace.

High job demands, low control over work, and inadequate team support are among the most reliable predictors of a pain problem becoming a long-term disability (Linton, 2000). Workers who fear the pain indicates permanent damage, or who feel they cannot report it without consequences, recover more slowly than workers who understand what is happening and feel supported to act. Fear and avoidance behaviours are modifiable, but only if they are identified early (Nicholas et al., 2011).

PainPal addresses this directly. It provides plain-language reassurance grounded in current pain science. It helps workers understand that pain does not equal damage, that staying active with appropriate modifications is more effective than rest and avoidance, and that early action is professional, not a sign of weakness. It also screens for orange flags, which are indicators of high distress or low mood. When these are present, it directs workers toward mental health support through 1737.

PainPal's scope extends to other sensitive topics that intersect with pain management. Cannabis use for pain relief, for example, is a question that workers are already navigating independently. PainPal's knowledge base can be extended to cover this and similar topics, provided content is reviewed through the established governance process. For mental health concerns, the Negative Constraint List already includes psychological crisis indicators. When detected, AI coaching stops and the worker is directed to 1737. The system is designed to handle complexity, not avoid it.

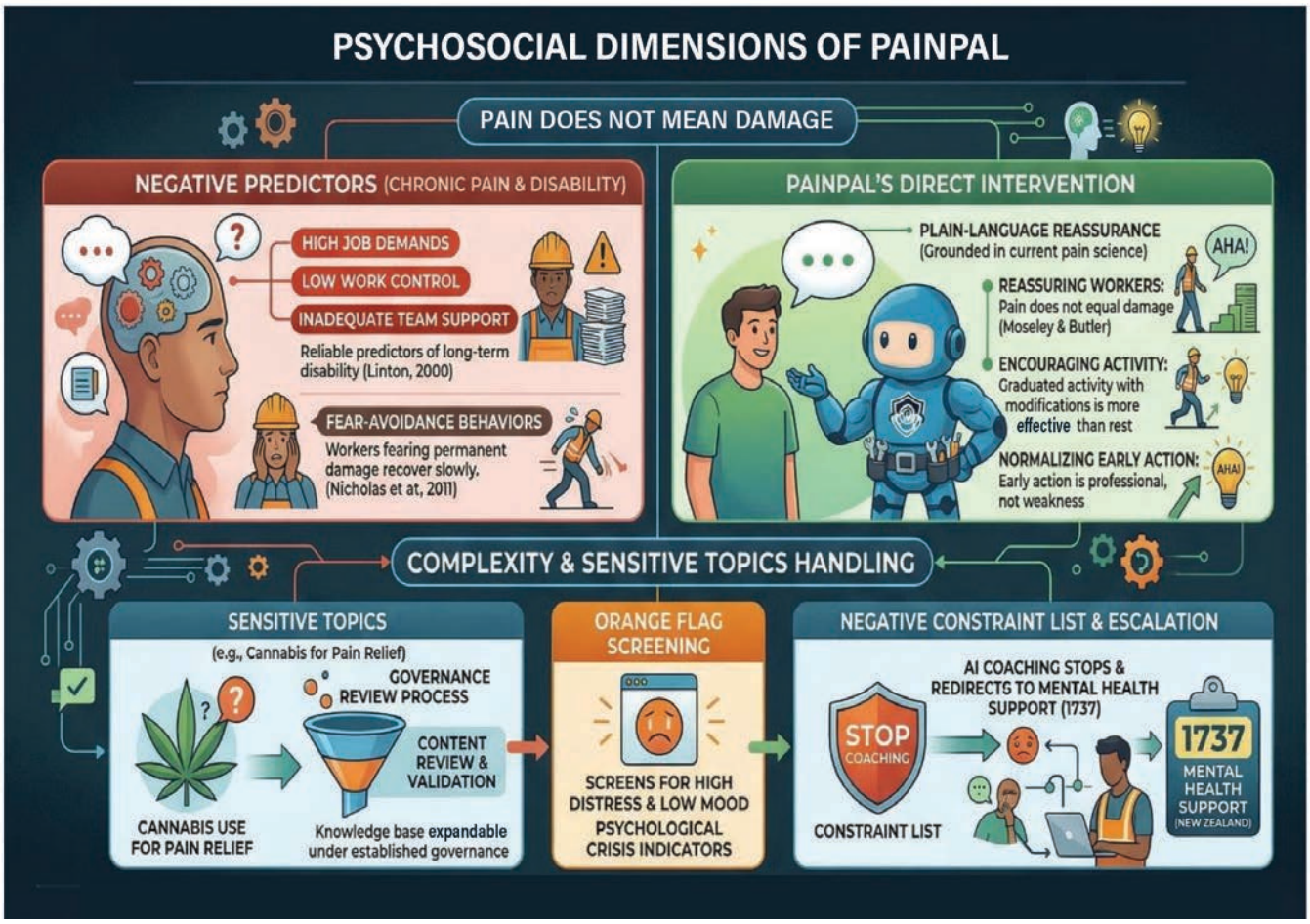


Figure 7. Unmanaged psychological stress and fear of movement act as amplifiers for physical pain, creating a feedback loop that drives chronic disability.

2.3 THE BUSINESS CASE

PainPal can be used as an individual worker tool, or with PainPal for Business an organisation-wide tool.

2.3.1 DIRECT FINANCIAL RETURN

Every MSD claim prevented or shortened by early self-management is a direct cost saving. Identifying a shoulder problem at week two can theoretically avoid a 32-day average ACC claim or, in high-exposure trades like Scaffolding, a 91-day long-duration claim. Given the all-construction MSD data, even a modest reduction in escalation rates pays for a PainPal deployment across an entire worksite.

2.3.2 AGGREGATED, ANONYMISED SITE INTELLIGENCE

With PainPal, workers receive complete privacy. Their conversations are confidential and never accessible to their employer without explicit consent. However, organisations on a subscription tier receive aggregated, anonymised data on pain trends across the workforce.

This is not surveillance. It is operational intelligence. If a cluster of shoulder pain reports is emerging from a specific task on a specific shift, management can identify that pattern without ever identifying the individuals involved, and act on it through targeted task redesign, adjusted rosters, or equipment review. This is the kind of specific, evidence-based intervention that currently only occurs after a series of formal claims has made the problem undeniable.

This model is dependent on worker trust. Without it, early reporting does not occur, and the value of the system is lost.

Recent events in New Zealand have reinforced this requirement. The Manage My Health data breach exposed sensitive health information and has increased scrutiny from workers around how digital platforms manage personal data. In practical terms, tradespeople are now asking direct questions about data privacy before engaging with digital tools.

This shift is consistent with established evidence showing that perceived data privacy and security are primary determinants of user adoption and sustained engagement in digital health systems, particularly following high-profile breaches (Angst & Agarwal, 2009; Bansal et al., 2010).

PainPal has been designed to meet this requirement. Worker conversations are completely private and confidential. Employers cannot access individual conversation content, red-flag triggers, or any personally identifiable information. Employer dashboards display only anonymised, aggregated data.

This separation enables a critical balance. Workers feel safe to report early symptoms, while organisations still receive the intelligence needed to act. For PainPal, privacy is not an added feature but a mechanism that allows early reporting and prevention to occur. A recent internal compliance assessment confirmed alignment with recognised privacy frameworks, including ISO/IEC 27701 and ISO/IEC 29100, reinforcing that data protection is embedded at the system architecture level rather than applied retrospectively. Future development will align with emerging AI management system standards.

2.3.3 PAINPAL AS A MANAGER SUPPORT TOOL

PainPal is designed for workers, but managers and supervisors face their own gap when a worker reports pain or discomfort. Most site managers have no formal training in musculoskeletal injury management.

When a worker raises a problem, the default response is often binary: send them to a GP, or tell them to push through. Neither is appropriate for early-stage presentations, and both carry some degree of risk. The first triggers a formal pathway that may be disproportionate, the second allows a manageable complaint to deteriorate into a long-duration claim.

PainPal includes a dedicated manager-facing knowledge base that provides practical, evidence-informed guidance for these situations. When a worker reports pain, a manager can use PainPal to understand what reasonable task modifications look like for that specific complaint, what the current evidence says about graduated return-to-work approaches, and at what point a referral to a health professional is warranted rather than precautionary. This guidance is aligned with ACC's expectations around employer-supported early intervention (Accident Compensation Corporation & WorkSafe New Zealand, 2023) and the evidence base for recovery at work (BPAC, 2024), and draws on the same occupational health evidence base that underpins the worker-facing tool.

Critically, PainPal helps managers avoid two common errors. The first is over-medicalising early-stage discomfort by referring a worker with a two-week sore shoulder straight into the ACC claims pathway when supported self-management and task modification would be more appropriate and more effective. The second is under-responding by treating every report as minor because there is no practical framework for distinguishing between what is manageable on-site, and what requires clinical assessment. PainPal provides that framework in plain language, calibrated to the manager's decision rather than a clinical diagnosis.

The tool also supports managers in having more confident, better-informed conversations with ACC, physiotherapists, and other treatment providers. Rather than passively receiving a rehabilitation plan, managers using PainPal can engage with providers on the basis of current return-to-work evidence, referring to what the literature says about staying active versus rest, what workplace accommodations are realistic for the specific role, and how to monitor progress without over-reliance on formal review cycles. This shifts the manager's role from claims administrator to active participant in the recovery process, which the evidence consistently associates with better return-to-work outcomes (Shaw et al., 2011; Loisel et al., 2001).

For organisations operating across multiple sites or crews, PainPal also provides consistency. The guidance a supervisor receives on a building site in Auckland is the same guidance a warehouse team leader receives in Hamilton. It is grounded in the same evidence base, subject to the same governance, and updated through the same review process. This removes the variability that currently exists when individual managers rely on personal judgement, past experience, or informal advice from colleagues.

2.4 RETURN ON INVESTMENT

Every argument in this report comes down to one question: does it pay? The answer, for both the worker and the business, is unambiguous. The figures below (Tables 2–4) are built from NZ wage data, ACC claim statistics, and standard industry cost benchmarks. The assumptions are conservative and spelled out for independent verification.

Key assumptions:

1. Average NZ trades/ physical worker wage:	$32/hour[1]
2. Standard shift:	8 hours/day, 5 days/week
3. MSD claim duration:	32 days[2] (across 2015 – 2025)
4. Average MSD claim cost	~$1,668 (ACC average cost per MSD claim)
5. PainPal subscription cost:	To be confirmed[3]

The figures above represent different cost components and are not directly comparable.

2.4.1 COST TO THE INDIVIDUAL WORKER

ACC covers 80% of pre-injury earnings. What remains is a 20% income gap for every day off work, before factoring in out-of-pocket medical costs, lost overtime, and the impact on long-term earning capacity in a physically demanding trade.

[1] Stats NZ, 2024 median for construction related trades.

[2] The 32-day figure is the average MSD claim duration across all construction (strains/sprains and soft tissue injuries), derived from the CHASNZ Injuries & Days Lost dashboard (220,726 claims, 2015–2025). In high-exposure trades such as scaffolding, shoulder-specific claims average 91 days.

[3] Illustrative figure of $30/worker/year was used.

Table 2. Financial cost of a 32-day MSD claim to the individual worker

Cost item	Calculation	Est. cost (NZD)
Lost income 20% ACC gap	$32/hr x 8hrs x 32 days x 20%	**$1,638**
GP visits (3 visits, includes ACC co-payment)	$50 per visit x 3	**$150**
Transport and Parking (higher if rural)	~$20 x 11 visits (3 GP + 8 physio)	**$220**
Physiotherapy (ACC-subsidised, ~8 sessions)	~8 sessions, ~$30 x 8	**$240**
Specialist/imaging (if required)	$200	**$200**
Medication and recovery equipment	$150	**$150**
Lost overtime/allowances during recovery	2hrs/wk. x 4.5 weeks × $48	**$432**
Total direct financial cost		**~$3,030**

Note. Costs are conservative estimates based on NZ ACC co-payment schedules and average trade wages (Stats NZ, 2024; ACC, 2023). Individual costs will vary. For reference, ACC's average cost per MSD claim across all construction is approximately $1,668 (CHASNZ Injuries & Days Lost dashboard, 2015–2025).

The $3,030 direct cost is only the visible impact. Workers who experience a serious MSD are significantly more likely to have recurring episodes, be redeployed to lighter-duty roles at lower pay rates or exit physically demanding trades earlier than planned (Shaw et al., 2011). For a 35-year-old tradesperson with twenty years of earning capacity ahead of them, the cumulative career cost of one poorly managed shoulder injury can (in theory) run into the tens of thousands.

2.4.2 COST TO THE BUSINESS

In plain terms, the worker absorbs the personal cost while the business absorbs everything else, and it accumulates rapidly. Across all construction, the average MSD claim results in 32 days off work (CHASNZ Days Lost dashboard, 2015–2025). For a business, that represents over a month of replacement labour, reduced crew productivity, and all the administrative overhead of managing an active ACC claim. That is before factoring in the downstream effect on experience-rated ACC levies. In high-exposure trades such as scaffolding, shoulder claims average 91 days, compounding these costs significantly.

Extrapolated over the course of 12 months, a mid-size operation with 50 workers at the national average MSD claim rate can expect 3 to 4 MSD claims per year. At approximately $19,300 per claim totalling $58,000 to $77,000 in direct costs annually.

Table 3. Cost of a single 32-day MSD claim to the business

Cost item	Calculation	Est. cost (NZD)
Replacement labour premium (temp/labour hire)	$40/hr x 8hrs x 32 days	**$10,240**
Replacement worker productivity gap (first 4 weeks)	20 days x 8hrs x $32 x 30% efficiency gap	**$1,536**
Investigation, ACC liaison, RTW coordination	33hrs x $60/hr	**$2,000**
ACC experience-rated levy increase (indicative)	Claim history affects annual levy (conservative estimate per claim)	**$1,500**
Project delay/crew downtime (conservative, 1 day)	1 day = $4,000	**$4,000**
Total direct cost per MSD claim		**~$19,300**

Note. Replacement labour rate based on NZ construction industry benchmarks. Project delay costs are conservative and sector dependent. ACC levy impact is indicative; actual impact depends on claim size and employer levy history.

Table 4. Annual PainPal ROI (an 'illustrative business case' based on a 50-worker operation). The annual subscription costs below (e.g., $1,500) are indicative only.

Metric	Without PainPal	With PainPal
Expected MSD claims (50 workers, 1 year)	3 to 4 MSD claims	**1.5 to 2 with PainPal**
Direct claim cost	$58,000 to $77,000	**$29,000 to $39,000**
Presenteeisxm losses (20–40% output reduction, ~8 workers managing pain)	~$20,000	**~$10,000**
Annual PainPal subscription cost (50 workers @ $30/ worker)	N/A	**$1,500**
Net annual saving		**~$29,660 – $49,100**
Return on investment		**20:1 - 33:1**

Note. 40–50% claim reduction rate is based on published evidence for early musculoskeletal intervention programmes (Shaw et al., 2011; Loisel et al., 2001). Presenteeism estimates derived from Schultz & Edington (2007). PainPal subscription pricing is indicative only.

Note, at the indicative subscription rate, PainPal's ROI significantly exceeds the return from alternative uses of the equivalent capital, reinforcing the value proposition for early adoption.

SUMMARY

A 20:1 return is the conservative end of the range (Figure 8). It assumes PainPal only partially reduces claim rates and presenteeism losses. Even in the pessimistic scenario where PainPal prevents one long-duration claim across two years, it returns the annual subscription cost more than six times over (claim cost only) or more than nine times over (including presenteeism). That figure does not include longer-term benefits: lower ACC levies over time, reduced staff turnover, and the intelligence value of aggregated pain trend data informing smarter task design across different workplaces

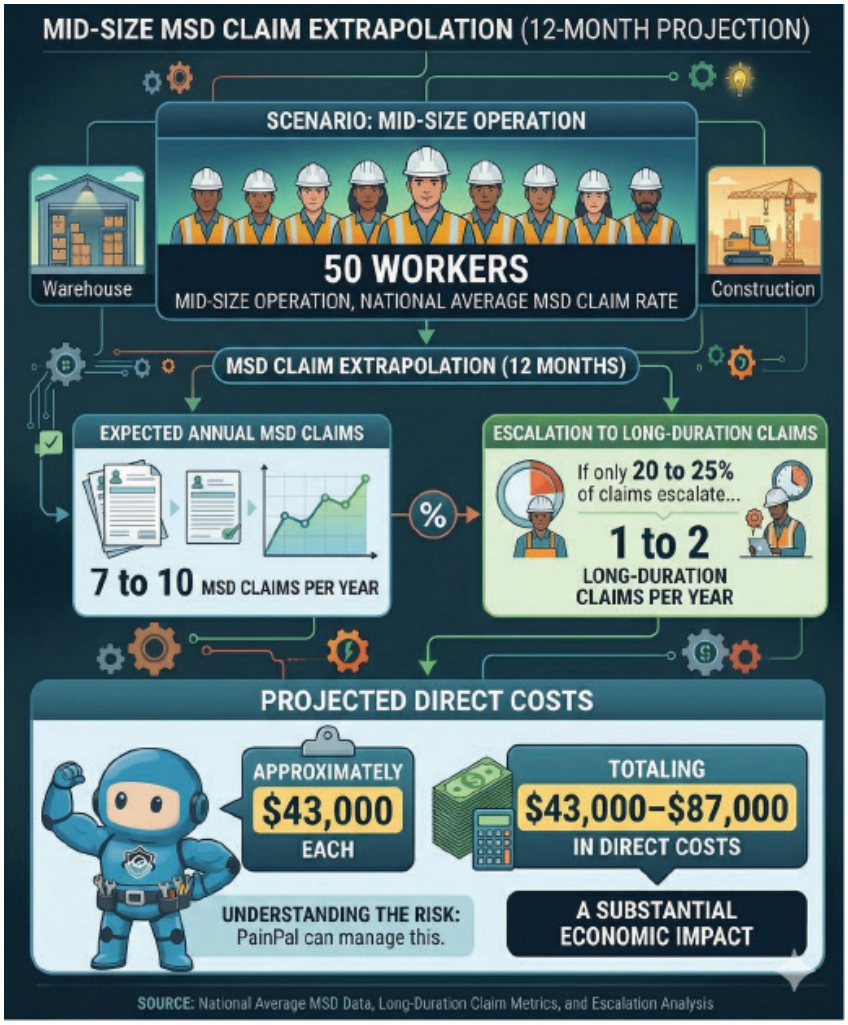


Figure 8. Conservative estimate of using PainPal ??? to 50 worker company.

2.5 CONCLUSIONS

Musculoskeletal disorders account for over 40% of all work-related ACC claims in New Zealand, and claim durations are worsening. Across all construction, 220,726 MSD claims (strains/sprains and soft tissue injuries) were recorded between 2015 and 2025, averaging 32 days off work per claim. In high-exposure trades such as scaffolding, shoulder claims average 91 days with 10,248 days lost in 2025 alone.

The evidence identifies exactly where the system fails, which is the window between the first sign of discomfort and the first formal action. Workers have nowhere practical to go during that window, so they delay. By the time a problem enters the formal system, it has become a clinical injury with a recovery period averaging 32 days and a $19,300 cost to the business. PainPal fills that gap with a governed safety architecture assessed against seventeen international standards, a curated occupational health knowledge base, and human-in-the-loop oversight that no generic AI platform offers.

The ROI is documented in this report with conservative assumptions shown. A 50-worker operation investing approximately $1,500 per year can expect net savings of $29,660 - $49,100 which equates to a 20:1 to 33:1 return.

2.5.1 FOR EMPLOYERS, MANAGERS, AND H&S LEADERS

The question is not whether early intervention works. The question is whether your organisation will continue to absorb preventable costs or act on them. PainPal is not a wellness initiative or a medical device. It is a workforce self-management tool with a documented return, a governance framework assessed against ISO standards, and a deployment model that requires nothing beyond a smartphone. This case is clearly established.

2.5.2 FOR WORKERS

A sore shoulder at week two is not a weakness; it is information. What you do with it determines whether it stays a two-week problem or becomes a three-month claim that costs you $3,030 and puts your career at risk. PainPal is private, evidence-based, and free. Use it before the niggle becomes the claim.

The system has always been better at processing injuries than preventing them.

PainPal changes that.

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