Development of an upper limb screening tool and the New Zealand assessment of repetitive tasks (NZART)

RESEARCH REPORT

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WORKSAFE
Mahi Haumaru Aotearoa

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EXECUTIVE SUMMARY

Background and purpose

There are currently no recommended methods to assess repetitive upper limb tasks in New Zealand, and generally there is a need to improve hazardous manual task risk management. The current, and only marginally relevant guidance, *Code of practice for manual handling* (Department of Labour *et al*., 2001), does not address repetitive upper limb activities, is over 20 years old, and needs updating.

Previous research reported that resources and tools are needed that help businesses, inspectors, and professionals from across the work health and safety disciplines to easily identify musculoskeletal risks and controls (WorkSafe New Zealand, 2024c, 2025a). This led to WorkSafe adopting the suite of tools from the Health and Safety Executive (HSE), in the United Kingdom (UK). These tools were selected as they provide a comprehensive approach to address a range of risk factors associated with hazardous manual tasks, including activities where there is repetitive use of the upper limbs.

A staged approach was used to develop the initial set of hazardous manual tasks tools for use in Aotearoa New Zealand. The purpose of this report is to outline and record the development process undertaken at Stage 2 which saw the completion of the upper limb screening tool and a risk assessment tool, the 'New Zealand assessment of repetitive tasks' (NZART).

How we developed NZART

At Stage 1 we confirmed that the HSE tools could be adapted to make them relevant for New Zealand. In Stage 2 we developed an initial draft of the upper limb screening tool and NZART. These were reviewed internally before being designed. Due to time and budget restrictions, a simplified approach was taken, with no user trials occurring. The principles learnt during Stage 1 were applied and similar formatting and layout were used to ensure consistency across the Stage 2 upper limb tools.

Outcomes

The HSE's *Simple filter for identifying risks of upper limb disorders (ULDs)* (Health and Safety Executive, 2002a) was adapted and became the New Zealand *Upper limb screening tool* (WorkSafe New Zealand, 2025c). This can be used to quickly screen a repetitive upper limb task to check if it is low risk or if a more detailed assessment is needed.

The *New Zealand assessment of repetitive tasks* (NZART) (WorkSafe New Zealand, 2025b) was developed from the HSE's *Assessment of repetitive tasks of the upper limbs (the ART tool) (Health and Safety Executive, 2010)*. The NZART assesses tasks where there are repetitive movements of the upper limbs, helping to identify common risk factors that contribute to discomfort, pain, or injury.

Conclusions

There was a clear need to provide New Zealand businesses, inspectors, and those working across the health and safety disciplines with up-to-date, quick and easy to use, but scientifically robust hazardous manual task risk assessment tools that address repetitive upper limb activities. Research showed that the HSE suite of tools from the UK would be the most suitable. The Stage 2 development process adapted the HSE repetitive upper limb tools and saw the development of New Zealand versions. These tools were aligned with the manual handling tools developed in Stage 1.

Recommendations

We recommend that the *Upper limb screening tool* and 'NZART' are used with other tools such as the *Contributing factors for musculoskeletal risks checklist* to address the wide range of work organisation and psychosocial risk factors. This will contribute towards a more comprehensive health risk management approach and should involve worker engagement and participation.

There is still much to be done to provide additional resources to assist businesses to better manage the musculoskeletal risks that workers are exposed to. The development of online tools, case studies, additional resources, and training are recommended. This work needs to be supported by an updated or new *Code of practice for manual handling* or hazardous manual tasks good practice guide or similar.

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1.0
Background and purpose of this report

This report outlines the development process of the New Zealand upper limb screening tool and NZART. It provides a record of the logic behind why specific changes to the HSE tools were made.

These tools focus on assessing repetitive upper limb tasks and have been adapted from the Health and Safety Executive (HSE) in the United Kingdom for use in Aotearoa New Zealand. These tools are part of a series of manual task risk assessments which were developed in Stage 2 of the project. This report also aims to provide an important record of the logic behind why decisions were made during the development of these tools.

Within this report we use the term 'hazardous manual tasks'. Repetitive upper limb tasks may be considered hazardous when one or more of the following characteristics are present:

- high, sudden, repetitive, or sustained forces
- repetitive movements
- sustained or awkward postures, or
- exposure to vibration (Safe Work Australia, 2016).

There is a need to improve hazardous manual task risk management in New Zealand. Current guidance such as the Code of practice for manual handling (Department of Labour *et al*., 2001) does not consider other manual tasks that may expose workers to risk. For example, repetitive actions performed by the upper limbs, such as when working on production lines. As previously reported this guidance is over 20 years old, does not apply to the Health and Safety at Work Act (2015), and needs updating. Updated resources and tools are needed to help businesses, inspectors, and professionals from across the work health and safety disciplines to easily identify risks and controls (WorkSafe New Zealand, 2024c).

This work follows on from the manual handling set of tools that were developed in Stage 1. The screening tools and New Zealand Manual Handling Assessment Charts (NZMAC) were published on the WorkSafe website in August 2024, followed by the development report, published in February 2025 (WorkSafe New Zealand, 2025a).

A variety of tools were recommended for selection by WorkSafe as they provide a comprehensive approach to address the risk factors associated with hazardous manual tasks. One of the limitations of these tools is that they mainly focus on physical risk factors, with limited consideration of work organisation or psychosocial factors (WorkSafe New Zealand, 2024c, 2025a).

This issue has been addressed by the development of the 'Contributory factors for musculoskeletal risks checklist' (WorkSafe New Zealand, 2024a). This checklist considers the range of contributory risk factors associated with musculoskeletal discomfort, pain, or injury that workers might be exposed to. The checklist can be used after completion of the NZMAC, NZART, or NZRAPP.

In the United Kingdon there are many resources businesses can access to better manage their workplace musculoskeletal risks. For example, the 'Manual Handling Operations Regulations 1992' (Health and Safety Executive, 2016a), specifically address manual handling tasks. The 'Upper limb disorders in the workplace' guidance (Health and Safety Executive, 2002b) address specific risks associated with repetitive upper limb tasks. In addition to these, business have access to many other shorter guides and resources that provide helpful information on managing musculoskeletal risks. Work-related musculoskeletal harm affects about 30% of workers in New Zealand. The depth, variety, and quality of resources available in the United Kingdom on musculoskeletal health risk management highlights how far New Zealand still needs to come to better manage these risks.

2.0
Outline of the staged development approach

IN THIS SECTION:

The New Zealand upper limb screening and risk assessment tools were developed as Stage 2 of a 3-stage process.

2.1 Review of the three development stages

There are many tools in the HSE suite that cover different manual tasks, so a staged approach was needed to adapt them for use in New Zealand. The priority was given to the types of activities that commonly occur in businesses:

- Stage 1 – manual handling activities (published August 2024):
  - Screening tools for lifting/lowering, carrying, pushing/pulling, and manual handling-while-seated
  - New Zealand manual handling assessment charts (NZMAC)
  - Contributing factors for musculoskeletal risks checklist that can be used for any manual task.
- Stage 2 – repetitive upper limb activities (published February 2025):
  - Screening tool for repetitive upper limb tasks
  - New Zealand assessment of repetitive tasks (NZART).
- Stage 3 – pushing and pulling – manual handling activities (published February 2025):
  - New Zealand risk assessment of pushing and pulling (NZRAPP).

Future stages might be needed to develop other newly created tools such as the *Back injury risks in driving (BIRD)* tool (Health and Safety Executive, 2023) or to investigate how the APHIRM toolkit (La Trobe University, 2018) could be implemented. This report only outlines the development process of repetitive upper limb tools completed in Stage 2.

2.2 Reasons for selecting the tools at the different stages

The development of the Stage 1 manual handling tools occurred first because manual handling tasks are the most easily recognised and are the source of the most harm.

The upper limb tools were developed in Stage 2 because we were aware that the Health and Safety Executive were in the process of reviewing and updating the Risk assessment of pushing and pulling (RAPP) (Health and Safety Executive, 2016c). We thought it would make more sense to wait for a revised version of the RAPP before creating a New Zealand version. The pushing and pulling screening tool was developed along with the other manual handling screening tools at Stage 1 as it made sense to develop all of these screening tools at the same time.

2.3 The repetitive upper limb tools developed in Stage 2

At Stage 2 the repetitive upper limb tools from the HSE that were reviewed and adapted were the:

- simple filter for identifying risks of upper limb disorders (ULDs) (Health and Safety Executive, 2002b), and the
- assessment of repetitive tasks of the upper limbs (the ART tool) (Health and Safety Executive, 2010).

Figure 1 shows different types of hazardous manual tasks divided into manual handling and repetitive upper limb tasks, and shows the matching screening and risk assessment tools. These manual tasks could be considered hazardous if certain characteristics are present. For example, there are high, sudden, repetitive, or sustained forces, there are repetitive movements, sustained or awkward postures, or exposure to vibration. The figure shows the relationships between the screening tools (risk filters), risk assessment tools, and the contributing factors checklist. It shows the different stages that these tools were developed in, with the Stage 2 tools (in grey) outlined within this report.

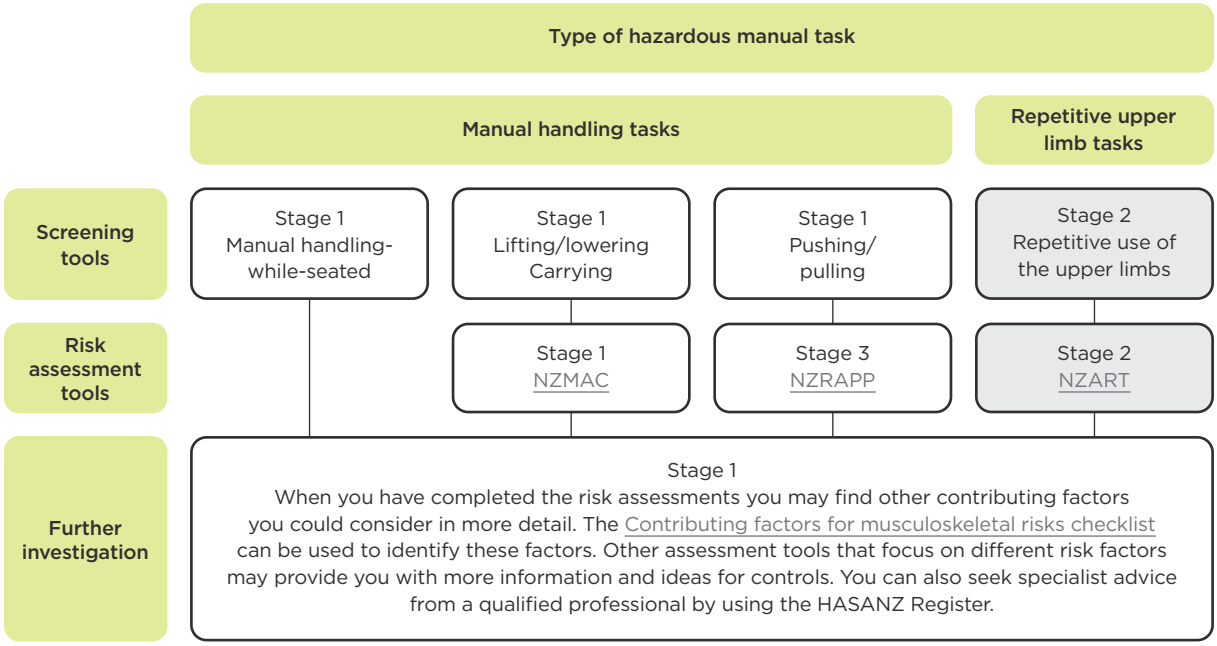


FIGURE 1: Development stages of the hazardous manual task screening and risk assessment tools

2.4 The Stage 2 development activities

The Stage 2 development activities are outlined below and summarised in Figure 2.

- **Initial tool development**: The Human Factors/Ergonomics (HFE) team reviewed and adapted the HSE tools: *Simple filter for identifying risks of upper limb disorders (ULDs)* (Health and Safety Executive, 2002a) and the Assessment of repetitive tasks (ART) (Health and Safety Executive, 2010).
  - **Upper limb screening tool**: The HSE's *Simple filter for identifying risks of upper limb disorders (ULDs)* was reviewed and the HFE team developed an initial draft. The questions in the risk filter were reworded slightly and made into a flowchart. This ensured consistency using the same layout as the manual handling screening tools. Users work through the flowchart answering the questions which guides them to an outcome. For example, the risk is considered as low and no further action is needed, or, if the user answers 'yes' to any questions then a more detailed risk assessment such as using NZART is needed.
  - The layout of the upper limb screening tool is the same as the manual handling screening tools (WorkSafe New Zealand, 2024b) but there is one key difference in how the questions flow. In the upper limb screening tool if the user answers 'no' to the questions they carry on moving **downwards** to the next set of questions in the flowchart. If they answer 'no' to all the questions, then the outcome is that the risk of injury is considered 'low' and that no further action is needed at this stage. But, if the user answers 'yes' to any of the questions then they follow the arrow **to the right** which means that there is a risk of injury and that a more detailed assessment such as NZART should be completed. This is the opposite flow compared to the manual handling screening tools, but was the thought to be the best option to make sure the questions were still worded using a plain language approach.
  - **NZART**: The HSE's ART tool (Health and Safety Executive, 2010) was reviewed, and an initial NZART draft was developed. The intention was to make the supporting text within the ART relevant for a New Zealand audience that reflected the Health and Safety at Work Act (HSWA), 2015. It was important that the assessments remained scientifically robust. We wanted to avoid making any large changes to the risk assessment as this could alter the validity and reliability.
- **Internal review**: Both the draft screening tool and NZART were reviewed by the Guidance team to consider from a plain language and novice user perspective. The NZART was also reviewed by the Regulatory Practice team to consider from a practical application point of view.
- **Review of internal feedback and tool design**: Following the reviews from the Guidance and Regulatory Practice teams, we reviewed, refined, and edited both tools. Support from the Communications team to design the tools was requested.
- **Final review, editing and publication**: We worked with the Designer to fine tune the screening tool and NZART ready for publication. Due to time and budget limitations, we were unable to trial the upper limb screening tool or NZART, as we had done for the manual handling tools. This step was missed because of the internal organisational change process and the need to publish the tool as quickly as possible, before the HFE team were disestablished. While this was not ideal, we had tested the screening tool flowchart layout and NZMAC layout in the previous trials and were confident that if we followed the similar format then they should be easy to follow and intuitive to use. We worked with the Communications team to publish the tools on the WorkSafe website with final publication of the screening tool and NZART in February 2025.

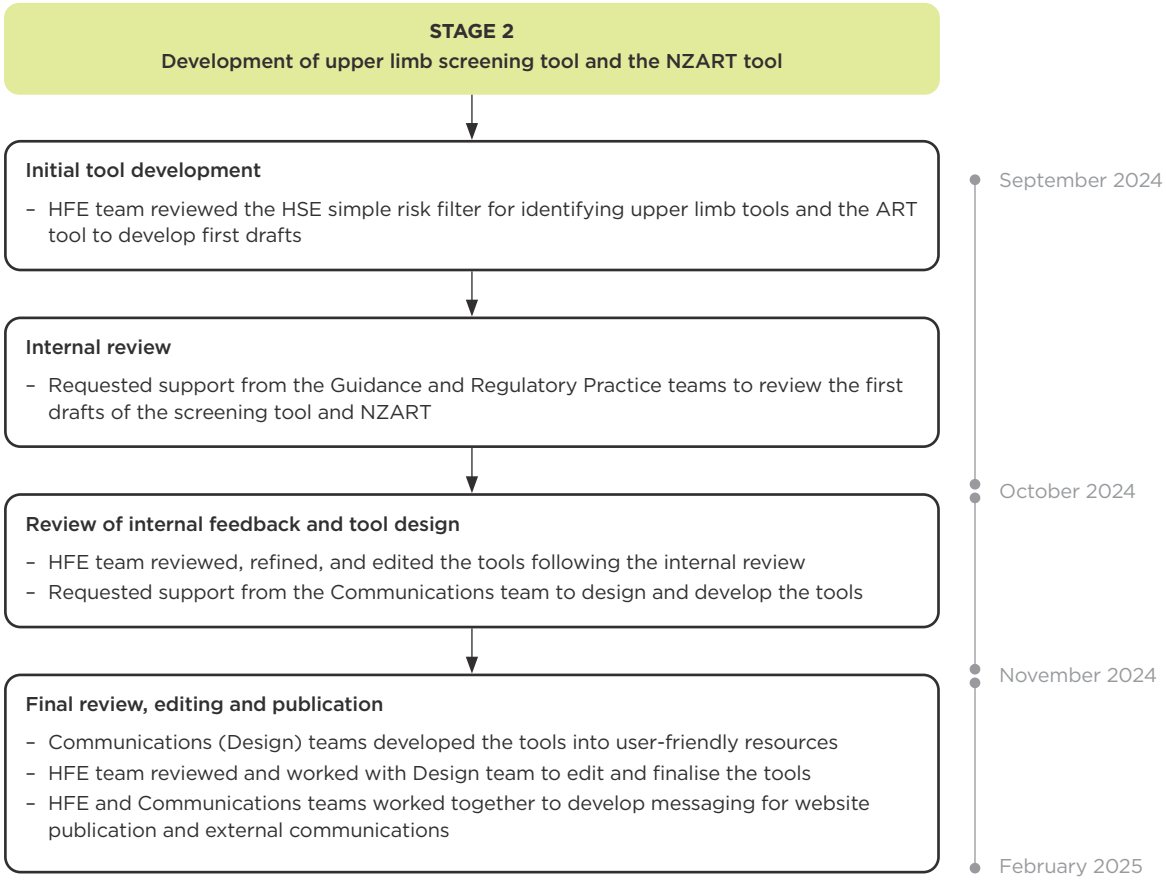


FIGURE 2: Outline of the Stage 2 upper limb tool development process and timeline

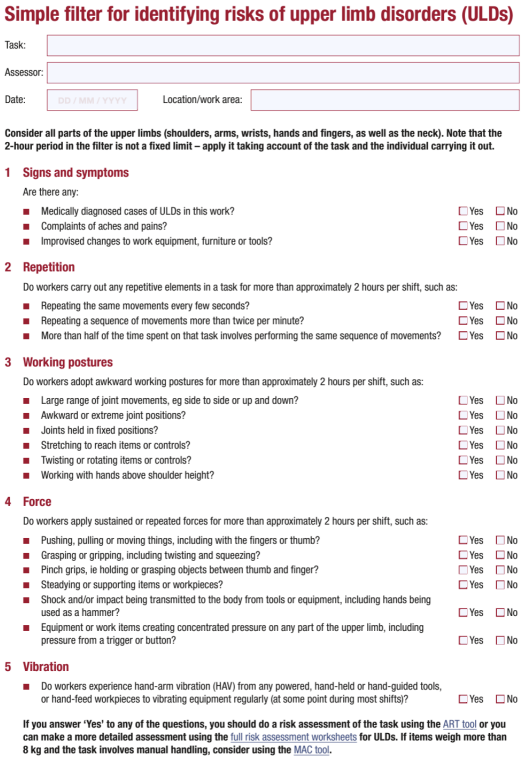
3.0
Key differences between the upper limb screening tool and the HSE risk filter

IN THIS SECTION:

The New Zealand 'upper limb screening tool' was adapted and developed from the HSE 'simple filter for identifying risks of upper limb disorders (ULDs)'.

3.1 Main differences between the WorkSafe upper limb screening tool and the HSE risk filter

The HSE risk filter is shown in Figure 3 compared to the New Zealand screening tool in Figure 4, and Table 1 shows a summary of the key changes made. The following sections provide more detailed explanations of why the changes were made.



Simple filter for identifying risks of upper limb disorders (ULDs)

Task:

Assessor:

Date: DD / MM / YYYY Location/work area:

Consider all parts of the upper limbs (shoulders, arms, wrists, hands and fingers, as well as the neck). Note that the 2-hour period in the filter is not a fixed limit – apply it taking account of the task and the individual carrying it out.

1 Signs and symptoms

Are there any:

- Medically diagnosed cases of ULDs in this work? ☐ Yes ☐ No
- Complaints of aches and pains? ☐ Yes ☐ No
- Improvised changes to work equipment, furniture or tools? ☐ Yes ☐ No

2 Repetition

Do workers carry out any repetitive elements in a task for more than approximately 2 hours per shift, such as:

- Repeating the same movements every few seconds? ☐ Yes ☐ No
- Repeating a sequence of movements more than twice per minute? ☐ Yes ☐ No
- More than half of the time spent on that task involves performing the same sequence of movements? ☐ Yes ☐ No

3 Working postures

Do workers adopt awkward working postures for more than approximately 2 hours per shift, such as:

- Large range of joint movements, eg side to side or up and down? ☐ Yes ☐ No
- Awkward or extreme joint positions? ☐ Yes ☐ No
- Joints held in fixed positions? ☐ Yes ☐ No
- Stretching to reach items or controls? ☐ Yes ☐ No
- Twisting or rotating items or controls? ☐ Yes ☐ No
- Working with hands above shoulder height? ☐ Yes ☐ No

4 Force

Do workers apply sustained or repeated forces for more than approximately 2 hours per shift, such as:

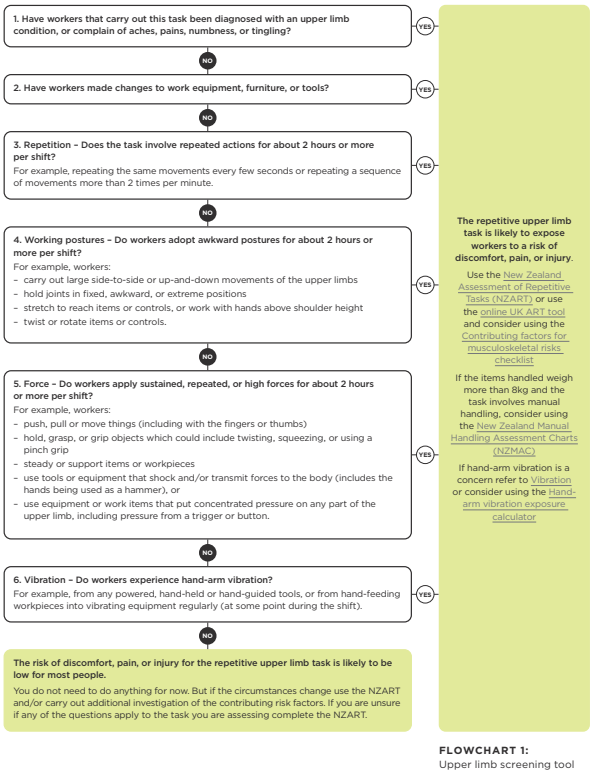
- Pushing, pulling or moving things, including with the fingers or thumb? ☐ Yes ☐ No
- Grasping or gripping, including twisting and squeezing? ☐ Yes ☐ No
- Pinch grips, ie holding or grasping objects between thumb and finger? ☐ Yes ☐ No
- Steadying or supporting items or workpieces? ☐ Yes ☐ No
- Shock and/or impact being transmitted to the body from tools or equipment, including hands being used as a hammer? ☐ Yes ☐ No
- Equipment or work items creating concentrated pressure on any part of the upper limb, including pressure from a trigger or button? ☐ Yes ☐ No

5 Vibration

- Do workers experience hand-arm vibration (HAV) from any powered, hand-held or hand-guided tools, or hand-feed workpieces to vibrating equipment regularly (at some point during most shifts)? ☐ Yes ☐ No

If you answer 'Yes' to any of the questions, you should do a risk assessment of the task using the ART tool or you can make a more detailed assessment using the full risk assessment worksheets for ULDs. If items weigh more than 8 kg and the task involves manual handling, consider using the MAC tool.

FIGURE 3: Simple filter for identifying risks of upper limb disorders (ULDs) (Health and Safety Executive, 2002a)



FLOWCHART 1:
Upper limb screening tool

FIGURE 4: Upper limb screening tool (WorkSafe New Zealand, 2025c)

CHANGES MADE	HSE SIMPLE FILTER FOR IDENTIFYING RISKS OF UPPER LIMB DISORDERS (ULDS)	WORKSAFE UPPER LIMB SCREENING TOOL
Title change	– Title used the term 'risk filter' – Upper limb disorders (ULDs) are the result of exposure to risk factors	– Title changed to upper limb screening tool – Focus is on the exposure to the risk factors associated with upper limb discomfort, pain, or injury rather than the outcome (for example, upper limb disorders)
Structure and presentation of information	– Standalone tick-box tool that has a different structure from the manual handling risk filters – Risk factors are divided into 5 areas, followed by a question that users can answer 'yes' or 'no' to (tick-box)	– Standalone tool that follows a similar layout as the New Zealand manual handling screening tools – Flowchart divided into the 5 risk areas with the addition of slightly reworded/simplified questions in the heading with a sub-question below. The questions direct the user to the action they need to take
Vulnerable workers	– Vulnerable workers are not mentioned	– This tool mostly uses the same definition of 'vulnerable workers' as the New Zealand manual handling screening tools. These workers are considered at Step 1 – Point 5 in the vulnerable worker definition was changed slightly to include the 'neck and upper limbs' For example, '...have a disability, significant health condition, injury or are recovering from an injury, particularly if this affects their neck or upper limbs'. (WorkSafe New Zealand, 2025c)

TABLE 1: Summary of differences between the HSE simple filter for identifying risks of upper limb disorders (ULDs) and the WorkSafe upper limb screening tools

Title change

The first major difference between the HSE simple filter for identifying risks of upper limb disorders (ULDs) is the change in name to the 'upper limb screening tool'. The WorkSafe New Zealand (2025a) report previously outlined the logic for changing the title from 'risk filter' to 'screening tool' and the same reasoning exists here. For example, the concern that the term 'risk filter' doesn't help non-expert users to understand what the tool does. The term 'screening tools' better describes the activity occurring. It also made sense to keep the terms the same as the New Zealand manual handling screening tools (WorkSafe New Zealand, 2024b).

In New Zealand we are not specifically using the term upper limb disorders (ULDs) as used in the United Kingdom. We have chosen to use the broader term, work-related musculoskeletal disorders (WRMSDs). This term was developed in 2022 and covers all types of work-related musculoskeletal conditions, including those of the upper limbs (WorkSafe New Zealand, 2022a, 2022b). For the screening tool we have focused on the known risk factors associated with the development of upper limb conditions rather than the outcome of that exposure.

Structure and presentation of information

The HSE simple upper limb filter (Health and Safety Executive, 2002a) is different from the HSE simple manual handling risk filters (Health and Safety Executive, 2016b) in how they are structured. The upper limb filter is structured into five areas and has tick-boxes so the user can answer if the risk is present or not. The manual handling filters are bullet-pointed lists and are more easily found on the HSE website.

The New Zealand upper limb screening tool kept the five risk areas and questions from the HSE upper limb risk filter with some minor wording changes. Instead of the tick-box style of the HSE risk filter we used a flowchart approach to ensure consistency with the New Zealand manual handling screening tools – with minor differences outlined in Section 4.1

Vulnerable workers

The HSE's simple upper limb risk filter does not mention vulnerable workers. We decided to use the same 'vulnerable worker' criteria as was used in the manual handling screening tools (WorkSafe New Zealand, 2024b).

The reason to include vulnerable workers was to acknowledge that this group of workers may be at increased risk of experiencing discomfort, pain, or injury when performing repetitive upper limb activities. It was also to ensure consistency with the manual handling screening tools. We kept the first four criteria the same with a slight modification to the fifth criteria to address neck or upper limb issues. The vulnerable worker criteria are those workers who:

- are new mothers, or pregnant
- are young workers
- are older workers
- are new to the job or workforce
- have a disability, significant health condition, injury, or are recovering from an injury, **particularly if this affects their neck or upper limbs**.

4.0 Key differences between NZART and ART

IN THIS SECTION:

The ‘New Zealand assessment of repetitive tasks’ (NZART) was adapted and developed from the HSE’s ‘Assessment of repetitive tasks’ (ART) tool.

4.1 General differences between NZART and ART

Because we had trialled the NZMAC at workshops we had a good idea what worked and had used the established format to develop NZART. The main differences between the ART (Health and Safety Executive, 2010) and NZART (WorkSafe New Zealand, 2025b) are outlined here as ‘general’ differences. Changes made to specific risk factors are outlined in Section 4.2 and changes made to the score sheet are outlined in Section 4.3

Title change

In keeping with the style of NZMAC, we called this tool the NZART to help distinguish between the HSE version.

Initially we are still relying on the HSE website for supporting resources and referring users to the HSE online ART tool, so it was important to distinguish between the two.

Overall design

The overall design of the NZART remains very similar to the HSE version with the most significant changes occurring in the introductory section and with the score sheet.

The WorkSafe design guidelines were followed resulting in a slightly different overall look compared to ART:

- at the initial stage only a PDF version was designed so we decided on an A4 sized document that could be printed easily
- slight changes were made to the colours used but they still follow the ‘traffic light’ system that ART is based on
- minor formatting changes were made to align with the WorkSafe design guidelines
- the term ‘workers’ is used in NZART, compared to ‘operators’ in ART
- a contents page was developed that identifies the four main risk categories and each of the risk factors assessed. Each risk factor has changed from an individual letter identifying it to a number identifier. For example, A2 – Repetition (in ART), Figure 5, has become 2.2 (in NZART), Figure 6
- the instructions followed the style of NZMAC and were broken into bullet points to help users identify and understand what needs to be done, but remained very similar to the HSE version (Figure 5)

- the individual risk factor layout in NZART is slightly different to ART. The question is asked outside the assessment box, the text for the green, amber or red factors are coloured with the scores in the corresponding lighter colour, and the scores shows the 'colour band' (G, A, R) and numerical score. This more closely aligns with NZMAC. The differences are shown in Figure 5 and 6.
- we would have liked to improve some of the images used, for example in the 'awkward postures' section but were unable to do so
- New Zealand references were added in and the score sheet was modified slightly to align better with NZMAC. Both are in the appendices.

A2 Repetition

This refers to movement of the arm and hand, but not the fingers. Observe the movement of the arm and hand and count the number of times the same or a similar pattern of motion is repeated over a set period of time (eg 1 minute). Assess both the left (L) and right (R) arm.

		L	R
Similar motion pattern of the arm and hand is repeated	10 times per minute or less	0	0
	11–20 times per minute	3	3
	More than 20 times per minute	6	6

FIGURE 5: Example of the risk factor layout in ART

2.2 Repetition

- This refers to movement of the arm and hand, but not the fingers.
- Observe the movement of the arm and hand and count the number of times the same or a similar pattern of motion is repeated over a set period of time (for example, one minute).
- Assess both the left (L) and right (R) arm.

Similar motion pattern of the arm and hand is repeated:	L	R
10 times per minute or less	G/0	G/0
11–20 times per minute	A/3	A/3
More than 20 times per minute	R/6	R/6

FIGURE 6: Example of the risk factor layout in NZART

Introductory text

The NZART follows a similar layout in the introductory section with some slight re-ordering of content. The key differences are:

- we adapted the language and references to guidance, making it relevant for a New Zealand audience
- some of the introductory sections were presented in a different order compared to ART
- the introduction of a numbering system, with bold text and a clear statement of what to do at each step
- the addition of a table to show when to use, and not use the NZART (with links to other risk assessments)
- the added reference to the Privacy Act 2020 to make sure users are aware of their responsibilities if they record workers
- the addition of 'Step 10' – further investigation. This will be discussed in more detail in Section 4.3

4.2 Key changes made to specific risk factors

This section outlines the changes made to specific risk factors within NZART.

FORCE (PART B)

The 'force' risk factor saw the most changes. We felt that the way the information was presented in ART was a little disjointed and that it might led to confusion. While most of the wording remains very similar to ART it is ordered slightly differently.

NZART breaks this section down into two main parts which should guide the user through the steps to assess the force risk factor. The first part asks the assessor to *Determine the level of force*. NZART has taken a slightly different approach to ART in that it combines both methods used in ART to determine the level of hand force. Assessors can ask workers to estimate the force for each activity but are also encouraged to use the written descriptions when observing workers carrying out the tasks. Using this combined approach should help to more accurately estimate the hand forces.

The NZART written descriptions have also added to the ART descriptors particularly in the 'light force', 'strong force', and 'very strong force' categories. The additions were made because these are terms or descriptions that professionals such as occupational therapists might use and be familiar with. These additions serve to strengthen and clarify the original ART descriptors. A comparison of the ART and NZART descriptors is shown in Figures 7 and 8.

Light force	There is no indication of any particular effort
Moderate force	Force needs to be exerted. For example: ■ Pinching or gripping objects with some effort ■ Moving levers or pushing buttons with some effort ■ Manipulating lids or components with some effort ■ Pushing or forcing items together with some effort ■ Using tools with some effort
Strong force	Force is obviously high, strong or heavy
Very strong force	Force is near to the maximum level that the worker can apply

FIGURE 7: Descriptors used in ART to determine the level of hand force

Light force	The effort applied is minimal or low. You don't observe any particular effort. For example: – a light force is applied to control an object or keep it in place – working with gravity.
Moderate force	Force needs to be exerted. For example: – pinching or gripping objects with some effort, you may see finger blanching – moving levers or pushing buttons with some effort – manipulating lids or components with some effort – pushing or forcing items together with some effort – using tools with some effort – applying force against gravity.
Strong force	Force is obviously high, strong or heavy. For example: – you may see finger blanching when pinching, gripping or holding – workers take short rest breaks between force applications – workers use postural repositioning, bracing or using larger joint movements for a task – such as using shoulder and elbow effort when opening a jar.
Very strong force	Force is near to the maximum level that the worker can apply. For example: – two handed effort – overflow actions such as facial grimacing during force application – actions suggesting muscle fatigue such as arm shaking – breath holding during force application – sustained high force application.

FIGURE 8: Descriptors used in NZART to determine the level of hand force

The second part of the 'Force' assessment asks the assessor to 'Determine the score'. This uses the similar text from ART but in a different order so that the 'scoring grid' is now directly below the instructions. But the name of the grid 'Worker's description of the level of force exerted with the hand' has been removed in NZART as the grid is used irrespective of if the force description was from the worker or from observation. Assessors use the selected level of force and then consider how frequently the force is applied. As with ART, assessors use the grid to find the score. These differences are shown in Figures 9 and 10.

Worker's description of the level of force exerted with the hand

	Light	Moderate	Strong	Very strong
Infrequent	G0	A1	R6	Changes required*
Part of the time (15–30%)	G0	A2	R9	Changes required*
About half the time (40–60%)	G0	A4	R12	Changes required*
Almost all the time (80% or more)	G0	R8	Changes required*	Changes required*

* Changes to the task are required due to unacceptable levels of force.

FIGURE 9: Hand force grid used in ART

Determine the score

- Use the grid below to determine:
  - the level of force exerted with the hand, and
  - the time that the force is exerted for.
- It is possible to select intermediate scores on the grid if appropriate.
- If more than one type of force is exerted, select the highest score from the grid.

	LIGHT	MODERATE	STRONG	VERY STRONG
Infrequent	G/0	A/1	R/6	Urgent changes required[1]
Part of the time (15–30%)	G/0	A/2	R/9	Urgent changes required[1]
About half the time (40–60%)	G/0	A/4	R/12	Urgent changes required[1]
Almost all the time (80% or more)	G/0	R/8	Urgent changes required[1]	Urgent changes required[1]

[1] **Prompt action is needed**
Changes to the task are required due to unacceptable levels of force. This task may expose a significant proportion of the working population to a risk of injury and further assessment is urgently recommended.

FIGURE 10: Hand force grid used in NZART

The descriptors used within NZART were changed from 'Changes required' in ART (Figure 9) to 'Urgent changes required' in NZART (Figure 10). These 'scores' are coloured 'red' and are given when a 'strong' hand force is exerted almost all of the time, and for all 'very strong' hand forces exerted. This was done so that it more closely followed the terminology used in NZMAC where a 'purple' score is given indicating an 'unacceptable' level of risk and that tasks should be changed 'urgently'. We did consider changing the NZART 'urgent changes required' categories to 'purple', but decided instead to add additional text around the urgency of the changes needed to reduce the risk so it was more aligned with ART. This was done because given the organisational changes at the time creating an online version of NZART was not likely to occur. But New Zealand users can use the HSE online version, so we wanted to keep NZART as similar to ART in the short term.

Awkward postures (Part C) – hand/finger grip

In NZART we kept the heading for this section as 'Awkward postures' but used the word 'positions' for each of the factors assessed (for example, arm position). We thought this was a simpler term and would help assessors to focus on what position each of the body parts being assessed was in.

There was a minor addition made in NZART to the 'amber' and 'red' descriptors. For example, in ART the descriptor is "Pinch or wide finger grip for part of the time" (amber) or "...for more than half of the time." (red). In NZART this reads: "Pinch or wide finger/span grip..." This was done based of previous experience where we felt this type of grip would normally be called a 'position'.

Additional factors (Part D)

In NZART Section 2.11 – 'Other factors', point 3 was changed slightly from: "the hand is used as a tool (for example, hammer) and **struck** ten or more times per hour." We thought this was slightly confusing so reworded it to: "the hand is used as a tool (for example, as a hammer) and **strikes** ten or more times per hour."

In ART Section 'D5' is labelled 'psychosocial factors'. In NZART this was changed to '2.13 psychosocial and work organisation factors'. This aligns with the changes made in NZMAC. The list has also been reorganised so that the top four are the psychosocial risks and the bottom four are the work organisation factors.

There was also some minor wording changes made to two of these factors. For example:

- the lack of support point in ART was changed from "lack of support from supervisors or co-workers" to "lack of support from colleagues, supervisors, or managers" (NZART), and
- "incentives to skip breaks or finish early" (ART) was changed to "incentives to skip breaks, finish early, or other pay incentives (piece-rate work)" (NZART).

4.3 Changes made to the NZART score sheet

Information on completing the score sheet and flowchart

The information, or *Guide to completing the NZART score sheet* is mostly the same as the HSE version except for some very minor changes.

The flowchart remains largely unchanged from the HSE version of ART. But it is worth noting that an additional box was added into the 'Force' scores to reflect 'urgent changes needed' if forces were unacceptable'. This gives the assessor somewhere to record this information.

Minor layout changes were made to the NZMAC scoring fields across the bottom of the flowchart and some additional prompts were added in around calculating the 'task score' and the 'exposure score'. This was done to provide a quick reminder for assessors about what they need to do. The differences in the ART and NZART flowcharts are shown in Figures 11 and 12.

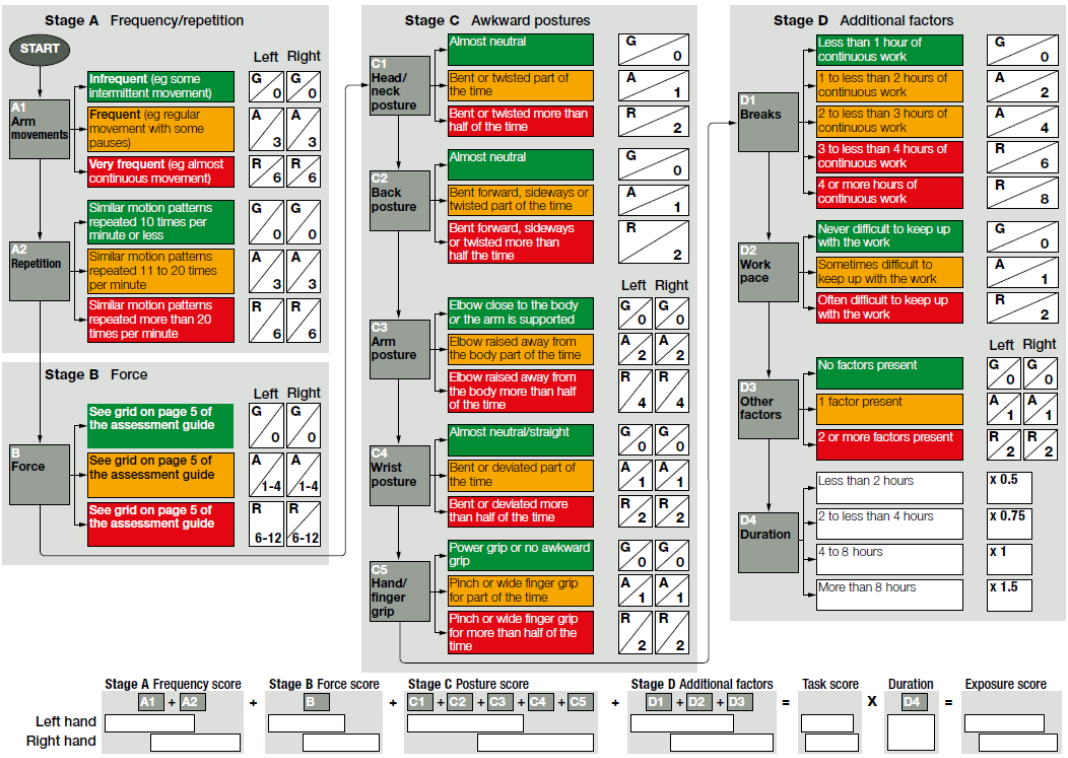


FIGURE 11: ART flowchart

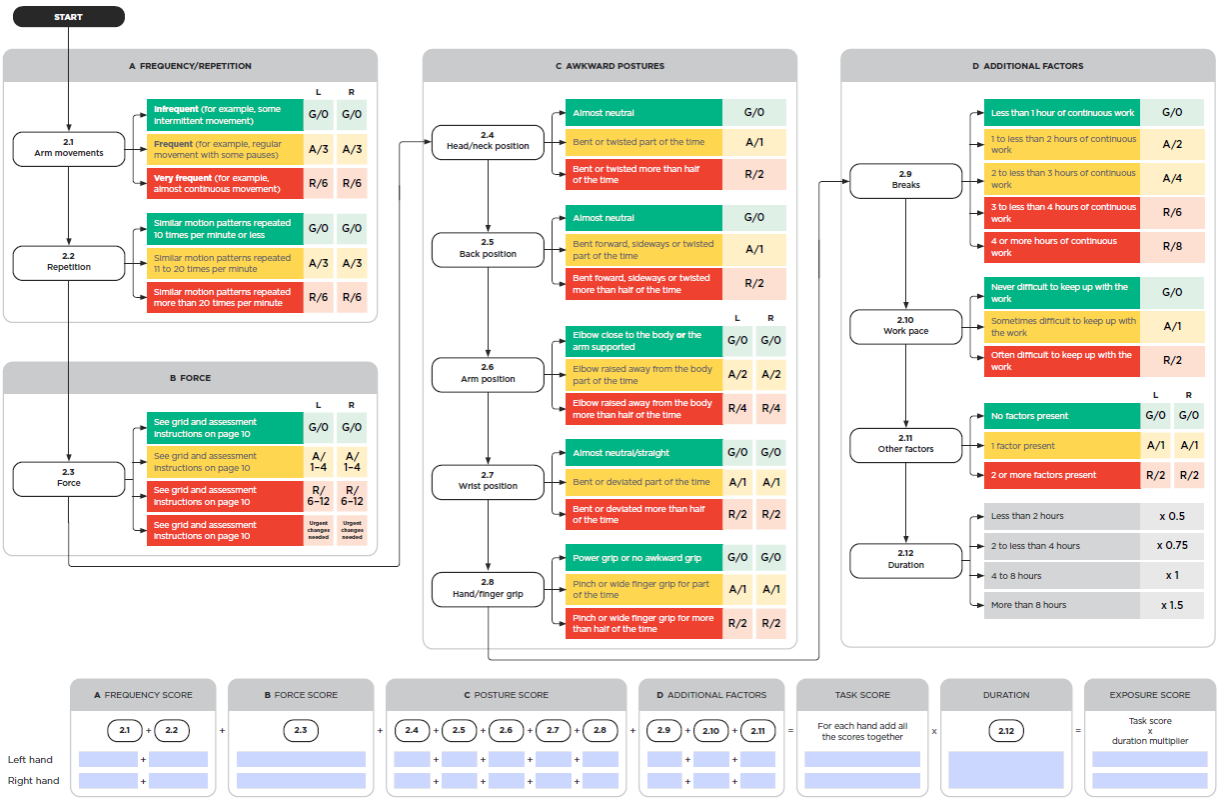


FIGURE 12: NZART flowchart

The score sheet is located in Appendix 4 of NZART and largely follows the same structure as the HSE version, but also follows a similar layout to NZMAC. We have included the task description on the first page of the score sheet and then the table that assessors can use to enter the risk factor scores is on page 2.

The first page of the ART and NZART score sheets are shown in Figure 13 and Figure 14.

- The 'company/site details' remains unchanged.
- On ART the question about 'are there indications that the task is high risk' have been changed slightly to remove reference to RIDDOR reports which we don't have in New Zealand. This short checklist has been moved onto the first page of NZART, rather than having it under the score sheet table as it is in the HSE version (shown in Figure 15).
- The NZART includes a large 'notes' section.
- Like NZMAC, the 'assessment completed by' information is located at the end of the first page of NZART.

Task description form

Assessor name:		Date:	
Company name:		Location:	
Name of task:			
Task description:			

What is the weight of any items handled?	

If items weigh more than 8 kg and the task involves manual handling consider using the MAC

Which side of the body is primarily involved?	Left		right		both	

What hand tools are used?	
Production rate (if available)	units per shift, hour or minute (circle as appropriate)
How often is the task repeated?	every seconds

Draw the breaks in the shift

First hour →

How long does a worker perform the task?	...without a break	hours
	...in a typical day or shift (excluding breaks)	hours
How often does an individual perform the task? (eg daily, weekly, etc)		
How often is the task carried out within the organisation? (eg daily, etc)		
Do workers rotate to other tasks? If so, what tasks?		

FIGURE 13: ART task description, page 1

NZART score sheet

Company and task details

Company name:

Name/purpose of task:

Location of task:

Team/individuals involved:

Task description:

What is the weight of any items handled:

Which side of the body is primarily involved:

What hand tools are used:

Production rate and repetition

What is the production rate: (units per shift, hour, or minute – indicate as appropriate)

How often is the task repeated: Every seconds

How often is the task carried out within the business: (daily, weekly, monthly)

How often does a worker perform the task: (daily, weekly, monthly)

Do workers rotate to other tasks?

If so, what tasks? For example, do they give the worker an opportunity for rest and recovery of repetitive movements, or are they carrying out similar movement patterns using their upper limbs?

Breaks

How long does a worker perform the task?

Without a break: (hours)

In a typical day or shift (excluding breaks): (hours)

If you find it helpful record breaks below:

First hour →

Are there indications that the task is high risk for WRMSDs?

- The task or similar tasks have a history of upper limb incidents or injuries. For example, reports in the accident register, lost time, week away from work reports.
- There are signs workers find the task difficult. For example, wearing arm supports or bandages, workers complain about or report aches, pains, numbness, or tingling, workers have made changes to the work equipment, furniture, or tools. Ask the workers if they have any of these symptoms.
- Other indications? If so, what:

Notes

Assessment completed by

Name of assessor:

Signature:

Date: / / (DD / MM / YEAR)

FIGURE 14: NZART score sheet, page 1

The colour band and numerical score columns in the table on page 2 of the NZART score sheet were combined (page 22 in the whole NZART document). This was done to simplify the recording process and noting the assessors will tend to write the letter and number in one box. For example, G0, A2, R3. We have also assumed that many assessors will use the online tools which completes the score sheet automatically.

The last column ‘Possible control measures to reduce the risk of red and amber factors’ was introduced to NZART and is laid out the same as NZMAC. This provides a consistent and familiar approach across the New Zealand tools and allows assessors to record notes of any possible controls to reduce the risk as they are completing the score sheet. These differences are shown in Figure 15 and Figure 16.

Score sheet

Enter the colour band and numerical score for each risk factor in the table below. Follow the instructions on page 10 to determine the task score and exposure score.

Risk factors	**Left arm**		**Right arm**	
	Colour	Score	Colour	Score
A1 Arm movements				
A2 Repetition				
B Force				
C1 Head/neck posture				
C2 Back posture				
C3 Arm posture				
C4 Wrist posture				
C5 Hand/finger grip				
D1 Breaks				
D2 Work pace				
D3 Other factors				
Task score				
D4 Duration multiplier		**X**		**X**
Exposure score				
D5 Psychosocial factors				

Are there other indications that the task is high risk?

☐ The task or similar tasks have a history of ULDs (eg company accident book, RIDDOR reports, medically diagnosed cases of upper limb disorders).

☐ There are signs workers find the task difficult (eg wearing arm supports or bandages, reporting discomfort, aches or pains). Ask the workers if they have any of these symptoms.

☐ Other indications? If so, describe:

FIGURE 15: ART score sheet, page 2

RISK FACTORS	**LEFT ARM** SCORE (COLOUR BAND, AND NUMERICAL SCORE)	**RIGHT ARM** SCORE (COLOUR BAND, AND NUMERICAL SCORE)	**POSSIBLE CONTROL MEASURES TO REDUCE THE RISK OF RED AND AMBER FACTORS**
2.1 Arm movements			
2.2 Repetition			
2.3 Force			
2.4 Head/neck position			
2.5 Back position			
2.6 Arm position			
2.7 Wrist position			
2.8 Hand/finger grip			
2.9 Breaks			
2.10 Work pace			
2.11 Other factors			
TASK SCORE			
2.12 Duration multiplier	x	x	
EXPOSURE SCORE			

2.13 Psychosocial and work organisation (or individual) factors present — List the factors present:

FIGURE 16: NZART score sheet, page 2

On page 3 of the NZART score sheet an additional set of questions was added that prompt the assessor to consider further investigation (see Figure 17). This is like the approach used in the NZMAC. These questions are grouped into the five main risk factor areas (individual, biomechanical and physical, work organisation, environmental, psychosocial) outlined in WorkSafe’s ‘contributing factors for work-related musculoskeletal disorders’ model (WorkSafe New Zealand, 2023).

These questions prompt assessors to consider the full range of contributing factors and consider investigating these further. For example, by discussing the specific risks with workers, supervisors, and managers and to determine how the risks can be managed to reduce exposure and the likelihood of musculoskeletal harm occurring. These questions are not an exhaustive list and other more detailed risk assessments might be appropriate.

Is further investigation needed?

Use the checklist below to identify if you need to complete further assessment.

CONSIDER FURTHER ASSESSMENT IF ANY OF THE FOLLOWING APPLY	TICK IF ANY APPLY
Individual factors The task is carried out by workers who may be at significant risk. For example, workers who: - are new mothers or pregnant - are young workers - are older workers - are new to the job or workforce - have a disability, significant health condition, injury, or are recovering from an injury particularly if this affects their neck or upper limbs.	○
Biomechanical and physical factors For example: - the loads handled weigh more than 8kg (also consider using NZMAC) - the repetitive work is very intense for short periods of time (for example, less than 2 hours) - the repetitive work occurs for more than 8 hours - workers are regularly exposed to hand-arm vibration (HAV) at some point during most shifts or tools create or transmit shock or torque/twisitng forces. Such as, from using powered tools, handheld or hand-guided tools, hand-fed workpieces, or vibrating equipment. Impulsive tools such as chipping hammers, needle guns, hammer drills and rotary tools such as grinders and sanders may quickly exceed recommended action levels and may need particular attention.	○
Work organisation factors For example, the jobs or tasks: - require workers to keep up with a rate of work imposed by a process - are monotonous, workers repeat the same work tasks over-and-over - have pay incentives that affect how workers complete the work (such as piece work) - have shiftwork or workers regularly work additional overtime shifts/hours - require special information, training or require high levels of attention or concentration for its safe performance - need workers to wear personal protective equipment (PPE) or clothing and the movement, posture, or grip is hindered.	○
Environmental factors Environmental factors, clothing, PPE, and work activities may combine to place additional physiological demands on workers. For example: - workers are sweating a lot which may lead to dehydration - the work is carried out in cold environments or draughts, particularly if cold air is blowing over the hands - cold tools, work items, or objects are held or used.	○
Psychosocial factors Workers consistently identify the same types of psychosocial factors. For example: - high job demands or workloads (mental or emotional) - lack of control over how they complete their work (freedom or autonomy) - lack of support (from managers or colleagues) - low job satisfaction (unsatisfied with their jobs or have poor work-life balance) - low role clarity (unclear of their responsibilities and expectations).	○

If you have ticked that any of the factors apply you may want to investigate these further. The Contributing factors for musculoskeletal risks checklist can be used. Other assessment tools that focus on different risk factors may provide you with more information and ideas for controls.

FIGURE 17:
NZART score sheet page 3 'Is further investigation needed?'

5.0
Discussion – the need for updated resources

Up until the recent publication of NZART there has been no guidance in New Zealand that provides up-to-date information to help businesses manage their risks associated with repetitive upper limb tasks.

The current and outdated *Code of practice for manual handling* (Department of Labour *et al*., 2001) mainly focusses on lifting/lowering, carrying, and pushing and pulling activities and does not reflect current work health and safety legislation. While it does briefly mention 'hazardous manual handling' it only refers to upper limb vibration (for example, when using hand tools). The term 'repetitive movements' are considered but not specifically related to the upper limbs. For example, it mentions that repetitive tasks may require high levels of muscle activity and overload tissues, that can result in fatigue and tiredness and increase the potential for harm, particularly if rest breaks are insufficient.

Previous research discussed the need to improve hazardous manual task risk management in New Zealand (WorkSafe New Zealand, 2024c). It identified that there was a clear need for up-to-date tools and resources that businesses, inspectors, and those working across the various health and safety disciplines could use. The need for updated resources was further discussed in the Stage 1 development report titled *Development of hazardous manual task risk assessments for use in Aotearoa New Zealand* (WorkSafe New Zealand, 2025a). It also discussed the concerns raised by some researchers about the effectiveness and limitations of risk assessment tools. We recognise that there are limitations with all types of risk assessment tools but due to the lack of fit-for-purpose, easy to use New Zealand resources currently available we needed to start somewhere.

Described within this current report is the development of the Stage 2 tools that include the upper limb screening tool and NZART. The development process was simpler than the manual handling tools developed in Stage 1. The upper limb tools needed to be completed in a much shorter timeframe than was originally anticipated. This was due to an organisational restructure that saw the disestablishment of the HFE team who were responsible for delivering this work. Due to time and budget restrictions, we were unable to trial either the screening tool or the NZART risk assessment. Instead, we used the feedback and principles we had learnt during Stage 1 to inform their development. For example, we used a similar layout and style for the upper limb screening tool and NZART as was used for the manual handling screening tools and NZMAC.

Like the manual handling assessment tools developed in Stage 1 the upper limb screening tool and NZART were adapted from the suite of tools from the Health and Safety Executive (HSE), United Kingdom (UK). Previous WorkSafe reports outlined that the HSE tools were selected because they provide a comprehensive approach to address the key risk factors associated with musculoskeletal harm. But they were not without their limitations. They mainly focus on physical risk factors, with limited consideration of work organisation or psychosocial factors (WorkSafe New Zealand, 2024c, 2025a).

Oakman *et al*. (2022) suggested that tools that take a hazard-by-hazard approach are not sufficiently preventing harm. They developed a job-based participative assessment method (APHIRM) that considers both physical and psychosocial risks' (Oakman & Macdonald, 2019). The upper limb and manual handling tools described within this and previous reports takes a task-based approach to begin with. We agree that a job-based approach might be useful for some, particularly large employers, but also believe that there is a place for assessment tools like NZART, NZMAC, and NZRAPP. They can provide users with valuable information about aspects of a task that are exposing workers to greater risk than others. They provide structure to guide businesses to control the risk, they can be used by any size of business and are quick and relatively easy to use with some training. They may be used as part of a toolkit where businesses can use a range of methods to assess the musculoskeletal risk.

The ART (Health and Safety Executive, 2010) better includes psychosocial factors compared to MAC (Health and Safety Executive, 2019), but these factors while mentioned are not scored. The same approach is used in NZART, with the heading changed to 'psychosocial and work organisation factors', but there is still no requirement to score these. NZART (like ART) mainly assesses the key physical risk factors associated with the development of upper limb conditions. But, after completing NZART we encourage assessors to undertake further investigation by using the *Contributing factors for musculoskeletal risks checklist* (WorkSafe New Zealand, 2024a). This checklist consists of 64 questions covering the range of contributing risk factors. Within it are 26 questions that address the most common psychosocial and work organisation risk factors attributed to the development of WRMSDs. Businesses can use the checklist to prompt conversations with their workers to provide a more comprehensive overview of the risk factors that may contribute to harm.

We agree with authors who have suggested that a risk management approach that considers all the contributing risk factors and includes meaningful worker engagement is necessary to reduce the high rates of work-related musculoskeletal harm. While observation-based approaches have their limitations (Lind *et al*., 2014; Macdonald & Oakman, 2015; Oakman *et al*., 2022) we recommend that NZMAC, NZART, and NZRAPP are used as part of a toolkit that supports a risk management approach. These tools must be completed with workers to understand the risks, how the work is done, and where improvements could be made. Additional methods such as the *Contributing factors for musculoskeletal risks checklist* may be used to support these assessments. By using the tools in this way, we suggest that businesses will be able to assess the level of risk that workers are exposed to and to help better control the risk using good work design principles. This will help businesses to effectively meet their obligations under the Health and Safety at Work Act (2015).

The review and inclusion of additional tools such APHIRM (Oakman & Macdonald, 2019) was planned to occur after the publication of the Stage 1, 2, and 3 tools. The aim being to provide businesses with a 'toolkit' of resources to support them to manage the risks associated with work-related musculoskeletal disorders, but this work will not occur at this time.

One of the current limitations with the NZART (like the NZMAC) is that it is only offered in a PDF format and a separate fillable PDF score sheet. Anyone can use the online UK ART tool so the assessment scores will be the same (apart from some minor wording differences). But the information around the New Zealand tool does make it feel a little different from the HSE version. While most of the changes are not particularly significant, apart from the inclusion of a 'further investigation' section in the score sheet, it would be ideal to have a standalone online New Zealand version.

There are real opportunities to develop the full suite of online tools (for example, screening tools and NZMAC, NZART, and NZRAPP) to assist businesses to assess and manage the work-related musculoskeletal disorders. Most people use smartphones and having a tool at your fingertips that automatically presents the findings and suggests possible control measures would likely enhance their use and uptake. A similar approach could be taken as the UK online tools (MAC, ART, RAPP) where the tool is hosted on a survey site. It is expected that this should be relatively cost-effective and easy to set-up.

6.0
Conclusions

The upper limb screening tool and NZART are part of a musculoskeletal risk assessment toolkit that businesses can use to manage these health risks.

The purpose of this report was to outline the Stage 2 development process of the New Zealand versions of the upper limb screening and risk assessment tool, NZART. It also acts as a record of the logic behind why decisions were made during development of these tools.

There was a clear need to provide New Zealand businesses, those working across the health and safety disciplines, and inspectors, with manual task risk assessment tools that are up-to-date, quick and easy to use, and scientifically robust. We did not have the resources to develop new tools and adapted them from tools from the HSE (United Kingdom). Adaptation of these occurred with consideration given to how they could more widely include the range of contributing risk factors, particularly psychosocial and organisation factors associated with WRMSDs.

The tools were developed in a staged approach:

- Stage 1 saw the completion of the manual handling set of tools that included four screening tools for lifting/lowering, carrying, pushing/pulling, and manual handling-while-seated, the risk assessment tool NZMAC, and the contributing factors for musculoskeletal risks checklist. These were published on the WorkSafe website in August 2024.
- Stage 2 resulted in the development of an upper limb screening tool and a more detailed risk assessment, NZART. These were published on the WorkSafe website in February 2025, with the development process outlined within this report.
- Stage 3 involved the development of the pushing and pulling risk assessment, NZRAPP and a separate report will outline the development process. NZRAPP was developed last because the HSE were reviewing and updating RAPP, and we wanted to wait to get the most up to date version. But, due to the organisational restructure, there was urgency to develop a New Zealand version as soon as possible. This meant that we developed NZRAPP alongside NZART, but it will likely need updating in 2–3 years to reflect the changes made to the HSE version.

It is important to remember that while there are limitations to any risk assessment, they simply provide a structured approach to help assessors and businesses consider and manage musculoskeletal risks. This is a critical first step to build knowledge and understand the risks workers are exposed to.

This second set of tools adds to the musculoskeletal risk assessment toolkit which is best used as part of a health risk management approach. The aim of any risk assessment should be to identify where the risk occurs and how it can be controlled. Businesses have a primary duty of care under the Health and Safety at Work Act (2015) and this includes the management of musculoskeletal risks. Following the hierarchy of control measures and following good work design principles will help businesses to manage their musculoskeletal risks. Where practical, higher order controls such as removing the risk altogether (elimination) should be considered first. If not possible using substitution or engineering controls to minimise the risk will be the most effective.

To get the best out of any of these tools and to effectively control the risk, worker engagement and participation is key. These task-based risk assessments should not be a desk-based exercise, rather completed with workers where the work is being done. To further understand the range of contributing factors we recommend using the *Contributing factors for musculoskeletal risks checklist* after an NZART assessment.

7.0
Recommendations and next steps

The development of the upper limb screening tool and NZART marks the completion of Stage 2. Further work is needed to develop resources and training to support these tools.

The closure of the ACC discomfort, pain, and injury (DPI) programme and removal of all supporting resources by 2018 left a gap that is only now starting to be filled. The Stage 1 manual handling screening tools and NZMAC were published in August 2024. The Stage 2, upper limb screening tool and NZART, and the Stage 3 risk assessment of pushing and pulling tasks (NZRAPP) were both published in February 2025. This completes the first set of hazardous manual tasks risk assessment tools available for use in New Zealand. But there remain other opportunities for further resource development such as the *Back injury risks in driving (BIRD)* tool (Health and Safety Executive, 2023).

The following list of activities are recommendations for the next steps in the development of tools and resources to support businesses to manage the risks associated with work-related musculoskeletal disorders. But, given the disestablishment of the HFE team within WorkSafe and the current WorkSafe strategy these recommendations are unlikely to be acted upon at this time. They simply identify the need for more work to be done in this area at some point, when there is an appetite to revisit these risks:

- deliver training across the breadth of the work health and safety disciplines, sector, and industry groups
- create online versions of the NZART (in the first instance), and potentially the screening tools
- develop New Zealand case studies and other resources to support businesses use the tools
- develop resources to support inspectors' awareness and potential use of the tools
- complete Stage 3 development of the pushing and pulling risk assessment (NZRAPP)
- consider the development of future stages, beyond Stage 3. For example, to include the *Back injury risks in driving (BIRD)* tool (Health and Safety Executive, 2023) or, to recommend other participative approaches such as the *APHIRM* toolkit (La Trobe University, 2018)
- develop an updated code of practice for manual handling, or a new hazardous manual tasks code of practice (or similar) to provide businesses with updated guidance on work-related musculoskeletal disorders risk management.

Appendices

IN THIS SECTION:

Appendix 1: Glossary

ABBREVIATION	TERM
ACC	Accident Compensation Corporation
APHIRM	A participative hazard identification and risk management toolkit
ART	Assessment of repetitive tasks of the upper limbs
BIRD	Back injury risks in driving tool
DPI	Discomfort, Pain, and Injury
HSE	Health and Safety Executive (United Kingdom)
HSWA	Health and Safety at Work Act
HFE	Human Factors/Ergonomics (team)
HWSA	Heads of Workplace Safety Authorities (Australia and New Zealand)
Kaimahi	Workers
MAC	Manual Handling Assessment Charts
MSDs	Musculoskeletal disorders
NZART	New Zealand assessment of repetitive tasks of the upper limbs
NZISM	New Zealand Institute of Safety Management
NZOHNA	New Zealand Occupational Health Nurses Association
NZMAC	New Zealand manual handling assessment charts
NZRAPP	New Zealand risk assessment of pushing and pulling
PCBU	Person conducting a business or undertaking
RAMP	Risk management assessment tool for manual handling proactively
RAPP	Risk assessment for pushing and pulling
UK	United Kingdom
ULD(s)	Upper limb disorder(s)
WEPR	Worker engagement, participation, and representation
WRMSDs	Work-related musculoskeletal disorders

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Notes

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