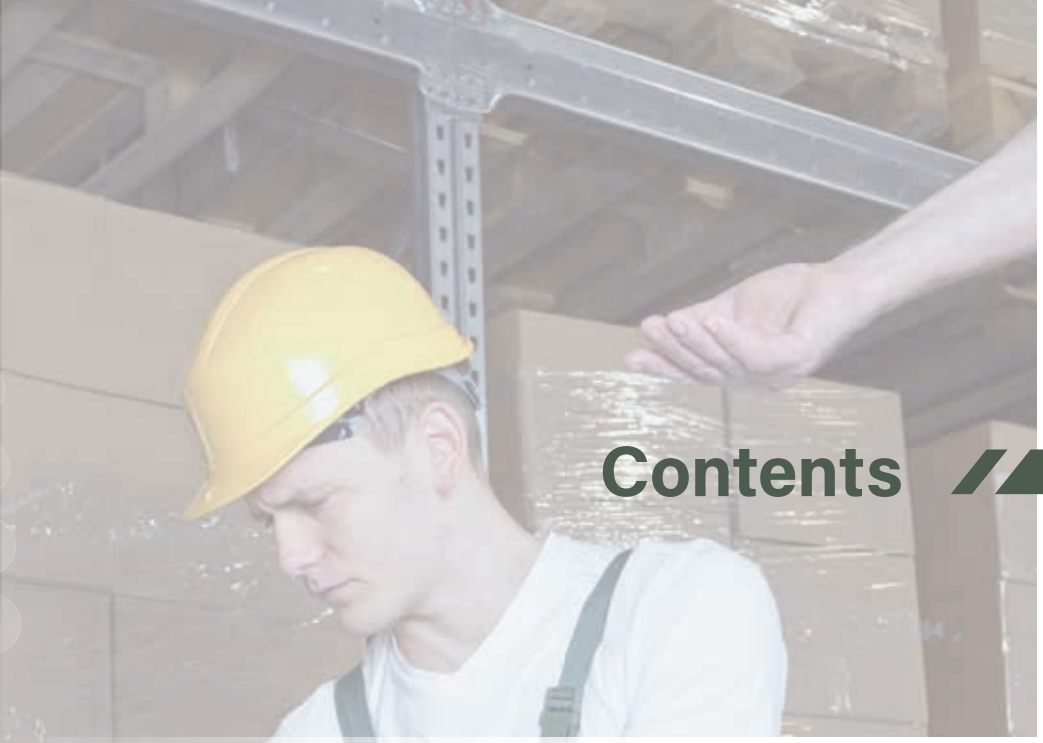
HSA

An tÚdarás Sláinte agus Sábháilteachta
Health and Safety Authority

Risk Assessment for Managing Ergonomic Risks

to Improve Musculoskeletal Health

Our Vision: Healthy, safe and productive lives and enterprises



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The risk assessment process

The risk assessment process is central to effective ergonomic risk management. This guide focuses on the revised five-step risk assessment process to manage unfavourable ergonomic conditions when carrying out manual handling tasks or highly repetitive tasks of the upper limbs. Further guidance on the display screen equipment regulations and the risk assessment requirements for work at computer workstations is available from the Health and Safety Authority.[1]

The revised five-step model allows for greater detail under step 3 of the risk assessment process in relation to identifying ergonomic risks and quantifying the level of risk. For example, in the past a risk factor for a manual handling task may have been identified as 'load is too heavy'; now, with the use of a risk assessment tool such as the UK Health and Safety Executive's Manual handling assessment charts, the risk can be identified in more detail: 'load is too heavy as it weighs 50kg and this results in a high level of risk as it may expose a significant proportion of the working population to a risk of injury'. This revision has introduced more factual and evidence-based data.

The UK Health and Safety Executive (HSE UK) has three relevant risk assessment tools that may be used:

- Manual handling assessment charts (the MAC tool)
- Risk assessment of pushing and pulling (RAPP) tool
- Assessment of repetitive tasks of the upper limbs (the ART tool)

People who carry out assessments (assessors) need to be familiar with the operations in question and have competency in using the relevant risk assessment tools (i.e. the MAC, RAPP or ART tools). This guide does not describe how to use these tools so it is important that assessors receive appropriate training. A system of verification should be in place to ensure that assessors have the relevant training and that their assessments are carried out properly. It may be necessary to call in outside expertise in some situations.

Employees should be involved in any risk assessment process and redesign of the system of work.

HSE UK Manual handling assessment charts (MAC)

The MAC tool[2] is designed to assess the most common ergonomic risk factors in lifting, carrying and team handling operations. It is important to read the assessment guide before completing an assessment and to follow the guide and flow chart to determine the level of risk for each ergonomic risk factor (load weight/ frequency, hand distance from lower back, vertical lift region, etc.). Once you have identified the level of risk for each ergonomic risk factor, you should enter the colour band and corresponding numerical score on the score sheet. Figure 1 is an example of a MAC tool score sheet.

[1] See www.hsa.ie/eng/Workplace_Health/Manual_Handling_Display_Screen_Equipment/Guidance_Documents/Display_Screen_Equipment/.

[2] See www.hse.gov.uk/pubns/indg383.pdf.

Figure 1

Insert the colour band and numerical score for each of the risk factors in the appropriate boxes below, with reference to your assessment using the tool

Risk Factors	Colour Band (G,A,R or P)			Numerical Score		
	Lift	Carry	Team	Lift	Carry	Team
Load weight and lift/carry frequency	P			10		
Hand distance form the lower back	R			6		
Vertical lift region	G			0		
Trunk twisting / sideways bending Asymmetrical trunk / load carrying	R			2		
Postural constraints	A			1		
Grip on load	R			2		
Floor surface	G			0		
Other environment factors	G			0		
Carry distance (carrying only)						
Obstacles en route (carrying on)						
Communication and co-ordination (team handling only)						
Other risk factors e.g. individual factors, psychosocial factor, etc.	TOTAL SCORE:			21		

The colour bands identify which elements of the task require attention: those with a red or purple colour band have a high or very high level of risk. The total numerical score helps to prioritise those tasks that need most urgent attention and to check the effectiveness of any improvements put in place.

The MAC tool can be used only when you have a full understanding of the task requirements and you have collected all relevant technical information needed to make an informed judgement using the tool.

The MAC tool scoresheet includes a section to note other risk factors that may be evident, including psychosocial risk factors such as:

- little control over how the work is done,
- monotonous work,
- high levels of attention and concentration required,
- frequent tight deadlines, and
- lack of support from supervisors or co-employees.

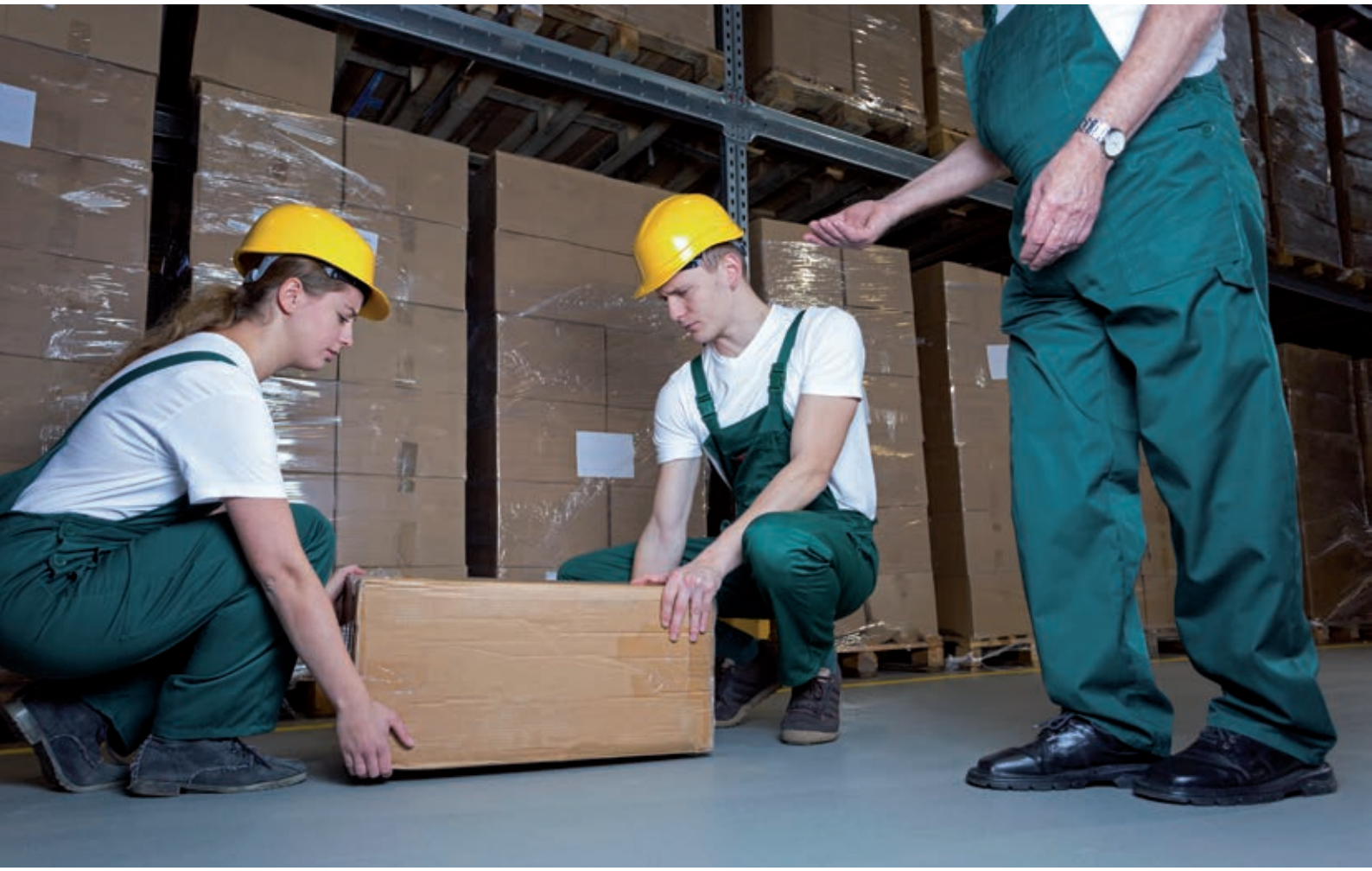
Any identified psychosocial risk factors should be referred to management at an organisational level.

HSE UK Risk assessment of pushing and pulling (RAPP)

The RAPP tool follows a similar approach to the MAC tool and is designed to assess the most common ergonomic risk factors in pushing and pulling operations such as moving loads on wheeled equipment and moving loads without wheels. For each type of operation there is a flow chart, an assessment guide and a score sheet. The flow charts provide an overview of the ergonomic risk factors and assessment process. The assessment guides provide information to help you determine the level of risk for each ergonomic risk factor.

HSE Assessment of repetitive tasks (ART) of the upper limbs

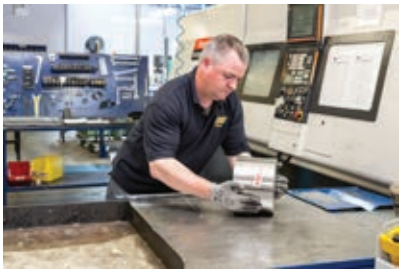
The ART tool is designed to assess repetitive tasks that involve a sequence of upper limb actions of short duration that are repeated over and over again (such as cutting pieces of meat or packing products in a box). Such tasks are typically part of assembly, production, packaging and packing activities. The ART tool follows the same approach as the MAC and RAPP tools and has the same features: the flow chart, the assessment guide and the score sheet.

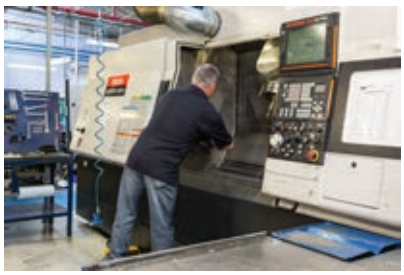


Worked example of the risk assessment process

Step 1 — Task description

The metal billets have to be transferred manually from a table into a CNC machine. The employee takes the billet from the table and carries it to the machine and then reaches in to place the billet in position in the machine.





Step 2 — Collect technical information

As this is a manual handling task, the appropriate risk assessment tool to use is the MAC tool.

There are changes in posture as the billet is transferred from the table to the CNC. The billet can weigh 20–130kg. The table is at waist height. The floor is clean and free of debris. There are no handles on the load and it is difficult to carry.

Step 3 — Identify the risk factors using the relevant risk assessment tool and fill in the relevant score sheet

Complete the MAC tool score sheet for this task:

Insert the colour band and numerical score for each of the risk factors in the appropriate boxes below, with reference to your assessment using the tool

Risk Factors	Colour Band (G,A,R or P)			Numerical Score		
	Lift	Carry	Team	Lift	Carry	Team
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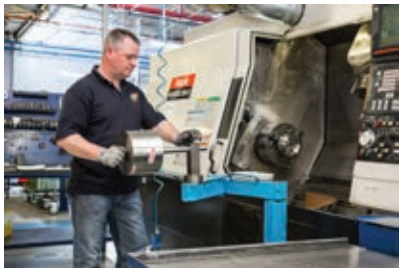
Postural constraints	A			1		
Grip on load	R			2		
Floor surface	G			0		
Other environment factors	G			0		
Carry distance (carrying only)						
Obstacles en route (carrying on)						
Communication and co-ordination (team handling only)						
Other risk factors e.g. individual factors, psychosocial factor, etc.	TOTAL SCORE:			21		

There are a number of ergonomic risk factors with respect to this handling task. These include the load weight (billet weight up to 130kg), hand distance from the lower back (upper arms angled away from the body and trunk), trunk twisting and sideways bending when placing the billet into the CNC machine, and grip on load.

Step 4	Identify the improvements to be put in place	High-risk and very high-risk ergonomic risk factors were identified in step 3. As a result, the employer consulted with the person who does the job and a number of other colleagues to identify an appropriate solution to avoid the handling of the billets. A custom-engineered billet loader was fixed to the floor at each CNC machine centre and all operators were trained to use it. 
Step 5	Review the effectiveness of the improvements made	The new engineering intervention is very effective in that it has eliminated the ergonomic risk factors completely. The billet loader eliminates the manual lifting of the billet and can be operated with a neutral standing posture.

The above example involved use of the MAC tool for the risk assessment of a manual handling task. The risk assessment tool that you use will depend on the work activity being assessed. If you need to assess a work task that involves high repetition movements of the upper limbs, then it is appropriate to use the ART tool. If you need to assess a work task that involves a lot of pushing and pulling of trolleys or pallets, then the appropriate tool to use is the RAPP tool. The assessor must have undergone appropriate training prior to using any of these risk assessment tools.

When introducing a change in work practice to address ergonomic risk factors, it is important that the information is communicated to all relevant staff. Below are a number of actions that need to be taken:

- Implement the appropriate task-specific control(s) to clearly address the ergonomic risk factors identified in the assessment tool score sheet
- Develop a safe system of work plan (SSWP) or a method statement as a useful way of demonstrating and documenting the interventions that have been put in place
- Provide appropriate training so that workers understand what changes have been put in place, how the changes will address ergonomic risk and how they should carry out the task using the appropriate equipment provided or in line with the relevant SSWP or method statement
- Ensure that the introduction of a new control measure to address ergonomic risk does not introduce any new risks

Notes

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Further Information and Guidance:

Visit our website at **www.hsa.ie**, telephone our contact centre on **0818 289 389** or email **wcu@hsa.ie**

Use BeSMART, our free online risk assessment tool at **www.besmart.ie**

Check out our range of free online courses at **www.hsalearning.ie**

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