

Risk Assessment by using Key Item Method in Practice

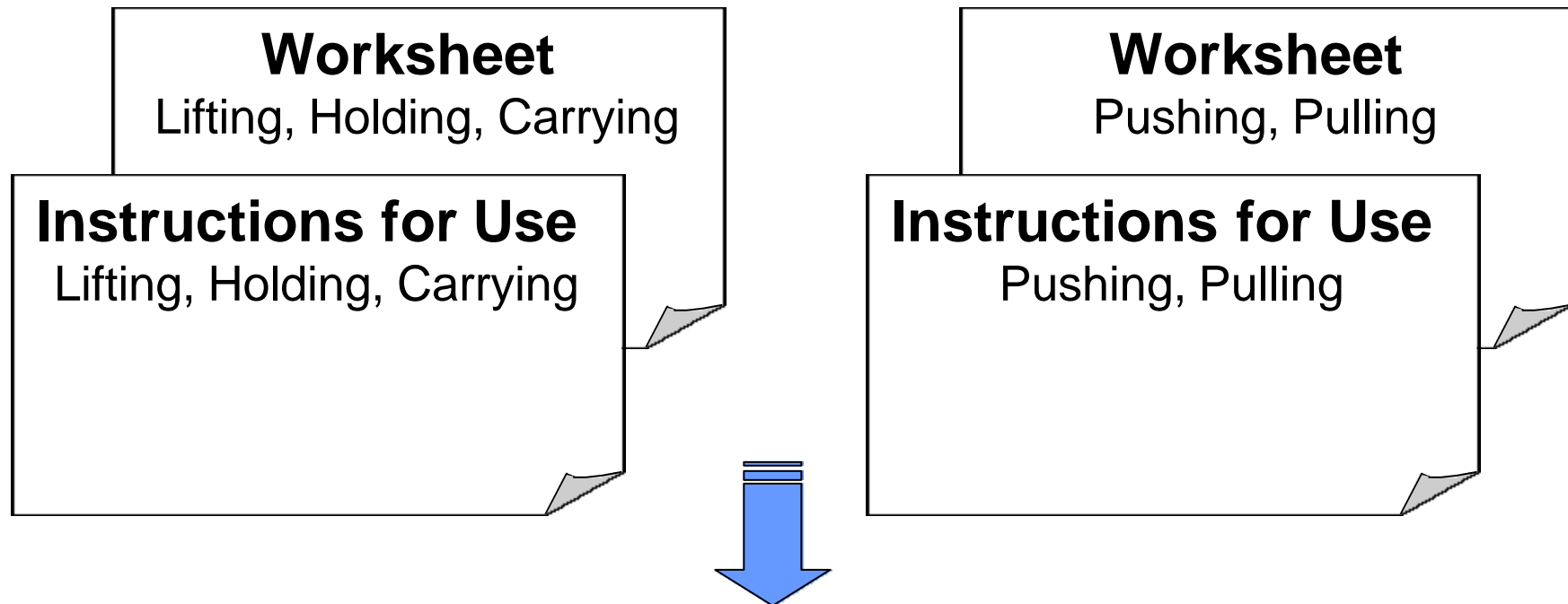
Examples for Assessment and Answers to frequently asked Questions



A short lesson for carrying out a risk assessment by using key item methode in correct way

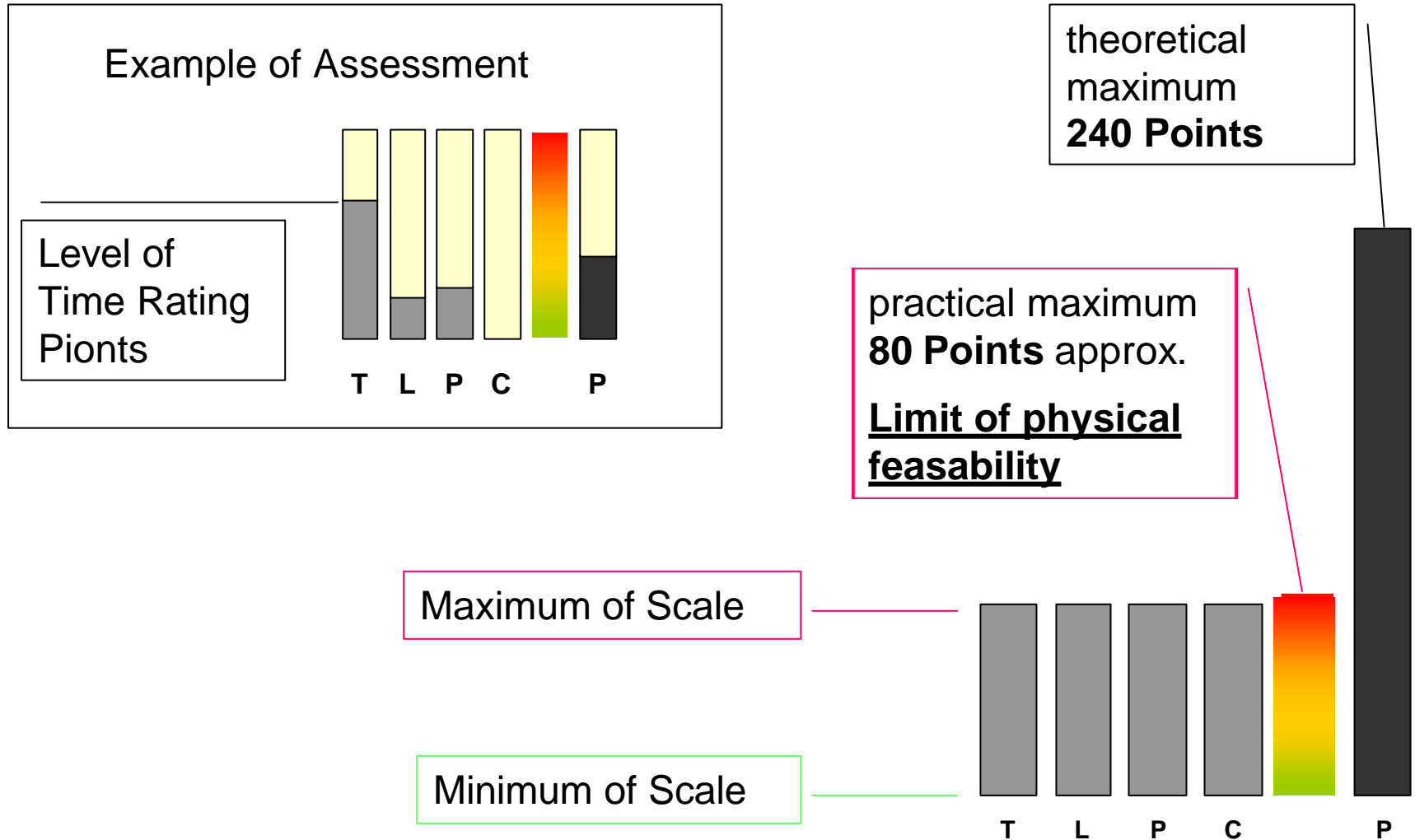
Before starting lesson:

These Worksheets must be available and read carefully



Download from: [www.baua.de/Practical Solutions](http://www.baua.de/Practical%20Solutions)

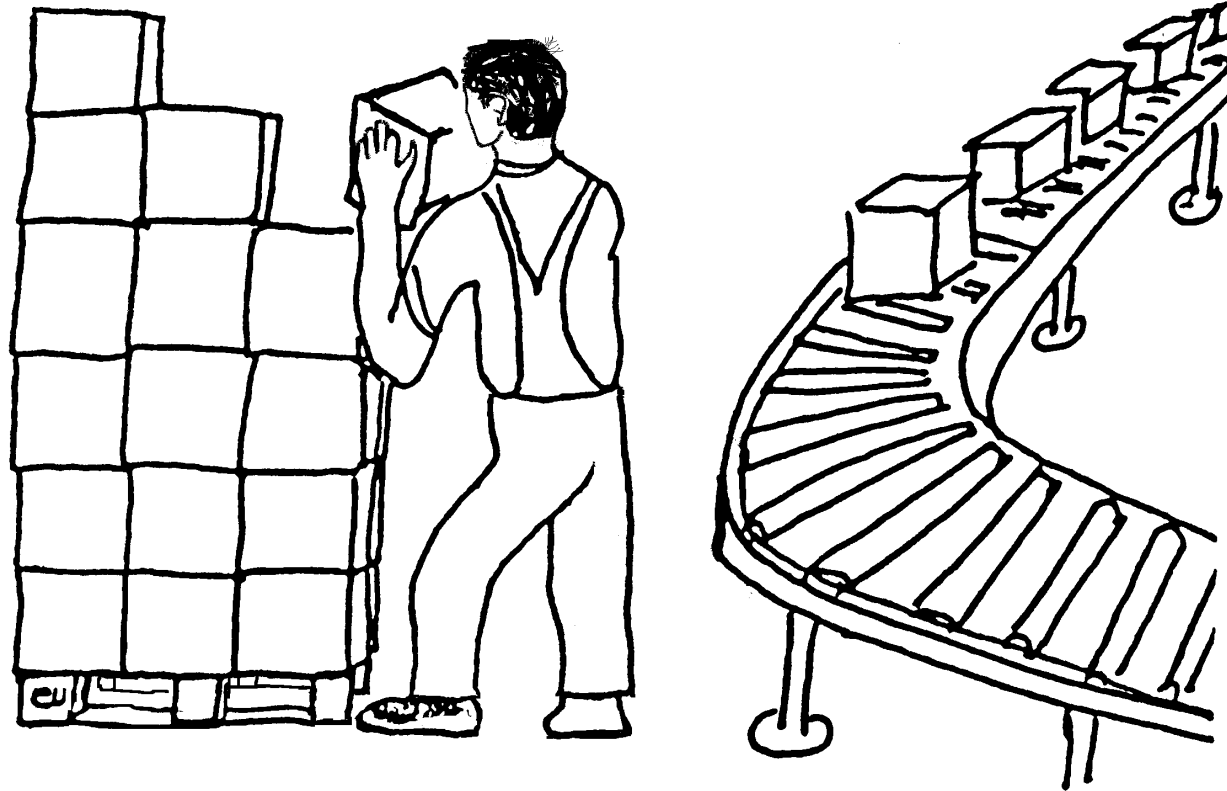
Before starting lesson: Short Introductions about used bar charts



1. Easy case

Checking before Dispatch

Easy Case



***Pick up, Checking, Sign, Stacking
600 Pieces per Day, Weigh 12 kg***

ASS
Where

Work

1st s

Pick up, Checking, Sign, Stacking 600 Pieces per Day, Weigh 12 kg

Number on working day	Time rating points	Total duration on working day	Time rating points	Overall length on working day	Time rating points
< 10	1	< 5 min	1	< 300 m	1
10 to < 40	2	5 to 15 min	2	300 m to < 1km	2
40 to < 200	4	15 min to < 1 hr	4	1 km to < 4 km	4
200 to < 500	6	1 hrs to < 2 hrs	6	4 to < 8 km	6
500 to < 1000	8	2 hrs to < 4 hrs	8	8 to < 16 km	8
= 1000	10	≥ 4 hrs	10	= 16 km	10

Examples: • laying bricks, • placing workpieces into a machine • taking boxes out of a container and putting them onto a conveyor belt

Examples: • holding and guiding a cast iron slug while working on a wheel stand, • operating a hand grinding machine, • operating a weed-eater

Examples: • furniture removal, • delivering scaffolding parts to a building site

2nd step: Determination of rating points of load, posture and working conditions

Effective load ¹⁾ for men	Load rating point	Effective load ¹⁾ for women	Load rating point
< 10 kg	1	< 5 kg	1
10 to < 20 kg	2	5 to < 10 kg	2
20 to < 30 kg	4	10 to < 15 kg	4
30 to < 40 kg	7	15 to < 25 kg	7
= 40 kg	25	= 25 kg	25

1) „Effective load“ means in this context the real action force which is necessary for moving load. This action force does not correspond to the load mass in each case. When tilting a carton, only 50 % of the load mass will have an effect on worker and when using a cart only 10 %.

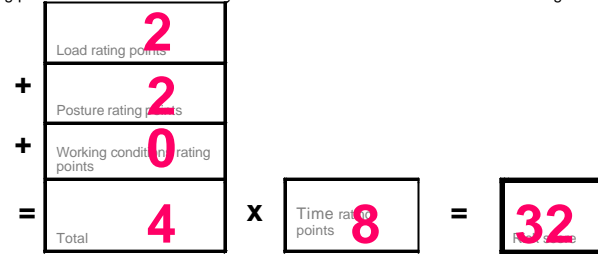
Typical posture, position of load ²⁾	Posture, position of load	Posture rating point
	<ul style="list-style-type: none"> Upper body upright, not twisted When lifting, holding, carrying and lowering the load is close to body 	1
	<ul style="list-style-type: none"> Slightly bending forward or twisting the trunk When lifting, holding, carrying and lowering load is near to medium to body 	2
	<ul style="list-style-type: none"> Low bending or far bending forward Slightly bending forward with simultaneous twisting of trunk Load far from the body or above shoulder height 	4
	<ul style="list-style-type: none"> Bending far forward with simultaneous twisting of trunk Load far from body Restricted stability of posture when standing Crouching or kneeling 	8

2) To determine the posture rating points the typical posture during manual handling must be used. For example when there are different postures with load a mean value must be used – not occasional extreme values.

Working conditions	Working conditions rating point
e.g. sufficient space, no physical obstacles within the old flooring, sufficient lighting, good gripping conditions	0
ed and unfavourable ergonomic conditions restricted by too low high or working area less than 1,5 m ² or 2. posture stability impaired by uneven floor or soft ground)	1
Strongly restricted space of movement and/or instability of centre of gravity of load (e.g. transfer of patients)	2

3rd step: Evaluation

The rating points relevant to this activity are to be entered and calculated in the diagram.



On the basis of the rating calculated and the table below it is possible to make a rough evaluation. ³⁾ Regardless of this provisions of the Maternity Leave Act apply.

Risk range	Risk score	Description
1	< 10	Low load situation, physical overload unlikely to appear.
2	10 bis < 25	Increased load situation, physical overload is possible for less resilient persons ⁴⁾ . For that group redesign of workplace is helpful.
3	25 bis < 50	Highly increased load situation, physical overload also possible for normal persons. Redesign of the workplace is recommended.
4	≥ 50	High load situation, physical overload is likely to appear. Workplace redesign is necessary ⁵⁾ .

³⁾ Basically it must be assumed that as the number of point rating rises, so the risk of overloading the muscular-skeletal system increases. The boundaries between the risk ranges are fluid because of the individual working techniques and performance conditions. The classification may therefore only be regarded as an orientation aid. More exact analyses require specialist ergonomic knowledge.

⁴⁾ Less resilient persons in this context are persons older than 40 or younger than 21 years, newcomers in the job or people suffering from illness.

⁵⁾ Design requirements can be determined with reference to the number of point in the table. By reducing the weight, improving the execution conditions or shortening the strain time, elevated stress can be avoided.

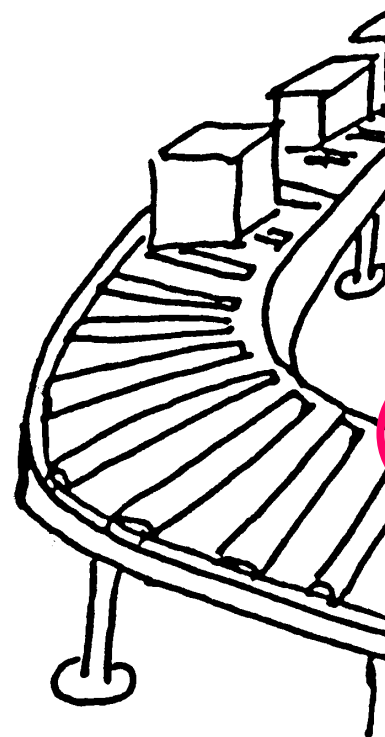
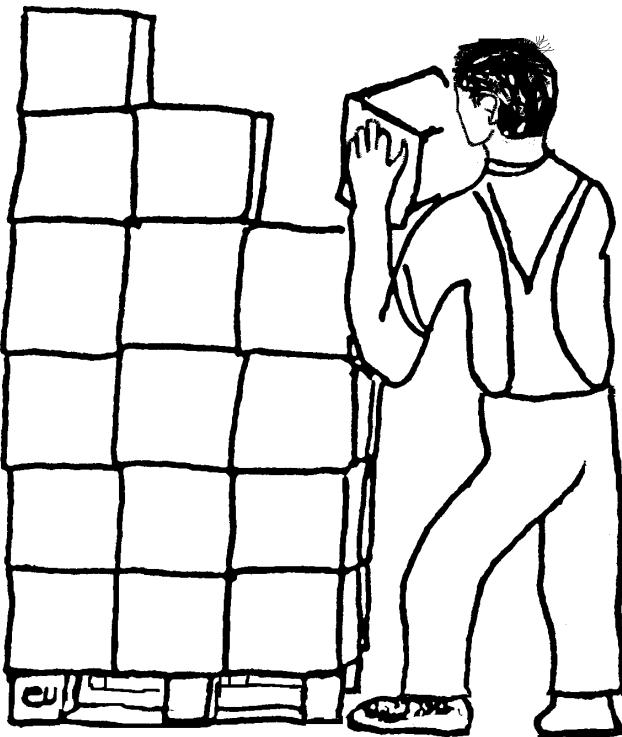
Check of the workplace necessary for other reasons:

Reasons: _____

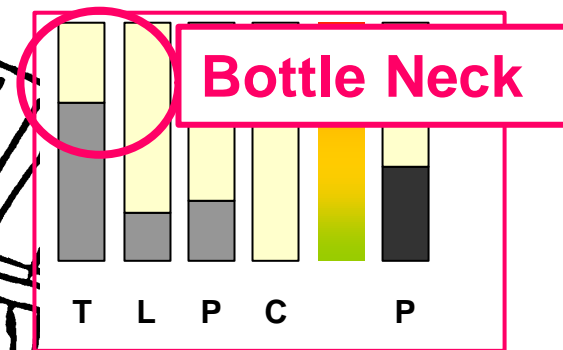
Date of assessment: _____ Assessed by: _____

Checking before Dispatch

Easy Case



<u>T</u> ime	8
<u>L</u> oad	2
<u>P</u> osture	2
<u>C</u> onditions	0
<u>P</u> oints	32

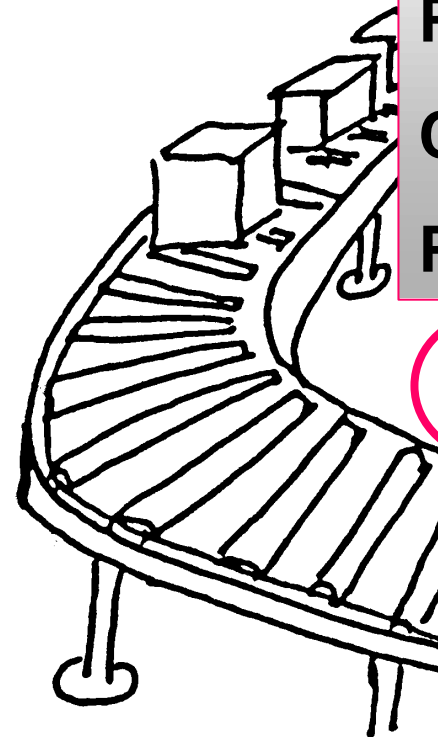
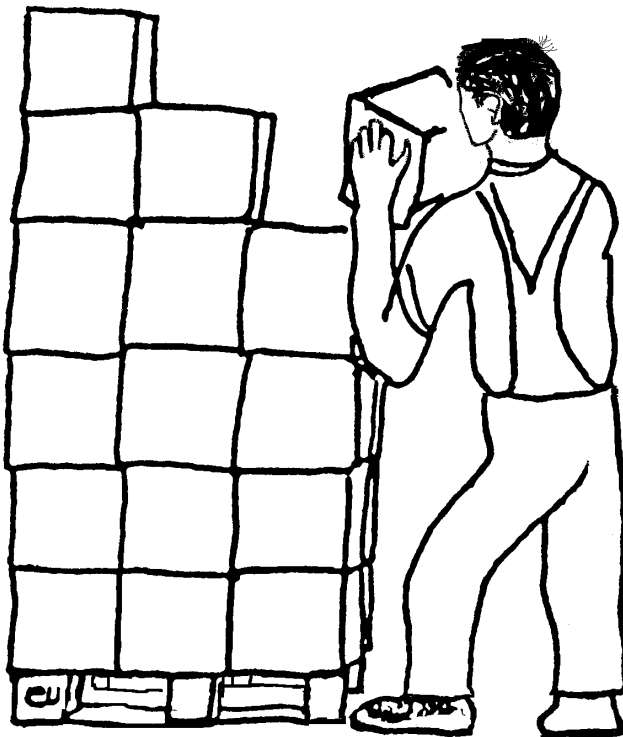


Pick up, Checking, Sign, Stacking
600 Pieces per Day, Weigth 12 kg

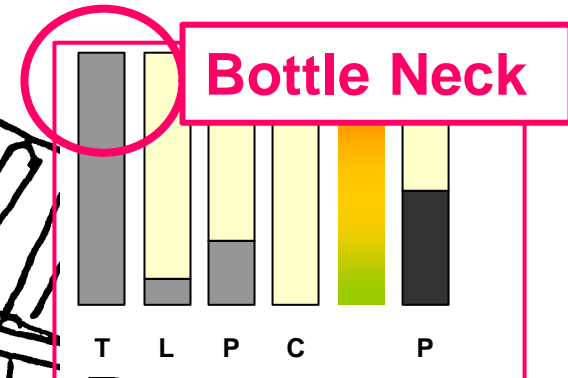
2. Extrapolation

Stacking without Check

Extrapolation



Time	12
Load	1
Posture	2
Conditions	0
Points	36



Pick up, Stacking
1.600 Pieces per Day, Weigh 5 kg

3. Interpolation & several Tasks

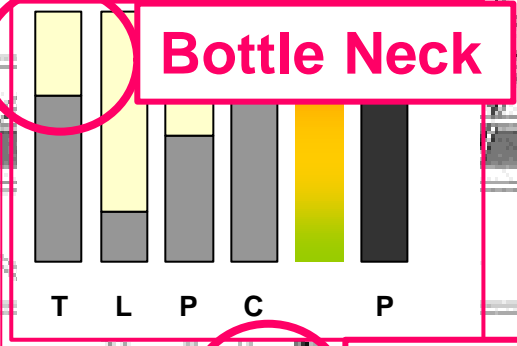
Scaffolding

Interpolation & several Tasks

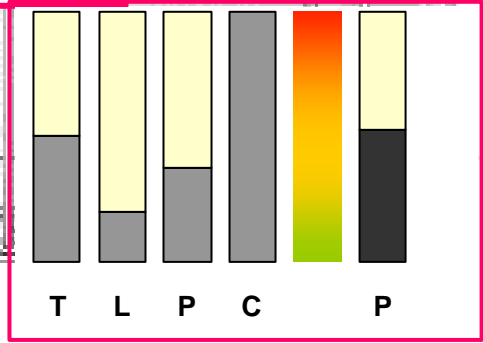
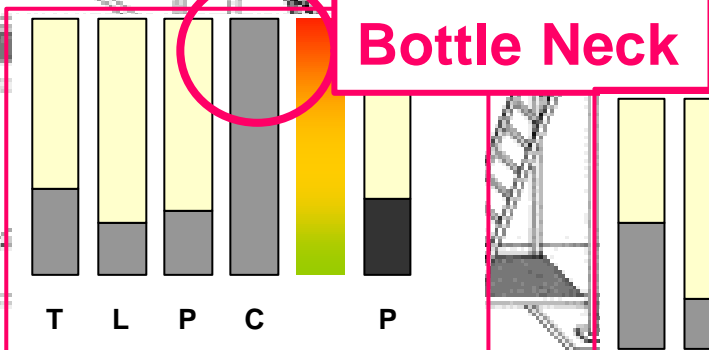
*To put a scaffolding (Job-Rotation)
250 Pieces per Day and Person, Weigth 4 ..17.. 25 kg*



Time		8
L Time		4
P Load		2
C Posture		2
P Conditions		2
Points		24



Time		6
Load		2
Posture		3
Conditions		2
Points		42





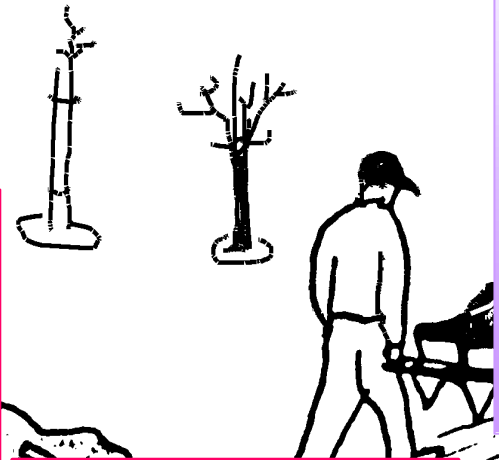
*Carrying Pieces to Lorry
80 Pieces per Day and Person, 4 ..17.. 25 kg*

4. Several tasks & pushing and pulling

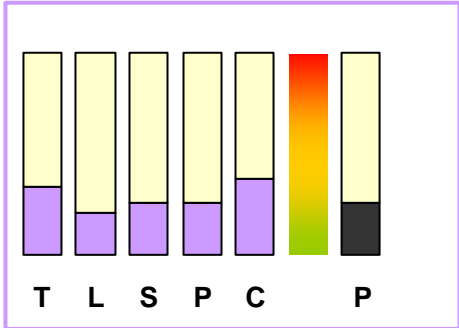
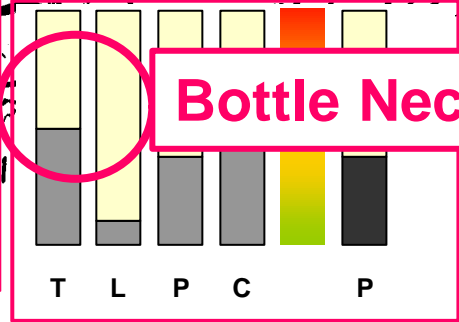
Landscaper

Serval Tasks & Pushing and Pulling

	
Time	6
Load	1
Posture	3
Conditions	1
Points	30



Time	4
Load	1
Speed	1
Posture	2
Conditions	3
Points	28



**Loading Garden Mold, Driving, Tilting, Raking, Turn back
1,5 Tons per Day, 5 kg per Shovel, 10 Shovels per Wheelbarrow, 30
Wheelbarrows per Day, approx. 2 km Way**

Assessment of pulling and pushing based on key indicators *Version Sept 2002*

Loading Garden Mold, Driving, Tilting, Raking, Turn back 1,5 Tons per Day, 5 kg per Shovel, 10 Shovels per Wheelbarrow, 30 Wheelbarrow per Day, approx. 2 km Way

Number on working day	Time rating points	Total distance on working day	Time rating points
< 10	1	< 300 m	1
10 to < 40	2	300 m to < 1km	2
40 to < 200	4	1 km to < 4 km	4
200 to < 500	6	4 to < 8 km	6
500 to < 1000	8	8 to < 16 km	8
= 1000	10	= 16 km	10

Examples: operation of manipulators, setting up machines, distribution of meals in a hospital

Examples: garbage collection, furniture transport in buildings on rollers, unloading and transloading of containers

2nd step: Determination of rating points of mass, positioning accuracy, speed, posture and working conditions

Mass to be moved (load weight)	Industrial truck, aid				
	Without, load is rolled	Barrow	Carriage, roller, trolleys without fixed rollers (only steerable rollers)	Rail cars, hand carts, roller tables, carriages with rollers	Manipulators, rope balancers
rolling					
< 50 kg	0.5	0.5	0.5	0.5	0.5
50 to < 100 kg	1	1	1	1	1
100 to < 200 kg	1.5	2	2	1.5	2
200 to < 300 kg	2	4	3	2	4
300 to < 400 kg	3		4	3	
400 to < 600 kg	4		5	4	
600 to < 1000 kg	5			5	
= 1000 kg					

sliding	Grey areas:	
	Critical because a check of the movement of industrial truck/load depends very much on skill and physical strength.	
< 10 kg	1	
10 to < 25 kg	2	
25 to < 50 kg	4	
> 50 kg		

White areas without number:
Basically to be avoided because the necessary action forces can easily exceed the maximum physical forces.

Positioning accuracy	Speed of motion	
	slow (< 0.8 m/s)	fast (0.8 bis 1.3 m/s)
Low - no specification of travelling distance - load can roll to a stop or runs against a stop	1	2
High - load must be accurately positioned and stopped - travelling distance must be adhered to exactly - frequent changes in direction	2	4

Note: the average walking speed is approx. 1 m/s

In general the whole muscular-skeletal system is subject to strain when pulling and pushing, but in particular the hand-arm-shoulder area. Depending on the specific force applied however, it is also possible that the lumbar spine and the hip and knee joints will be under severe strain. Because the physical forces are substantially lower and more varied than when pulling and pushing, it is difficult to verify chronic damage from overload. It is typical for pulling and pushing that there is a risk to the muscular-skeletal system from sudden overloads as a result of unexpected and great forces with change of direction or when stopping.

	Body inclined low in direction of motion	1
	Squatting, kneeling, bending	2
	Combination of bending and twisting	4
		8

1) The typical posture must be used. The greater trunk inclination possible when starting up, braking or shunting can be ignored if it only occurs occasionally.

Working conditions		
Good: → floor or other surfaces level, firm, smooth, dry → no incline → no obstacles in work-space → rollers or wheels run easily, no evident wear in the wheel bearings		0
Restricted: → floor soiled, a little uneven, soft → slight incline up to 2° → obstacles in work-space which have to be bypassed → rollers or wheels soiled, no longer run easily, bearings worn		3
Difficult: → unpaved or roughly paved roadway, potholes, severe soiling → inclines of 2 to 5° → industrial trucks have to be torn loose when starting up → rollers or wheels soiled, bearings run sluggishly		4
Complicated: → steps, stairs → inclines >5° → combinations of indicators from "restricted" to "difficult"		8

Indicators not mentioned in the table must be added as appropriate.

3rd step: Evaluation

The rating points relevant to this activity are to be entered and calculated in the diagram.

+	Mass/industrial truck	1				
+	Positioning accuracy/speed of motion	1				
+	Posture rating points	2				
+	Working conditions/rating points	3				
=	Total	7				

for women employees: 1.3

7 x **4** x **1.3** = **Risk 28**

On the basis of the rating points calculated and the table below it is possible to make a rough evaluation.

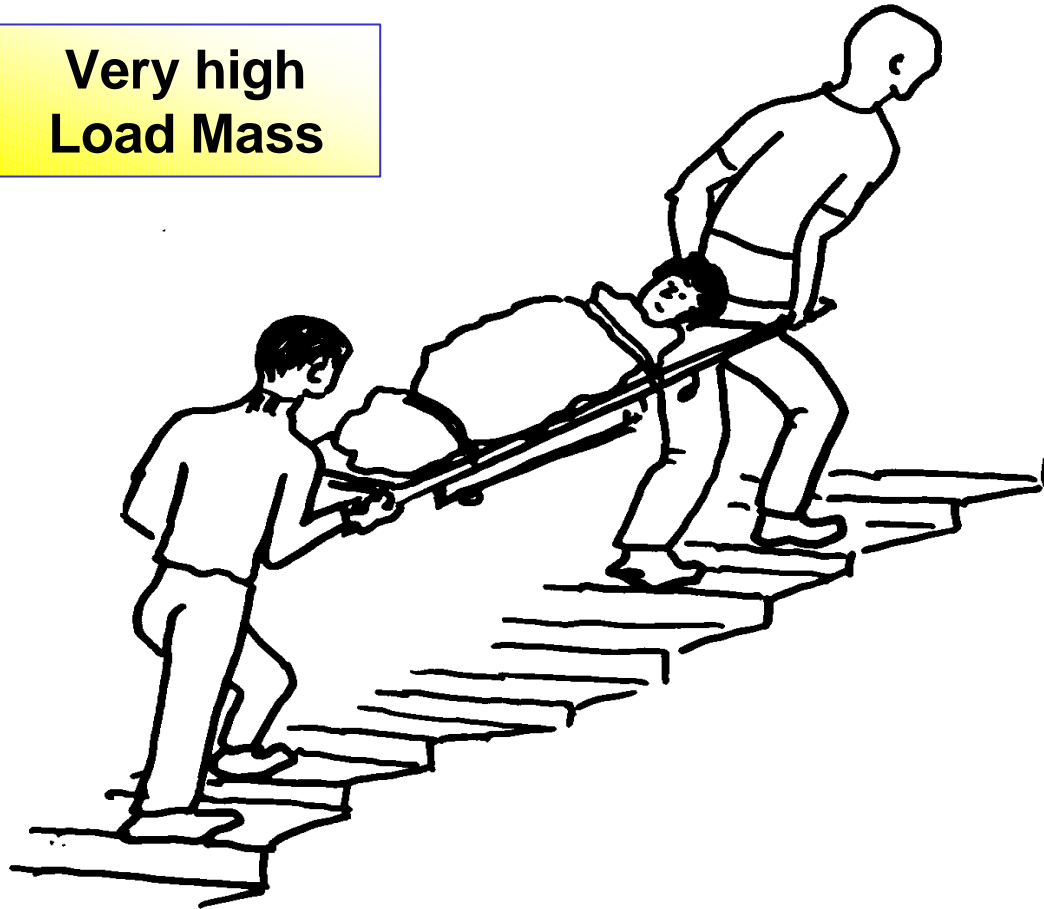
Risk range ²⁾	Risk score	Description
1	< 10	Low load situation, physical overload unlikely to appear.
2	10 to < 25	Increased load situation, physical overload is possible for less resilient persons ³⁾ . For that group redesign of workplace is helpful.
3	25 to < 50	Highly increased load situation, physical overload also possible for normally resilient persons. Redesign of workplace is recommended.
4	≥ 50	High load situation, physical overload is likely to appear. Workplace redesign is necessary.

2) The boundaries between the risk ranges are fluid because of the individual working techniques and performance conditions. The classification may therefore only be regarded as an **orientation aid**. Basically it must be assumed that as the number of risk scores rises, so the risk of overloading the muscular-skeletal system increases.
3) Less resilient persons in this context are persons older than 40 or younger than 21 years, newcomers in the job or people suffering from illness.

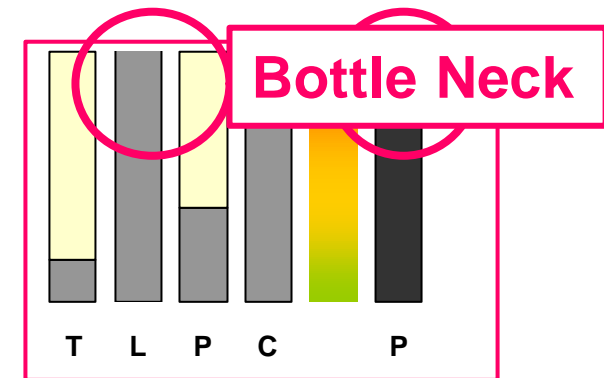
5. Very high Load Mass

Moving of sick Persons

Very high
Load Mass



Time	2
Load	25
Posture	3
Conditions	2
Points	60



*To transport Persons, to run, to rise
10 sick Persons per Day, Load Mass incl. Stretcher 40...85...120 kg,
Carrying Distance per Day 400 Meter*

6. Complicated Case

Saleswomen

**Several
Tasks &
frequently
Changing**

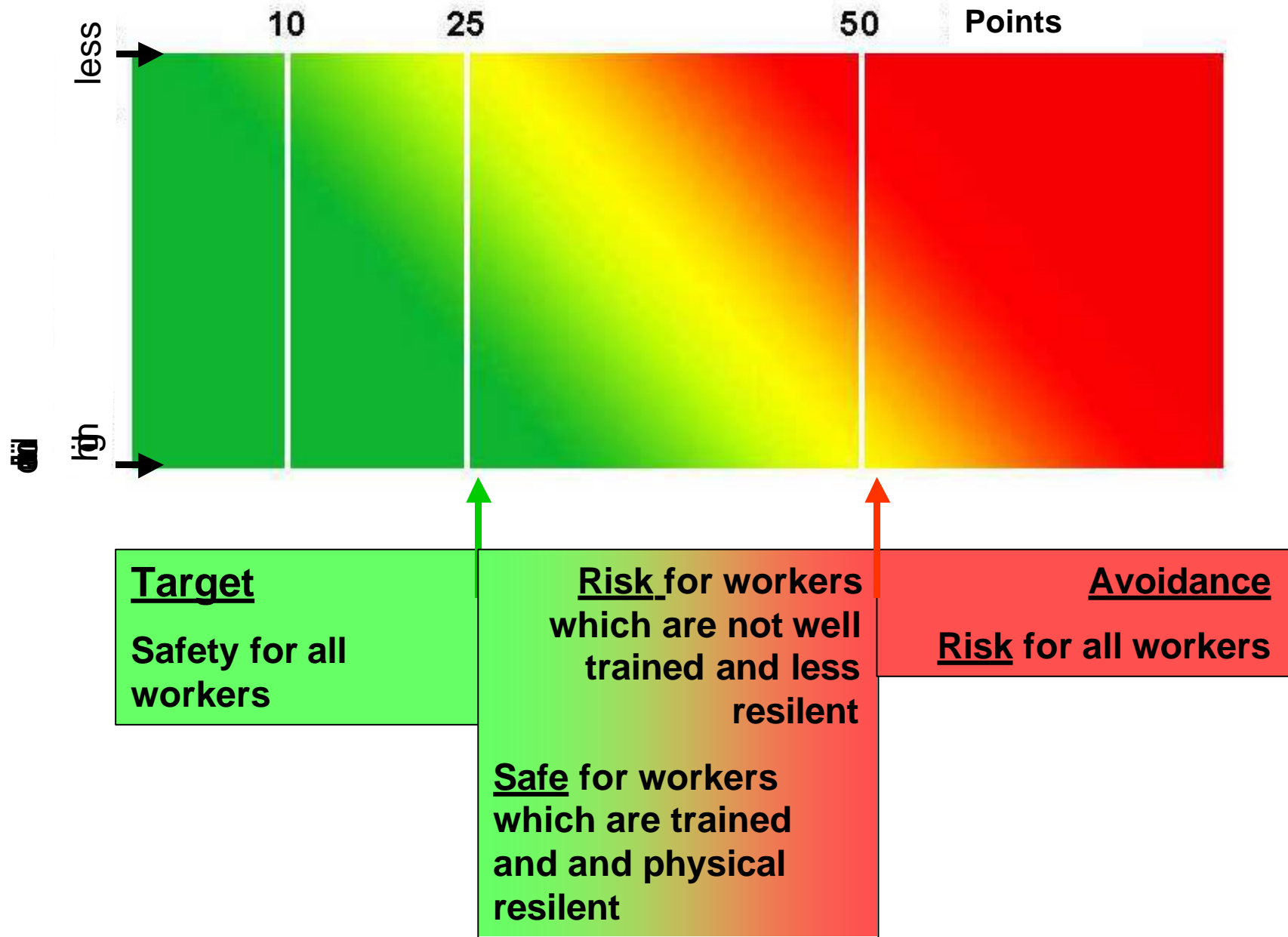
- **Weekly and seasonal variation of amount of work**
- **personnel placement of saleswomen in several stores**

In this case a simple risk assessment by using Key Item Method is not allowed. There are no representative and valid informations about time, load weigth and posture.

Therefore an other approach must be selected:

- 1. Enquiries of**
 - felt physical strain of workers and**
 - complaints with musculo-skeletal-system.**
- 2. If neccessary an analysis of bottle neck situations must be done .**

Before finish: Evaluation of Assessment Results



Please note:

The score could be incorrect because of

- **wrong rating points,**
- **arithmetic errors,**
- **changing situations and others.**

**Therefore check the results by using
safeguard-system for risk assessment.**

Safeguard-system for risk assessment

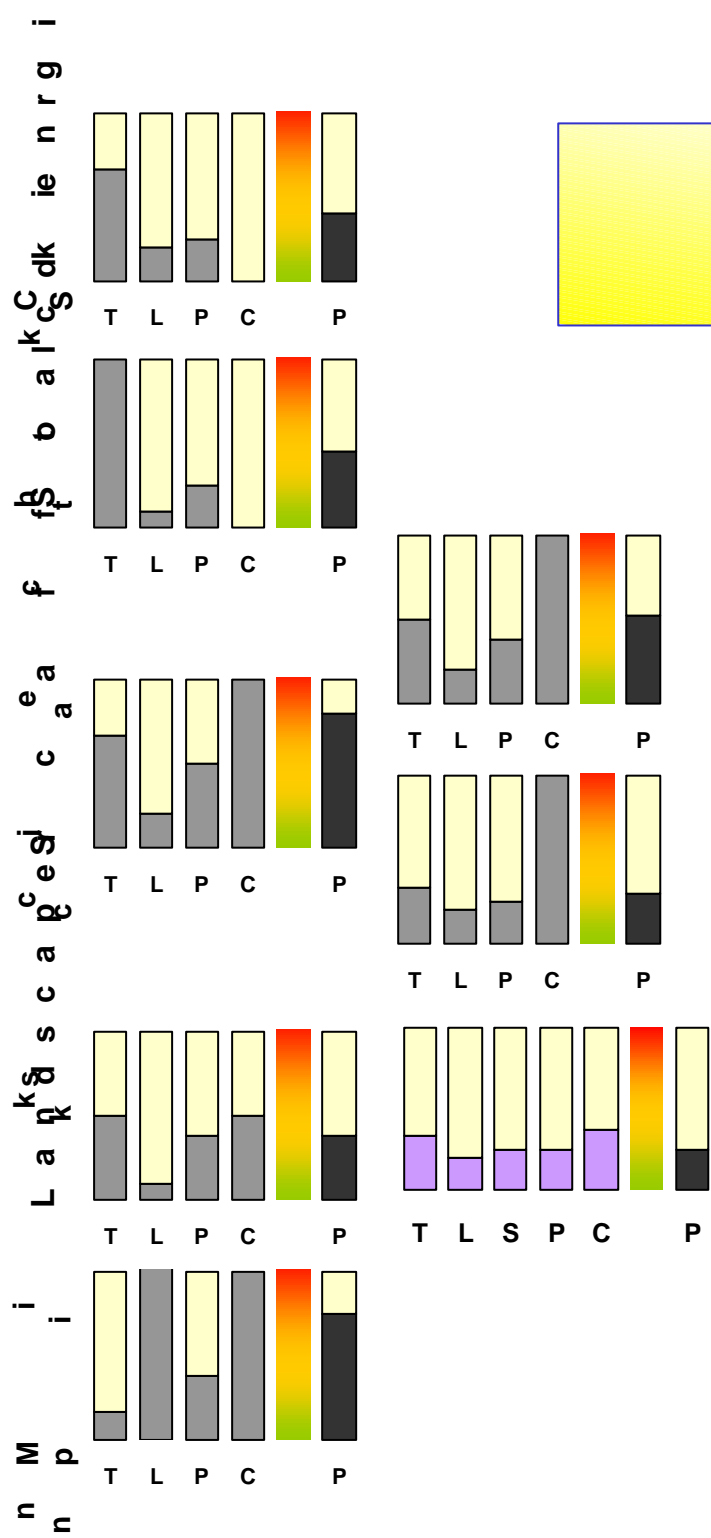
Check the perception of strain

Check the perception of complaints

LMM score	There are negative perception of strain?			
	no		manifestly	
	There are accumulation of similar complaints?		There are accumulation of similar complaints?	
Points	no	manifestly	no	manifestly
< 25				
25 bis 50				
> 50				

legend:

	No further actions
	Check the necessity for technical or organisational redesign, keep on watching the situation,
	necessity for technical or organisational redesign



View at Bottle Necks & integrative Assessment

Steps for risk estimation

1. Evaluation of stress profiles
2. Specifying the bottle necks
3. Development of specific solutions

- Reduce of load weigth
- Reduce of frequency/duration
- Improvement of ergonomic design
- Improvement of organisation
- Training of a better way of execution work
- Improvement the physiscal fitness of worker

**Now you are well prepared
for carrying out the risk assessment**



ASSESSMENT OF MANUAL HANDLING TASKS BASED ON KEY INDICATORS Version 2001

Where there are a number of individual activities with considerable physical strains, they must be estimated separately.

Workplace/Activity:

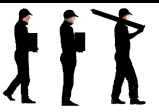



1st step: Determination of time rating points (Select only one column!)

Lifting or displacement operations (< 5 s)		Holding (> 5 s)		Carrying (> 5 m)	
Number on working day	Time rating points	Total duration on working day	Time rating points	Overall length on working day	Time rating points
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<i>Examples:</i> • laying bricks, • placing workpieces into a machine • taking boxes out of a container and putting them onto a conveyor belt		<i>Examples:</i> • holding and guiding a cast iron slug while working on a wheel stand, • operating a hand grinding machine, • operating a weed-eater		<i>Examples:</i> • furniture removal, • delivering scaffolding parts to a building site	

2nd step: Determination of rating points of load, posture and working conditions

Effective load ¹⁾ for men	Load rating point	Effective load ¹⁾ for women	Load rating point
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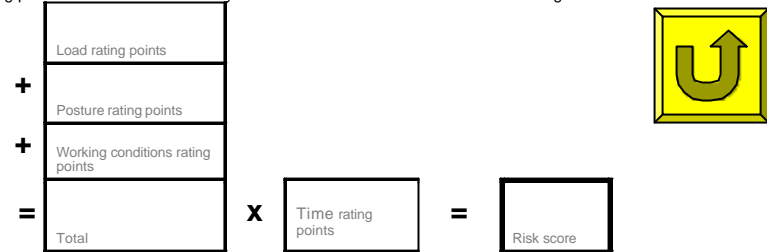
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2) To determine the posture rating points the typical posture during manual handling must be used. For example when there are different postures with load a mean value must be used – not occasional extreme values.

Working conditions	Working conditions rating point
Good ergonomic conditions, e.g. sufficient space, no physical obstacles within the workspace, even level and solid flooring, sufficient lighting, good gripping conditions	0
Space for movement restricted and unfavourable ergonomic conditions (e.g. 1: space for movement restricted by too low high or working area less than 1,5 m ² or 2: posture stability impaired by uneven floor or soft ground)	1
Strongly restricted space of movement and/or instability of centre of gravity of load (e.g. transfer of patients)	2

3rd step: Evaluation

The rating points relevant to this activity are to be entered and calculated in the diagram.



On the basis of the rating calculated and the table below it is possible to make a rough evaluation.³⁾ Regardless of this provisions of the Maternity Leave Act apply.

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5) Design requirements can be determined with reference to the number of point in the table. By reducing the weight, improving the execution conditions or shortening the strain time, elevated stress can be avoided.

Check of the workplace necessary for other reasons:

Reasons: _____

Date of assessment: _____ Assessed by: _____