AMERICAN SOCIETY OF SAFETY PROFESSIONALS
Wisconsin Chapter

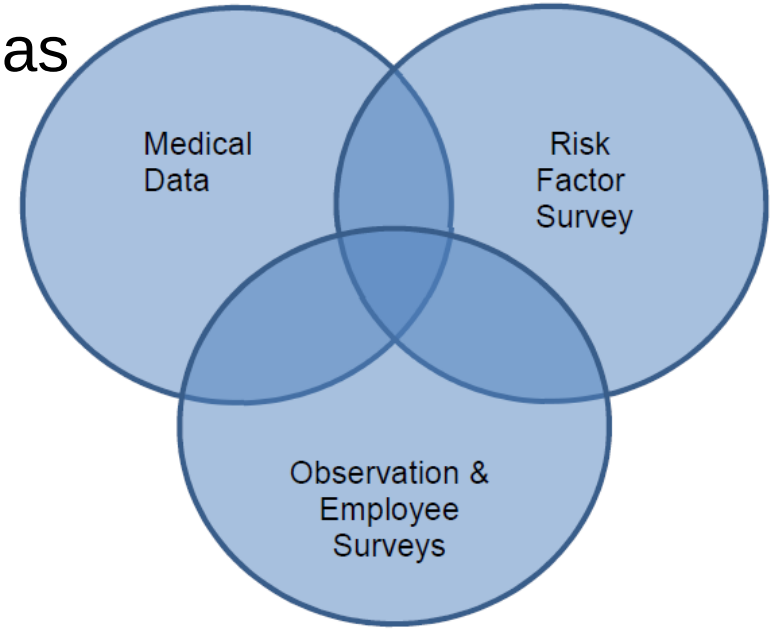
Ergonomic Risk Assessment

Quick **E**xposure **C**heck

Sharon McFarren
CPE, CSP

Why the **Q**uick **E**xposure **C**heck

- Non-copyrighted, publically available
- Evaluated for reliability and validity
- Assesses ALL major risk factors for WMSDs
- User friendly
- Involves both the assessor and the worker being assessed
- Provides scoring for major body areas



Assessment Methods (QEC)

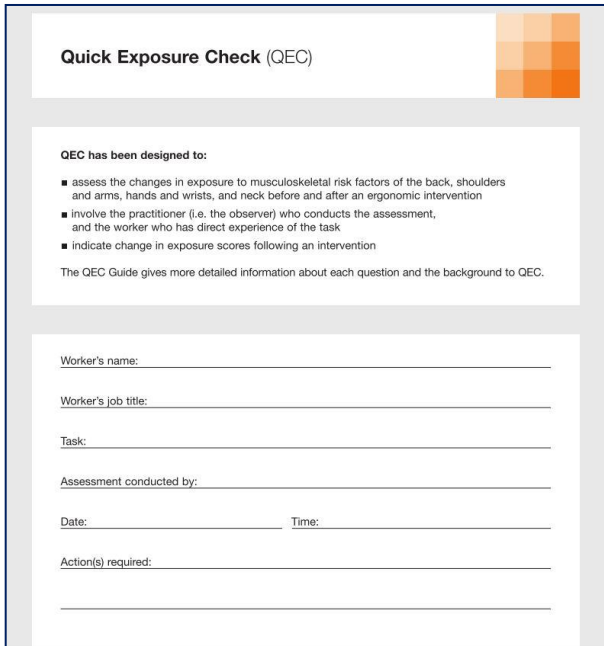
Geoffrey David, Valerie Woods and Peter Buckle
Robens Centre for Health Ergonomics
University of Surrey

QEC - What is it?

- Developed for use by those responsible for health and safety
- Assesses exposure of 4 body areas
  - Back
  - Shoulder/arm
  - Wrist/hand
  - Neck
- Involves both the observer and the worker

QEC – How it Works

- One assessment is completed per task
- The first page is mostly for identification of the task you've picked
- The left side of the next page contains the Observer's Assessment
- The right side of that page contains the Worker's Assessment
- The last page contains the exposure scores



Quick Exposure Check (QEC)

QEC has been designed to:

- assess the changes in exposure to musculoskeletal risk factors of the back, shoulders and arms, hands and wrists, and neck before and after an ergonomic intervention
- involve the practitioner (i.e. the observer) who conducts the assessment, and the worker who has direct experience of the task
- indicate change in exposure scores following an intervention

The QEC Guide gives more detailed information about each question and the background to QEC.

Worker's name:

Worker's job title:

Task:

Assessment conducted by:

Date: Time:

Action(s) required:

QEC – Observer's Assessment

Worker's name _____ Date _____

Observer's Assessment

Back

A When performing the task, is the back
(select worse case situation)

- A1 Almost neutral?
- A2 Moderately flexed or twisted or side bent?
- A3 Excessively flexed or twisted or side bent?

B Select ONLY ONE of the two following task options:

EITHER

For seated or standing stationary tasks. Does the back remain in a static position most of the time?

- B1 No
- B2 Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back

- B3 Infrequent (around 3 times per minute or less)?
- B4 Frequent (around 8 times per minute)?
- B5 Very frequent (around 12 times per minute or more)?

Shoulder/Arm

C When the task is performed, are the hands
(select worse case situation)

- C1 At or below waist height?
- C2 At about chest height?
- C3 At or above shoulder height?

D Is the shoulder/arm movement

- D1 Infrequent (some intermittent movement)?
- D2 Frequent (regular movement with some pauses)?
- D3 Very frequent (almost continuous movement)?

Wrist/Hand

E Is the task performed with
(select worse case situation)

- E1 An almost straight wrist?
- E2 A deviated or bent wrist?

F Are similar motion patterns repeated

- F1 10 times per minute or less?
- F2 11 to 20 times per minute?
- F3 More than 20 times per minute?

Neck

G When performing the task, is the head/neck bent or twisted?

- G1 No
- G2 Yes, occasionally
- G3 Yes, continuously

Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?
H1 Light (5 kg or less)
H2 Moderate (6 to 10 kg)
H3 Heavy (11 to 20kg)
H4 Very heavy (more than 20 kg)

J On average, how much time do you spend per day on this task?
J1 Less than 2 hours
J2 2 to 4 hours
J3 More than 4 hours

K When performing this task, is the maximum force level exerted by one hand?
K1 Low (e.g. less than 1 kg)
K2 Medium (e.g. 1 to 4 kg)
K3 High (e.g. more than 4 kg)

L Is the visual demand of this task
L1 Low (almost no need to view fine details)?
*L2 High (need to view some fine details)?
* If High, please give details in the box below

M At work do you drive a vehicle for
M1 Less than one hour per day or Never?
M2 Between 1 and 4 hours per day?
M3 More than 4 hours per day?

N At work do you use vibrating tools for
N1 Less than one hour per day or Never?
N2 Between 1 and 4 hours per day?
N3 More than 4 hours per day?

P Do you have difficulty keeping up with this work?
P1 Never
P2 Sometimes
*P3 Often
* If Often, please give details in the box below

Q In general, how do you find this job
Q1 Not at all stressful?
Q2 Mildly stressful?
*Q3 Moderately stressful?
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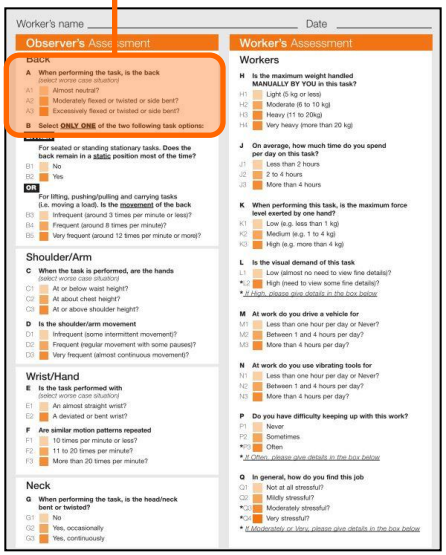
* If Moderately or Very, please give details in the box below

QEC – Observer's Assessment


Worker's name _____ Date _____

Observer's Assessment

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A1 Almost neutral?
A2 Moderately flexed or twisted or side bent?
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B Select **ONLY ONE** of the two following task options:

For seated or standing stationary tasks. Does the back remain in a static position most of the time?
B1 No
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For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back
B3 Infrequent (around 3 times per minute or less)?
B4 Frequent (around 8 times per minute)?
B5 Very frequent (around 12 times per minute or more)?

Shoulder/Arm

C When the task is performed, are the hands *(select worse case situation)*
C1 At or below waist height?
C2 At about chest height?
C3 At or above shoulder height?

D Is the shoulder/arm movement
D1 Infrequent (some intermittent movement)?
D2 Frequent (regular movement with some pauses)?
D3 Very frequent (almost continuous movement)?

Wrist/Hand

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E1 An almost straight wrist?
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G1 No
G2 Yes, occasionally
G3 Yes, continuously

Worker's Assessment

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H1 Light (5 kg or less)
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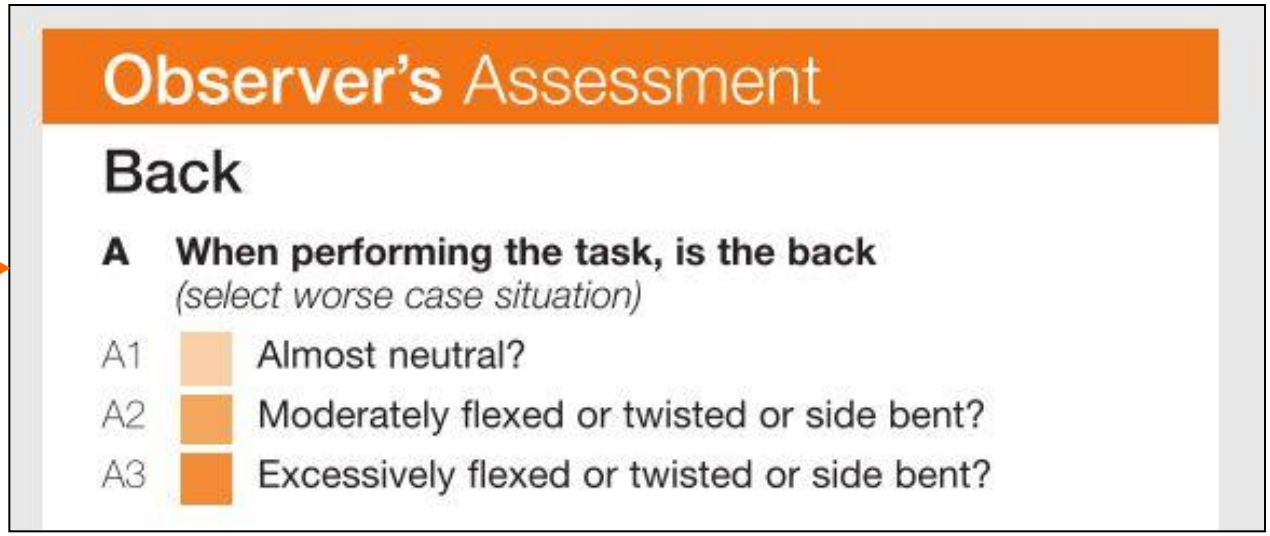


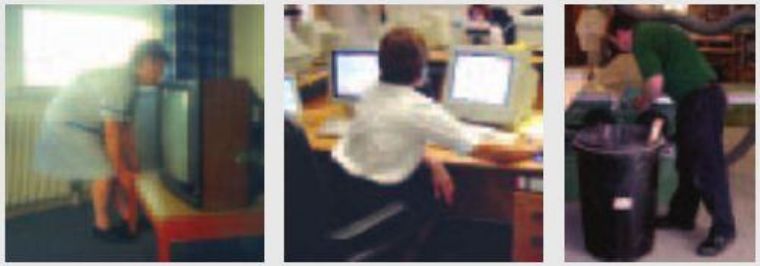
QEC – Observer's Assessment

Almost neutral (A1)

- The back is defined as almost neutral (A1) if it is in less than 20 of flexion/extension, twisting, or side bending.

Moderately flexed/twisted side bent (A2)

- The back is defined as moderately flexed or twisted or side bent (A2) if it is in more than 20 but less than 60 of flexion/extension, twisting or side bending.



Excessively flexed/twisted side bent (A3)

- The back is defined as excessively flexed or twisted or side bent (A3) if it is in more than 60 of flexion, twisting or side bending.

QEC Example

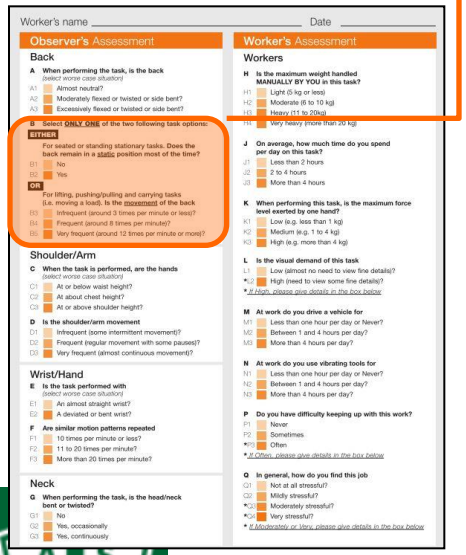
Observer's Assessment

Back

A **When performing the task, is the back**
(select worse case situation)

A1		Almost neutral?
A2	X	Moderately flexed or twisted or side bent?
A3		Excessively flexed or twisted or side bent?

QEC Example


Worker's name _____ Date _____

Observer's Assessment

Back

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For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back
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Shoulder/Arm

C When the task is performed, are the hands *(select worse case situation)*
- C1 At or below waist height?
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- E1 An almost straight wrist?
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- F3 More than 20 times per minute?

Neck

G When performing the task, is the head/neck bent or twisted?
- G1 No
- G2 Yes, occasionally
- G3 Yes, continuously

Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?
- H1 Light (5 kg or less)
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- J1 Less than 2 hours
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- K1 Low (e.g. less than 1 kg)
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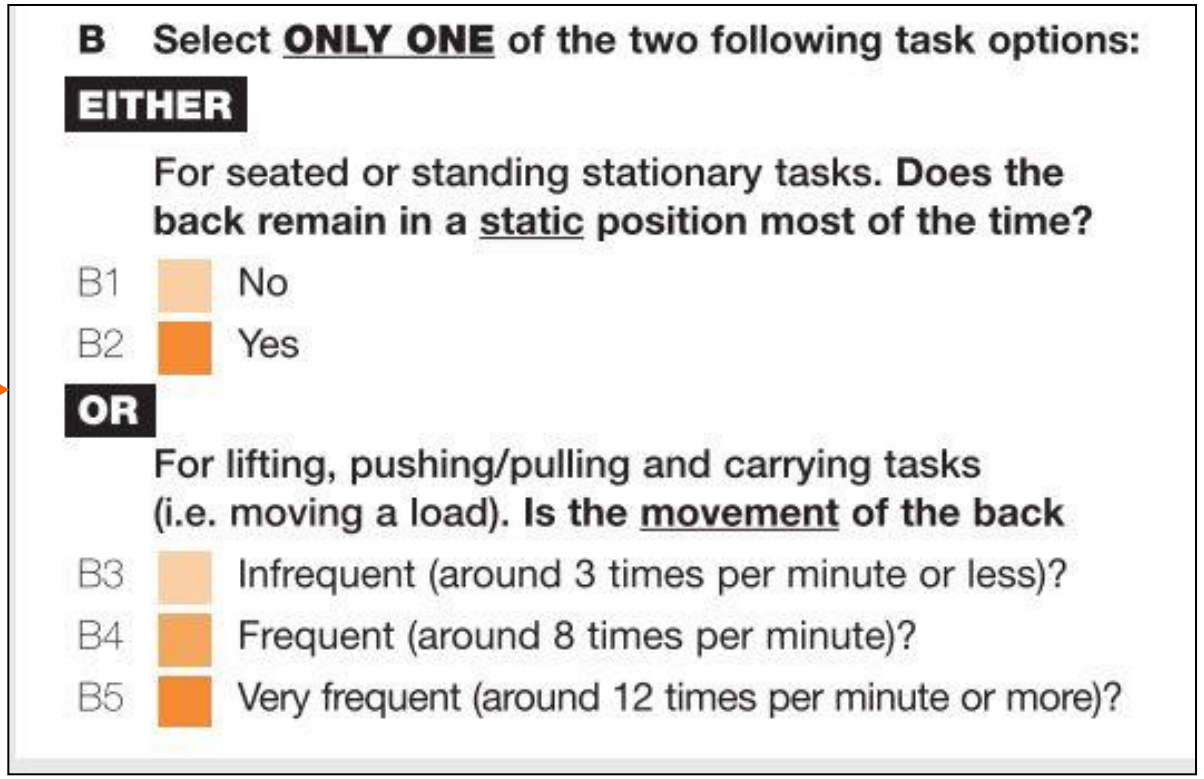
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EITHER

For seated or standing stationary tasks. **Does the back remain in a static position most of the time?**

B1 No

B2 Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). **Is the movement of the back**

B3 Infrequent (around 3 times per minute or less)?

B4 Frequent (around 8 times per minute)?

B5 Very frequent (around 12 times per minute or more)?

QEC Example

Back movement (B1-B5) Select ONLY one of the two task options: • If you are assessing a standing or seated stationary task (e.g. sedentary work, repetitive tasks), assess B1-B2 and ignore B3-B5. If the back is static for most of the time, select B2.	• If you are assessing a lifting, pushing/pulling or carrying task (i.e. moving a load by moving the back), assess B3-B5 and ignore B1-B2. This question refers to how often the person needs to bend or rotate the back when performing these types of manual handling tasks. For example, when unloading boxes from a pallet, count the number of times per minute the individual's back moves to lift and lower the load. Then select the most appropriate category B3-B5.

QEC Example

Each pieces takes about 30 seconds (two lifts per minute)

B Select ONLY ONE of the two following task options:

EITHER

For seated or standing stationary tasks. **Does the back remain in a static position most of the time?**

B1		No
B2		Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). **Is the movement of the back**

B3	X	Infrequent (around 3 times per minute or less)?
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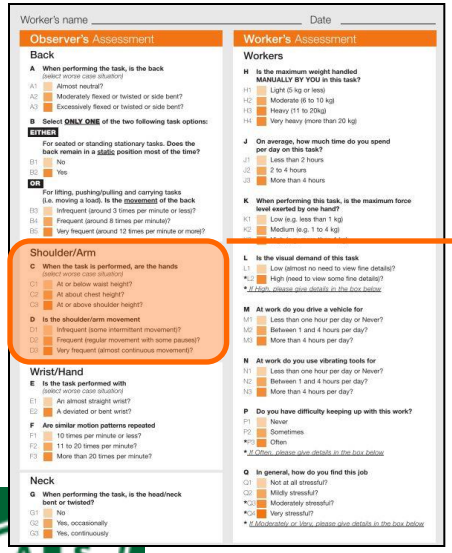
QEC Example


Worker's name _____ Date _____

Observer's Assessment

Back

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Shoulder/Arm

C When the task is performed, are the hands *(select worse case situation)*
- C1 At or below waist height?
- C2 At about chest height?
- C3 At or above shoulder height?

D Is the shoulder/arm movement
- D1 Infrequent (some intermittent movement)?
- D2 Frequent (regular movement with some pauses)?
- D3 Very frequent (almost continuous movement)?

Wrist/Hand

E Is the task performed with *(select worse case situation)*
- E1 An almost straight wrist?
- E2 A deviated or bent wrist?

F Are similar motion patterns repeated
- F1 10 times per minute or less?
- F2 11 to 20 times per minute?
- F3 More than 20 times per minute?

Neck

G When performing the task, is the head/neck bent or twisted?
- G1 No
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- G3 Yes, continuously

Worker's Assessment

Workers

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- Q1 Not at all stressful?
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Shoulder/Arm

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(select worse case situation)

- C1 At or below waist height?
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D Is the shoulder/arm movement

- D1 Infrequent (some intermittent movement)?
- D2 Frequent (regular movement with some pauses)?
- D3 Very frequent (almost continuous movement)?

QEC Example

Assessment of the shoulder/arm

Shoulder/arm position (C1-C3)
The assessment should be based upon the position of the hands when the shoulder/arms are most heavily loaded during work.

This may not necessarily be at the same time as when the exposure of the back is assessed. For example, the load on the shoulder may not be at the highest level when the person bends down to pick up a box from the floor, but may become greater subsequently when the box is placed at a higher level.

Hands at or below waist height (C1)

Hands at about chest height (C2)

Hands at or above shoulder height (C3)

Shoulder/arm movement (D1-D3)
The movement of the shoulder/arm is defined as:

- Infrequent (D1) if there is some intermittent movement.
- Frequent (D2) if there is a regular movement with some pauses.
- Very frequent (D3) if there is almost continuous movement.

QEC Example

Shoulder/Arm

C When the task is performed, are the hands
(select worse case situation)

C1		At or below waist height?
C2	X	At about chest height?
C3		At or above shoulder height?

D Is the shoulder/arm movement

D1		Infrequent (some intermittent movement)?
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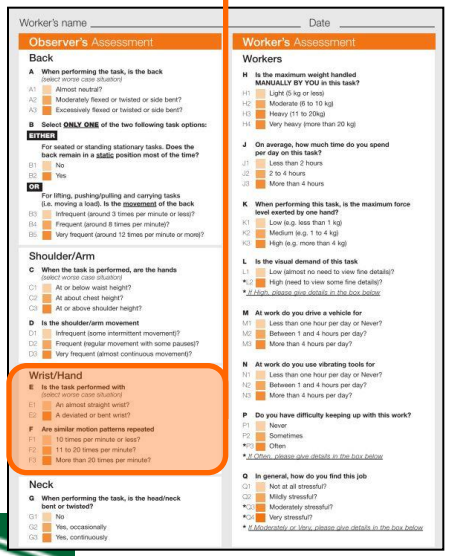
QEC Example


Worker's name _____ Date _____

Observer's Assessment

Back

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Wrist/Hand

E Is the task performed with
(select worse case situation)
E1 An almost straight wrist?
E2 A deviated or bent wrist?

F Are similar motion patterns repeated
F1 10 times per minute or less?
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Neck

G When performing the task, is the head/neck bent or twisted?
G1 No
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Worker's Assessment

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QEC Example

Assessment of the wrist/hand

Wrist/hand posture (E1-E2)
This posture is assessed during the task when the most awkward wrist posture is adopted. This may be wrist flexion/extension, side bending (ulnar/radial deviation).

The wrist is regarded as almost straight (E1) if the movement is limited within a small angular range (e.g. less 15 of the neutral wrist posture. Otherwise, if an obvious wrist angle can be observed during the performance of the task, the wrist is considered to be deviated or bent (E2).

Wrist/hand movement (F1-F3)
This refers to the movement of the wrist/hand and forearm, excluding the movement of the fingers. One motion is counted every time the same or similar motion pattern is repeated over a set period of time (e.g. 1 minute).

The wrist is deviated or bent (E2)

QEC Example

Wrist/Hand

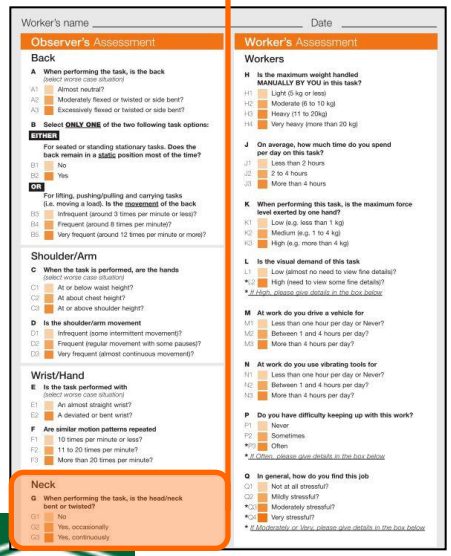
E **Is the task performed with**
(select worse case situation)

E1		An almost straight wrist?
E2	X	A deviated or bent wrist?

F **Are similar motion patterns repeated**

F1		10 times per minute or less?
F2	X	11 to 20 times per minute?
F3		More than 20 times per minute?

QEC Example



Worker's name _____ Date _____

Observer's Assessment

Back

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- A1 Almost neutral?
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B Select ONLY ONE of the two following task options:

EITHER

For seated or standing stationary tasks. Does the back remain in a static position most of the time?
- B1 No
- B2 Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back
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- F2 11 to 20 times per minute?
- F3 More than 20 times per minute?

Neck

G When performing the task, is the head/neck bent or twisted?
- G1 No
- G2 Yes, occasionally
- G3 Yes, continuously

Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?
- H1 Light (5 kg or less)
- H2 Moderate (6 to 10 kg)
- H3 Heavy (11 to 20kg)
- H4 Very heavy (more than 20 kg)

J On average, how much time do you spend per day on this task?
- J1 Less than 2 hours
- J2 2 to 4 hours
- J3 More than 4 hours

K When performing this task, is the maximum force level exerted by one hand?
- K1 Low (e.g. less than 1 kg)
- K2 Medium (e.g. 1 to 4 kg)
- K3 High (e.g. more than 4 kg)

L Is the visual demand of this task
- L1 Low (almost no need to view fine details)?
- *L2 High (need to view some fine details)?

* *If High, please give details in the box below*

M At work do you drive a vehicle for
- M1 Less than one hour per day or Never?
- M2 Between 1 and 4 hours per day?
- M3 More than 4 hours per day?

N At work do you use vibrating tools for
- N1 Less than one hour per day or Never?
- N2 Between 1 and 4 hours per day?
- N3 More than 4 hours per day?

P Do you have difficulty keeping up with this work?
- P1 Never
- P2 Sometimes
- *P3 Often

* *If Often, please give details in the box below*

Q In general, how do you find this job
- Q1 Not at all stressful?
- Q2 Mildly stressful?
- *Q3 Moderately stressful?
- *Q4 Very stressful?

* *If Moderately or Very, please give details in the box below*

Neck

G When performing the task, is the head/neck bent or twisted?

G1	No
G2	Yes, occasionally
G3	Yes, continuously

QEC Example

Assessment of the neck (G)

The neck posture is defined as excessively bent or twisted if the angle is greater than 20° relative to the torso. If this angle is exceeded select either G2 or G3 dependent upon the duration. Otherwise select G1.

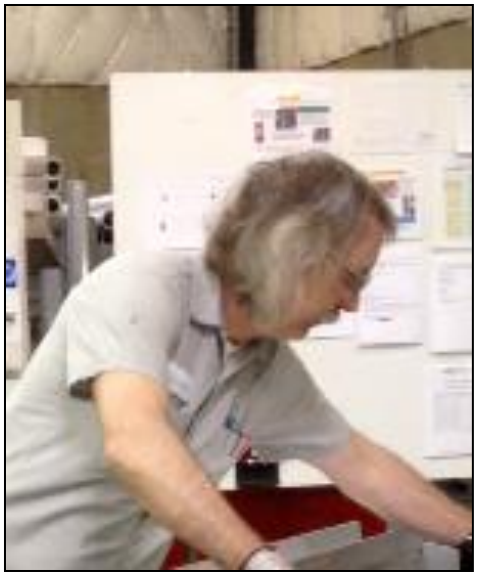
Neck excessively bent (G)

QEC Example

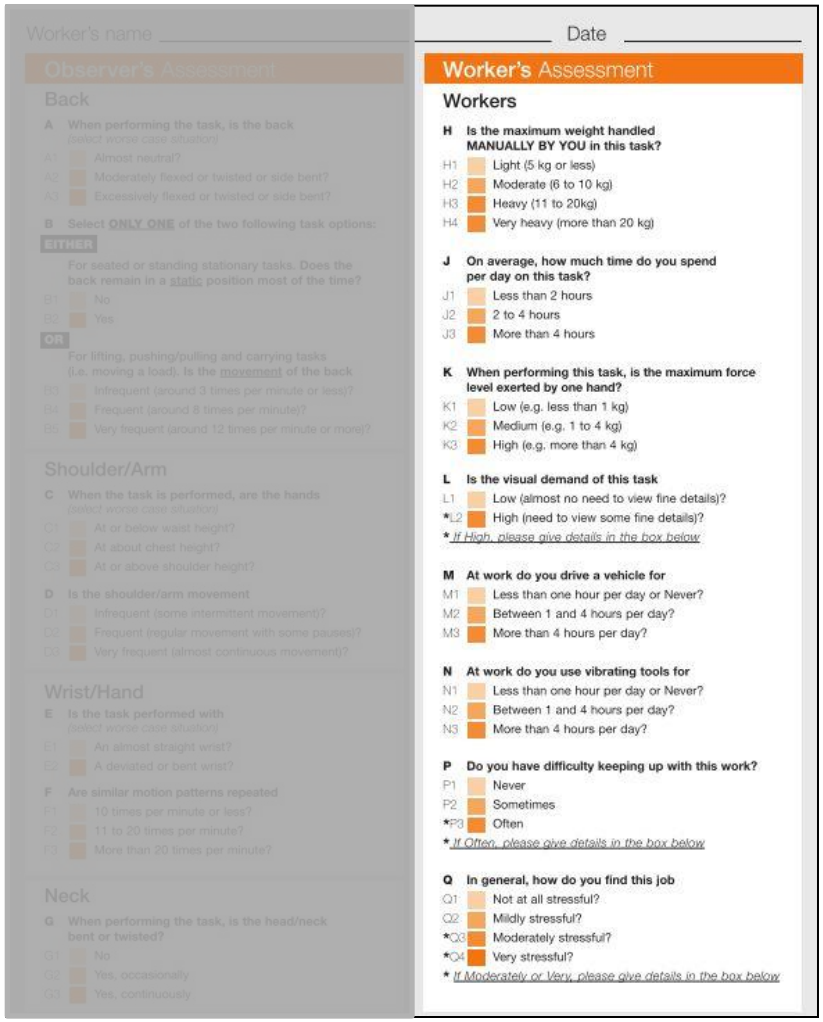
Neck

G When performing the task, is the head/neck bent or twisted?

G1		No
G2	X	Yes, occasionally
G3		Yes, continuously



QEC – Worker's Assessment



Worker's name _____ Date _____

Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?

- H1 Light (5 kg or less)
- H2 Moderate (6 to 10 kg)
- H3 Heavy (11 to 20kg)
- H4 Very heavy (more than 20 kg)

J On average, how much time do you spend per day on this task?

- J1 Less than 2 hours
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- J3 More than 4 hours

K When performing this task, is the maximum force level exerted by one hand?

- K1 Low (e.g. less than 1 kg)
- K2 Medium (e.g. 1 to 4 kg)
- K3 High (e.g. more than 4 kg)

L Is the visual demand of this task

- L1 Low (almost no need to view fine details)?
- *L2 High (need to view some fine details)?

* *If High, please give details in the box below*

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P Do you have difficulty keeping up with this work?

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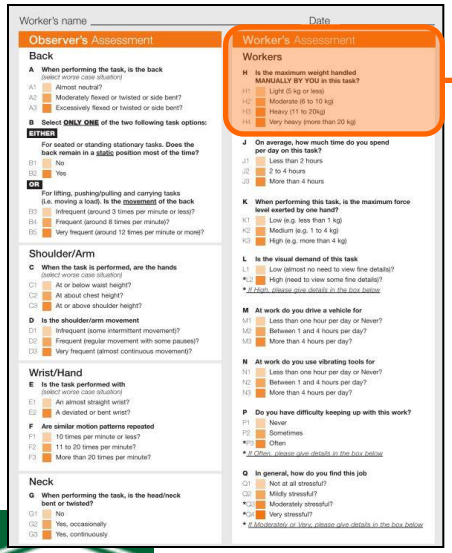
QEC – Worker's Assessment


Worker's name _____ Date

Observer's Assessment

Back

A When performing the task, is the back *(select worse case situation)*
- A1 Almost neutral?
- A2 Moderately flexed or twisted or side bent?
- A3 Excessively flexed or twisted or side bent?

B Select **ONLY ONE** of the two following task options:

EITHER

For seated or standing stationary tasks. Does the back remain in a static position most of the time?
- B1 No
- B2 Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back
- B3 Infrequent (around 3 times per minute or less)?
- B4 Frequent (around 8 times per minute)?
- B5 Very frequent (around 12 times per minute or more)?

Shoulder/Arm

C When the task is performed, are the hands *(select worse case situation)*
- C1 At or below waist height?
- C2 At about chest height?
- C3 At or above shoulder height?

D Is the shoulder/arm movement
- D1 Infrequent (some intermittent movement)?
- D2 Frequent (regular movement with some pauses)?
- D3 Very frequent (almost continuous movement)?

Wrist/Hand

E Is the task performed with *(select worse case situation)*
- E1 An almost straight wrist?
- E2 A deviated or bent wrist?

F Are similar motion patterns repeated
- F1 10 times per minute or less?
- F2 11 to 20 times per minute?
- F3 More than 20 times per minute?

Neck

G When performing the task, is the head/neck bent or twisted?
- G1 No
- G2 Yes, occasionally
- G3 Yes, continuously

Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?
- H1 Light (5 kg or less)
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- H4 Very heavy (more than 20 kg)

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- M3 More than 4 hours per day?

N At work do you use vibrating tools for
- N1 Less than one hour per day or Never?
- N2 Between 1 and 4 hours per day?
- N3 More than 4 hours per day?

P Do you have difficulty keeping up with this work?
- P1 Never
- P2 Sometimes
- *P3 Often

* *If Often, please give details in the box below*

Q In general, how do you find this job
- Q1 Not at all stressful?
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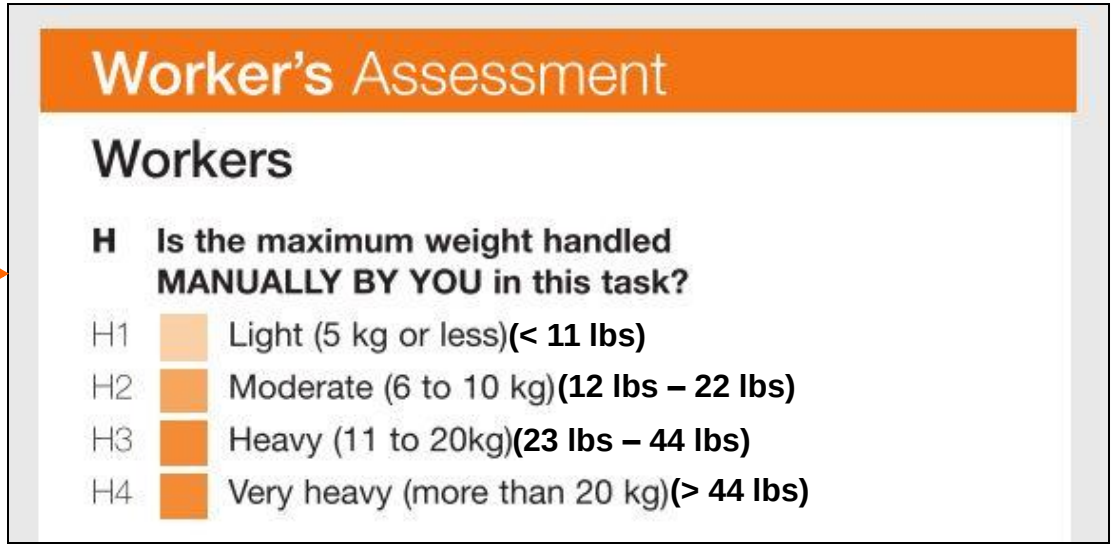


QEC – Worker's Assessment

Maximum weight handled (H1-H4)

This question refers to the weight borne by the worker, and not the maximum weight handled in the task or the load handled with the use of equipment.

The worker's perception of the load weight may differ from the actual weight category, e.g. a light load may seem heavy if held at full reach. The actual weight of the load can be measured by the observer if required, to inform any intervention that may be introduced. However, this measure should be used to supplement the exposure assessment and not to replace the worker's assessment of the load.

QEC Example

Piece weighs 13 lbs

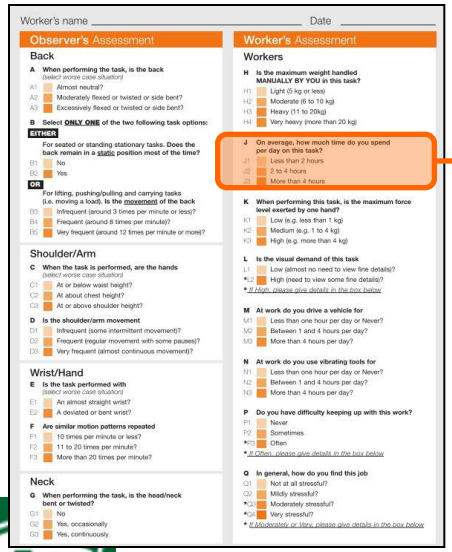
Worker's Assessment

Workers

H **Is the maximum weight handled MANUALLY BY YOU in this task?**

H1		Light (5 kg or less) **(< 11 lbs)**
H2	X	Moderate (6 to 10 kg) **(12 lbs – 22 lbs)**
H3		Heavy (11 to 20kg) **(23 lbs – 44 lbs)**
H4		Very heavy (more than 20 kg) **(> 44 lbs)**

QEC Example


Worker's name _____ Date _____

Observer's Assessment

Back

A When performing the task, is the back *(select worse case situation)*
- A1 Almost neutral?
- A2 Moderately flexed or twisted or side bent?
- A3 Excessively flexed or twisted or side bent?

B Select **ONLY ONE** of the two following task options:

EITHER

For seated or standing stationary tasks. Does the back remain in a static position most of the time?
- B1 No
- B2 Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back
- B3 Infrequent (around 3 times per minute or less)?
- B4 Frequent (around 8 times per minute)?
- B5 Very frequent (around 12 times per minute or more)?

Shoulder/Arm

C When the task is performed, are the hands *(select worse case situation)*
- C1 At or below waist height?
- C2 At about chest height?
- C3 At or above shoulder height?

D Is the shoulder/arm movement
- D1 Infrequent (some intermittent movement)?
- D2 Frequent (regular movement with some pauses)?
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Wrist/Hand

E Is the task performed with *(select worse case situation)*
- E1 An almost straight wrist?
- E2 A deviated or bent wrist?

F Are similar motion patterns repeated
- F1 10 times per minute or less?
- F2 11 to 20 times per minute?
- F3 More than 20 times per minute?

Neck

G When performing the task, is the head/neck bent or twisted?
- G1 No
- G2 Yes, occasionally
- G3 Yes, continuously

Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?
- H1 Light (5 kg or less)
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J On average, how much time do you spend per day on this task?
- J1 Less than 2 hours
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- K1 Low (e.g. less than 1 kg)
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L Is the visual demand of this task
- L1 Low (almost no need to view fine details)?
- *L2 High (need to view some fine details)?

* *If High, please give details in the box below*

M At work do you drive a vehicle for
- M1 Less than one hour per day or Never?
- M2 Between 1 and 4 hours per day?
- M3 More than 4 hours per day?

N At work do you use vibrating tools for
- N1 Less than one hour per day or Never?
- N2 Between 1 and 4 hours per day?
- N3 More than 4 hours per day?

P Do you have difficulty keeping up with this work?
- P1 Never
- P2 Sometimes
- *P3 Often

* *If Often, please give details in the box below*

Q In general, how do you find this job
- Q1 Not at all stressful?
- Q2 Mildly stressful?
- *Q3 Moderately stressful?
- *Q4 Very stressful?

* *If Moderately or Very, please give details in the box below*

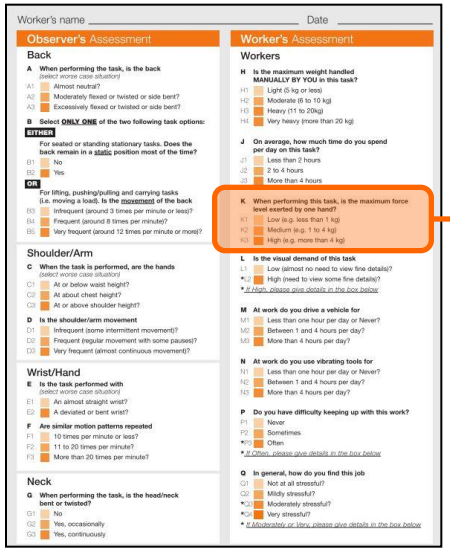
J **On average, how much time do you spend per day on this task?**

J1		Less than 2 hours
J2		2 to 4 hours
J3	X	More than 4 hours

Time spent on task (J1-J3)

This question examines the amount of time per day the worker spends conducting the task being assessed.

QEC Example


Worker's name _____ Date _____

Observer's Assessment

Back

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B Select **ONLY ONE** of the two following task options:

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For seated or standing stationary tasks. Does the back remain in a static position most of the time?
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Worker's Assessment

Workers

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L Is the visual demand of this task
- L1 Low (almost no need to view fine details)?
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M At work do you drive a vehicle for
- M1 Less than one hour per day or Never?
- M2 Between 1 and 4 hours per day?
- M3 More than 4 hours per day?

N At work do you use vibrating tools for
- N1 Less than one hour per day or Never?
- N2 Between 1 and 4 hours per day?
- N3 More than 4 hours per day?

P Do you have difficulty keeping up with this work?
- P1 Never
- P2 Sometimes
- *P3 Often

* If Often, please give details in the box below

Q In general, how do you find this job
- Q1 Not at all stressful?
- Q2 Mildly stressful?
- *Q3 Moderately stressful?
- *Q4 Very stressful?

* If Moderately or Very, please give details in the box below

K When performing this task, is the maximum force level exerted by one hand?

K1	Low (e.g. less than 1 kg)	**(< 2.2 lbs)**
K2	Medium (e.g. 1 to 4 kg)	**(≥ 2.2 lbs, but < 8.8 lbs)**
K3	High (e.g. more than 4 kg)	**(≥ 8.8 lbs)**

Maximum force level (K1-K3)

This question refers to the maximum force level exerted by one hand when performing the task. Even if the task is performed with two hands, ask the worker about the force for one hand only.

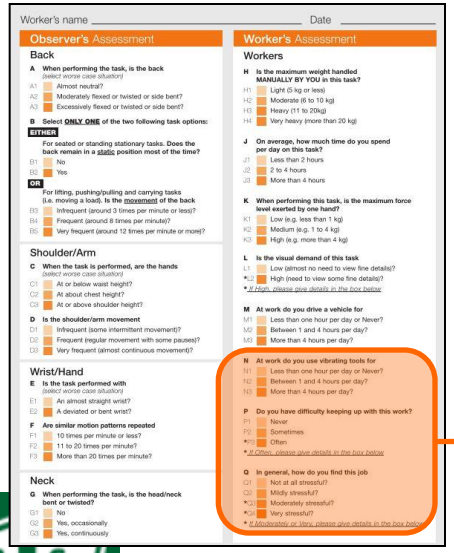
Measures of the forces involved can be made by the observer to inform any intervention that may be introduced. However, this measure should be used to supplement the exposure assessment and not to replace the worker's perception of the force required to perform the task.

QEC Example

Grip force on vice grips is approx 15 lbs

K	When performing this task, is the maximum force level exerted by one hand?	
K1	Low (e.g. less than 1 kg) **(< 2.2 lbs)**	
K2	Medium (e.g. 1 to 4 kg) **(≥ 2.2 lbs, but < 8.8 lbs)**	
K3	High (e.g. more than 4 kg) **(≥ 8.8 lbs)**	X

QEC Example


Worker's name _____ Date _____

Observer's Assessment

Back

A When performing the task, is the back *(select worse case situation)*
- A1 Almost neutral?
- A2 Moderately flexed or twisted or side bent?
- A3 Excessively flexed or twisted or side bent?

B Select ONLY ONE of the two following task options:

EITHER

For seated or standing stationary tasks. Does the back remain in a static position most of the time?
- B1 No
- B2 Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back
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Shoulder/Arm

C When the task is performed, are the hands *(select worse case situation)*
- C1 At or below waist height?
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D Is the shoulder/arm movement
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Wrist/Hand

E Is the task performed with *(select worse case situation)*
- E1 An almost straight wrist?
- E2 A deviated or bent wrist?

F Are similar motion patterns repeated
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Neck

G When performing the task, is the head/neck bent or twisted?
- G1 No
- G2 Yes, occasionally
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Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?
- H1 Light (5 kg or less)
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L Is the visual demand of this task
- L1 Low (almost no need to view fine details)?
- *L2 High (need to view some fine details)?

* *If High, please give details in the box below*

M At work do you drive a vehicle for
- M1 Less than one hour per day or Never?
- M2 Between 1 and 4 hours per day?
- M3 More than 4 hours per day?

N At work do you use vibrating tools for
- N1 Less than one hour per day or Never?
- N2 Between 1 and 4 hours per day?
- N3 More than 4 hours per day?

P Do you have difficulty keeping up with this work?
- P1 Never
- P2 Sometimes
- *P3 Often

* *If Often, please give details in the box below*

Q In general, how do you find this job
- Q1 Not at all stressful?
- Q2 Mildly stressful?
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* *If Moderately or Very, please give details in the box below*

L Is the visual demand of this task

L1 Low (almost no need to view fine details)?

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M At work do you drive a vehicle for

M1 Less than one hour per day or Never?

M2 Between 1 and 4 hours per day?

M3 More than 4 hours per day?

Visual demand (L1-L2)

Ask the worker to specify if the level of visual demand of the task is 'low' (almost no need to view fine details) or 'high' (need to view some fine details). If the requirement is 'high', ask for more information about this aspect of the task. Record this in the space at the bottom of the page.

Driving (M1-M3)

This question investigates whole-body vibration that may result from driving a vehicle at work. The worker is asked to estimate total time spent driving a vehicle during the working day. If the worker does not drive, do not leave the answer blank, place a tick in M1 'Less than one hour per day or Never'. This question only refers to driving at work, do not include driving to and from work.

QEC Example

L Is the visual demand of this task

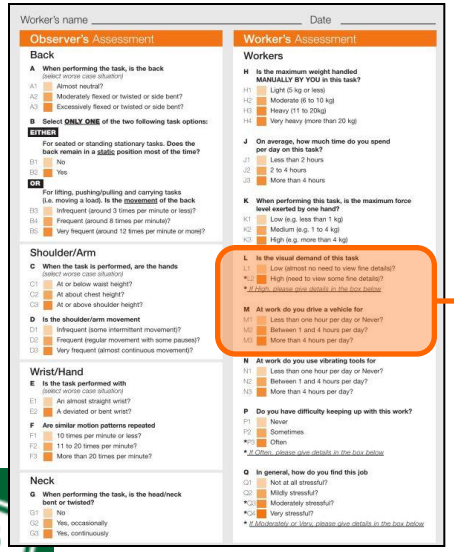
L1	X	Low (almost no need to view fine details)?
*L2		High (need to view some fine details)?

* *If High, please give details in the box below*

M At work do you drive a vehicle for

M1	X	Less than one hour per day or Never?
M2		Between 1 and 4 hours per day?
M3		More than 4 hours per day?

QEC Example


Worker's name _____ Date _____

Observer's Assessment

Back

A When performing the task, is the back *(select worse case situation)*
- A1 Almost neutral?
- A2 Moderately flexed or twisted or side bent?
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B Select **ONLY ONE** of the two following task options:

EITHER

For seated or standing stationary tasks. Does the back remain in a static position most of the time?
- B1 No
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- E1 An almost straight wrist?
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Neck

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- G3 Yes, continuously

Worker's Assessment

Workers

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N At work do you use vibrating tools for
- N1 Less than one hour per day or Never?
- N2 Between 1 and 4 hours per day?
- N3 More than 4 hours per day?

P Do you have difficulty keeping up with this work?
- P1 Never
- P2 Sometimes
- *P3 Often

* *If Often, please give details in the box below*

Q In general, how do you find this job
- Q1 Not at all stressful?
- Q2 Mildly stressful?
- *Q3 Moderately stressful?
- *Q4 Very stressful?

* *If Moderately or Very, please give details in the box below*

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- N1 Less than one hour per day or Never?
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- *Q4 Very stressful?

* *If Moderately or Very, please give details in the box below*

QEC Example

N At work do you use vibrating tools for

N1		Less than one hour per day or Never?
N2	X	Between 1 and 4 hours per day?
N3		More than 4 hours per day?

P Do you have difficulty keeping up with this work?

P1	X	Never
P2		Sometimes
*P3		Often

* *If Often, please give details in the box below*

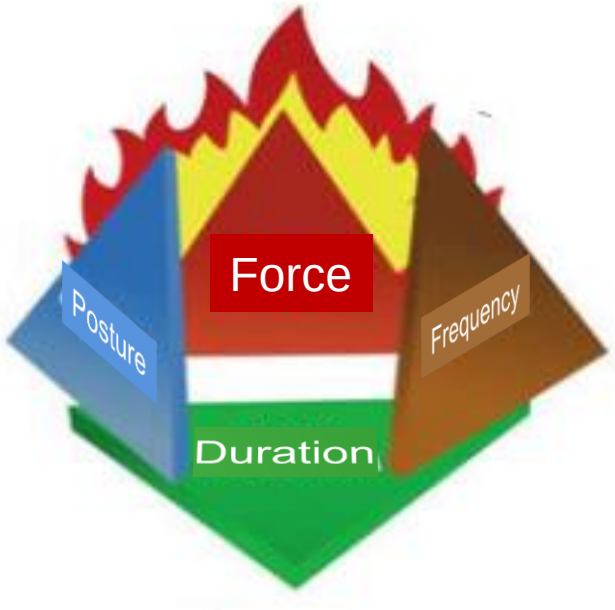
Q In general, how do you find this job

Q1	X	Not at all stressful?
Q2		Mildly stressful?
*Q3		Moderately stressful?
*Q4		Very stressful?

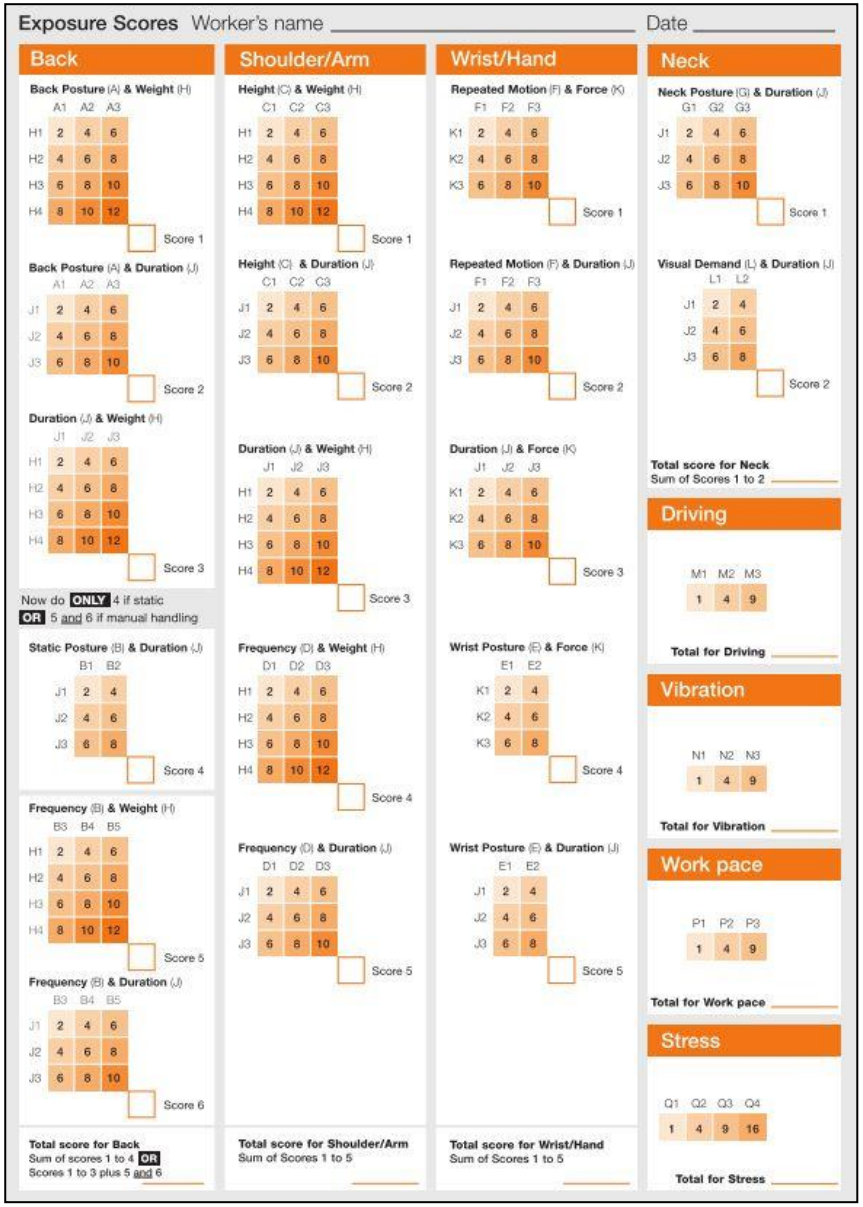
* *If Moderately or Very, please give details in the box below*

Scoring the QEC

- Scores are based on combinations of risk factors
  - Posture + duration
  - Frequency + duration
  - Frequency + force
  - Duration + force
  - Posture + force
- Represents a relationship between exposure to risk factors and WMSDs



Scoring the QEC



Exposure Scores Worker's name _____ Date _____

Back

Back Posture (A) & Weight (H)

	A1	A2	A3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

Score 1

Back Posture (A) & Duration (J)

	A1	A2	A3
J1	2	4	6
J2	4	6	8
J3	6	8	10

Score 2

Duration (J) & Weight (H)

	J1	J2	J3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

Score 3

Now do **ONLY** 4 if static
OR 5 and 6 if manual handling

Static Posture (B) & Duration (J)

	B1	B2
J1	2	4
J2	4	6
J3	6	8

Score 4

Frequency (B) & Weight (H)

	B3	B4	B5
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

Score 5

Frequency (B) & Duration (J)

	B3	B4	B5
J1	2	4	6
J2	4	6	8
J3	6	8	10

Score 6

Total score for Back
Sum of scores 1 to 4 **OR** Scores 1 to 3 plus 5 and 6

Shoulder/Arm

Height (C) & Weight (H)

	C1	C2	C3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

Score 1

Height (C) & Duration (J)

	C1	C2	C3
J1	2	4	6
J2	4	6	8
J3	6	8	10

Score 2

Duration (J) & Weight (H)

	J1	J2	J3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

Score 3

Frequency (D) & Weight (H)

	D1	D2	D3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

Score 4

Frequency (D) & Duration (J)

	D1	D2	D3
J1	2	4	6
J2	4	6	8
J3	6	8	10

Score 5

Total score for Shoulder/Arm
Sum of Scores 1 to 5

Wrist/Hand

Repeated Motion (F) & Force (K)

	F1	F2	F3
K1	2	4	6
K2	4	6	8
K3	6	8	10

Score 1

Repeated Motion (F) & Duration (J)

	F1	F2	F3
J1	2	4	6
J2	4	6	8
J3	6	8	10

Score 2

Duration (J) & Force (K)

	J1	J2	J3
K1	2	4	6
K2	4	6	8
K3	6	8	10

Score 3

Wrist Posture (E) & Force (K)

	E1	E2
K1	2	4
K2	4	6
K3	6	8

Score 4

Wrist Posture (E) & Duration (J)

	E1	E2
J1	2	4
J2	4	6
J3	6	8

Score 5

Total score for Wrist/Hand
Sum of Scores 1 to 5

Neck

Neck Posture (G) & Duration (J)

	G1	G2	G3
J1	2	4	6
J2	4	6	8
J3	6	8	10

Score 1

Visual Demand (L) & Duration (J)

	L1	L2
J1	2	4
J2	4	6
J3	6	8

Score 2

Total score for Neck
Sum of Scores 1 to 2

Driving

M1	M2	M3
1	4	9

Total for Driving

Vibration

N1	N2	N3
1	4	9

Total for Vibration

Work pace

P1	P2	P3
1	4	9

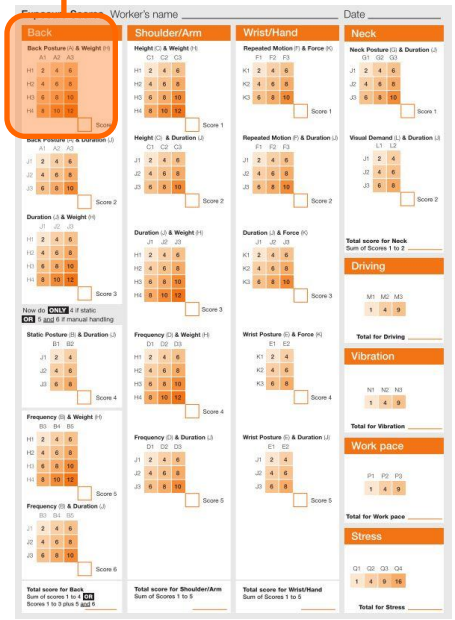
Total for Work pace

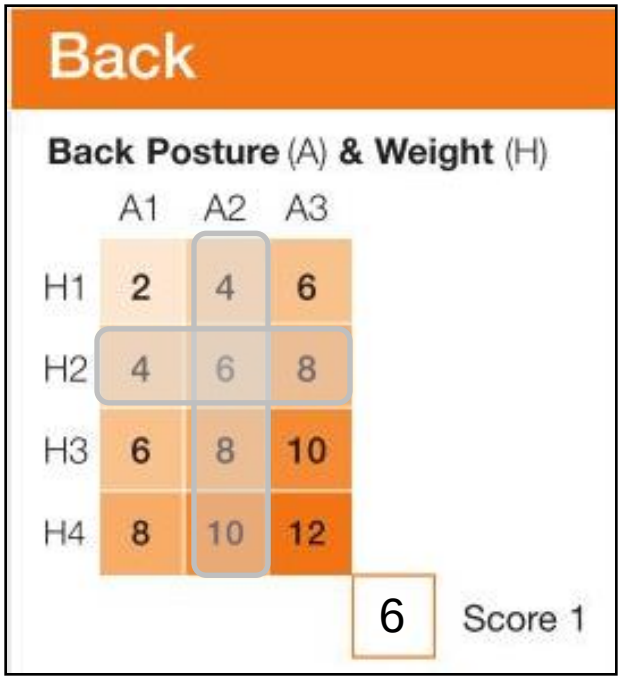
Stress

Q1	Q2	Q3	Q4
1	4	9	16

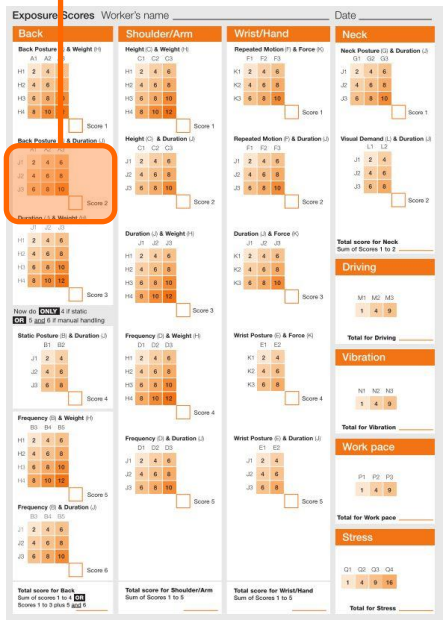
Total for Stress

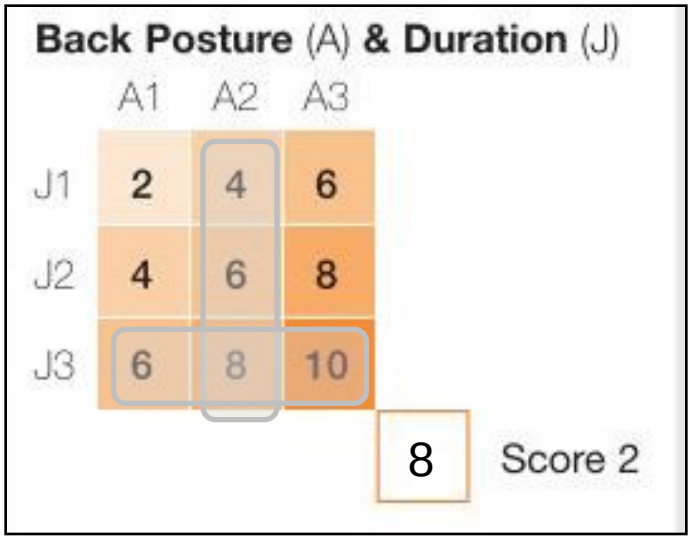
Scoring the QEC



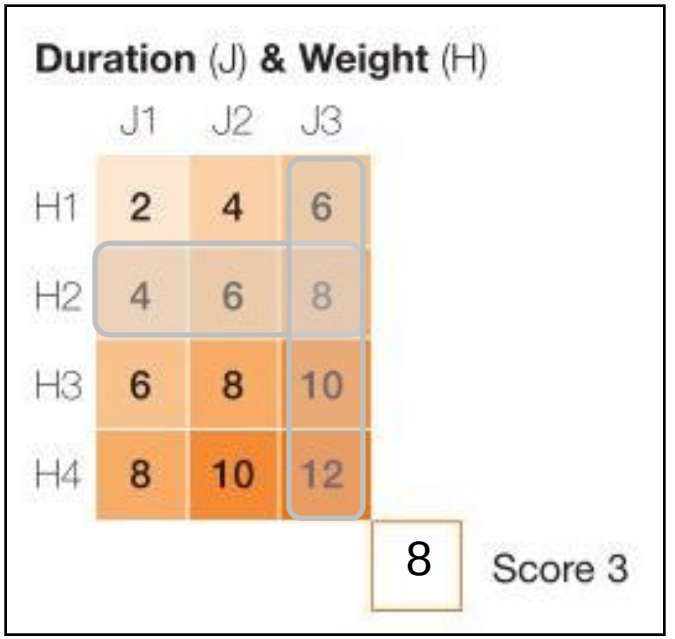


Scoring the QEC





Scoring the QEC



Scoring the QEC

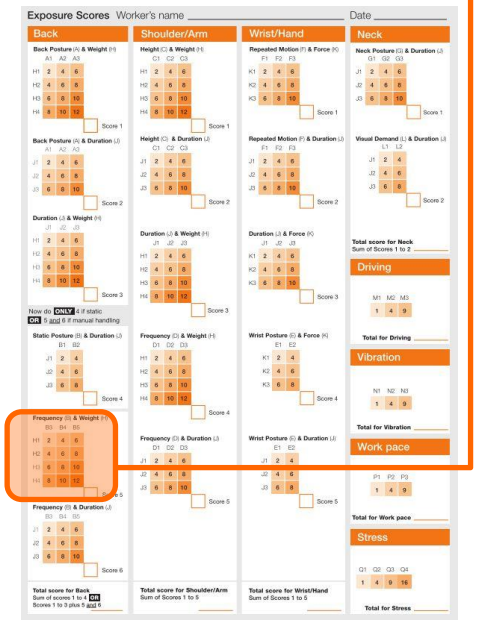
How do **ONLY** 4 if static
OR 5 and 6 if manual handling

Static Posture (B) & Duration (J)

	B1	B2
J1	2	4
J2	4	6
J3	6	8

Score 4

Scoring the QEC

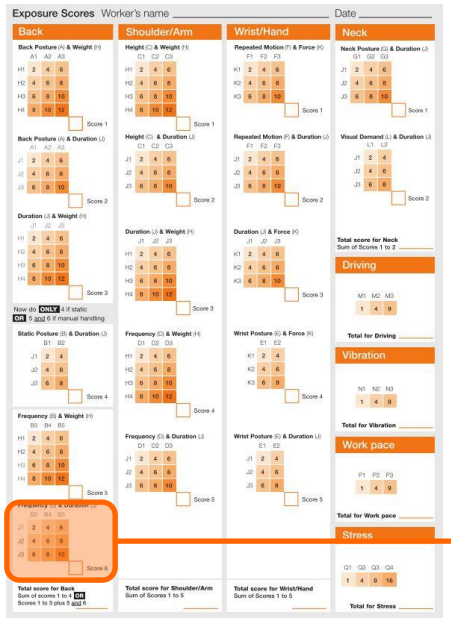


Frequency (B) & Weight (H)

	B3	B4	B5
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

4 Score 5

Scoring the QEC

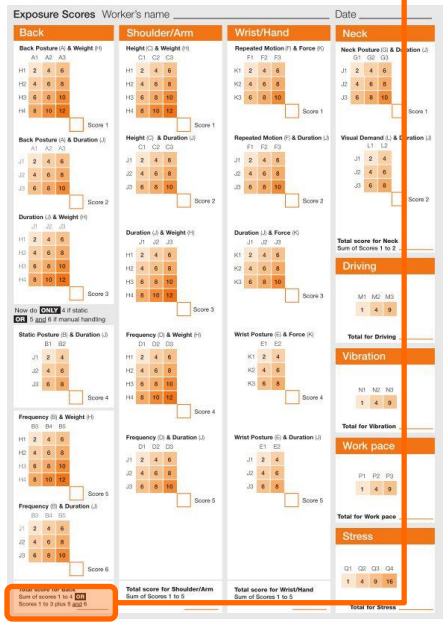


Frequency (B) & Duration (J)

	B3	B4	B5
J1	2	4	6
J2	4	6	8
J3	6	8	10

6 Score 6

Scoring the QEC

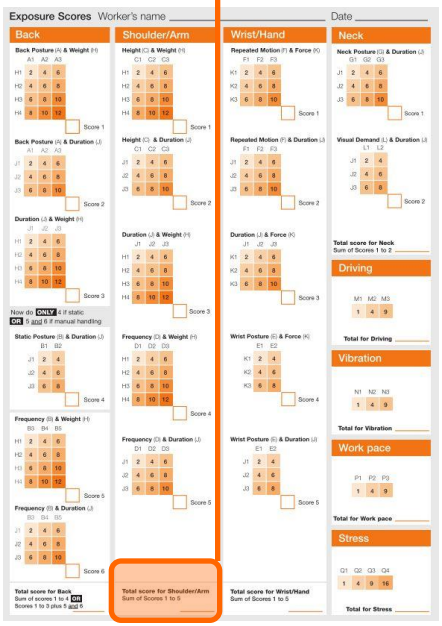


Total score for Back

Sum of scores 1 to 4 **OR**

Scores 1 to 3 plus 5 and 6 **32**

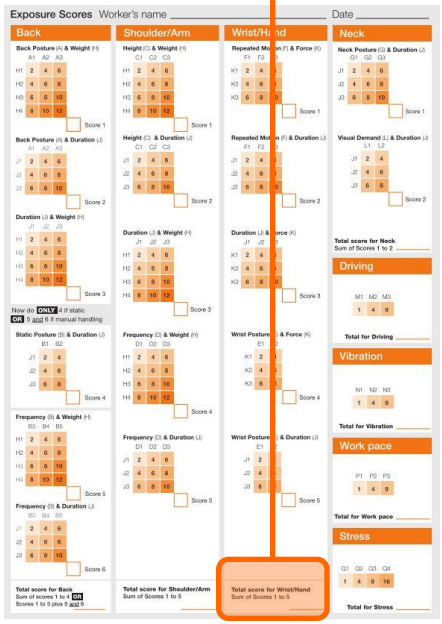
Scoring the QEC



Total score for Shoulder/Arm
Sum of Scores 1 to 5

36

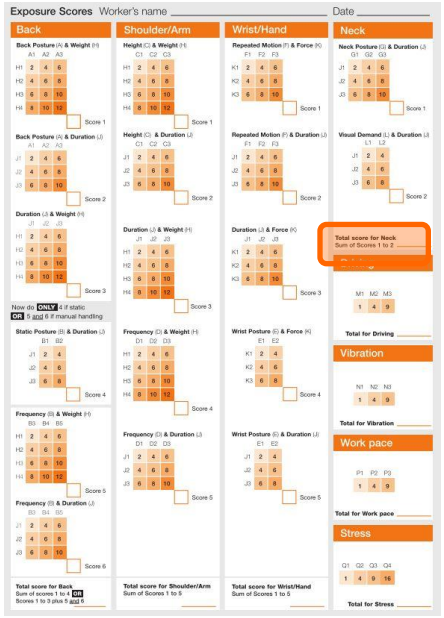
Scoring the QEC

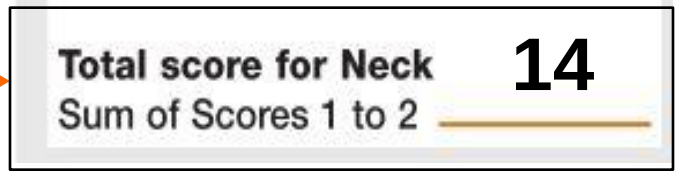


Total score for Wrist/Hand
Sum of Scores 1 to 5

42

Scoring the QEC





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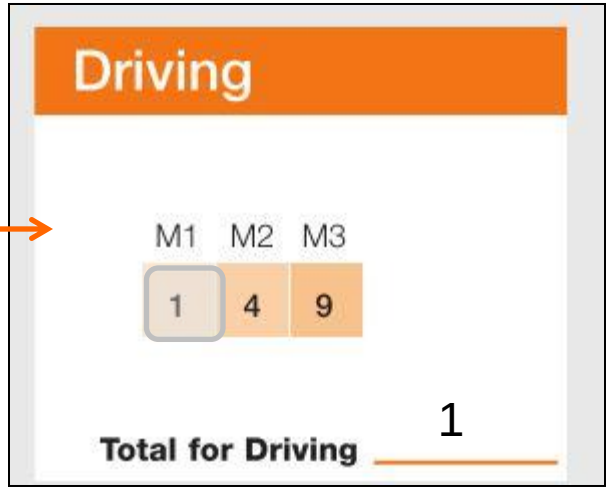

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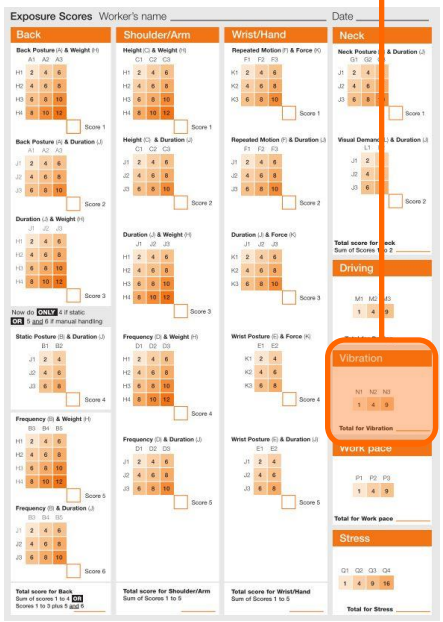
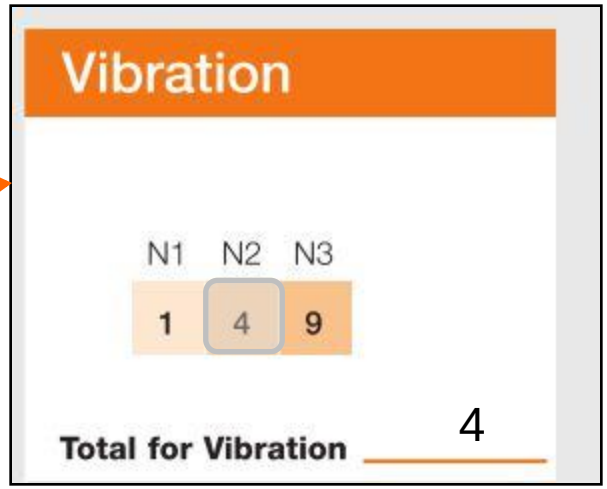
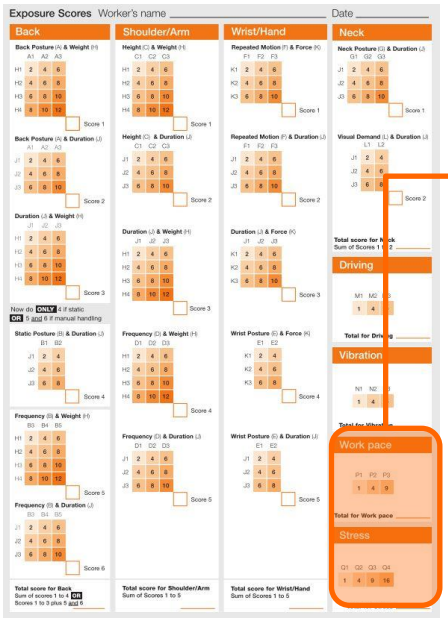




Scoring the QEC



QEC Scores

- Used to show “before and after” reductions in risk
- Used to determine the levels of exposure for each body area
- Used to prioritize where to spend resources

Before

After

Exposure Level

	Exposure level			
Score	Low	Moderate	High	Very High
Back (static)	8-15	16-22	23-29	29-40
Back (moving)	10-20	21-30	31-40	41-56
Shoulder/arm	10-20	21-30	31-40	41-56
Wrist/hand	10-20	21-30	31-40	41-46
Neck	4-6	8-10	12-14	16-18

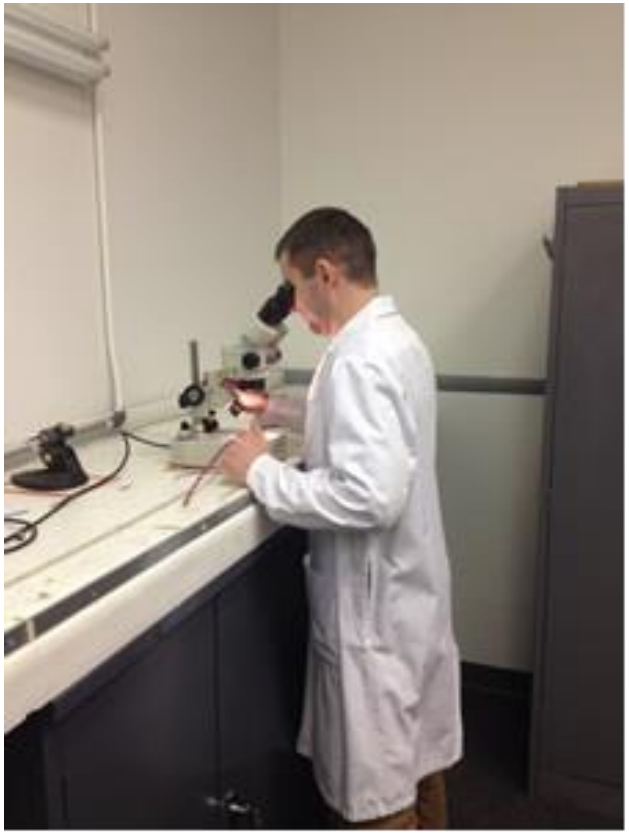
QEC Example - Lab

Observer's Assessment

Back

A **When performing the task, is the back**
(select worse case situation)

A1	X	Almost neutral?
A2		Moderately flexed or twisted or side bent?
A3		Excessively flexed or twisted or side bent?



QEC Example - Lab

Shoulder/Arm

C When the task is performed, are the hands
(select worse case situation)

C1		At or below waist height?
C2	X	At about chest height?
C3		At or above shoulder height?

D Is the shoulder/arm movement

D1	X	Infrequent (some intermittent movement)?
D2		Frequent (regular movement with some pauses)?
D3		Very frequent (almost continuous movement)?

QEC Example - Lab

Wrist/Hand

E **Is the task performed with**
(select worse case situation)

E1	X	An almost straight wrist?
E2		A deviated or bent wrist?

F **Are similar motion patterns repeated**

F1		10 times per minute or less?
F2	X	11 to 20 times per minute?
F3		More than 20 times per minute?

QEC Example - Lab

Neck

G When performing the task, is the head/neck bent or twisted?

G1		No
G2	X	Yes, occasionally
G3		Yes, continuously

QEC Example - Office

Observer's Assessment

Back

A **When performing the task, is the back**
(select worse case situation)

A1		Almost neutral?
A2	X	Moderately flexed or twisted or side bent?
A3		Excessively flexed or twisted or side bent?

QEC Example - Office

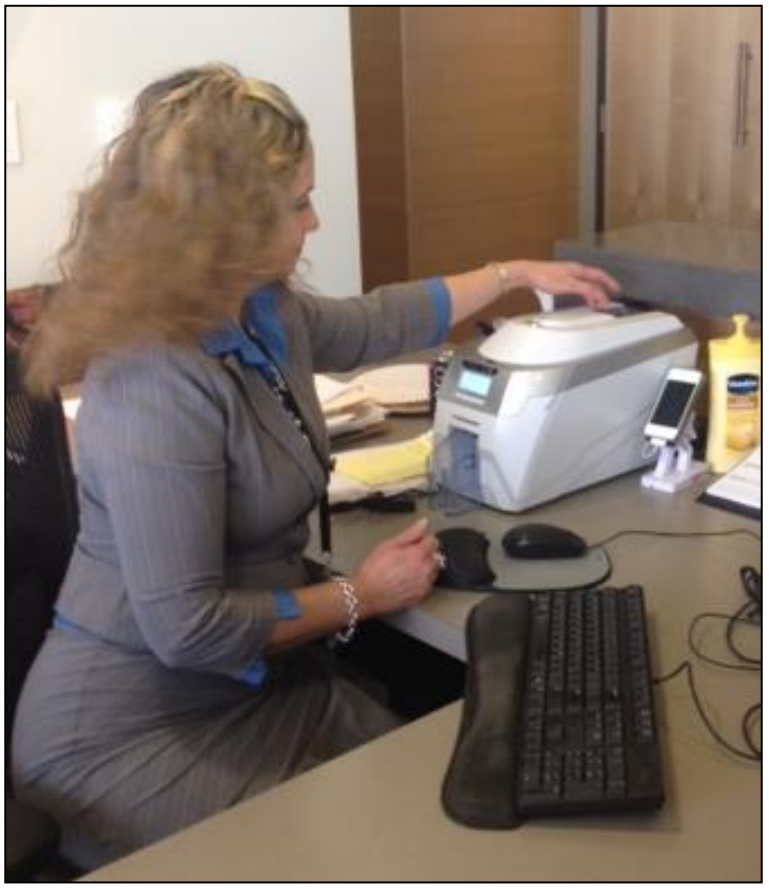
Shoulder/Arm

C When the task is performed, are the hands
(select worse case situation)

C1		At or below waist height?
C2		At about chest height?
C3	X	At or above shoulder height?

D Is the shoulder/arm movement

D1	X	Infrequent (some intermittent movement)?
D2		Frequent (regular movement with some pauses)?
D3		Very frequent (almost continuous movement)?



QEC Example - Office

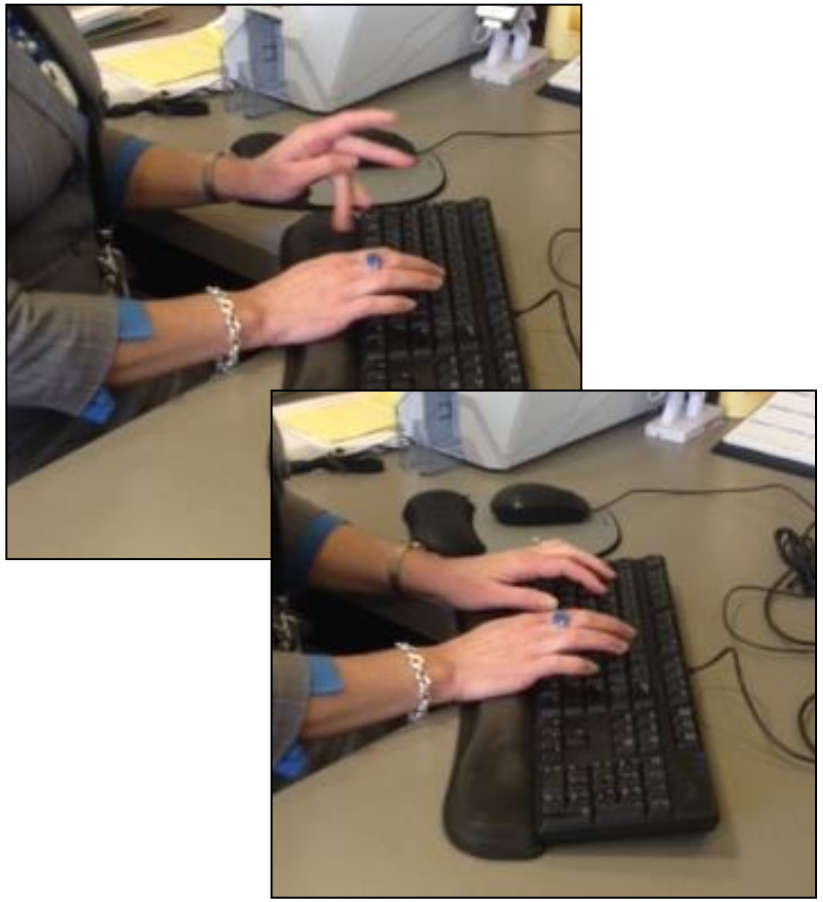
Wrist/Hand

E Is the task performed with
(select worse case situation)

E1		An almost straight wrist?
E2	X	A deviated or bent wrist?

F Are similar motion patterns repeated

F1		10 times per minute or less?
F2		11 to 20 times per minute?
F3	X	More than 20 times per minute?

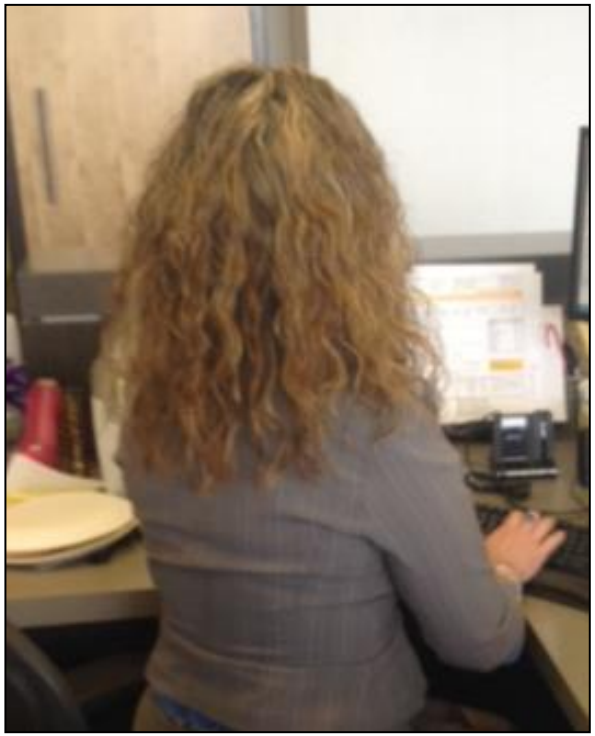


QEC Example - Office

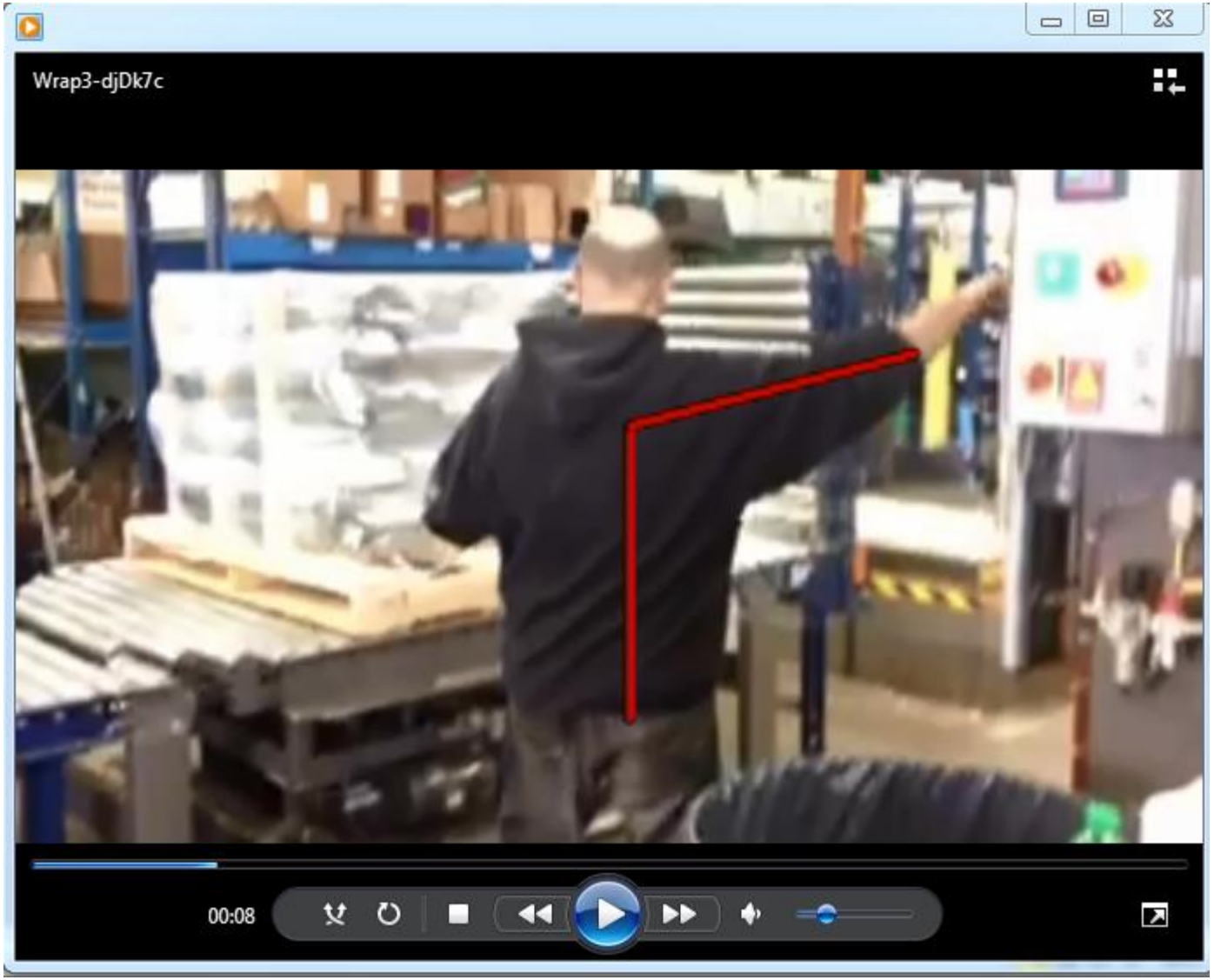
Neck

G When performing the task, is the head/neck bent or twisted?

G1	X	No
G2		Yes, occasionally
G3		Yes, continuously



Video Analysis



Current State

Observer's Assessment

Back

A **When performing the task, is the back**
(select worse case situation)

A1		Almost neutral?
A2		Moderately flexed or twisted or side bent?
A3	X	Excessively flexed or twisted or side bent?

B **Select ONLY ONE of the two following task options:**

EITHER

For seated or standing stationary tasks. Does the back remain in a static position most of the time?

B1		No
B2		Yes

OR

For lifting, pushing/pulling and carrying tasks (i.e. moving a load). Is the movement of the back

B3	X	Infrequent (around 3 times per minute or less)?
B4		Frequent (around 8 times per minute)?
B5		Very frequent (around 12 times per minute or more)?

Shoulder/Arm

C **When the task is performed, are the hands**
(select worse case situation)

C1		At or below waist height?
C2		At about chest height?
C3	X	At or above shoulder height?

D **Is the shoulder/arm movement**

D1		Infrequent (some intermittent movement)?
D2	X	Frequent (regular movement with some pauses)?
D3		Very frequent (almost continuous movement)?

Wrist/Hand

E **Is the task performed with**
(select worse case situation)

E1		An almost straight wrist?
E2	X	A deviated or bent wrist?

F **Are similar motion patterns repeated**

F1		10 times per minute or less?
F2	X	11 to 20 times per minute?
F3		More than 20 times per minute?

Neck

G **When performing the task, is the head/neck bent or twisted?**

G1		No
G2	X	Yes, occasionally
G3		Yes, continuously

Current State

Worker's Assessment

Workers

H Is the maximum weight handled MANUALLY BY YOU in this task?

H1		Light (5 kg or less)
H2		Moderate (6 to 10 kg)
H3	X	Heavy (11 to 20kg)
H4		Very heavy (more than 20 kg)

J On average, how much time do you spend per day on this task?

J1		Less than 2 hours
J2	X	2 to 4 hours
J3		More than 4 hours

K When performing this task, is the maximum force level exerted by one hand?

K1		Low (e.g. less than 1 kg)
K2		Medium (e.g. 1 to 4 kg)
K3	X	High (e.g. more than 4 kg)

L Is the visual demand of this task

L1	X	Low (almost no need to view fine details)?
*L2		High (need to view some fine details)?

* *If High, please give details in the box below*

M At work do you drive a vehicle for

M1	X	Less than one hour per day or Never?
M2		Between 1 and 4 hours per day?
M3		More than 4 hours per day?

N At work do you use vibrating tools for

N1	X	Less than one hour per day or Never?
N2		Between 1 and 4 hours per day?
N3		More than 4 hours per day?

P Do you have difficulty keeping up with this work?

P1	X	Never
P2		Sometimes
*P3		Often

* *If Often, please give details in the box below*

Q In general, how do you find this job

Q1	X	Not at all stressful?
Q2		Mildly stressful?
*Q3		Moderately stressful?
*Q4		Very stressful?

* *If Moderately or Very, please give details in the box below*

Current State

Back

Back Posture (A) & Weight (H)

	A1	A2	A3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

10 Score 1

Back Posture (A) & Duration (J)

	A1	A2	A3
J1	2	4	6
J2	4	6	8
J3	6	8	10

8 Score 2

Duration (J) & Weight (H)

	J1	J2	J3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

8 Score 3

Frequency (B) & Weight (H)

	B3	B4	B5
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

6 Score 5

Frequency (B) & Duration (J)

	B3	B4	B5
J1	2	4	6
J2	4	6	8
J3	6	8	10

4 Score 6

Total score for Back
Sum of scores 1 to 4 **OR**
Scores 1 to 3 plus 5 and 6

36

Current State

Shoulder/Arm

Height (C) & Weight (H)

	C1	C2	C3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

10 Score 1

Height (C) & Duration (J)

	C1	C2	C3
J1	2	4	6
J2	4	6	8
J3	6	8	10

8 Score 2

Duration (J) & Weight (H)

	J1	J2	J3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

8 Score 3

Frequency (D) & Weight (H)

	D1	D2	D3
H1	2	4	6
H2	4	6	8
H3	6	8	10
H4	8	10	12

8 Score 4

Frequency (D) & Duration (J)

	D1	D2	D3
J1	2	4	6
J2	4	6	8
J3	6	8	10

6 Score 5

Total score for Shoulder/Arm
Sum of Scores 1 to 5 40

Current State

Wrist/Hand

Repeated Motion (F) & Force (K)

	F1	F2	F3
K1	2	4	6
K2	4	6	8
K3	6	8	10

8 Score 1

Repeated Motion (F) & Duration (J)

	F1	F2	F3
J1	2	4	6
J2	4	6	8
J3	6	8	10

6 Score 2

Duration (J) & Force (K)

	J1	J2	J3
K1	2	4	6
K2	4	6	8
K3	6	8	10

8 Score 3

Wrist Posture (E) & Force (K)

	E1	E2
K1	2	4
K2	4	6
K3	6	8

8 Score 4

Wrist Posture (E) & Duration (J)

	E1	E2
J1	2	4
J2	4	6
J3	6	8

6 Score 5

Total score for Wrist/Hand
Sum of Scores 1 to 5 36

Current State

Neck

Neck Posture (G) & Duration (J)

	G1	G2	G3
J1	2	4	6
J2	4	6	8
J3	6	8	10

6 Score 1

Visual Demand (L) & Duration (J)

	L1	L2
J1	2	4
J2	4	6
J3	6	8

4 Score 2

Total score for Neck
Sum of Scores 1 to 2 _____

Driving

M1	M2	M3
1	4	9

Total for Driving 1

Vibration

N1	N2	N3
1	4	9

Total for Vibration 1

Work pace

P1	P2	P3
1	4	9

Total for Work pace 1

Stress

Q1	Q2	Q3	Q4
1	4	9	16

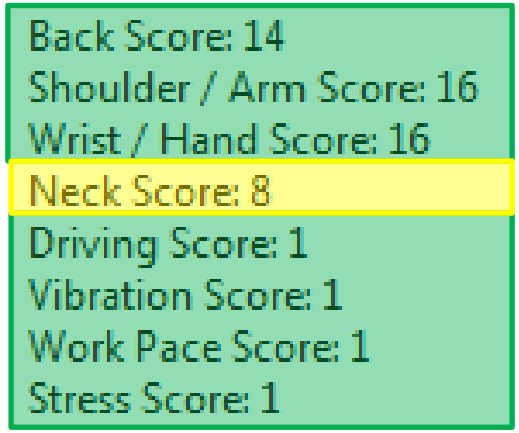
Total for Stress 1

Back Score: 36
Shoulder / Arm Score: 40
Wrist / Hand Score: 36
Neck Score: 10

Driving Score: 1
Vibration Score: 1
Work Pace Score: 1
Stress Score: 1

What should we do?

- Program the wrapper to always return to a lower position (waist height) – Change back posture from high risk to low risk.
- Store knife in holster or lower shelf (lower shoulder risk from high to low)
- Power the conveyor - ensure button location is good (reduce the force requirement from high to low)



Where can I get the QEC?

- https://www.lni.wa.gov/Safety/SprainsStrains/pdfs/QECReferenceGuide.pdf
- http://www.hse.gov.uk/research/rrpdf/rr211.pdf

Questions?