The Role of Rehabilitation and Functional Assessment during SARS COVID-19

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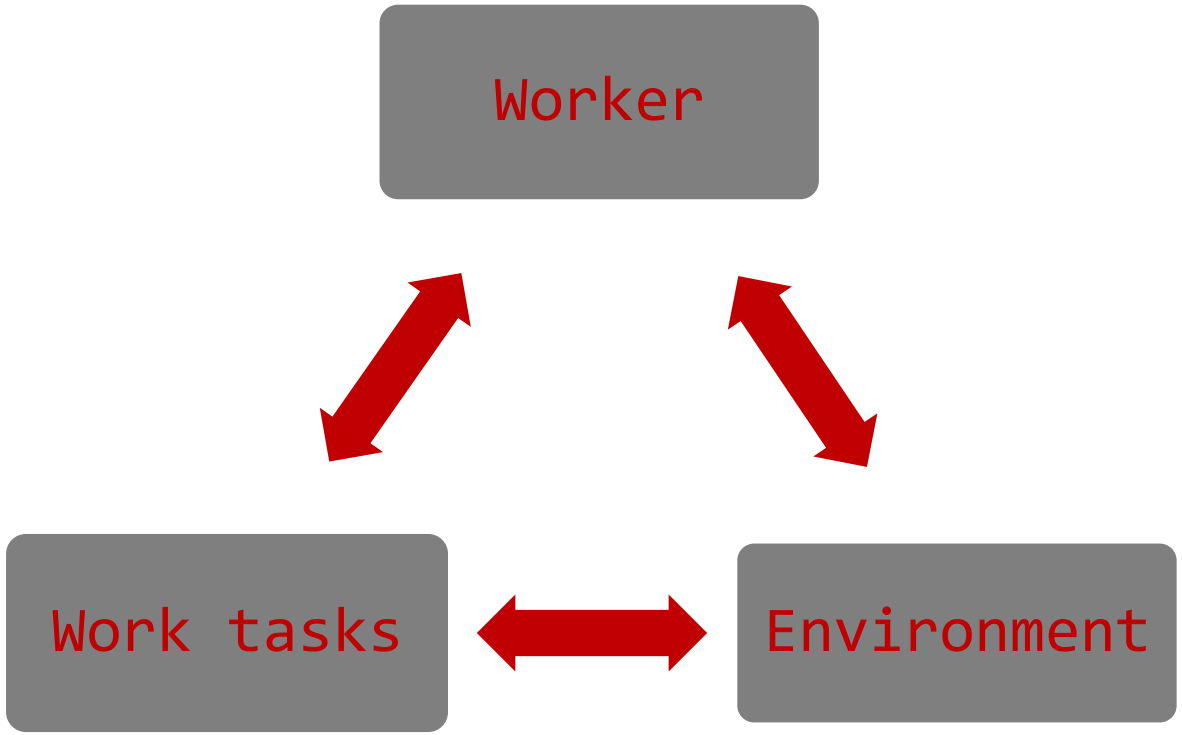
RFA
THE WORK EXPERT
For a healthy, safe, productive workforce

Every COVID-19 case is writing its own story...

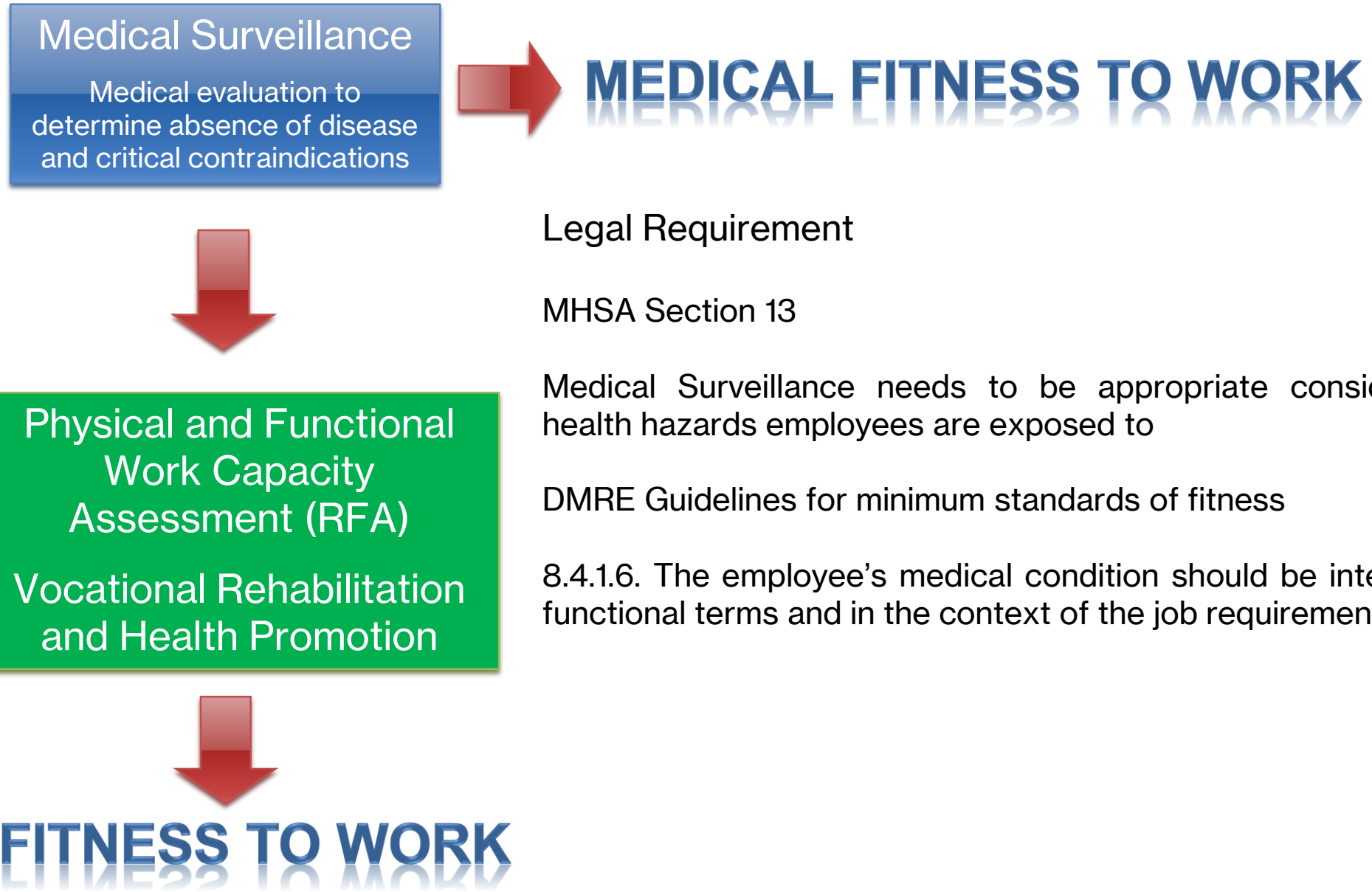
www.freepik.com/macrovector

Safe return to work...



... a maximised fit

Holistic Medical Surveillance



Legal Requirement

MHSA Section 13

Medical Surveillance needs to be appropriate considering the health hazards employees are exposed to

DMRE Guidelines for minimum standards of fitness

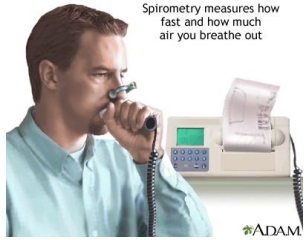
8.4.1.6. The employee's medical condition should be interpreted in functional terms and in the context of the job requirements

Referral criteria for a baseline RFA Assessment

Referral criteria for a Baseline Functional Work Capacity Assessment:

- Two negative COVID-19 Tests
- Pre-exercise heart rate ≤100 bpm
- Tympanic temperature < 37.4ºC

Assessment of Physical and Functional Work Capacity



Body Functions & Structures

AMA Guidelines
Measuring deviation from the norm

=

Impairment

Performance skills

(Mobility and ADL)

- Self report assessments: questionnaires
- Clinical observations,
- Rating scales (AMA Guidelines)
- Functional Capacity Evaluation (cognitive affective etc.)

+

Consideration of personal and environmental factors

=

Limitation

Performance area: Work

Fitness to work

- Work Capacity Assessment against the inherent job requirements to determine safe and productive execution of work tasks

+

Consideration of personal and environmental factors

=

Restriction

Reference: WHO Classification of Function- ICF Model

Minimum Standard of Fitness – Cardiorespiratory

DMRE Requirement

8.5.1 The cardiovascular system needs to be able to take the physical exertion of a particular category of work.

8.5.2 Respiratory system

8.5.2.1 The respiratory system should be free from acute or chronic disease which may impair the ability to meet the required physical performance of a particular category of work.

Physical activity and the immune system

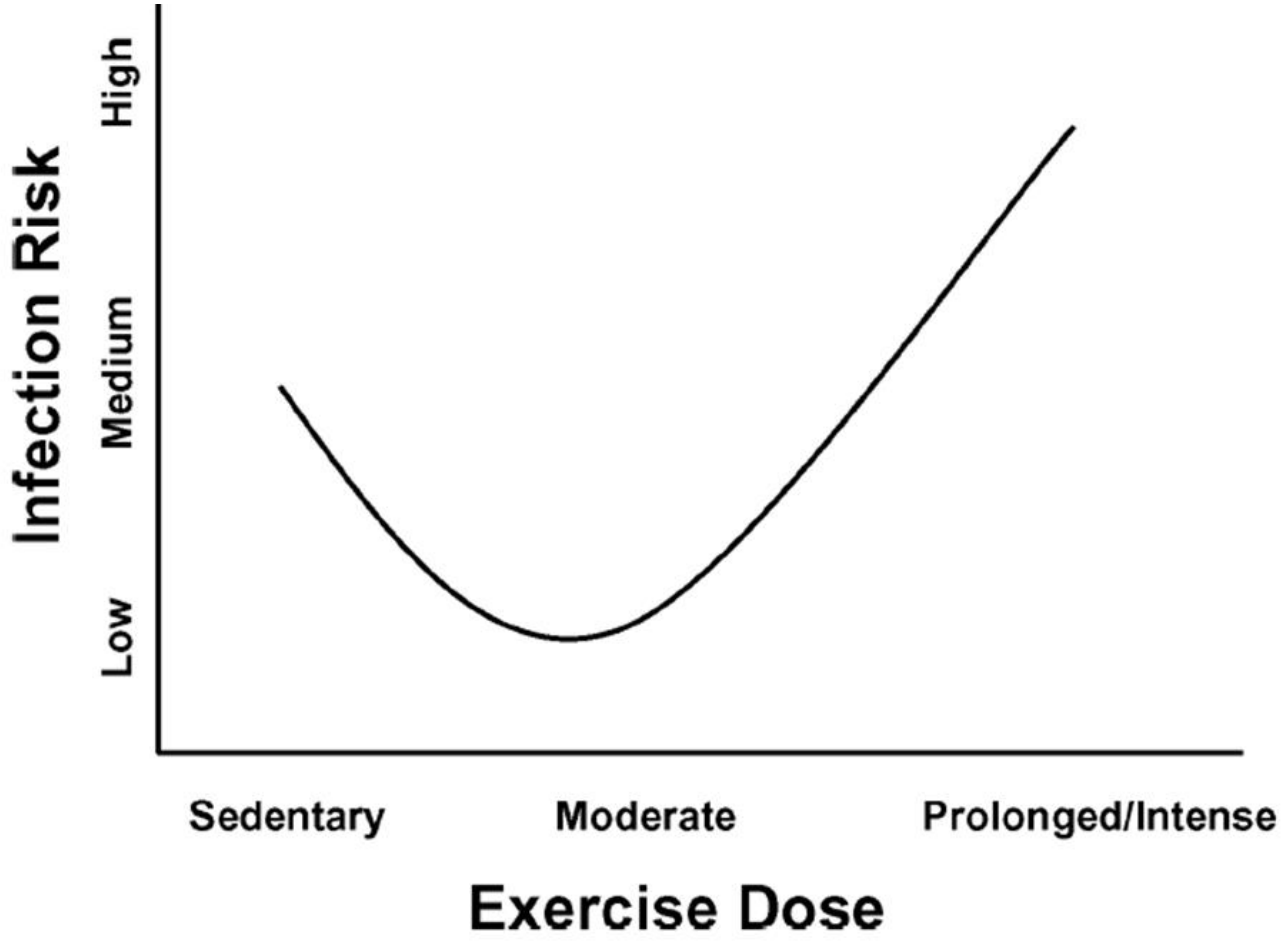


Figure 1.
"J-shaped" model depicting dose-dependent effect of exercise on risk and severity of respiratory tract infections. Sedentary persons are considered to be at normal risk of URTI. Exercise of low-to-moderate intensity or frequency is associated with reduced risk of URTI (3,18,23,25,34) while high-intensity exercise is associated with an increased risk of infection (8,11,24). [Adapted from Nieman DC, Johanssen LM, Lee JW. Infectious episodes in runners before and after a roadrace. *J Sports Med Phys Fitness*. 1989;29(3):289–96. Copyright © 1989 BMJ Publishing Group Ltd. Used with permission.]

Heat Stress Management

TABLE 1.2: Framework for HSM work practices on the basis of the most important casual factors in the development of heat stroke

CAUSAL FACTOR	WORK PRACTICE
Strenuous work	• Adequate physical work capacity (physical evaluation) • Self-pacing (educational) • Work-rest cycles (administrative and mandatory, if required)
Suspect heat tolerance	• Overall fitness for work in hot environments: o Medical evaluation o Physical evaluation o Screening for heat intolerance
Dehydration • Alcohol-induced • Insufficient fluid replacement	• Education • Provide potable and palatable water at place of work • Introduced water-breaks
Excessively hot environments	• Ongoing monitoring and control • Action plans • Emergency planning

Reference : DMR Thermal Stress guideline, annexure 7 pg. 70.

Low work capacity...

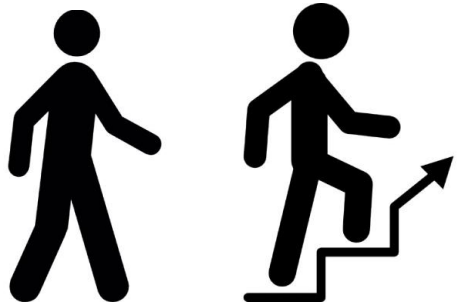
Premature fatigue, which may impact on

- tolerance of PPE, facemasks, encapsulated garments,
- safe evacuation using self rescuers,
- safe work practices, i.e. self-pacing in hot work environments, shortcuts, trip and fall accidents, and
- health implications – compromising the immune system.

...risks

Health Risks

- Dust
- Noise
- Heat
- Radiation



Position	Energy consumption
Sitting 	3 - 5%
Standing 	8 - 10%
Stooping 	50 - 60%
Kneeling 	30 - 40%

ENVIRONMENTAL & TASK DEMANDS

ELICITS

CARDIORESPIRATORY

AND/OR

MUSCULOSKELETAL RESPONSES

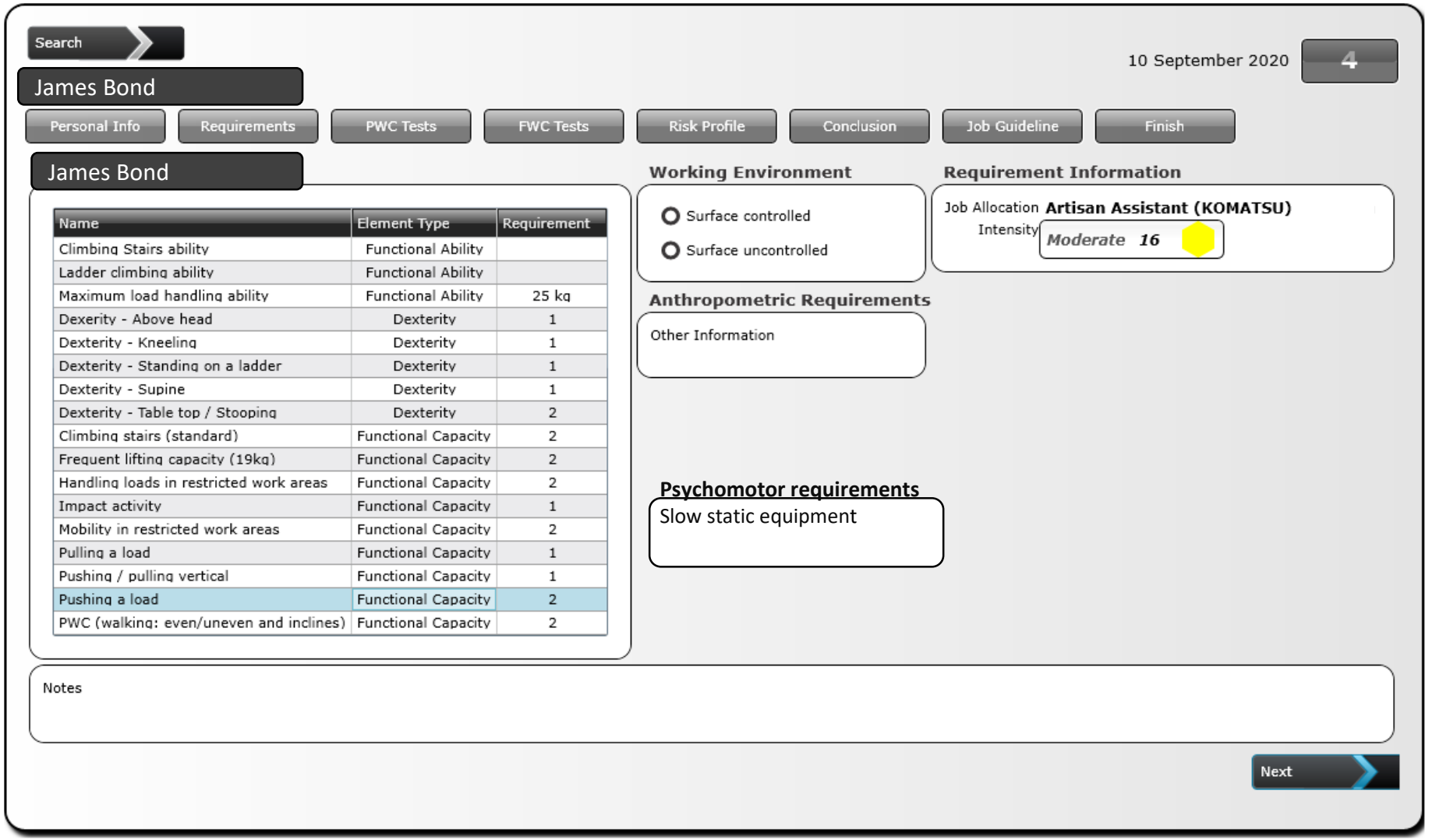
Classification of Work Demands

The exposure to physical demanding work tasks and work environments can be categorised as follows:

Occupations with physical demands				
Very heavy Fire Fighter Emergency Services	Heavy Mechanical Artisan	Moderate Artisans	Light Instrumentation Technicians	Roaming Foremen Engineers
PWC/FWC requirements	PWC/FWC requirements	PWC/FWC requirements	PWC/FWC requirements	PWC/FWC requirements

DMRE Guidelines for Minimum Standards of Fitness Table1: The categorisation for strenuous work

RFA Job Analyses



Name	Element Type	Requirement
Climbing Stairs ability	Functional Ability	
Ladder climbing ability	Functional Ability	
Maximum load handling ability	Functional Ability	25 kg
Dexerity - Above head	Dexterity	1
Dexterity - Kneeling	Dexterity	1
Dexterity - Standing on a ladder	Dexterity	1
Dexterity - Supine	Dexterity	1
Dexterity - Table top / Stooping	Dexterity	2
Climbing stairs (standard)	Functional Capacity	2
Frequent lifting capacity (19kg)	Functional Capacity	2
Handling loads in restricted work areas	Functional Capacity	2
Impact activity	Functional Capacity	1
Mobility in restricted work areas	Functional Capacity	2
Pulling a load	Functional Capacity	1
Pushing / pulling vertical	Functional Capacity	1
Pushing a load	Functional Capacity	2
PWC (walking: even/uneven and inclines)	Functional Capacity	2

Assessment methodology Vocational Rehabilitation

Occupation

Type of injury/disease

Physical Intensity of the occupation: Very heavy, Heavy, Moderate, light, Roaming

(Calculated by the RFA test system)

FWC requirements

(pull through from job analyses)

Test Element

Name	Element Type	Requirement
Climbing Stairs ability	Functional Ability	
Ladder climbing ability	Functional Ability	
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Pshycomotor requirements
(pull through from the RFA job analyses)

Physchomtor demand	Movement/pace of mobile equipment
High	Fast moving
High	Slow-fast moving
Medium	Static slow moving
Low	Static

- Exposure risks (pulled through from OREPS' only risks flagged)
- Special PPE requirements
- Antropometrics

RTW

Type of Assessment

Treatment Goals

Treatment Programs

- Cardiorespiratory
- Upper / lower limb conditioning etc.
- Psychomotor training / CogniPlus
- Educational
- Stress management
- Back care
- Healthy Lifestyle etc.

Home programs

Workplace visits

RFA Assessment

Objective Assessment of Work Capacity

Physical Work Capacity Test (PWC)

Aim: To determine the inherent aerobic capacity to cope with physical aspects of the work.

Functional Work Capacity Test (FWC)

Aim: To assess functional abilities necessary to perform a specific task / to meet essential job demands

RFA Test Methodology

Work Physiology Approach

- Individuals' work response is used to measure the heaviness of the task and sustainable capacity for task completion [1]
- Physiological monitoring of heart rate is the best index of stress imposed by a task [2,3,4]
- Linear relationship between oxygen consumption and heart rate response [5,6,7]
- When the task is not heavy, the heart rate response exhibits a steady state for clients who is not burdened by disease.
- If the burden placed on the worker is too high in relation to their capacity for sustained physical work, the individual will fatigue.
- An individual's physical tolerance to work is inversely proportional to his/her physical condition.
- The closer the task is to the workers maximum capacity, the shorter the length of time an individual can work.
- By comparing an individual's actual heart rate during FWC tasks to work tolerance data, determine the actual capacity of the individual for work.

References

1. Jiang B. Psychophysical capacity modeling of individual and combined manual materials handli [illegible] 1984.eferences
2. Astrand P, Saltin B. Oxygen uptake during the first minutes of heavy muscular exercise.] *App Physiology. 1961;16:9*
3. Fernandez]. Psychophysical lifting capacity over extended periods. Lubbock, Tex: Texas Tech University; 1986.
4. Fraser T. Fitness for work. Washington, DC: Taylor & Francis;1992.

RFA Test Standards

Basic principle

Basic principle of assessment is that normal healthy individuals should be able to sustain a full-shift (8 hours) work rate at levels corresponding to about 30-40 percent of maximal aerobic power or VO_2 max without undue fatigue in any industrial setting.

Heart rate is being used as indicator for an industrial physiological measurement mainly because it is

- Uncomplicated to administer and interpret
- It reacts to both dynamic and static work loads and
- It is reproducible

Several researches endorse using heart rate as a primary measurement criteria as it has a linear relationship with energy expenditure, and it can be measured without interfering with the work task in progress.
Heart rate is also the best index for physical work because it is reasonably similar for all persons during work.

References:
Davies.C. Heart rate and respiration in relation to working capacity. Scotland: University of Edinburg.
Rodahl K. The Physiology of Work. New York.
American Medical Association (AMA): Guidelines to the Evaluation of Permanent Impairment. Sixth Edition.
ISO Standard 8996

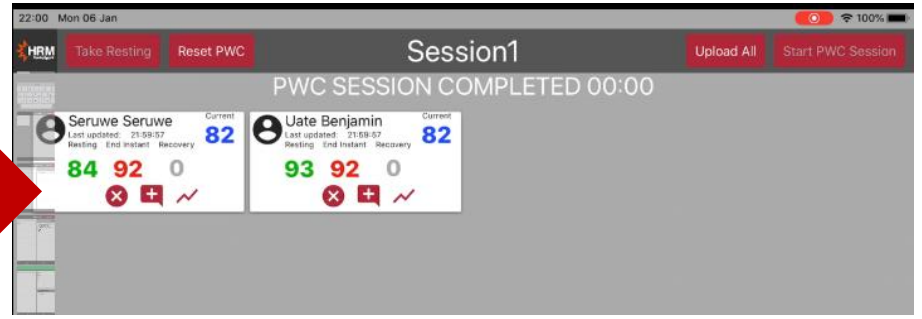
Assessment of RFA

$$\frac{\text{Work output}}{\text{Physiological effort}}$$

Supporting assessments: BORG Pain Scale, BORG Rating of Perceived Exertion & Clinical Observations

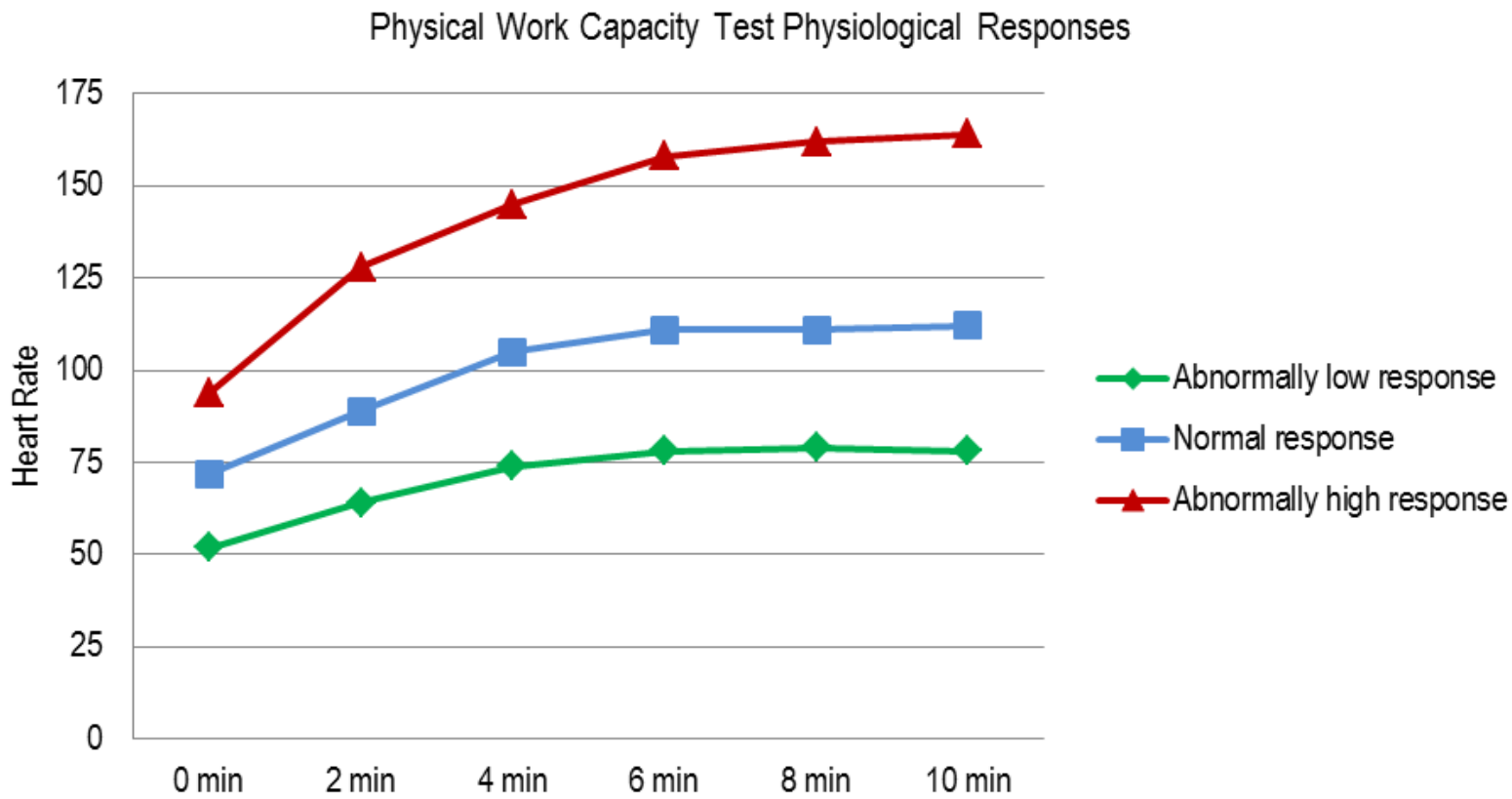
RFA PWC Assessment

Stepping with heart rate transmitter belts



Automatic data capturing and transmission to RFA Software for report creation

PWC Heart Rate Profile

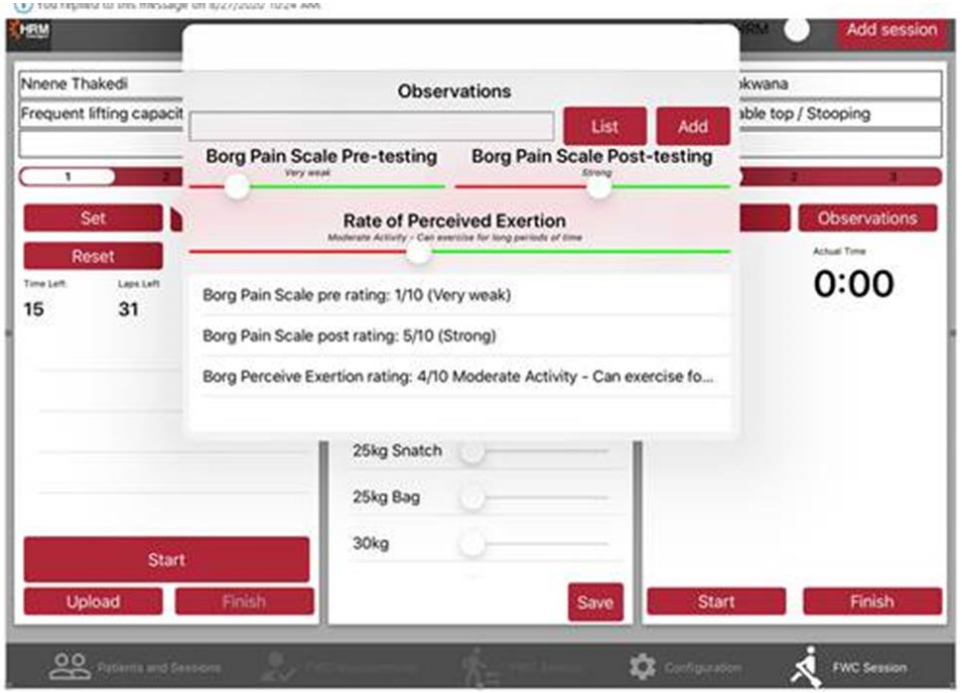


Premature Fatigue Risk

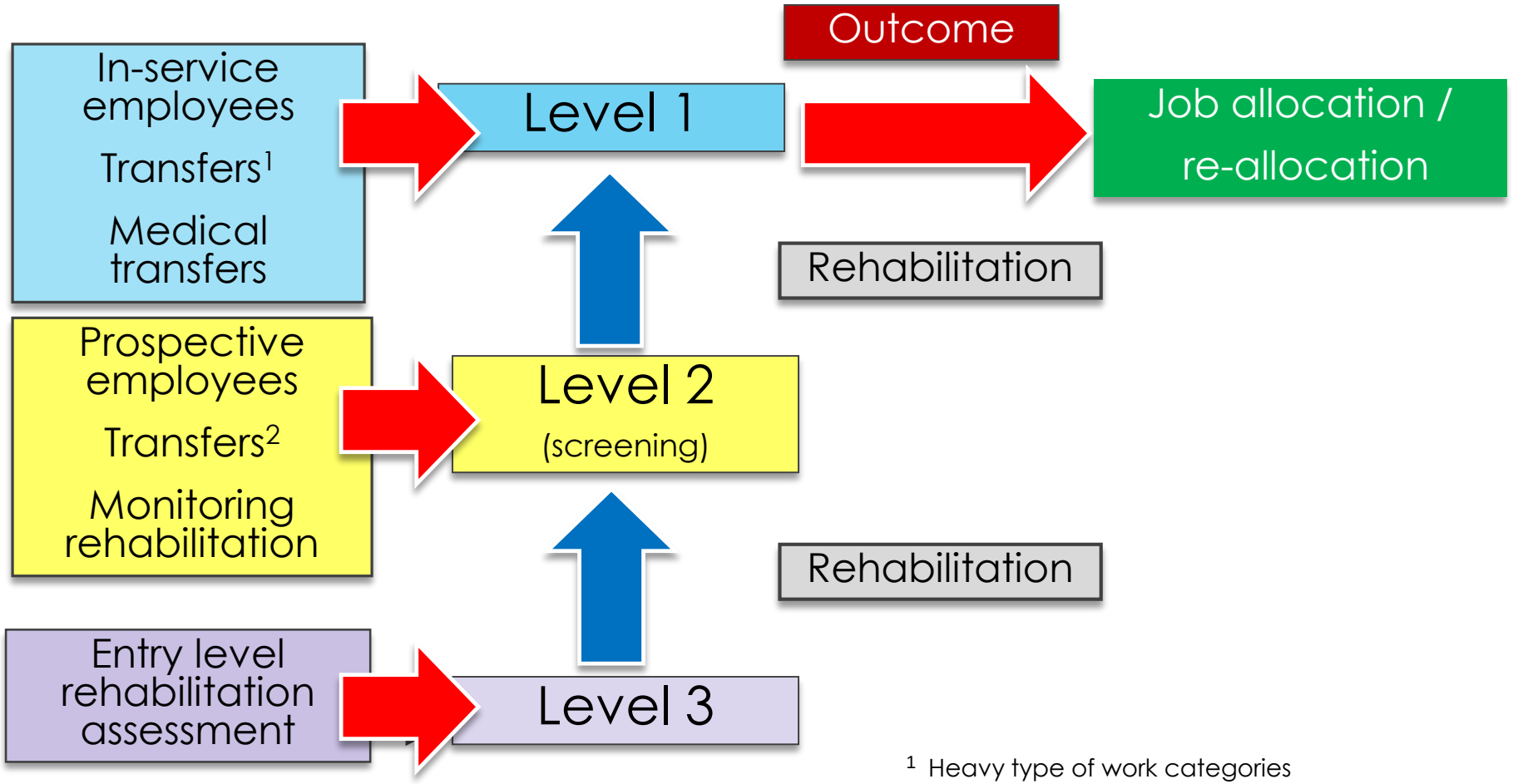
VO_2Max	Corresponding heart rate	Tolerable for…
30-40% of VO_2Max	100 - 115bpm	8 hours
45% of VO_2Max	125bpm	2 hours
50% of VO_2Max	130bpm	1 - 2 hours
50 - 75% VO_2Max	140 - 150bpm	< 1 hour
> 75% VO_2Max	>150bpm	20 minutes

Dr TJ Becker. Functional Capacity Evaluations: the work physiology component for predicting full time work Volume 18. Lesson 16.

Functional Work Capacity



Monitoring of effectiveness of rehabilitation



[1] Heavy type of work categories
[2] Light to heavier type of work

Assessment Outcomes of COVID-19 cases

Period of data sample: 1 June -17th of September 2020

Size of data sample:

Number of clients tested: 695
Number of assessments performed: 810

Type of assessments

- Risk based medical out of cycle: 79%
- Initial risk based medical assessment – New Employees : 18%
- Initial risk based medical assessment for novices- 3%

Outcomes
Recommended: 81%
Not recommended: 16.7%
Not for assessment:1.2%
Invalid: 0.6%

Cases presenting with limitations
(n =133)

Prevalence of risk factors

Age ≥ 50 years: 25%
Body Mass Index ≥ 30: 37%

Comorbidities: 25%

- Hypertension:15 cases
- Immunocompromised: 7 cases
- Diabetes: 7 cases
- Asthma: 1 case
- Orthopedic condition: 2 cases
- Cardiomyopathy: 1 case

Physical Demands of the occupation

Nature of work employees will be exposed to

- Very heavy: 8%
- Heavy: 27%
- Moderate: 36%
- Light: 26%
- Roaming: 3%

Vocational Rehabilitation

- In-house rehab program
- Home program

Duration

7 - 60 days +
Average: 3 weeks

Case Studies

Case Study No 1: 57-year-old male Stope Team Leader (Very heavy)

Date	19/07/2017	30/07/2020	13/08/2020	25/08/2020
PWC Test Outcomes	118	142	135	112
Assessment	New Employee	Return to work post COVID-19		

Immunocompromised on HAART, normal BMI (27.57)
Good response to conditioning program
Post COVID-19 last FWC Assessment correlates with 2017 pre-employment assessment outcomes

Case Study No 2: 33-year-old male Stope Rock Drill Operator (Very heavy)

Date	17/03/2017	11/08/2020	17/09/2020
PWC Test Outcomes	130	161	159
Assessment	New Employee	New Employee Assessment - POST COVID-19	

No other known medical conditions
BMI 2017 - 23.35 / BMI 2020 – 20.96
Not included in vocational rehabilitation program, not an in-service employee

Case Studies

Case Study No 3: 32-year-old female Loco Driver (Moderate)

Date	2005	27/8/2020	31/08/2020	07/09/2020	15/09/2020	22/09/2020
PWC Test Outcomes	148	Discontinued Coughing, dyspnea	144 Strain on FWC Assessment	137 Fatigue and limited upper limb strength on FWC Heavy breathing and dry throat	147 Conditioning program recommended	139 Fatigue and limited upper limb strength on FWC
Assessment	New Employee	Return to work post COVID-19				

Anxiety disorder
BMI 2005 - 21 / BMI 2020 – 32
Respiratory symptoms limited 1st PWC Assessment
Employee remains to present with fatigue and limited strength on FWC Assessment

Rehabilitation Framework

Occupation:

Physical Intensity of the occupation: Very heavy, Heavy, Moderate, light, Roaming

(Calculated by the RFA test system)

FWC requirements

(pull through from job analyses

Test Element

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(pull through from the RFA job analyses)

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High	Slow-fast moving
Medium	Static slow moving
Low	Static

- Exposure risks (pulled through from OREPS' only risks flagged)
- Special PPE requirements
- Antropometrics

CLIENT

Date of injury/illness

Medical intervention:

Date of surgery:

Date treatment started:

Date of referral to rehab:

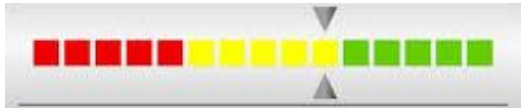
Medical history Tick list (use the one available on QMed)

Medication:

ASSESSMENT

Date of assessment

Physical Work Capacity result



FWC RESULTS (pull through from view report section)

Mobility

Manual Material Handling

Dexterity

Psychomotor test results

Treatment notes:

CLIENT REHABILITATION AGREEMENT

Digital signature

TREATMENT GOALS

Date:

DROP DOWN LIST: Headings with subheadings- e.g.

Heading: Improve Cardiorespiratory fitness

Subheading: PWC results from 160-140

INTERVENTION

Date:

TRAINING PROGRAMS (DROPDOWN LIST)

- Cardiovascular training program
- Upper limb strength training program
- Lower limb strength training program
- CogniPlus training program
- Ergonomic worksite visit

EDUCATIONAL (DROPDOWN LIST)

- Back care
- Ergonomics in the workplace
- Healthy Lifestyle
- Stress management

HOME PROGRAMS (DROPDOWN LIST)

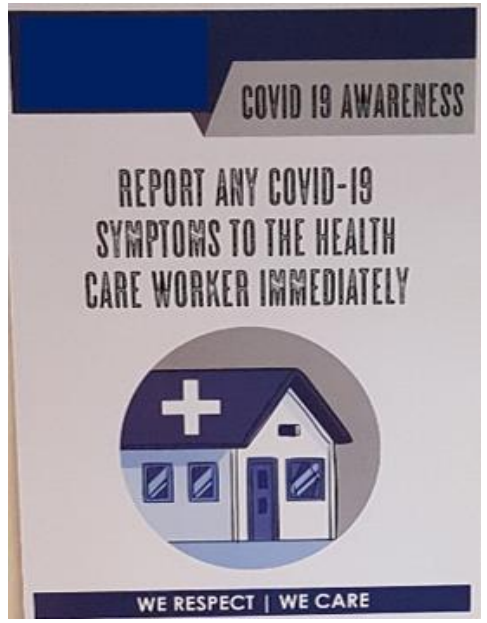
- Operator stretch program
- Female post-partum training program
- Physical conditioning program

Hygiene and Infection Control

Hand Hygiene

Social Distancing

Awareness



PPE

It is health that is real wealth, not pieces of gold and silver…

Mahatma Gandhi

Thank you