Functional Testing is a Validated Step Toward a Safer Workplace

Jenny Legge BPhty, MErg

Funding

Australian Coal Association Research Program

ACARP Project C14045

'Validating the JobFit System Functional Assessment Method'

Researchers

Ms Jenny Legge BPhty MErg

Assoc Prof Robin Burgess-Limerick BMHS (Hons) PhD CPE

Step by Step

- Steps Leading to Research
- Steps to Excellence
- Project Steps
- PEFA components
- Results to date
- Implications… steps
- Challenges … steps
- Next Steps

Steps Leading to PEFAs

- Sprains and strains cost Australian coal mining industry > $ 1 MILLION EVERY WEEK
- Industry is aging (retirement, superannuation)
- Skilled labour shortages; risk management
- Dissatisfaction with current practices
- Functional testing increasing popularity
- Legal issues
- Return on investment
- Limited research available

Assessment Types

3 types of pre-employment assessments

- **Medical / physio**
  - Not supported
- **Clinical functional**
  - Limited research
- **Field functional**
  - Very limited research

Steps to Excellence

Safety	Is the test safe to administer?
Reliability	Are the test results reproducible on any occasion between evaluators and participants?
Validity	Does the test measure what it reports to measure and is it predictive of performance?
Practicality	Is the test easy to administer with reasonable / minimal cost?
Utility	Does the functional test relate to job performance and does it meet the needs of the involved parties?

Project Steps

2 phases

- Reliability study & validity study

Objectives

1. Develop assessment method

2. Find out if there is a predictive relationship between assessment results and sprain and strain injuries

PEFA Components

Pre-Employment Functional Assessment

Periodic-Employment Functional Assessment

Post-Employment Functional Assessment

PEFA Components

- Informed consent
- Medical history questionnaire
- Musculoskeletal screen (inc balance)
- Fitness test
- Postural tolerances (job-specific)
- Lifting and carrying (job-specific)
- **Feedback**
- Overall score

PEFA Components

- JobFit System software compares worker capabilities to job demands

- Job demands database is used to develop job-specific assessment criteria

- Data matching capability is used to give PEFA score

Report Preview

Report: Dragline Operator

JobRecord

Combined Functional Analysis of Job "Dragline Operator" at 15/03/2007

POSTURAL TOLERANCES

Back	N	O	F	C	NT
Bend Forward	○	○	●	○	○
Bend Backward	○	○	●	○	○
Rotate Left	○	●	○	○	○
Rotate Right	○	○	●	○	○
Combined	○	○	●	○	○

Neck	N	O	F	C	NT
Head Down	○	○	●	○	○
Head Up	○	○	●	○	○
Rotate Left	○	○	●	○	○
Rotate Right	○	○	●	○	○
Combined	○	○	●	○	○

Shoulder	N	O	F	C	NT

MATERIAL HANDLING

Floor Lift

Occasional	35.0 kg
Frequent	10.0 kg
Continuous	0.0 kg

✔ Awkward Load

Bench Lift

Occasional	35.0 kg
Frequent	10.0 kg
Continuous	0.0 kg

✔ Awkward Load

Shoulder Lift

Page 3 of 4

Options   Preview   Print, Save & Email   Close

Does the Worker Fit The Job?

Does the Worker Fit The Job?

JobFit system™

- ☑ 👤 Tester, Terry
  - ☑ 🔨 Dragline Operator

| Summary | Postural Tolerances | Material Handling | Task Overview |

Filter: Show all items

	Task Title	Requirement	Postural Tolerances			Material Handling			Suitable Duties
			Suitable	Unsuitable	Not Tested	Suitable	Unsuitable	Not Tested	
	Dragline Operator [Including all Tasks Listed]		**16**	**5**	22	**10**	**2**	9	
☐	Dozer operation	**Essential**	**21**	**0**	22	**12**	**0**	9	☐
☐	Dragline boom, inspection	**Essential**	**18**	**3**	22	**12**	**0**	9	☐
☐	Dragline cable, coupling	**Essential**	**20**	**1**	22	**13**	**2**	6	☐
☐	Dragline cable, moving	**Essential**	**21**	**0**	22	**14**	**1**	6	☐
☐	Dragline cable, positioning	**Essential**	**20**	**1**	22	**13**	**2**	6	☐
☐	Dragline house, inspection	**Essential**	**20**	**1**	22	**12**	**0**	9	☐
☐	Dragline revolving frame, cleaning	**Essential**	**19**	**2**	22	**14**	**1**	6	☐
☐	Dragline revolving frame, inspection	**Essential**	**18**	**3**	22	**12**	**0**	9	☐
☐	Dragline, operation	**Essential**	**21**	**0**	22	**15**	**0**	6	☐
☐	Light vehicle operation	**Essential**	**21**	**0**	22	**12**	**0**	9	☐

➕ Add Task(s)   ❌ Hide ticked Task(s)

JobFit System score: 3   Notes & Comments   15/03/2007 at 2:32 am   Save

| Options | Workers | Jobs | Analyse | Reports |

Does the Worker Fit The Job?

Job Fit system™

☐ ☑ 👤 Tester, Terry
　　☑ 🔨 Dragline Operator

| Summary | Postural Tolerances | **Material Handling** | Task Overview |

Task: Dragline cable, coupling [Essential] ▼ | Only show items that don't fit ▼

Material Handling	Task Requirement	Worker Score	Fit?
Floor Lift [Task Requires: Awkward Load]			
Occasional	**35.0kg**	**21.0kg**	✖
Bench Lift [Task Requires: Awkward Load]			
Occasional	**35.0kg**	**27.0kg**	✖

JobFit System score: 3 ▼ | Notes & Comments | 15/03/2007 ▼ at 2:32 am ▼ | Save

| 🎲 Options | 👤 Workers | 🔨 Jobs | 🔍 Analyse | 🖨 Reports |

PEFA Components

Scoring system

- One   met job demands
- Two   minimal restrictions
- Three   moderate restrictions
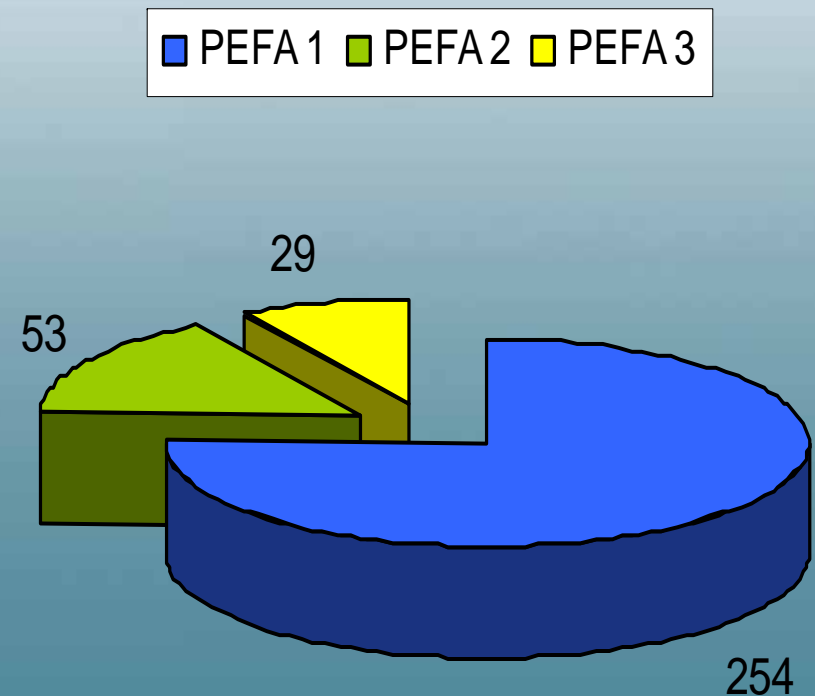- Four   did not meet

Validity Study Results

Sample

- 494 PEFAs total
- 385 hired
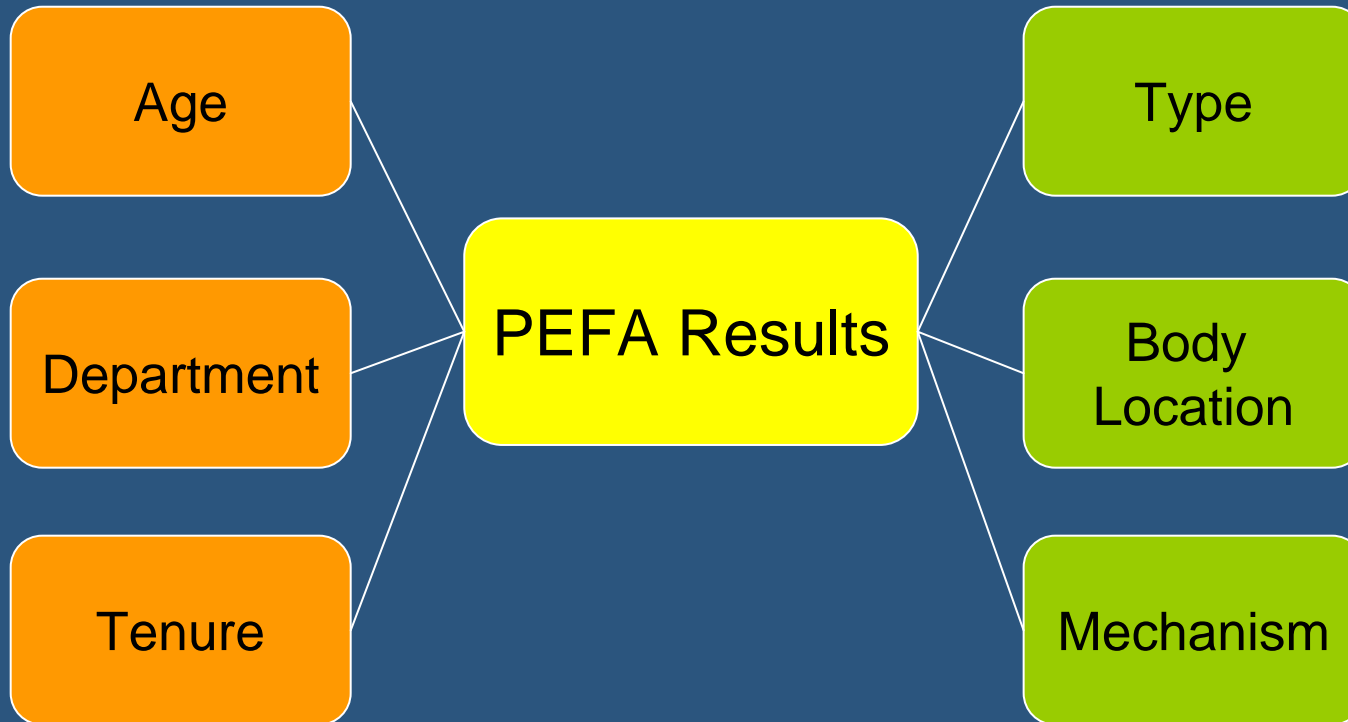- 368 records correct
- **336 workers > 90 days**

PEFA Scores

Legend: PEFA 1 | PEFA 2 | PEFA 3

29

53

254

Validity Study Results

Demographic Data	Injury Data

Age

Department

Tenure

PEFA Results

Type

Body Location

Mechanism

Validity Study Results
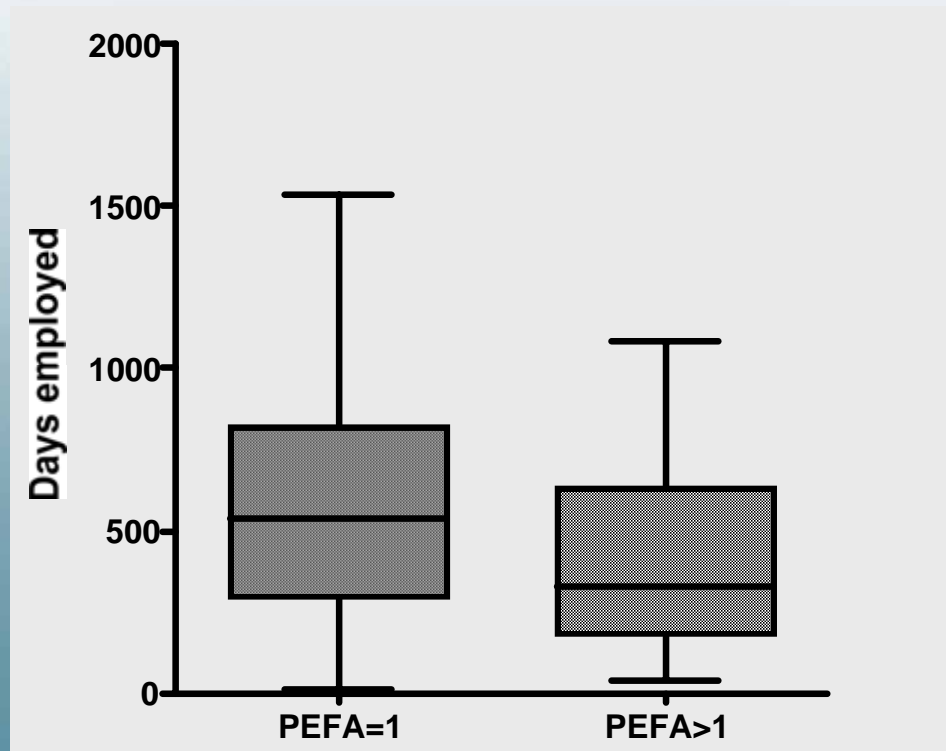
- Mean employ 2.18 years
- Mean age 39.3 years
- Younger in higher risk jobs

Significant Finding # 1

No assoc age and PEFA score
No assoc age and injury reports

Validity Study Results

PEFA score & Retention rates

PEFA=1
- 1.54 years

PEFA>1
- 1.09 years

Significant Finding # 2

PEFA score assoc with tenure

Validity Study Results

Sprain & strain injury rates

- 91 injuries: 38x1, 17x2, 5x3 and 1x4 reports
- Injured 2.85yrs, not injured 2.04 yrs
- Injury probability related to exposure (no surprises here!)
- Manual handling most common mechanism
- Back / trunk most common body location
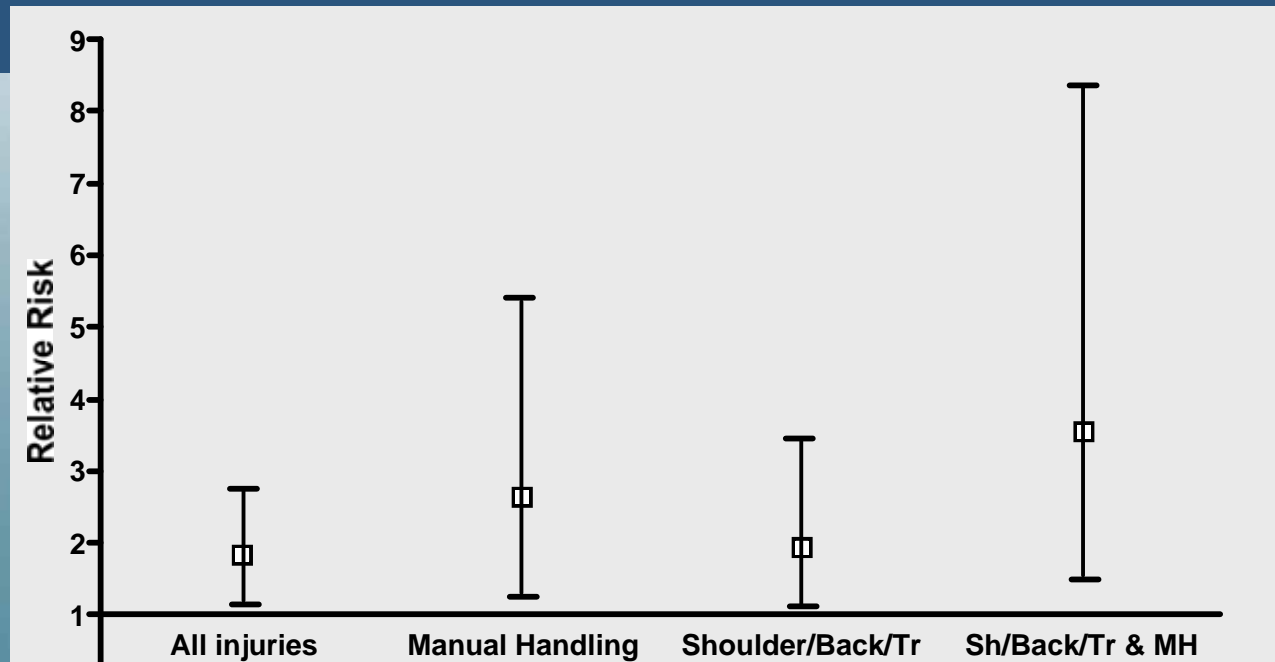
Validity Study Results

PEFA score and injury rates

- PEFA=1 (n=254)
  - 54 injuries by 39 workers (0.096 injuries per person year)
  - Back / trunk / shoulder injury rate from manual handling 0.023 per person year
- PEFA>1 (n=82)
  - 37 injuries by 23 workers (0.213 injuries per person year)
  - Back / trunk / shoulder injury rate from manual handling 0.086 **3.7 times the rate**

Validity Study Results

PEFA score and relative risk (95%CI)

Significant Finding # 3

PEFA score assoc with injury risk

Validity Study Results

PEFA components and relative risk

RESULTS INCONCLUSIVE

(at this time)

Study Conclusions

- JobFit System PEFA is **reliable and valid**

- No assoc with PEFA score and age

- Mismatch **reduces tenure**

- Mismatch **increases risk 3.5 times**

- **Accurate job demands** are critical

- **Not absolute** indicator

- **Snapshot** – more valuable if repeated

- Full value of data not realised

Challenges

- No guarantee 'healthy' workers

- PEFA is a 'snapshot'

- Research 'after the fact'

- Changes in job demands

- Working environment

- Privacy legislation and access to data

- Accuracy of work injury data

- Multiple and changing contacts

Next steps for Research

- Continue data collection
- Continue in-depth analysis as subject numbers increase
- Liaise with insurance company and safety team for accuracy and access to data
- Investigate 'under-reporting' of contribution of work or 'injury'

Jenny Legge

+ 61 7 4954 8652

jenny.legge@jobfitsystem.com

www.jobfitsystem.com