

**Promoting  
Musculoskeletal  
Fitness through  
Movement Screening**

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### Seminar Objectives

- ROI challenges facing traditional workplace wellness programs
- Evolution of movement screening to promote musculoskeletal health
- Triage to suitable physical activity and safe pain management
- Demonstration: WorkAbility Movement Screen
- Integration with post-offer screening, wellness and post-injury care

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### Challenges Facing Traditional Workplace Wellness Programs

- Traditional programs may include expensive lab biometrics for cardiovascular risk factors, but ignore musculoskeletal risks & physical function that contributes more to lost productivity and treatment costs
- Baxter (2014) negative ROI after excluding early RTW and injury prevention studies
- Mattke (2013) healthcare savings average \$157, but worker incentives may cost up to \$50/week
- Are wellness resources consumed by the “Worried Well?”
  - Participants have lower medical expenses & healthier behaviors than non-participants (Jones, 2018)
- Do privacy concerns scare some workers away?
  - Mean participation 20% with no incentives, 40% with rewards, 73% with rewards and penalties

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## Workforce Characteristics that have Lower Participation

- Male gender, abnormal BMI, and not having access to a primary care provider (Hall, 2017)
  - Fatiguing job demands, low social support and work health program available only during leisure time (Jorgenson, 2016)
  - Smaller employers, especially < 100 workers, more reserved with program implementation
    - Blood lipid tests and health risk appraisals may not be appealing to workers in physical jobs.
- ✓ **All workers need to learn how to warm up, alleviate symptoms at work & choose the right physical activity for their condition.**

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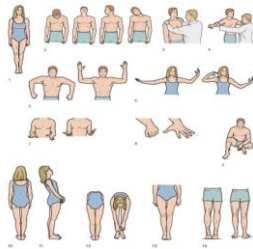
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## 2-min. Musculoskeletal Screening Exam Smith DM (1997)



Movements rated as:  
 Normal  
 Abnormal.

**Limited validity research**

Recommended in sports preparticipation screening guidelines for primary care doctors (Mirabelli 2015)

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## Functional Movement Screen (FMS) (Cook et al, 2010/2014)



Movements rated as:  
 0 - Painful  
 1 - Unable to complete movement  
 2 - Completes movement with compensation  
 3 - Completes movement correctly

Extensive research in athletes (Moran et al, 2017) does not support FMS Composite Scores for injury prediction

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## Functional Movement Tests Used by Rehab Professionals

### Functional Mobility Tests

- ❖ Usual/Fast Gait Speed
  - ❖ Working adult norms
- ❖ Timed Up and Go
  - ❖ Predictive of fall risk, older adults
- ❖ Five Times Sit to Stand
- ❖ Maximal Step Length (MSL)

### New:

- ❖ Two Square Agility Test (TSAT)

### Hand Dexterity Tests

- ❖ Grooved Pegboard Test
  - ❖ Working adult norms
  - ❖ Most sensitive test to fine motor deficits
- ❖ Purdue Pegboard Test
- ❖ Box & Block Test
- ❖ Minnesota Manual Dexterity Test

### New:

- ❖ WorkAbility Rate of Manipulation Test

## Two Square Agility Test (TSAT)



- Timed Test for stepping back and forth quickly across a marked tape for 5 complete cycles.
- Relevant to fall risk and walking speed for task productivity.

Wickstrom et al (2018)

## WorkAbility Rate of Manipulation Test (Wang et al, 2017)



Minnesota Manual Dexterity Test



WorkAbility Rate of Manipulation Test

## WorkAbility Rate of Manipulation Test Posture Options




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## WorkAbility Movement Screen

A “fun” screen of musculoskeletal fitness that assesses active movement, agility and finger dexterity to promote suitable physical activity.

- PAR-Q+ The Physical Activity Readiness Questionnaire for Everybody (Bredin, 2013)
- Active Movement Screen (AMS)
- Two Square Agility Test (TSAT)
- WorkAbility Rate of Manipulation Test (WRMT)

Addressing Musculoskeletal Risk Factors informs the worker how to increase physical activity. It also improves Cardiovascular Risk Factors!

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## PAR-Q+ Physical Activity Readiness Questionnaire

**2018 PAR-Q+**  
The Physical Activity Readiness Questionnaire for Everybody

**GENERAL HEALTH QUESTIONS**

Answer each of the 7 questions below carefully and answer each one honestly. Check YES or NO.

1. Do you have any of the following conditions? a. Heart disease b. High blood pressure c. Diabetes d. Stroke e. Lung disease f. Any other condition that a doctor has told you about	YES	NO
2. Do you ever feel dizzy or faint, or do you ever feel like you are going to faint?	YES	NO
3. Do you ever feel short of breath, or do you ever feel like you are out of breath?	YES	NO
4. Do you ever feel pain or discomfort in your chest, arms, or legs when you are active?	YES	NO
5. Do you ever feel pain or discomfort in your neck, head, or back when you are active?	YES	NO
6. Do you ever feel pain or discomfort in your joints when you are active?	YES	NO
7. Do you ever feel pain or discomfort in your muscles when you are active?	YES	NO

YES or NO?  YES  NO

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**IF you answered YES to one or more of the questions above, COMPLETE PAGES 2, 3 AND 4.**

**After finishing check with a:**

- Health care professional (e.g., doctor, nurse, physical therapist, etc.)
- Qualified fitness professional (e.g., personal trainer, fitness instructor, etc.)
- Qualified health care professional (e.g., pharmacist, etc.)

- Bredin et al (2013)
- Replaces the PAR-Q and AHA/ACSM Preparticipation Screening Questionnaire.
  - Reduces barriers to exercise and false positive screenings.

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# WorkAbility Movement Screen

Group: WorkAbility Center

Worker Name	Birth Date	Age	Gender	Examiner Name	Exam Date
Misty Sample	1/15/1979	39 yr	Female	Rick Wickstrom PT, DPT, CPE, CDMS	7/2/2018

**Physical Activity Readiness Questionnaire (PAR-Q+)**

1. Diagnosed with heart condition or high BP? None

2. Chest pain with rest or physical activity?

3. Balance loss from dizzy/unconsciousness?

4. Diagnosed w/ other chronic health condition?

5. Taking drugs for a chronic health condition?

6. Bone, joint, or muscle problem with activity?

7. Advised to do medically supervised activity?

**Active Movement Screen**

	Right	Left		Right	Left
1. Close hands	4-Normal	4-Normal	8. Single leg stance	4-Normal	4-Normal
2. Flex elbows back	4-Normal	4-Normal	9. Toe walk sideways	4-Normal	4-Normal
3. Elevate shoulders	2-Fair	2-Fair	10. Heel walk forward	4-Normal	4-Normal
4. Extend wrists	4-Normal	4-Normal	11. Step up and over	4-Normal	4-Normal
5. Diagonal neck bend	2-Fair	2-Fair	12. Lunge back to knee	2-Fair	2-Fair
6. Rotate torso in stand	2-Fair	2-Fair	13. Deep squat down	2-Fair	2-Fair
7. Diagonal bend over	2-Fair	2-Fair			

Upper Body Score 87.5% Spine Score 50.0% Lower Body Score 86.4% Overall Score 78%

**Two Square Agility Test (TSAT)**

Method	Practice	T1	T2	T3	Best	CV	M/sec	Rating	Pain?
Vary lead	12.10	8.50	8.60	8.70	8.50 s.	1.2%	1.18 m/s	Low	No

**WorkAbility Rate of Manipulation - Turning Test**

Stoop	T1	T2	T3	Best	CV	Worker%	Rating	Pain?	No
Right (Preferred)	22.5	21.8	21.5	21.5 s.	2%	95.8%	Medium		
Left	24.0	23.2	22.7	22.7 s.	3%	90.7%	Medium		

**Follow-up Recommendations**

Keep up the good work!

Modify physical activity

Supervised fitness training

Weight loss management

Physical therapist consult

Other health consultation

Healthy adults aged 18-65 years old are advised to perform moderate aerobic physical activity for at least 30 minutes on 5 days/week or vigorous aerobic activity for at least 20 minutes on 3 days/week.

**Exam Certification**  
Signed electronically by Rick Wickstrom PT, DPT, CPE, CDMS on 7/2/2018

Note: Physically inactive but otherwise healthy asymptomatic persons may begin light- to moderate-intensity exercise without medical clearance per new ACSM (2018) guidelines.

## How is Pre-Participation Screening Different for Workers than Athletes?

- Most workers don't have vigorous job demands
  - Detecting cardiovascular malformations is major priority to prevent sudden death for athletes.
- Workers are reluctant to disclose medical and family history (deters wellness participation)
  - PPE is the only annual medical evaluation for 30-88% of children and adolescents (promotes general health)
- **May screen of job candidates for physical function after a contingent job offer**
- **May only use information relevant to job performance to reject a job candidate.**

## Jamar Hand Dynamometer Isometric Strength



Grip Strength



WorkAbility Push Strength

✓ New: Adult Grip Strength Norms (Wang et al, 2018)

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## WorkAbility Systems High Lift Strength



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## WorkAbility Systems Low Lift Strength



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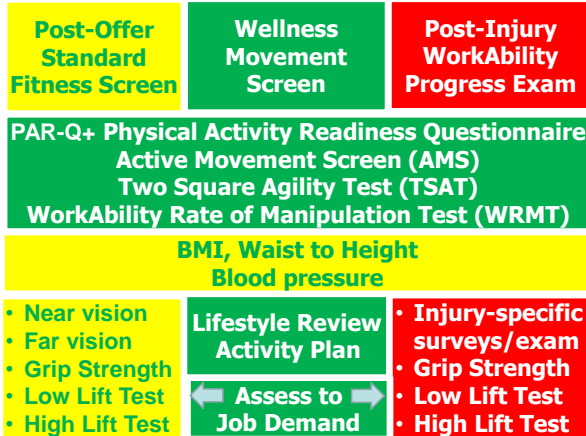
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