Physical screening and testing: From purpose to research to application

Rob Orr
Bond University, rorr@bond.edu.au

Follow this and additional works at: http://epublications.bond.edu.au/tru_conf
Part of the Defense and Security Studies Commons, Exercise Science Commons, Military and Veterans Studies Commons, and the Sports Sciences Commons

This work is licensed under a Creative Commons Attribution-Noncommercial-No Derivative Works 4.0 License.

Recommended Citation

This Conference Presentation is brought to you by the Tactical Research Unit at ePublications@bond. It has been accepted for inclusion in Tactical Research Unit Conference papers by an authorized administrator of ePublications@bond. For more information, please contact Bond University’s Repository Coordinator.
TACTICAL STRENGTH AND CONDITIONING

2017 NSCA TSAC ANNUAL TRAINING

APRIL 3 – 6, 2017 | ORLANDO, FL
NSCA.COM/TSAC2017

FIT TO SERVE. STRENGTH TO PERFORM.
Physical Screening and Testing: From Purpose to Research to Application

Dr. Rob Orr
Tactical Research Unit
Bond University
Session Objectives:

• Discuss the purposes of different physical assessments
• Designing measures useful for assessing tactical personnel
• Applying assessments in the field
What is the purpose of the test?

- Purpose of the testing
  - Injury prediction
  - Occupational capability
  - General health
  - Research
What is the purpose of the test?

• Purpose of the testing
  • Why is this important to define?
  • To make the assessment fair
  • To make the assessment defendable
What is the purpose of the test?

- General Tactical Forces
  - Examples of Push Up standards to enlist

<table>
<thead>
<tr>
<th></th>
<th>AFP</th>
<th>NSW Pol</th>
<th>VIC Pol</th>
<th>Q POL</th>
<th>NT POL~</th>
<th>TAS Pol</th>
<th>NZ Pol</th>
<th>UK Pol</th>
<th>Metro Pol</th>
<th>LA / Reno</th>
<th>ADF</th>
<th>QLD Fire &amp; Rescue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30</td>
<td>25*</td>
<td>5</td>
<td>N/A</td>
<td>5-25#</td>
<td>20</td>
<td>34</td>
<td>N/A</td>
<td>24</td>
<td>15**</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>10+</td>
<td>25*</td>
<td>5</td>
<td>N/A</td>
<td></td>
<td>3</td>
<td>20</td>
<td>N/A</td>
<td>24</td>
<td>8</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

* On toes or knees
~ 2 sec cadence
# Based on scoring system (5 repetitions = 2 points: 25 repetitions = 10 points)
+ Specialist is 30 reps
** 66 Repetitions to a 1:2 cadence for Special Forces
What is the purpose of the test?

• Purpose of the testing – Setting standards
  • Male scores – 22 Repetitions ✔
  • Female scores – 15 Repetitions ✗

What if the PASS score was 20 Repetitions?

• Would that account for differences in gender strength levels?
What is the purpose of the test?

• Purpose of the testing – Setting standards
  • Male scores – 22 Repetitions
  • Female scores – 15 Repetitions

What if the PASS score was 15 for Females and 25 for Males?
• What if below 20 Repetitions was associated with an increased risk of injury – Would that increase the risk of injury to the female? (What is the duty of care?)
• Would that be fair for two people who had to do the same job regardless of gender?
What is the purpose of the test?

- Purpose of the testing – Setting standards
  - Male A scores (38 years old) – 22 Repetitions
  - Male B scores (21 years old) – 25 Repetitions

What if the PASS score was 25 for Males?
- Would that account for differences in age related strength levels?
What is the purpose of the test?

• Purpose of the testing – Setting standards
  • Male A scores (38 years old) – 22 Repetitions ✓
  • Male B scores (21 years old) – 25 Repetitions ✗

What if the PASS scores were:
• under 25 years of age – 30 Repetitions
• 25-30 years of age – 25 Repetitions
• 31-39 years of age – 20 Repetitions

• Would that be fair for two people who had to do the same job regardless of age?
What is the purpose of the test?

- Purpose of the testing – Setting standards
- What about Rank? Do all ranks do the same job?
What is the purpose of the test?

- Purpose of the testing – Setting standards
- What about job role? Do all personnel do the same job?
What is the purpose of the test?

• Purpose of the testing – Setting standards
  • The purpose of the testing must be clearly stated and made known to the organization
What is the purpose of the test?

• Purpose of the testing – Injury prediction/prevention

• Research has shown, police and army personnel with lower fitness standards more likely to be injured in training
What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention

- Army Recruits
  - Measure was 20m Shuttle Run
    - Army = L7.5
    - Navy / Air Force = L6.5

What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
  - Army Officer Recruits
  - Measure was 20m Shuttle Run
  - Was not an exclusion criterion but used to inform DS

What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
- Police Officer Recruits
  - Measure was 20m Shuttle Run

Non Injured (0) M=65.6 Shuttles / Injured (1) M=55.1 Shuttles
p<0.001

Orr, et al., Unpublished work
What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
  - Police Officer Recruits
    - Measure was 20m Shuttle Run

Ln(inj)=1.644-0.045xMSFT
- So cut off point for MSFT is 51.9366 (Level 6.1 or 1040m)

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>INJ</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>NIL INJ</td>
<td>0 159 4 97.5</td>
</tr>
<tr>
<td>INJ</td>
<td>1 49 7 12.5</td>
</tr>
<tr>
<td>Overall Percentage</td>
<td>75.8</td>
</tr>
</tbody>
</table>

Orr, et al., Unpublished work
What is the purpose of the test?

• Purpose of the testing – Injury prediction/prevention
  • Police Officer Recruits
    • Measure was 30-15 IFT

- Non Injured (0) M=16.9
- Injured (1) M=15.7
- p<0.001

Orr, et al., Unpublished work
What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
  - Police Officer Recruits
    - Measure was 30-15 Intermittent Fitness Test

- \( \ln(\text{inj}) = 7.456 - 0.521 \times 30 - 15 \text{score} \)
- So cut off point for 30-15 is 15.65

Orr, et al., Unpublished work
What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention

- Police Officer Recruits
  - Measure was 30-15 IFT
  - Percent Injured vs. 30-15 IFT Score, 95% CI

Spearman’s Rho correlation between injury and 3–15 IFT score

\[ r_s = -0.315 \quad p < 0.001 \]

* Pooled results (small data sets)

Orr, et al., Unpublished work
What is the purpose of the test?

• Purpose of the testing – Injury prediction/prevention

• Police Officer Recruits

• Measure was Grip Strength

43.18 ± 8.73 kg (26-69)

40.48 ± 8.15kg (25-59)

(rs[219]=.126, p=0.63).

What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
- Police Officer Recruits
  - Measure was Grip Strength
  - Percentage of Recruits injured, by GS score, with 95% CI

Spearman’s rank-order correlation between injury status & GS score:

\[ r_s = -0.138, \text{ } p = 0.042 \]

*bins in quartile ranges

Stewart et al., unpublished work
What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
- Police Officer Recruits
  - Measure was Vertical Jump
  - Percentage of Recruits *injured*, by VJ height, with 95% CI

What is the purpose of the test?

• Purpose of the testing – Injury prediction/prevention
  
• Police Officer Recruits
  
  • Measure was Vertical Jump
  
• Percentage of Recruits reporting **illness**, by VJ height, with 95% CI

[Graph showing percentage reporting illness by VJ height with 95% CI]

Spearman’s rank-order correlation between illness status & VJ score:

\[ r_s = -0.157, \ p < 0.001 \]

* Pooled results (small cell counts)

doi:10.3390/ijerph13020237
What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
- Police Officer Recruits
  - Measure was Vertical Jump
  - Percentage of Recruits reporting **illness &/or injury**, by VJ height, with 95% CI

Spearman’s rank-order correlation between illness/injury status & VJ score:

\[ r_s = -0.170, \ p < .001 \]

* Pooled results (small cell counts)

What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
  - Police Officer Recruits
    - Measure was Push Ups
    - Percentage of Recruits injured, by PU score, with 95% CI

Spearman’s rank-order correlation between injury status & PU score:

\[ r_s = -0.348, \ p < 0.001 \]

* Pooled results (small cell counts)

Stewart et al., unpublished work
What is the purpose of the test?

- Purpose of the testing – Injury prediction/prevention
  - Police Officer Recruits
  - Measure was Push Ups

Pass rate for police recruits = 25 PU

25.6% did not achieve 25 PU (n=56)

Of those 53.7% sustained injury

Stewart et al., unpublished work
What is the purpose of the test?

- Purpose of the testing – Injury prediction/ survivability
- Australian Army Special Forces Entry Test

What is the purpose of the test?

- Purpose of the testing – Injury prediction/ survivability
- Australian Army Special Forces Entry Test

What is the purpose of the test?

• Purpose of the testing – Injury prediction/ survivability
• Tactical Operations Unit (Special Weapons and Tactics)

Caust, E., Hinton, B. Orr, R. & Pope, R._Physical predictors of success on a specialist police selection course, manuscript in preparation
What is the purpose of the test?

- Purpose of the testing – Injury prediction/ survivability
- Tactical Operations Unit (Special Weapons and Tactics)

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>Group 1 (failed BFA)</th>
<th>Group 2 (passed BFA, failed to complete SSC)</th>
<th>Group 3 (completed SSC - not selected)</th>
<th>Group 4 (completed SSC - selected)</th>
<th>Correlation between characteristic &amp; level of success</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>rₚ, p</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pull Ups (reps)</td>
<td>12.63 ± 3.89</td>
<td>15.75 ± 6.14</td>
<td>14.57 ± 1.90</td>
<td>16.10 ± 3.38</td>
<td>0.41, p=.017*</td>
</tr>
<tr>
<td>Push Ups (reps)</td>
<td>46.00 ± 9.15</td>
<td>50.38 ± 9.37</td>
<td>47.57 ± 3.26</td>
<td>58.80 ± 11.89</td>
<td>0.45, p=.009**</td>
</tr>
<tr>
<td>Ab Str (Level 1-7)</td>
<td>2.63 ± 0.74</td>
<td>3.00 ± 0.00</td>
<td>3.00 ± 0.00</td>
<td>3.00 ± 0.00</td>
<td>0.35, p=.049*</td>
</tr>
<tr>
<td>March (secs)</td>
<td>4935.00 ± 770.01</td>
<td>4763.00 ± 176.96</td>
<td>4990.29 ± 300.81</td>
<td>4659.40 ± 233.19</td>
<td>-0.33, p=.078</td>
</tr>
<tr>
<td>MSFT (no. of shuttles)</td>
<td>95.00 ± 0.00#</td>
<td>102.88 ± 12.11</td>
<td>101.00 ± 12.72</td>
<td>101.60 ± 6.11</td>
<td>0.11, p=.585</td>
</tr>
<tr>
<td>Agility run (secs)</td>
<td>22.40 ± 0.00#</td>
<td>17.93 ± 1.08</td>
<td>17.08 ± 1.43</td>
<td>17.12 ± 0.53</td>
<td>-0.40, p=.043*</td>
</tr>
<tr>
<td>Lift and carry (secs)</td>
<td>173.00 ± 0.00#</td>
<td>174.00 ± 15.68</td>
<td>178.00 ± 8.76</td>
<td>160.60 ± 9.85</td>
<td>-0.49, p=0.010*</td>
</tr>
<tr>
<td>300m swim (secs)</td>
<td>-</td>
<td>794.75 ± 95.63</td>
<td>903.00 ± 29.63</td>
<td>702.30 ± 137.53</td>
<td>-0.32, p=.118</td>
</tr>
</tbody>
</table>

Caust, E., Hinton, B. Orr, R. & Pope, R. Physical predictors of success on a specialist police selection course, manuscript in preparation
What is the purpose of the test?

• Purpose of the testing – Occupational capability

• Based on capability rather than gender .... or age
What is the purpose of the test?

- Purpose of the testing – Occupational capability
- What is needed to complete key tasks
What is the purpose of the test?

• Purpose of the testing – Occupational capability
  • Police Officer Recruits
    • Measure Grip Strength
    • Defensive Tactics

43.68 ± 8.36 kg (25-67)
40.00 ± 7.73 kg (28-62)

(rs[169]=-0.227, p=0.03)

What is the purpose of the test?

- Purpose of the testing – Occupational capability
- Police Officer Recruits
  - Measure Grip Strength
  - Marksmanship / Shooting


43.22 ± 8.04 kg (25-67)
34.67 ± 5.94 kg (28-51)

(rs[169]=-.419, p<0.001)
What is the purpose of the test?

• Purpose of the testing – Occupational capability
  • Police Officer Recruits
    • Measure Grip Strength
    • Defensive Tactics

What is the purpose of the test?

- Purpose of the testing – Occupational capability
  - Police Officer Recruits
    - Measure Grip Strength
    - Marksmanship / Shooting

What is the purpose of the test?

- Purpose of the testing – Occupational capability
- Australian Army - Physical Employments Standards Army (PESA)

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Overview</th>
<th>AC PESA</th>
<th>CA PESA</th>
<th>Infantry PESA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Load March</td>
<td>March with load at a rate of 5.5km/h (11min per km)</td>
<td>5km – 22kg load Time: 50-55 minutes</td>
<td>10km – 38kg load Time: 100-110 minutes</td>
<td>15km – 45kg load Time: 150-165 minutes</td>
</tr>
</tbody>
</table>
What is the purpose of the test?

- Purpose of the testing – Occupational capability
- Australian Army - Physical Employments Standards Army (PESA)

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Overview</th>
<th>AC PESA</th>
<th>CA PESA</th>
<th>Infantry PESA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Load March</td>
<td>March with load at a rate of 5.5km/h (11min per km)</td>
<td>5km – 22kg load Time: 50-55 minutes</td>
<td>10km – 38kg load Time: 100-110 minutes</td>
<td>15km – 45kg load Time: 150-165 minutes</td>
</tr>
<tr>
<td>Fire &amp; Movement Simulation</td>
<td>Complete 6m bounds (every 20 secs) to a cadence track (pers have 5 secs to reach 6m mark with 15 sec rest)</td>
<td>12 x 6m bounds</td>
<td>16 x 6m bounds + 18m leopard crawl</td>
<td>1km move with 22kg load in 8 minutes + 16 x 6m bounds + 18m leopard crawl</td>
</tr>
<tr>
<td>Casualty Drag</td>
<td>Drag casualty dummy (approx 82kg) 10m in 10 secs</td>
<td>N/A</td>
<td>N/A</td>
<td>Drag casualty dummy 10m in 10 secs</td>
</tr>
<tr>
<td>Lift &amp; Carry</td>
<td>Carry 2 x 22kg jerry cans in 25m legs to a cadence track (20 sec per 25m with 5 sec rest)</td>
<td>6 x 25m legs</td>
<td>11 x 25m legs Artillery only - Carry 1 x 43kg inert round 10 x 10m legs to a cadence track</td>
<td>11 x 25m legs</td>
</tr>
<tr>
<td>Box Lift &amp; Place</td>
<td>Lift a weighted box from the ground to a 1.5m high platform using a prescribed lifting technique</td>
<td>25kg</td>
<td>30kg Combat Engineer only – 40kg</td>
<td>35kg</td>
</tr>
</tbody>
</table>
What is the purpose of the test?

• Purpose of the testing – General health
• Considers gender and age
• Predictor of mortality

What is the purpose of the test?

• Purpose of the testing – General health
• Considers gender and age
• Predictor of mortality
What is the purpose of the test?

- Purpose of the testing – General health
- Differences in gender

<table>
<thead>
<tr>
<th>Test Category</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>36.21±8.45</td>
<td>39.52±8.09</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>67.49±25.62</td>
<td>91.99±19.54†</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>164.65±29.82</td>
<td>177.98±23.13†</td>
</tr>
<tr>
<td>Vertical Jump (cm.)</td>
<td>36.80±5.69</td>
<td>50.74±8.89†</td>
</tr>
<tr>
<td>Leg/Back Dynomometer (kg)</td>
<td>116.53±20.85</td>
<td>170.68±37.46†</td>
</tr>
<tr>
<td>Grip (kg)</td>
<td>37.875±5.34</td>
<td>55.04±7.77†</td>
</tr>
<tr>
<td>Push-ups (repetitions)</td>
<td>24.24±11.63</td>
<td>39.09±15.61†</td>
</tr>
<tr>
<td>Sit-ups (repetitions)</td>
<td>31.06±9.52</td>
<td>34.46±10.29</td>
</tr>
<tr>
<td>Shuttles (number)</td>
<td>26.19±10.86</td>
<td>38.04±19.87†</td>
</tr>
</tbody>
</table>

What is the purpose of the test?

• Purpose of the testing – General health
• Differences in age (shuttle run)

<table>
<thead>
<tr>
<th>Age group</th>
<th>20-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>55.63 (20.90)</td>
<td>42.19 (19.85)</td>
<td>31.31 (15.52)</td>
<td>26.74 (13.20)</td>
</tr>
<tr>
<td>95</td>
<td>89.91</td>
<td>74.74</td>
<td>56.76</td>
<td>48.39</td>
</tr>
<tr>
<td>90</td>
<td>82.38</td>
<td>67.60</td>
<td>51.18</td>
<td>43.64</td>
</tr>
<tr>
<td>60</td>
<td>60.86</td>
<td>47.15</td>
<td>35.19</td>
<td>30.04</td>
</tr>
<tr>
<td>55</td>
<td>58.35</td>
<td>44.77</td>
<td>33.33</td>
<td>28.46</td>
</tr>
<tr>
<td>50</td>
<td>55.63</td>
<td>42.19</td>
<td>31.31</td>
<td>26.74</td>
</tr>
<tr>
<td>45</td>
<td>52.91</td>
<td>39.61</td>
<td>29.29</td>
<td>25.02</td>
</tr>
<tr>
<td>40</td>
<td>50.41</td>
<td>37.23</td>
<td>27.43</td>
<td>23.44</td>
</tr>
<tr>
<td>10</td>
<td>28.88</td>
<td>16.78</td>
<td>11.44</td>
<td>9.84</td>
</tr>
<tr>
<td>5</td>
<td>21.35</td>
<td>9.64</td>
<td>5.86</td>
<td>5.09</td>
</tr>
</tbody>
</table>

What is the purpose of the test?

- Purpose of the testing – General health
- Differences in gender and age

The Australian Army Basic Fitness Assessment

<table>
<thead>
<tr>
<th>Age</th>
<th>Push-ups (number)</th>
<th>Sit-ups (number)</th>
<th>2.4 km Run (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 and under</td>
<td>40</td>
<td>70</td>
<td>11:18</td>
</tr>
<tr>
<td>26-30</td>
<td>35</td>
<td>65</td>
<td>11:48</td>
</tr>
<tr>
<td>31-35</td>
<td>30</td>
<td>57</td>
<td>12:18</td>
</tr>
<tr>
<td>36-40</td>
<td>25</td>
<td>50</td>
<td>12:42</td>
</tr>
<tr>
<td>41-45</td>
<td>20</td>
<td>30</td>
<td>13:12</td>
</tr>
<tr>
<td>46-50</td>
<td>10</td>
<td>20</td>
<td>13:48</td>
</tr>
<tr>
<td>51 and over</td>
<td>6</td>
<td>15</td>
<td>14:30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Push-ups (number)</th>
<th>Sit-ups (number)</th>
<th>2.4 km Run (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>70</td>
<td>13:30</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>65</td>
<td>14:00</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>57</td>
<td>14:30</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>15:00</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>30</td>
<td>15:30</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>16:00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>16:30</td>
<td></td>
</tr>
</tbody>
</table>

What is the purpose of the test?

- Purpose of the testing – General health
- Differences in gender and age

### The US Army Physical Fitness Test

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MAXIMUM 100%</strong></td>
<td>71</td>
<td>75</td>
<td>77</td>
<td>75</td>
<td>73</td>
<td>66</td>
<td>59</td>
<td>56</td>
<td>53</td>
<td>50</td>
</tr>
<tr>
<td><strong>MINIMUM 60%</strong></td>
<td>42</td>
<td>40</td>
<td>39</td>
<td>36</td>
<td>34</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>18</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MAXIMUM 100%</strong></td>
<td>42</td>
<td>46</td>
<td>50</td>
<td>45</td>
<td>40</td>
<td>37</td>
<td>34</td>
<td>31</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td><strong>MINIMUM 60%</strong></td>
<td>19</td>
<td>17</td>
<td>17</td>
<td>15</td>
<td>13</td>
<td>12</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>
What is the purpose of the test?

• Purpose of the testing – General health
• Differences in gender and age
• What are standards based on? Normative population?

What is the purpose of the test?

- Purpose of the testing – General health
- Differences in gender and age
- Stage of training?

Orr, R., Dawes, J., Pope, R. & Terry, J. (submitted). Key Differences in Anthropometric and Fitness Characteristics between Police Academy Cadets and Full Time Officers are not Explained by Age, PLOS ONE
What is the purpose of the test?

• Purpose of the testing – Validation
  • To review the effectiveness of training through evidence based research
    • Data collected pre- and post- training programs
    • Subjects: 90 male (n = 70) and female (n = 20) police cadets aged from 21 to 44 years (27.4 ± 5.9 years) from US Police Department
    • 2 Different conditioning programs

What is the purpose of the test?

• Purpose of the testing – Validation

PURPOSE OF TESTING – RESEARCH (VALIDATE TRAINING)
• To review the effectiveness of training through evidence based research

Designing the Assessment

• Reason for the testing
  • Injury prediction / occupational performance / health?

• Needs analysis
  • What is known
    • E.g. current standards / normative data
  • What do we need to know
    • E.g. most important tasks? types of injuries?

• Identify key requirements for identified tasks
  • Eg. Use of force - AnPwr. / MStr./ MEnd.

• Suitable Tests
  • Valid?
  • As many characteristics as possible
Designing the Assessment

• Performance criteria
  • What standards and why?
  • Legally defendable
Designing / Applying the Assessment

- Logistics and Procedure
  - Viability (1 RM for 300 soldiers)
  - Testing sequence
    - Shuttle Run 1st as it included a warm up?
  - Equipment and locations
Designing / Applying the Assessment

• Health and Safety Considerations
  • Temp, humidity, lightning, medical history, trainers, emergency response plan
  • Emergency facilities

• Selection and Training of Testers
  • Proper training on technique and administration (number per station)

• Test Format and Sequencing
  • Time starts, # groups, rest

• Record Keeping / Data entry
  • Who?
In-depth look at Designing the Assessment Framework – Law Enforcement

Jay Dawes, Trooper Charles Kornhauser & Master Trooper Ryan Holmes

• Toward Validation: The Colorado State Highway Patrol Project
• Wednesday, April 5, 2016: 15:00-15:50
In-depth look at Designing the Assessment Framework – Military

Tim Doyle

• Scientifically Defensible Physical Testing for Tactical Operators

• Wednesday, April 5, 2016: 08:00-08:50
TAKE HOME MESSAGES

• It is vital you know WHY you are doing / designing a fitness assessment framework

• Standards need to consider this reason and take into account the intent of the assessment (e.g. fitness or occupational performance)

• The application of the assessment framework
  • How will it work?
  • Can it be done with large numbers/equipment needs/staff needs
KEY REFERENCES


KEY REFERENCES


- Orr, R., Dawes, J., Pope, R. & Terry, J. (submitted). Key Differences in Anthropometric and Fitness Characteristics between Police Academy Cadets and Full Time Officers are not Explained by Age, PLOS ONE


Physical Screening and Testing: From Purpose to Research to Application

DR. Rob Orr
Tactical Research Unit
Bond University

Acknowledgements:
• NSCA
• My co-authors
• Serving personnel and ex-serving personnel
SCREENING AND ASSESSMENT FOR TACTICAL OCCUPATIONS