When does vision impairment limit performance in swimming?

Towards evidence-based minimum impairment criteria

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WHEN ARE YOU ELIGIBLE TO PARTICIPATE IN PARA-SPORTS?

Minimum impairment criteria:

“the level of impairment that has an impact upon sport performance”
CURRENT MIC FOR VI SWIMMERS

Visual acuity (logMAR units)

VF < 20 degrees radius

Minimum impairment criteria

Sport classes

B3 B2 B1
To identify the least severe vision impairment that has a negative impact on swimming performance
<table>
<thead>
<tr>
<th><strong>Participant:</strong></th>
<th>Skilled (sighted) swimmers</th>
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<tbody>
<tr>
<td><strong>Intervention:</strong></td>
<td>Simulation of various levels of vision impairment</td>
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<td><strong>Outcome measure:</strong></td>
<td>Swimming performance</td>
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<td><strong>Analysis:</strong></td>
<td>To determine the level of vision impairment that leads the performance to drop below optimal levels</td>
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</table>
EXPERIMENT 1

10 national-level swimmers

4 vision conditions:
• Habitual vision
• Bangerter foils:
  • Mild impairment (0.1 + 0.2)
  • Moderate impairment (<0.1)
  • Severe impairment (LP)

4 x 100m freestyle
SIMULATED VISION IMPAIRMENT LEVELS

Visual acuity (logMAR)

Vision condition - Bangerter foils

habitual  low  moderate  high
IMPACT OF SIMULATED IMPAIRMENT ON PERFORMANCE

CONCLUSION:
MIC somewhere between 0.7 logMAR and 1.6 logMAR
EXPERIMENT 2

4 vision conditions:
  • Habitual vision
  • Defocus lenses:
    • +4
    • +6
    • +8

28 national level swimmers
4 x 100m freestyle
SIMULATED VISION IMPAIRMENT LEVELS
IMPACT OF IMPAIRMENT ON PERFORMANCE

More severe impairment
WHAT LEVEL OF VA BEST PREDICTS SUB-OPTIMAL PERFORMANCE
Visual acuity cannot perfectly discriminate optimal from suboptimal performance

Setting the MIC at 1.1 logMAR balances sensitivity and specificity
THANK YOU

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