



 **CASA Reade**
Centrum voor Aangepast Sporten Amsterdam

 **LAKESHORE**
RESEARCH COLLABORATIVE
promoting the health and wellness of people with disabilities

Reliability and Validity of a Wheelchair Rugby Skills Test

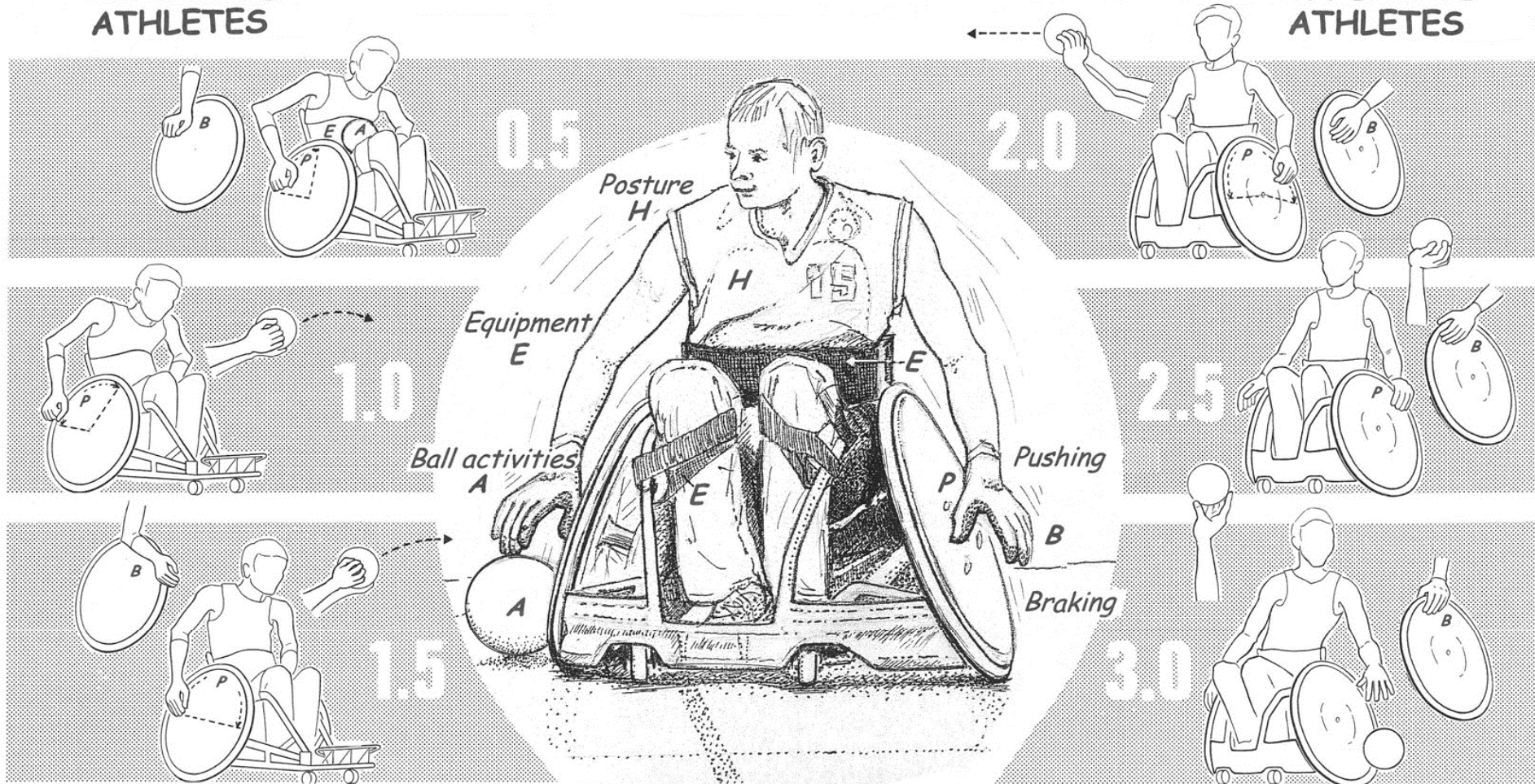
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WHEELCHAIR RUGBY

DEFENSIVE
ATHLETES

OFFENSIVE
ATHLETES



Classification in wheelchair rugby.

Every team can have 4 athletes with a maximum point value on court of 8 points. The highest eligible sport class for wheelchair rugby is 3.5. The athlete sport class can be seen from: Role on court (offensive or defensive)
 -Posture (H) -Pushing (P) -Braking (B) -Ball activities (A) -Equipment (E)

Besides a point value for their arms, athletes also get a point value for their trunk and legs. The minimum point value is 0 (no active trunk or leg function) and the maximum value is 1.5 (good to normal trunk and leg function). The value for trunk and legs is added to the average value for both arms for the entrance sport class. An athlete in the 3.5 class can have a combination of arm, trunk and leg function.



For more information visit:
www.iwrf.com

Training Elite Players

- Tactical skills
 - Club team, national team
- Wheelchair skills
 - Pushing drills
 - Slalom
 - Circuit
- Ball handling
- Strength training
- > 4 */wk



Skills Testing

- Essential for
 - Evaluation progression/status players
 - Individualize training program
 - Motivation
- Tests developed based on other sports (e.g., basketball): not specific
- Orr & Malone (Lakeshore Foundation, USA): developed new specific test
- Pilot study Malone (2009): correlation with classification, suggesting validity
- However: classification stable, but performance changes with training
- Reliability unknown

Purpose Study

- Test **Reliability**: reproducibility
- Test **Validity**:
 - Relation test result with specific muscle strength (dependent on lesion level/disorder AND training)



Methods

N=18 wheelchair basketball players

- N=8 Neth (Reade, Amsterdam)
- N=10 USA (Lakeshore, Alabama)

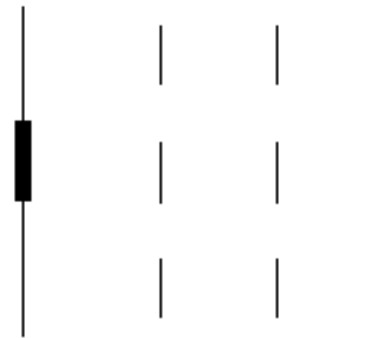
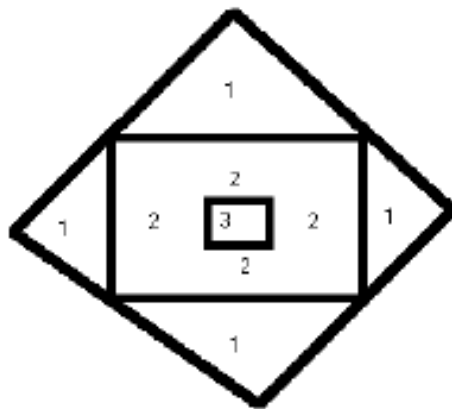


Dutch Participants

Participant	Age (yrs)	Injury Level, completeness	Time since Injury (yrs)	Classification
1	47	C5/6, C	20	0.5
2	35	C5/6, C	17	0.5
3	40	C6, C	21	0.5
4	23	C6, IC	6	1.0
5	43	C5/6, IC	23	1.0
6	39	C7, C	13	2.5
7	37	C6/7, C	22	2.5
8	28	C8, C	3	3.0
Mean	36.5		15.6	

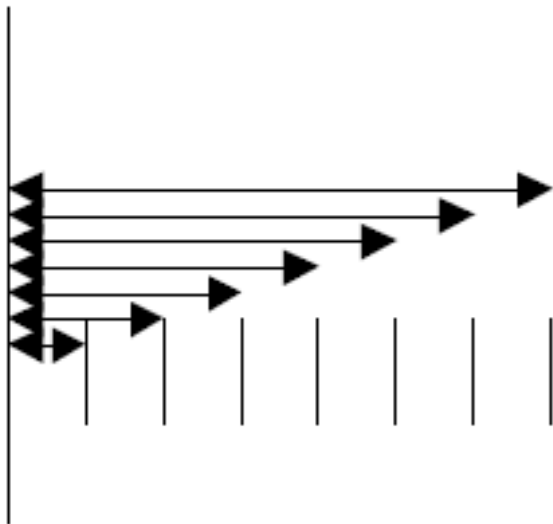
Wheelchair Rugby Skills Test (1)

- 5 tests in own rugby wheelchair, twice within 2 weeks
 - Passing test
 - 20m sprint
 - Endurance sprint
 - Forward/backward sprints “suicide”
 - Slalom with/without ball



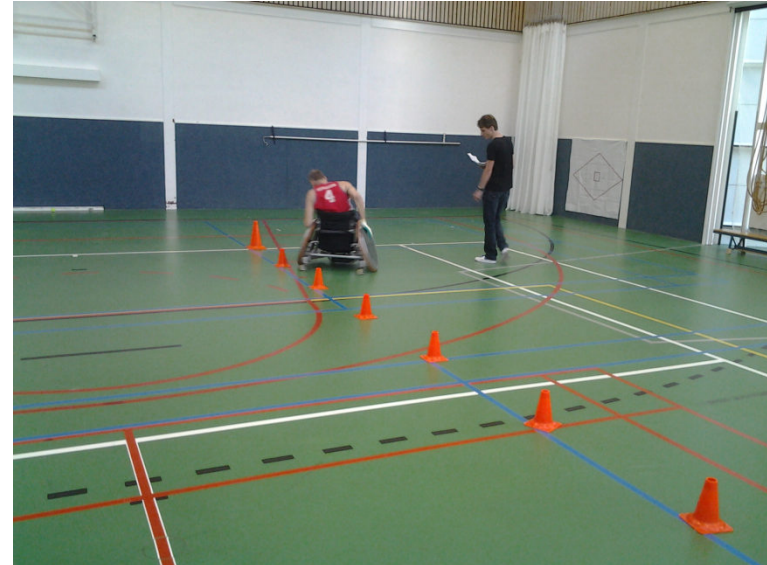
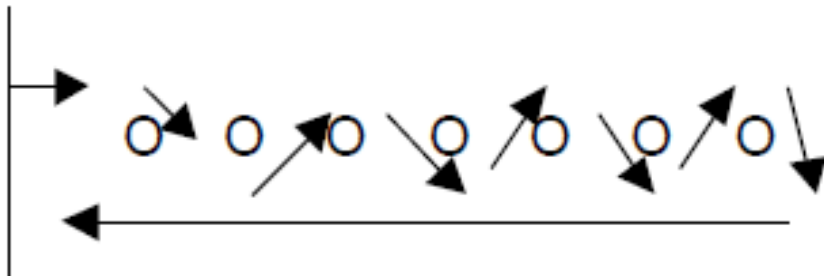
Wheelchair Rugby Skills Test (2)

- 20-m sprint, standing start, 3 attempts
- Endurance sprint around basketball court, clockwise & counterclockwise, 3 X
- Ups and Backs, “suicide”



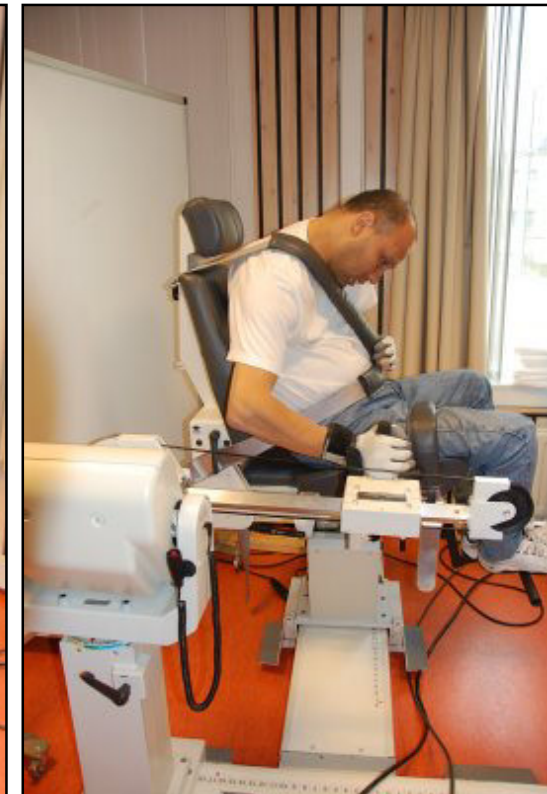
Wheelchair Rugby Skills Test (3)

- Slalom
 - Without ball
 - With ball (dribble every 10s)
 - Penalty seconds



Specific Strength

- Isokinetic dynamometer (Biodex)
- Closed chain attachment
- Pushing-Pulling, 0.22 m/s
- 2 sets, 3 reps
- Left-Right
- Max. torque (avg)



Results: Reliability

Item Test	ICC	Significance
Passing Skill	0.781	0.011
20-m Sprint	0.997	0.000
Endurance Sprint clockwise	0.992	0.000
Endurance Sprint counterclockwise	0.990	0.000
Ups and Backs	0.903	0.001
Slalom without ball	0.962	0.000
Slalom with ball	0.968	0.000

- Passing Skill: total points
- Ups and Backs: 1 trial
- Sprint tests (20m, endurance): average of 3 trials
- NB: ICC's of peak scores were similar

Results: Validity

- Spearman correlations between skills test items and muscle strength (averaged peak torques pushing-pulling, left-right)

Item Test	Spearman's rho	Significance
Passing Skill	0.319	0.538
20-m Sprint	-0.943	0.005
Endurance Sprint clockwise	-0.943	0.005
Endurance Sprint counterclockwise	-0.943	0.005
Ups and Backs	-0.771	0.072
Slalom without ball	-0.943	0.005
Slalom with ball	-0.943	0.005

- Passing Skill: total points
- Ups and Backs: 1 trial
- Sprint tests (20m, endurance): average of 3 trials

Discussion - Conclusion

- Small subject group, results preliminary, USA-data necessary, maybe more
- Wheelchair rugby skills tests are reliable, except for 'passing', and can be used to monitor wheelchair rugby players.
- Because passing is an important aspect of wheelchair rugby, taking this test is recommended, but interpreting test scores should be done carefully.
- Muscle strength is important for short and longer propulsion tasks and should be optimized
- Reference values necessary, for each class/point
- Testing on a regular basis is essential: we currently test the Dutch team 3 times/yr



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