



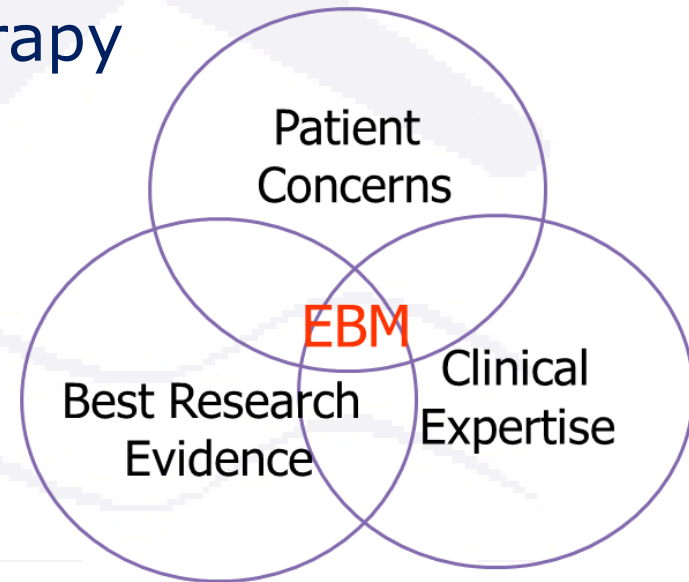
Translation and Cross - Cultural Adaptation to Brazil of Aquatic Skills Evaluations, Aquatic Independence Measure (AIM) and Water Orientation Test Alyn (Wota 1 e 2)

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Introduction

- Functional Aquatic Physical Therapy
- Evidence Based Practice
- Aquatic Physical Therapy for individuals with neuromotor impairments
- Measurement Instruments of Mental adjustment and water orientation skills



Introduction

- Functional Aquatic Physical Therapy "... changes of activity, or participation or body structure function defined by ICF...through the positive transference or similarity of the tasks..." (Borges, Branco 2011) ISBN: 9788531407840
- Scientific Evidence about efficient and / or interference of aquatic interventions in learning and motor control on land (Blohm 2011; Getz 2006; Gimenes 2005)
- "*General Movements*" (Einspieler, Marschik, & Prechtel 2008; Piek, 2006; Cioni & Prechtel 1988)

Introduction

- The wide variability in outcome measures across the studies presented an additional limitation reducing the ability to replicate particular intervention programs in terms of intensity, duration and content resulting in studies with low level of scientific evidence.

(Blohm 2011; Getz 2006; Gimenes 2005; Lambeck 2008)

Measurement Instruments

- Aquatic Independence Measure (AIM)
 - Chacham, A., & Hutzler, Y. (2002). Reliability and validity of the aquatic adjustment test for children with disabilities. *Movement*, **6**, 160-189.
- Water Orientation Test Alyn (Wota1 e 2)
 - Tirosh R, Katz-Leurer M, Getz M. Halliwick-Based Aquatic Assessment: Reliability and Validity. *IJARE*. 2008;2 (3):224–36
- S.W.I.M – Swimming With Independence Measure
 - Sršen, K. G., Vidmar, G., Pikl, M., Vrečar, I., Burja, C., & Krušec, K. (2012). Content validity and inter-rater reliability of the Halliwick-concept-based instrument “Swimming with Independent Measure.” *Int. J Rehabil Res.*, 35(2), 116–123.
- Humphries 'Assesment of Aquatic Readiness (HAAR)

AIM

- Hutzler Y, Chacham A, Bergman U. Effects of a movement and swimming program on vital capacity and water skills of children with cerebral palsy. *Developmental Medicine & Child Neurology*. 1998;40:176–81. (Blohm 2011)
- Chacham, A., & Hutzler, Y. (2002). Reliability and validity of the aquatic adjustment test for children with disabilities. *Movement*, **6**, 160-189.
- Getz M, Hutzler Y, Vermeer A. The Relationship between Aquatic Independence and Gross Motor Function in Children With Neuro-Motor Impairments. *APAQ*. 2006;23(4):339–55.

Wota 1 and 2

- Tirosh R, Katz-Leurer M, Getz M. Halliwick-Based Aquatic Assessment: Reliability and Validity. *IJARE*. 2008;2(3):224–36.
- Tirosh, R., Katz-Leurer, M., & Getz, M. (2011). Halliwick-based Aquatic Assessments: Reliability and Validity. *Aquatic Physical Therapy Section*, 19(1), 11–18.
- Ennis E. The Effects of a Physical Therapy- Directed aquatic Program on Children With Autism Spectrum Disorders. *The Journal of Aquatic Physical Therapy*. 2011;19(1):4–10.
- Jorgić B et al. The Swimming Program Effects on the Gross Motor Function, Mental Adjustment to the Aquatic Environment, and Swimming Skills in Children with Cerebral Palsy: A Pilot Study. *Specijalna Edukacija i Rehabilitacija*. 2012; 11(br. 1):51–66.

Objective

- Translate to Portuguese and adapt to Brazilian culture measurement instruments of aquatic skills: Aquatic Independence Measure (AIM) and Alyn Water Orientation Test 1 and 2 (WOTA 1 and 2).

AIM

- Hutzler, 1998
- 22 items
- Score 0 to 4
- Validate and reliable for children to 3 to 7 years with motor impairments
- Significance relation to GMFM and PEDI
(Chacham, A., & Hutzler, Y. 1998; Getz

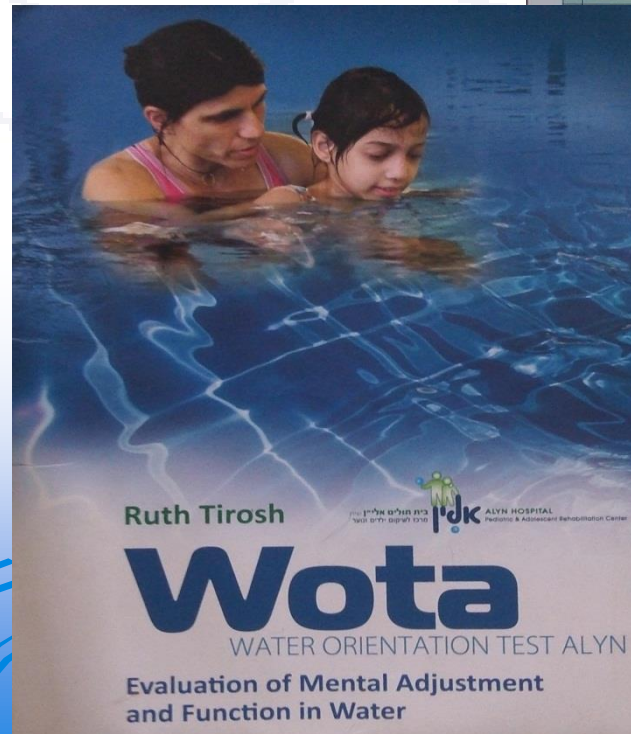
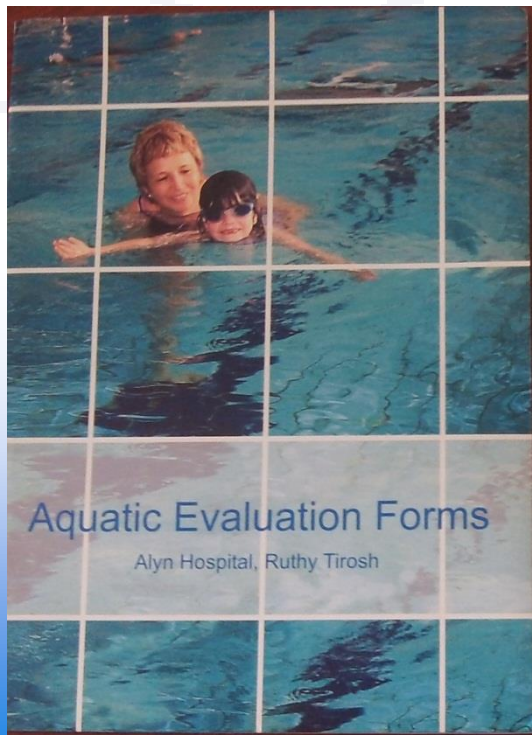
0	Does not initiate
1	Completes the skill partially with assistance of attendant and assistive flotation devices
2	Completes the skill partially with assistive flotation devices
3	Completes the task independently with assistive flotation devices
4	Completes the task independently without assistive flotation devices

Aquatic Independence Measure

W1	Entering the water to a safe position
W2	Holding the pool side rail without touching the pool floor
W3	Walking in shallow water while holding the pool side rail, with one hand
W4	Walking across the pool (3m)
W5	Exhaling into water (blowing bubbles) 5 consecutive times
W6	Submerging the entire face in the water without holding the side rail
W7	Maintaining a static back float
W8	Maintaining a static prone float position
W9	Holding on a flotation device, in prone position, and executing 3-4 propelling movement with legs
W10	Holding a flotation device, in supine position, and executing 3-4 propelling movement with the legs
W11	Rotating from prone float (5 sec) to a standing position
W12	Shifting from a back float position to an independent standing or vertical position
W13	Shifting from a standing or independent position to a back float
W14	Shifting from a standing or independent position to a prone float
W15	Jumping into the pool from a sitting position and obtaining a secure position in water
W16	Retrieving an object from the pool floor (1m)
W17	Advancing safely and independently in the water, without the feet touching the pool floor
W18	Exiting the water
W19	Rotating from prone to supine position
W20	Rotating from supine to prone position
W21	Advancing in deep water, while performing crawl or breast back-stroke
W22	Advancing in deep water, while performing classic or breast back-stroke

Water Orientation Test Alyn

- Ruth Tirosh, 1999
- Halliwick Concept
- 2ª Edição 2011



Wota1 WATER ORIENTATION TEST ALYN 1
Aquatic Evaluation based on the Halliwick Concept for swimmers with limited functional and cognitive abilities (Ruth Tirosh)

Item	Grade
4. Enters pool willingly	
3. Slightly hesitant or indifferent	

Wota2 WATER ORIENTATION TEST ALYN 2
Aquatic Evaluation based on the Halliwick Concept (Ruth Tirosh)

Item	Mental Adjustment	Score	Comments
1A	General Mental Adjustment to the water (MA)		
2B	Blowing bubbles through the mouth (over 5 sec.) (MA)		
3B	Blowing bubbles through the nose (over 5 sec.) (MA)		
4B	Blowing bubbles with face/head immersed (over 5 sec.) (MA)		
5B	Rhythmically exhaling while moving (10 times, face/head are immersed) (MA)		
6B	Exhaling alternately from nose and mouth (3 consecutive cycles, nose and mouth are immersed) (MA)		
7C	Entering the water (sit on deck, arms & head lead) (MA)		
8C	Getting out of the water (hands push body up on deck, rotate body to sit) (MA)		
9C	Chair (Box) Position (sitting in the water, for 20 sec.) (BS) (MA)		
10C	Progression along pool edge using hands (3 m) (MA)		
11C	Walking across the pool (8 m) (MA)		
12C	Jumping across the pool (8 m) (MA)		
13C	Jumping and ducking in & out of water (5 times) (MA)		

Item	Skills – Balance Control & Movement	Score	Comments
14C	Change position from standing to back floating (TR)		
15C	Static back float for 5 sec. (BS)		
16C	Change position from back floating to standing (TR)		
17C	Prone gliding for 5 sec. (head is immersed) (BS)		
18C	Change position from prone floating to standing (TR)		
19C	Right Longitudinal Rotation (change position from back to prone to back float) (LP)		
20C	Left Longitudinal Rotation (change position from back to prone to back float) (LP)		
21C	Combined Rotation (change position from standing in the water or sitting on deck to prone and longitudinal rotation on back) (CR)		
22C	Combined Rotation (change position from back to prone floats to standing position) (CR)		
23C	Submerging - touch pool floor with both hands (swimmer starts at chest water level, feet disengaged from the floor) (UP)		
24D	Simple progression on the back (using simple propulsive movements) (SP)		
25D	Freestyle		
26D	Backstroke (reciprocal)		
27D	Breaststroke		

Total score out of 81	Score in %	Adjusted score (if necessary)	
		Max score possible	Percentile score after Adjust

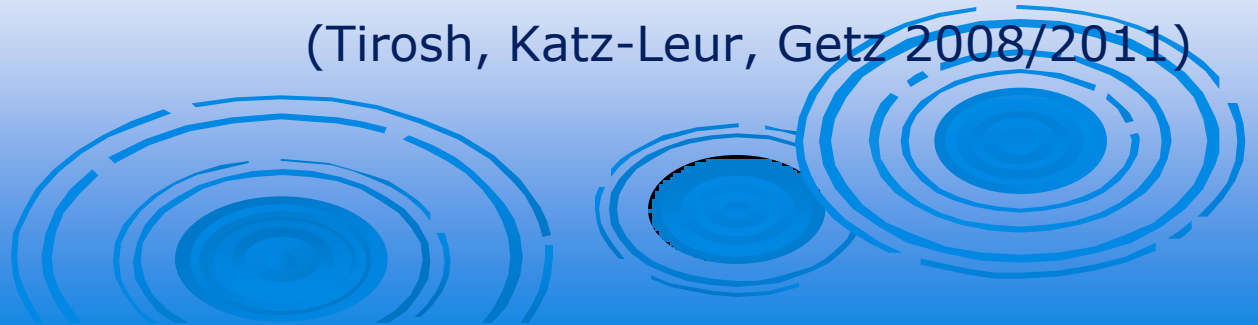
Wota 2



- Children with typical motor development (4 to 5 years old)
- Score 0 to 3
- Validated and reliable for children with neuromotor impairment to 1 to 15 years old
- GMFM



(Tirosh, Katz-Leur, Getz 2008/2011)



Item	Mental Adaptation
1A	General Mental Adjustment to the water (MA)
2B	Blowing bubbles through the mouth (over 5 sec.) (MA)
3B	Blowing bubbles through the nose (over 5 sec.) (MA)
4B	Blowing bubbles with face/head immersed (over 5 sec.) (MA)
5B	Rhythmically exhaling while moving (10 times, face/head are immersed) (MA)
6B	Exhaling alternately, from nose and mouth (3 consecutives cycles, nose and mouth are immersed) (MA)
7C	Entering the water (sit on deck, arms & head lead) (MA)
8C	Getting out of the water (hands push body up on deck, rotate body to sit) (MA)
9C	Chair (Box) Position (Sitting in the water , for 20 sec.) (BIS)(MA)
10C	Progression along the pool edge using hands (3m) (MA)
11C	Walking across the pool (6 m) (MA)
12C	Jumping across the pool (6 m) (MA)
13C	Jumping and ducking in & out of the water (5 times) (MA)
Item	Skills – Balance control & Movement
14C	Change position from standing to back floating (TR)
15C	Static back float for 5 sec (BIS)
16C	Change position from back floating to standing (TR)
17C	Prone gliding for 5 sec. (head is immersed) (BIS)
18C	Change position from prone floating to standing (TR)
19C	Right Longitudinal Rotation (change position from back to prone to back float) (LR)
20C	Left Longitudinal Rotation(change position from back to prone to back float) (LR)
21C	Combined Rotation (change position from standing in the water or sitting on deck to prone and long. Rot. on back) (CR)
22C	Combined Rotation (change position from back to prone to stand) (CR)
23C	Submerging- touch pool floor with both hands (swimmers starts at chest water level, feet disengaged from the floor) (UP)
24D	Simple Progression on the back (using simple propulsive movements) (SP)
25D	Freestyle
26D	Backstroke (reciprocal)
27D	Breaststroke

Wota2

Score

Section	Item	Graded evaluation
A	1	0- Scared/ cries/objects 1- Indifferent 2- Slightly hesitant, enjoys some activities in the water (does not open eyes in the water, some difficulty in disengagement) 3- Happy, relaxed (open eyes in the water, disengages from instructor)
B	2-6	X- Cannot be assessed 0- Does not perform or seems capable but does not cooperate 1- Poor quality performance 2- Moderate quality performance 3- High quality performance
C	7-23	X- Cannot be assessed 0- Does not perform or seems capable but does not cooperate 1- Performs the task with the instructor's full support 2- Performs the task with the instructor's partial support 3- Independent performs the task without the instructor's support. It should be noted under Comments whether the swimmer requires close supervision.
D	24-27	X- Cannot be assessed 1- Does not perform or seems capable but does not cooperate 1- Swim a distance of 20 meters, with 3-7 stops to rest during the swimming 2- Swim a distance of 20 meters, with 1-2 stops to rest during the swimming 3- Swim a distance of 20 meters, continuously, with no stops to rest. It should be noted under Comments whether the swimmer requires close supervision

Wota1



- Children with limited cognitive and motor function
- Children with typical motor development- until 4 years old
- 13 items
- Score 1 to 4
- Validated and reliable for children with cognitive and motor limites- 1 to 8 years old
- Significance correlation with BAMF (Brief Assessment of Motor Function Test)



(Tirosh, Katz-leur, Getz 2008/2011)

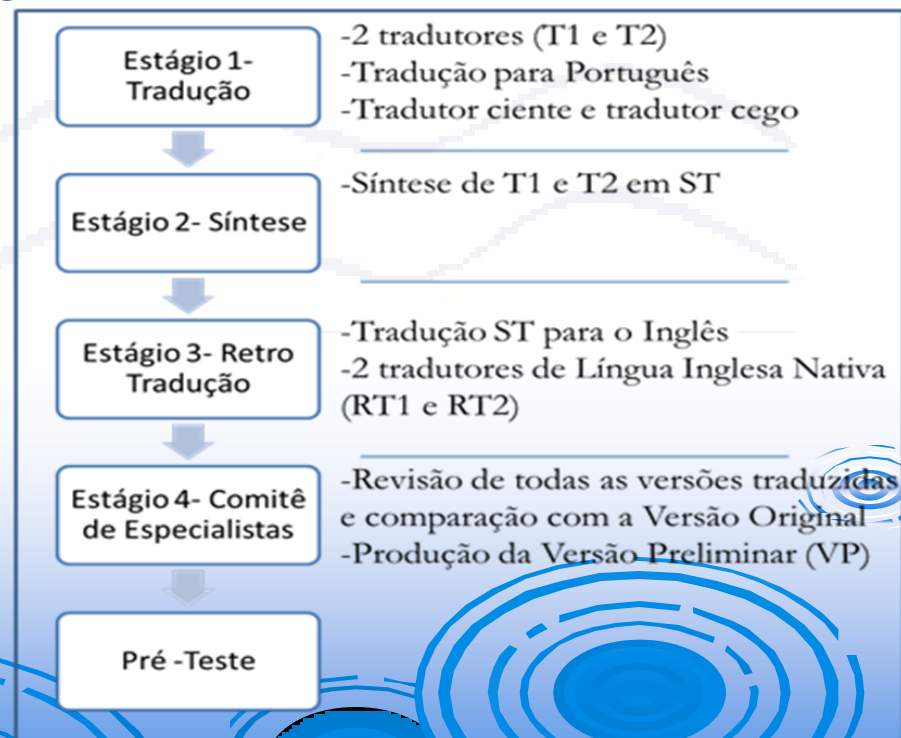


1	General Adjustment	4. Enters pool willingly 3. Slightly hesitant or indifferent 2. Frightened, clings to instructor, may be calmed intermittently 1. Cries, objects
2	Entering pool from pool edge: Sitting facing the water	4. Independent (arms forward, head follows) 3. Instructor supports hands only, without flexing elbows 2. Instructor supports forearms/upper arms, or at hands but elbows are flexed 1. Instructor supports trunk
3	Exiting the pool to pool edge: Holding pool edge without standing. Raising trunk with push up of hands, rotation of trunk and sitting.	4. Independent, lifts himself up and sits properly 3. Exits the water by crawling, without support, but no independent sitting 2. Initiates, exits by crawling, with assistance (sits down with/without assistance) 1. Does not initiate and/or does not perform due to weakness
4	Blowing bubbles in water	4. Blow bubbles through nose 3. Blow bubbles through mouth 2. Immerses mouth in water but does not blow bubbles and does not inhale water 1. Inhales water or objects or does not initiate or there is contraindication to immersing the mouth
5	Side floating with instructor's help: Instructor faces the swimmer, holding the sides of the upper trunk. Instruction: immerse ear in the water and lie on your side.	4. Support the sides of: pelvis/waist/upper trunk - initiates floating (ear is immersed) and returns to vertical position 3. Weakness does not allow for initiation of floating or returning, but does not object to floating with full support 2. Mildly objects, performs side flexion, ear is immersed in the water 1. Objects forcefully, performs side flexion and refuses to immerse ear
6	Back floating with instructor's help: Instructor faces the swimmer, holding the sides of the upper trunk. Instruction: lie on your back.	4. Support the sides of: pelvis/waist/upper trunk - initiates floating, relaxed, returns to vertical position 3. Weakness does not allow for initiation of floating or returning, but does not object to floating with full support 2. Mildly objects, ears are immersed, is not relaxed and tries to get up 1. Objects forcefully, does not immerse ears, flexes head/ pelvis/trunk (tries to get up)
7	"Splashing" water	4. With hands and/or legs. Does not recoil from water around the face 3. Splashes "carefully" and recoils from water around face 2. Does not splash, has no "feel" for the water 1. Is not able to perform

Methods

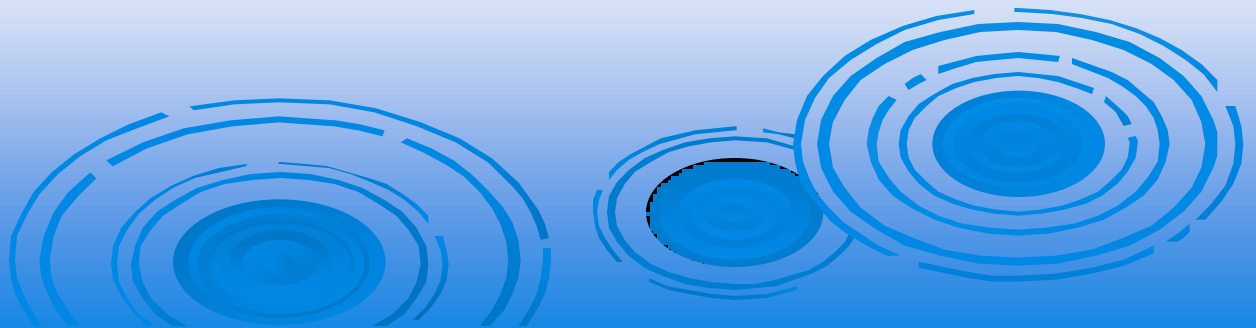
- Authors Permission
- Methodological procedure:

- Translation
- Synthesis of translation
- Back Translation
- Expert Committee
- Test of Preliminary Version



Methods

- Translation and Cross Culture Adaptation Process
 - Semantic Equivalence ●
 - Idiomatic Equivalence ■
 - Cultural or Experiential Equivalence ◆
 - Conceptual Equivalence ▲



Results

- Translation
- Synthesis of the translations
- Back Translation
- Expert Committee- Preliminary Version

Results

ST-AIM

Equivalence	
Semantic 	Non infinite verb W1 W2
Cultural or experiential 	W2 e W3 W6 a W14 W19 e W20
Conceptual 	W1 W3 W12 W13 W14 W15 W17 W21 W22 1a 4

Original	Itens/ Pontuação	Nomenclatura definida ST-AIM 
Pool side rail	W2 W3 W6	Barra lateral da piscina
Back float/ supine position	W7 W12 W10 W13 W19 W20	Flutuação dorsal (supino)
Prone float	W8 W9 W11 W14 W19 W20	Flutuação ventral (prono)
Flotation devices	W9 W10 1 a 4	Dispositivos de flutuação assistida (flutuadores) 

Results



Itens	AIM	Definição segundo Hutzler	Tradução em Português
W1 W13 W14 W15 W17	Safe/ Secure independent position	"Being independent in the water"	Ser independente na água em qualquer posição
W3	Shallow water	"In shallow water we mean that the participant can put the feet on the floor of the pool and walk"	Significa que o paciente pode colocar os pés no fundo da piscina e andar
W9;W10 1 a 4	Flotation device	"Any kind of flotation in any way to help"	Qualquer tipo de flutuador e de qualquer maneira para ajudar
W21 W22	Deep water	"...While in deep water this is not possible..."	Significa que o paciente não consegue colocar os pés no fundo da piscina e andar
W21 W22	Breast back-stroke	"This is one style in which the arms pull together on the back and the legs kick is same as breast"	Estilo de nado onde os braços realizam movimentos simétricos e os membros inferiores movimentos iguais ao do nado peito

Results

Comitê de Especialistas VP-AIM

Item AIM	Original	RT1 e RT2
W4	Walk across	Walk about
W11	Rotate	Turn
W16	Retrieving	Pick up
W17 W21 W22	Advancing	Move

Equivalência	Itens ou pontuação alterados na VP
Conceitual	Título W4 W11 W16 W17 W21 W22

ST-Wota

Original	Nomenclatura definida ST-Wota 1 e ST-Wota 2
Form(s) Test(s) Evaluation(s) Wota	Wota
Back float	Flutuação dorsal (supino)
Score Grade Score allocation	Pontuação
Prone Prone position	Flutuação ventral (prono)
Hold Support Help Assistance Skill Performance Achievement	Segurar Apoio Ajuda Assistência Habilidade Desempenho Aquisição

Ruth Tirosh

Wota
WATER ORIENTATION TEST ALYN

ALYN HOSPITAL
The Ministry of Health, Israel

[illegible]

Results

ST-Wota (manual)

Original	Nomenclatura definida ST-Wota	Divergência			
					
Introduction	Introdução		X	X	
Guidelines for Wota 1 •Evaluation goal •General Racionale •General Instructions •Item- Specific Guidelines	Diretrizes para Wota 1 •Metas da Avaliação •Fundamentos Gerais •Instruções Gerais •Itens - Diretrizes específicas			X X X X X	
Wota1	Teste de Orientação Aquática Alyn - Wota 1	X		X	X
Setting Goals based on Wota 1	Estabelecimento de Metas Baseadas em Wota 1			X	
Guidelines for Wota 2 •Evaluation goal •General Racionale •General Instructions •General Scoring Guidelines •Guidelines and instructions for test Item scoring	Diretrizes para Wota 2 •Metas da Avaliação •Fundamentos Gerais •Instruções Gerais •Diretrizes Gerais da Pontuação •Diretrizes e Instruções Específicas da Pontuação dos itens			X X X X X X X	
Wota2	Teste de Orientação Aquática Alyn - Wota 2	X		X	
Setting Goals based on Wota 2	Estabelecimento de Metas Baseadas em Wota 2			X	

Results

Comitê de Especialistas VP-Wota

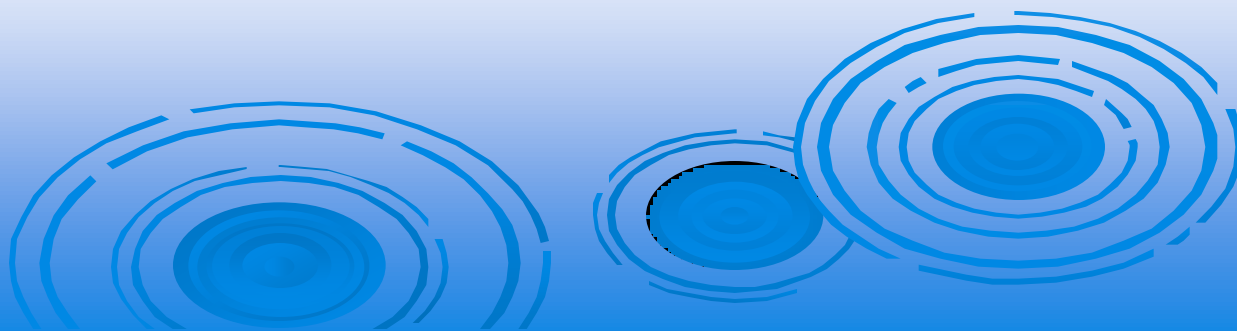
Nomenclatura definida VP-Wota	Alterações			
	▲	◆	●	■
Introdução			X	
Diretrizes para Wota 1			X	
•Metas da Avaliação			X	
•Fundamentos Gerais			X	
•Instruções Gerais			X	
•Itens - Diretrizes específicas			X	
Teste de Orientação Aquática Alyn - Wota 1	X	X	X	X
Estabelecimento de Metas Baseadas em Wota 1			X	
Diretrizes para Wota 2			X	
•Metas da Avaliação			X	
•Fundamentos Gerais			X	
•Instruções Gerais			X	
•Diretrizes Gerais da Pontuação			X	
•Diretrizes e Instruções Específicas da Pontuação dos itens			X	
Teste de Orientação Aquática Alyn - Wota 2	X		X	
Estabelecimento de Metas Baseadas em Wota 2			X	

Results

VP-Wota1

Equivalência	Itens	Pontuação
Semântica ●	2 3 4 6	
Conceitual ▲	1 3 7 8 9 13	1 e 2 3 e 4 1, 2 3 e 4 1, 2 e 3 1 1
Cultural ◆	5	
Idiomática ■	7	2, 3 e 4

Item	Pontuação	Original	RT1 e RT2	VP ▲
1	2	Frightned	Afraid	Amedronta
1 13	1 1	Cling	Grab	Agarra
3	3 e 4	Crawling	Crawling	Arrastando
7	2 e 3	Splashing	Spare	Respinga
7	3 e 4	Recoil	Dodge	Afasta
8	1, 2 e 3	Submerging	Immersion	Imersão
9	1	Sagging	Unstable	Instabilidade



Results

VP-Wota2

Equivalência	Itens
Semântica	2 3 4 7 8 11 12 13 23
Conceitual	1 12 13
Cultural ou Experimental	9 Todas as instruções

Results

- Preliminary versions of the translation and cultural adaptation of AIM and WOTA 1 and 2, including manual was produced with the discussion of all versions of translation and back translation by a committee of experts.

Conclusion

- AIM and WOTA (1 and 2) were translated to Portuguese and culture adapted to Brazil.

Application of the preliminary version in Brazilian population is in the last stage analyzing validity and reliability of the translation to Portuguese language spoken in Brazil.

