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# The screening Hand Assessment for infants (s-HAI) for early detection of infants at risk of unilateral CP

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# The screening Hand Assessment for Infants, s-HAI



Hand Assessment for Infants

Measure's goal directed **manual actions** performed with **each hand** separately

- ✓ Standardised observational assessment
- ✓ Infants from 3–12 months of age at risk of unilateral cerebral palsy (CP)
- ✓ Semi-structured, video recorded 5-minute play session
- ✓ Identification of high risk of unilateral CP



	s-HAI	HAI (Krumlinde et al 2017)
<b>Measurement properties</b>	Identification	Descriptive Evaluative Predictive
<b>Age focus</b>	3-10 months	3-12 months
<b>Number of items</b>	6	17
Unimanual	6	12
Bimanual	0	5
<b>Range of total raw score, EaHS</b>	0-12	0-24
<b>Number of toys to use</b>	5-6	15
<b>Setting</b>	Home environment and clinic	Clinic
<b>Length of play session</b>	5 minutes	10-15 minutes
<b>Assessors</b>	Guardian or professional after looking at instructional videos	Trained professionals
<b>Course for learning to use the assessment</b>	Self-administered online course, 10-15 hours	2.5 days

# Development of the s-HAI

## Aim

To develop a screening tool based on the Hand Assessment for Infants (HAI) that can identify infants at risk of unilateral CP.

Part 1: Development of an item selection and play session (Ryll et al 2024)

Part 2: Investigate aspects of validity, reliability, and feasibility (Kembe et al 2025)

Part 3: Development of an e-learning course

Part 4: Investigate the predictive value of s-HAI

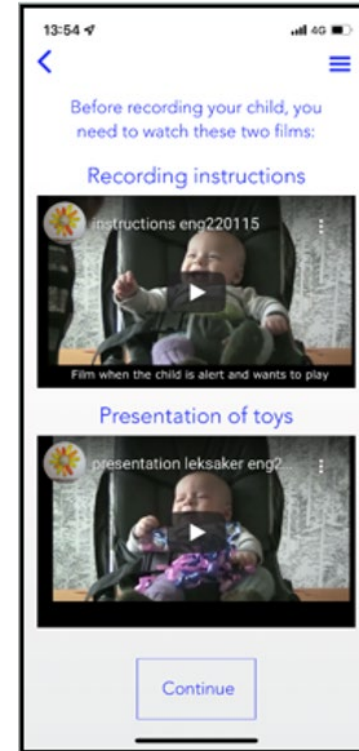
# Sensitivity of item set-up for s-HAI

## s-HAI 6-item set

1. Initiates hand use for objects on the side
4. Quality of holding
5. Grasps from an easy position
6. Object location when grasping
8. Moves fingers
11. Quality of hand and arm movements

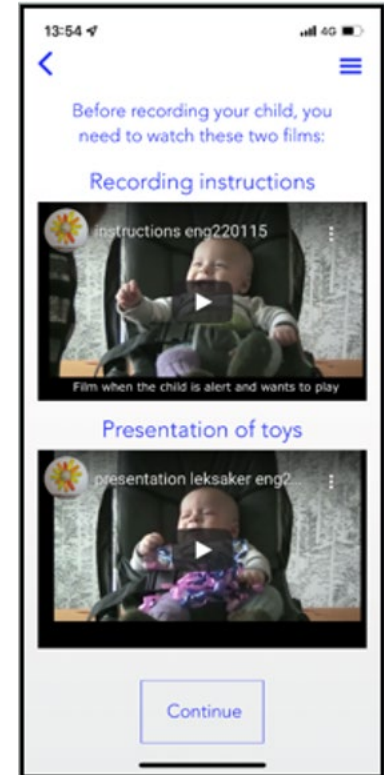
- Excellent accuracy, AUC = 0.86
- Cut-off score on the contralesional hand  $\leq 7$ 
  - 88 % sensitivity
  - 73 % specificity
- Cut-off value for asymmetry between hands  $\geq 3$ 
  - 87 % sensitivity
  - 76 % specificity

# Development of s-HAI play session and instructions for recording



# Investigation of s-HAI in a new data set

- 30 infants at risk of unilateral CP (stroke 13, IVH 8, asymmetry 5, asphyxia 4)
- HAI performed by occupational therapist as part of clinical routine
- s-HAI performed and recorded by parents at home
- NeuroMotion™ as digital solution
- Quality assurance of s-HAI recordings



# Validity and reliability of s-HAI

## Concurrent validity, Spearman rank correlation coefficient ( $r_s$ )

Correlation between comparable 6 items of s-HAI and HAI, EaHS

- $r_s = 0.86$

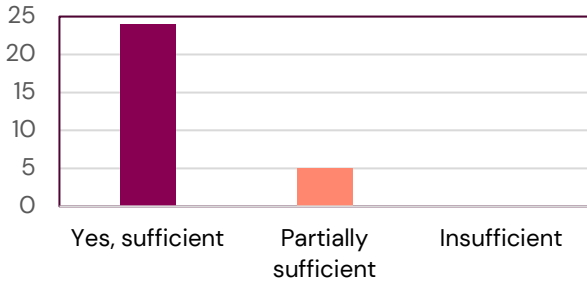
## Inter-rater reliability, Intraclass correlation coefficient, ICC (95% CI)

4 experienced raters, 16 s-HAI recordings

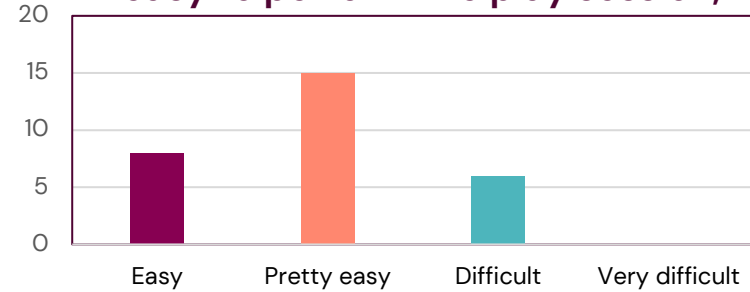
- EaHS affected hand                      ICC 0.96 (0.92–0.99)
- EaHS non-affected hand                ICC 0.95 (0.90–0.98)

# Feasibility of performing and recording the s-HAI play session ( $n=30$ )

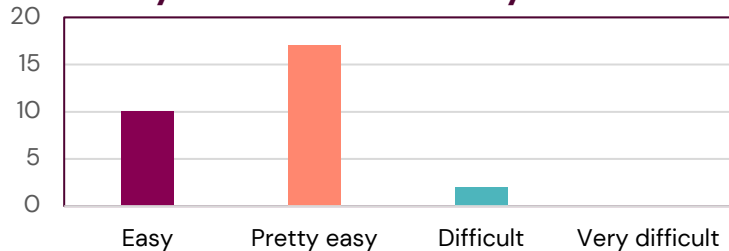
Parents found the instructions on how to arrange the play sessions sufficient.



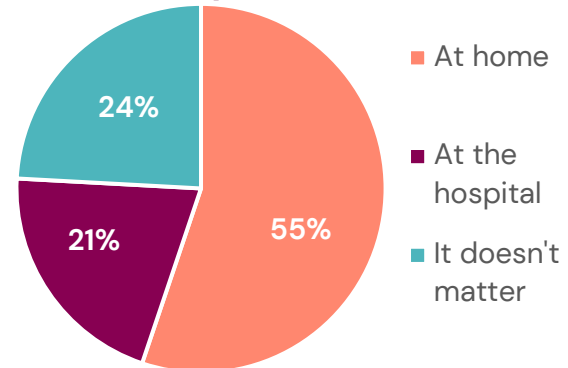
Parents found it easy or pretty easy to perform the play session,



Parents found it easy or pretty easy to find suitable toys to use.



55% preferred to perform the s-HAI at home



# Development of an e-learning course for s-HAI

## E-learning course for s-HAI

Digital

Self-paced

Free

Health care  
professionals

10-15 hours

Lectures  
Quiz  
Training

Certification

# Interested in the e-learning course?





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