

SUPPLEMENTAL DOCUMENT 1

VIDEO RECORDING GUIDE – PRESS ASSESSMENT (TRANSLATED FROM DANISH)

CAMERA SETUP AND POSITIONING

The patient is placed with elevated head and upper body, as seen in the picture. Additional support behind the back and neck may be needed.

The camera is placed at the end of the bed and as close to the bed as possible. The tripod is positioned in its highest position (as shown in the picture). This provides a view from which all items in PreSS may be evaluated optimally.



It is important that the combination of the camera's position and the position of the patient taken together provide a good picture of the patient's upper body and face. A subsequent zoom should leave the face centred to avoid repositioning of the camera during the recording.



THE ASSESSMENT WITH PRESS

The video recorded assessment with PreSS is ready when a picture on the camera screen like the one shown on the right is obtained. The patient's upper body, arms and face must be visible (a later zoom must focus on the face only). The assessor is positioned on the opposite side of the bed further away from the camera.

Line: This is "*the assessor's name*" providing a PreSS assessment of "*the patient's name*" with research ID "XX" (the research ID is printed on the written informed content).



PRESS PART 1

ASSESSMENT OF THE ITEM ARM WEAKNESS

Both arms are assessed simultaneously by helping the patient to extend both arms straight out at a 90-degree angle to a line following the thorax while seated.

Line: "*patient's name*" keep your arm extended for 10 seconds while I count"



Count to ten. The camera angle and zoom must be as shown in the picture on the right, where both arms can be seen clearly and independently.



ASSESSMENT OF THE ITEM FACIAL DROOP

The assessment is initiated by a **camera zoom** so that only the patient's face can be seen.

The obtained **zoom is maintained** throughout the rest of the PreSS assessment.

Line: "*the patient's name*", please smile very widely and show your teeth?"



ASSESSMENT OF THE ITEM SPEECH IMPAIRMENT

Line: "Please you repeat the sentence – the orchestra played and the audience applauded? (Original Danish sentence that requires a good ability to articulate "orkesteret spillede og publikum klappede")."

Line for the record: Now the assessment moves on to part 2.



PRESS PART 2

ASSESSMENT OF THE ITEM GAZE PALSY/DEVIATION

Doing this assessment, attention must be paid not to cover the view of the patient's eyes with the assessor's hand. Because of the camera's high position in the tripod, the assessor must remember to keep the hand low while doing the assessment.

Line: "patients name", please you follow my finger with your eyes and your eyes only?"



Support the patient's head to emphasise the eye movements. Closed eye lids are held open by the assessor (still with a focus on not covering the camera's view of the patient's eyes)

Note, that the assessor's hand does not cover the patient's eyes at any point. Only the finger briefly crosses the eyes, and the visible finger gives a viewer a notion of where the patient is fixing his/her sight.

The distance from the assessor's finger to the patient's eyes must be approximately 50 centimetres.



ASSESSMENT OF THE ITEM LEVEL OF CONSCIOUSNESS

Line: "Patients name", please answer me; How old are you? Please tell me what month this is?

For the record: "The assessment with PreSS has finished".

The camera is stopped, and the record is reviewed right away **with the camera and tripod still in position**. If the record has flaws, a new assessment may be recorded right away.



SUPPLEMENTAL DOCUMENT 2

THE ASSESSMENT AND INTERPRETATION OF THE PREHOSPITAL STROKE SCORE – THE ESSENTIAL CONTENT OF THE E-LEARNING-BASED TRAINING

The Prehospital Stroke Score (PreSS) is a symptom-based stroke score for stroke screening and severity assessment. PreSS part 1 consists of the Cincinnati Prehospital Stroke Scale (CPSS) and PreSS part 2 consists of the Prehospital Acute Stroke Severity Scale (PASS).

E-LEARNING

PreSS was already in use as a standard operating procedure at the time of the study to evaluate patients suspected of stroke in the prehospital environment in the Central Denmark Region. EMS providers and neurology physicians in the region were required to complete an e-learning module on how to assess a patient with CPSS and PASS and complete a small case-based test. The essential content of the instructions given in the E-learning material regarding CPSS and PASS is as follows.

THE CINCINNATI PREHOSPITAL STROKE SCALE (CPSS)

CPSS consisted of three classic symptoms: facial droop, arm weakness and speech impairment.

Facial droop was tested by having the patients smile and show their teeth. A positive score was given if one side of the face did not move as well as the other. A positive score was also given if facial droop could be observed spontaneously.

Arm weakness was tested by letting the patients extend both arms straight out for 10 seconds at a 90-degree angle from a sitting position. A positive score was achieved in the presence of asymmetrical arm weakness including arm drift and paresis.

Speech impairment was tested with a Danish sentence that challenged articulation (original Danish sentence “orkesteret spillede og publikum klappede”, that translates into English as “the orchestra played and the audience applauded”). A positive score was achieved in the presence of slurred speech, inappropriate word usage or inability to speak.

A score of ≥ 1 point was considered positive and constituted a positive CPSS which, in clinical usage meant confirmed suspicion of stroke “a code stroke”.

THE PREHOSPITAL ACUTE STROKE SEVERITY SCALE (PASS)

PASS also consisted of three symptoms: arm drift (re-used from CPSS); level of consciousness (month/age); and gaze palsy/deviation.

The level of consciousness was tested through questions revealing any inability to specify current age or present month. A positive score was present if one or both questions were answered incorrectly.

Gaze palsy/deviation was tested by observing spontaneous head and/or eye deviation and by testing eye movements following the examiner's finger from side to side. A positive score was given if the item was spontaneously present or if the eye movements were hindered or non-parallel.

A score of 2 or 3 points was considered positive for PASS that clinically translated into a suspicion of acute ischaemic stroke from a large-vessel occlusion (LVO).

CUT-OFF VALUES

The cut-off values used in this study were pre-defined from the original studies on CPSS¹ and PASS². All items were dichotomously assessed and positive scores provided one point each. Hence, a maximum score of 5 points was possible because of the use of arm weakness by both stroke scales.

- 1 Kothari, R., Hall, K., Brott, T. & Broderick, J. Early stroke recognition: developing an out-of-hospital NIH Stroke Scale. *Academic emergency medicine : official journal of the Society for Academic Emergency Medicine* **4**, 986-990, doi:10.1111/j.1553-2712.1997.tb03665.x (1997).
- 2 Hastrup, S., Damgaard, D., Johnsen, S. P. & Andersen, G. Prehospital Acute Stroke Severity Scale to Predict Large Artery Occlusion: Design and Comparison With Other Scales. *Stroke* **47**, 1772-1776, doi:10.1161/STROKEAHA.115.012482 (2016).

Supplemental Table S1: Variance determined by generalisability theory.

Source	Variance (95% CI)	Percentage
Residual	0.040 (0.039; 0.041)	24.9
Items (symptoms)	0.011 (0.003; 0.045)	6.8
Patients	0.035 (0.024; 0.050)	21.6
Raters	0.001 (0.000; 0.003)	0.7
Raters#items (symptoms)	0.003 (0.002; 0.004)	1.9
Raters#patients	0.002 (0.001; 0.002)	1.0
Patients#items (symptoms)	0.069 (0.061; 0.079)	43.1

Table S1 legend: # = interaction, CI=Confidence intervals

Supplemental Table S2: Differences in AUC between healthcare professions with 95% confidence intervals.

EMS providers versus consultants in neurology	Residents in neurology versus consultants in neurology	EMS providers versus residents in neurology
Cincinnati Prehospital Stroke Scale (CPSS)		
-0.12 (-0.16; -0.08)	-0.09 (-0.14; -0.04)	-0.03 (-0.07; 0.01)
Prehospital Acute Severity Scale (PASS)		
-0.12 (-0.15; -0.09)	-0.05 (-0.09; -0.02)	-0.07 (-0.10; -0.04)
Single items		
Arm weakness		
-0.15 (-0.18; -0.11)	-0.07 (-0.11; -0.03)	-0.08 (-0.11; -0.05)
Facial droop		
-0.15 (-0.19; -0.10)	-0.13 (-0.19; -0.07)	-0.02 (-0.06; 0.03)
Speech impairment		
-0.14 (-0.17; -0.11)	-0.01 (-0.05; 0.03)	-0.13 (-0.16; -0.10)
Level of consciousness (month/age)		
-0.02 (-0.04; 0.01)	-0.05 (-0.07; -0.02)	0.03 (0.01; 0.05)
Gaze palsy/deviation		
0.01 (-0.03; 0.05)	0.04 (-0.01; 0.10)	-0.03 (-0.07; 0.01)

Table S2 legend

AUC = area under the receiver-operating curve, EMS = emergency medical service, (95% CI) = all measures with 95% confidence intervals in parentheses.

Supplemental Figure S1: Bland-Altman plots of neurology consultants versus consensus assessment

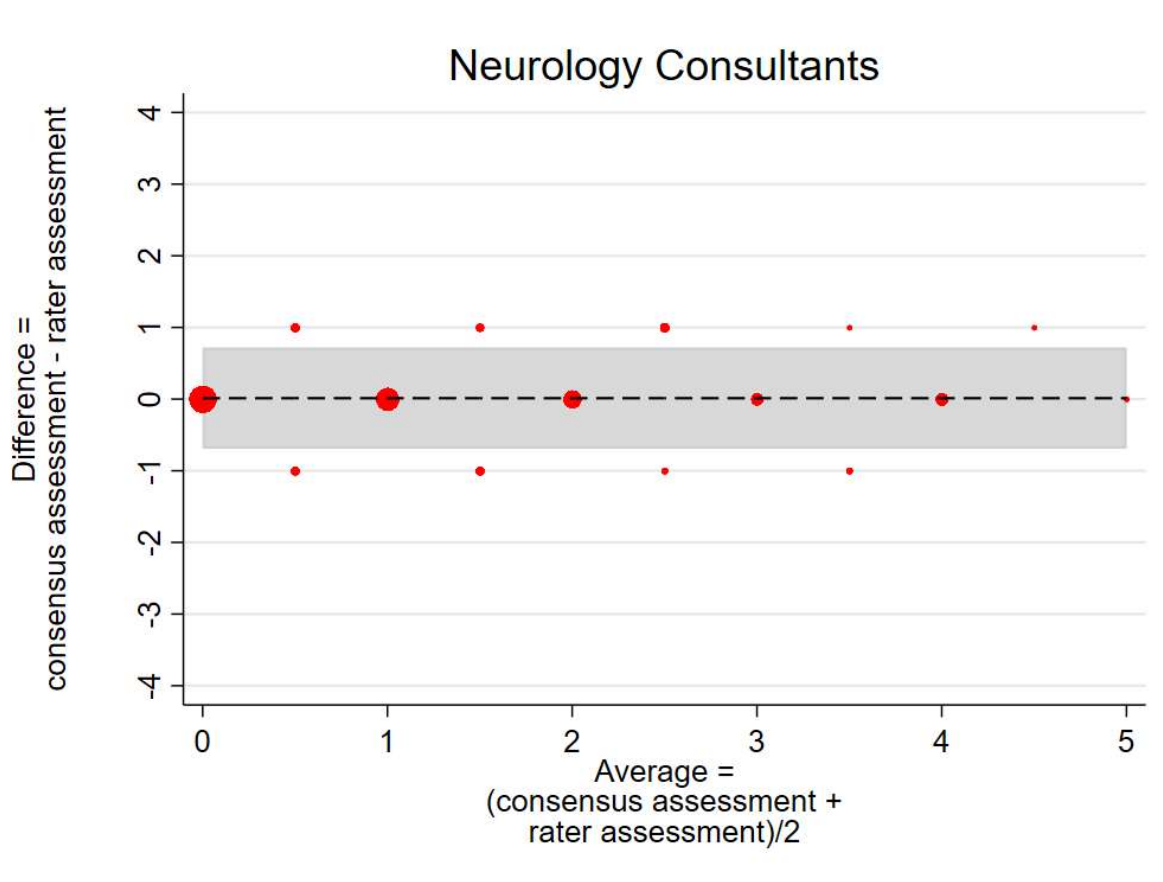


Figure S1 legend: Bland Altman plot of the 240 total scores from the group of neurology consultants versus the corresponding consensus assessments. Dashed line = mean difference between raters and the consensus, grey zone = limits of agreement (95%). Marker sizes represent number of assessments. X-axis = average values of each rater assessment and the corresponding consensus assessment, Y-axis = deviation of the rater score from the consensus assessment. Limits of agreement are placed at the 2.5 and 97.5 percentile centred at the mean difference and under assumption of normal distributed residuals. Mean difference = 0.01, lower limit of agreement = -0.69, upper limit of agreement = 0.72. 12.92% of the observations are placed outside the limit of agreement.

Supplemental Figure S2: Bland-Altman plots of neurology consultants versus consensus assessment – without constrains on trend

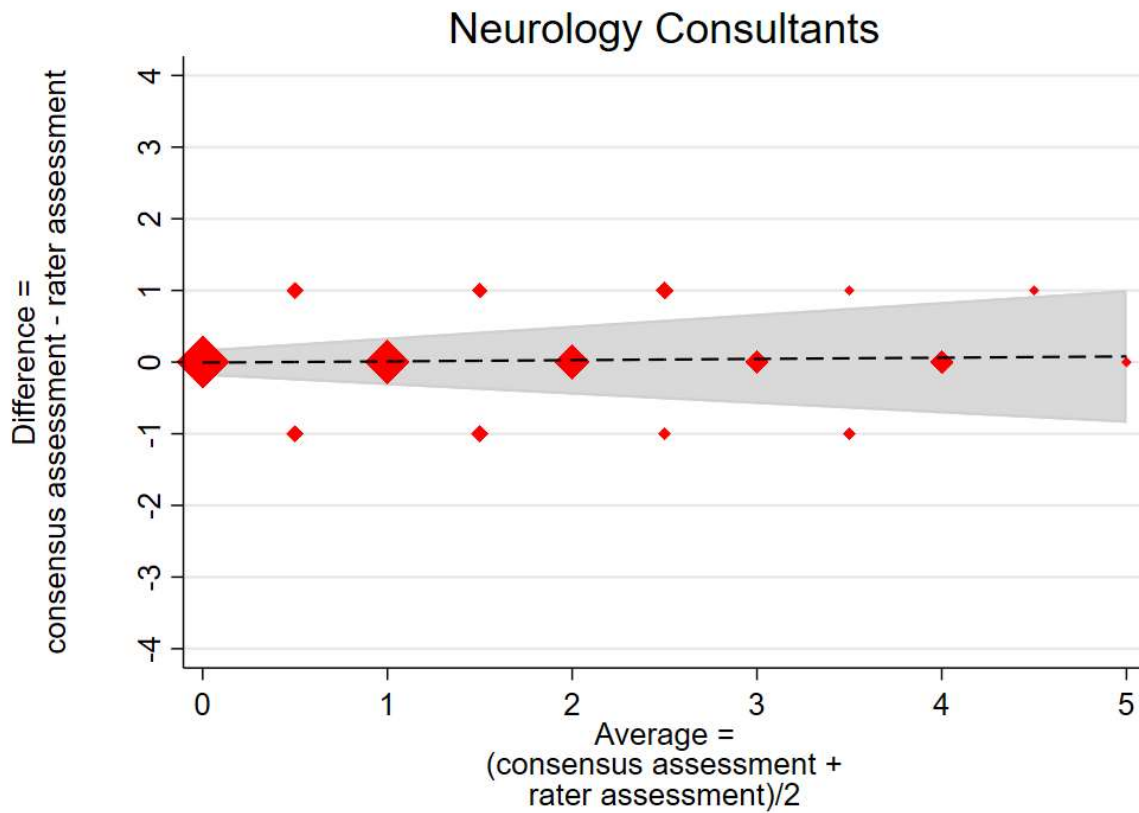


Figure S2 legend: Bland Altman plot of the 240 total scores from the group of neurology consultants versus the corresponding consensus assessments. Dashed line = trendline of the mean difference between raters and the consensus, grey zone = limits of agreement (95%). Marker sizes represent number of assessments. X-axis = average values of each rater assessment and the corresponding consensus assessment, Y-axis = deviation of rater score from the consensus assessment. The mean difference trendline is estimated using linear regression, while the limits of agreement are estimated using linear regression on the residuals of the trendline. Limits of agreement represents the 2.5 and 97.5 percentile observations centred at the mean difference and under assumption of normal distributed residuals. Mean difference trendline = $-0.01 + 0.02 \times \text{average}$. Limits of agreement = mean difference $\pm 2.46 \times (0.07 + 0.06 \times \text{average})$. 12.92% of the total scores are placed outside the limit of agreement.