Canadian Neurological Scale (CNS)

R Côté, VC Hachinski, BL Shurvell, JW Norris and C Wolfson (1986)

The Canadian Neurological Scale: a preliminary study in acute stroke

Instrument de mesure	Canadian Neuro Scale
Abréviation	CNS
Auteur	R Côté, et al.
Thème	Suivi neurologique - patients conscients aphasiques
Objectif	Evaluer l'évolution des symptômes neurologiques du patient n'ayant pas d'altération de la conscience mais pouvant être aphasique.
Population	Adultes
Utilisateurs	Médecins, infirmières
Nombre d'items	10
Participation du patient	oui
Localisation de l'instrument	http://stroke.ahajournals.org/cgi/reprint/17/4/731

Objectif :

Cet outil d'évaluation neurologique est utilisé pour évaluer l'évolution des symptômes neurologiques du patient n'ayant pas d'altération de la conscience mais pouvant être aphasique. Cet outil est donc à utiliser pour certains patients pour lesquels les échelles de type "Glasgow" ne sont pas adéquates.

Groupe Cible :

Cet outil a été validé uniquement auprès de patients adultes ayant subi un accident vasculaire cérébral.

Description :

Il s'agit d'un outil comportant 10 items, testant les 2 dimensions suivantes : l'état mental et les déficits.
L'état mental comprend : l'état de conscience, l'orientation et la parole.
Les déficits sont classés en 2 sous-sections : sans problème de compréhension, avec problème de compréhension. Dans ces deux sous-sections on teste, mais différemment, les réponses motrices du visage, des bras et des jambes.
Pour chaque item il y a de 2 à 4 scores possibles d'après la performance du patient - 0 étant un résultat normal. A la fin du test on additionne les scores de chaque item et

on obtient un score total. Plus ce score total est élevé plus grand est l'impact de l'accident cérébral sur le patient.
Les auteurs proposent de relever ce score sur un graphique afin de suivre l'évolution du patient.

Fiabilité :

La consistance interne (Cronbach alpha) de l'outil original est très bonne (alpha = 0.896 à 1 selon les sous-sections).

Les auteurs ont montré que sur les différents items du CNS avaient une bonne équivalence (résultats inter-observateurs) aussi bien entre infirmières qu'entre médecins ou en croisant les deux : kappa = 0,535 – 1 (tous les $p<0.05$) – le plus mauvais scores étant obtenus pour l'item "expression faciale". Les résultats les plus satisfaisants dans le registre de l'équivalence sont ceux obtenus auprès des patients ayant un déficit de la compréhension.

Dans une étude comparative de l'échelle NIHSS avec la CNS (Cheryl D. Bushnell, et al, 2001), le coefficient de corrélation intra-items entre 2 observateurs indépendants (*intraclass correlation coefficient*) avec le NIHSS et le CNS, était respectivement de 0.93 (95% IC, 0.82 to 1.00) et 0.97 (95% CI, 0.90 to 1.00) pour la partie "état mental", 0.89 (95% IC, 0.75 to 1.00) et 0.88 (95%, 0.73 to 1.00) pour la sous-section 1 (sans déficit de compréhension), et 0.48 (95% CI, 0.26 to 0.70) et 0.78 (95% CI, 0.60 to 0.96) pour la sous-section 2 (déficit de compréhension).
Pour eux, ceci démontre un meilleur intérêt de l'échelle CNS.

Validité :

Des mesures de validité n'ont pas été retrouvées.

Convivialité :

D'après les auteurs, l'évaluation du patient pour un utilisateur familiarisé avec l'outil est de 10 minutes.

Références :

R Côté, VC Hachinski, BL Shurvell, JW Norris and C Wolfson, "The Canadian Neurological Scale: a preliminary study in acute stroke", Stroke (1986), Vol 17 - n°4, 731-737.

Localisation de l'instrument :

http://stroke.ahajournals.org/cgi/reprint/17/4/731

CANADIAN NEURO SCALE (CNS)

R CÔTÉ, VC HACHINSKI, BL SHURVELL, JW NORRIS AND C WOLFSON (1986)

CAN (English)

Author (year)	Setting	Sample (n)	Design	Reliability	Validity
R Côté, VC Hachinski, BL Shurvell, JW Norris and C Wolfson (1986)	Neurology wards	Patients with a diagnosis of cerebral stroke (excluding subarachnoïd haemorrhage) – 2 or 3 observers, 129 assessments (n = 34)	Validation Study	IC E	

Fiabilité : Stability (S), Internal consistency (IC), Equivalence (E)
Validité : Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

Results reliability	Results validity	Commentary
(IC) *Cronbach's alpha:* α = 0.896 - 1 (n = 24) **(E)** interrater reliability kappa = 0,535 – 1 (all p<0.05)	Not found	

Fiabilité : Stability (S), Internal consistency (IC), Equivalence (E)
Validité: Face validity (FV), Content validity (CtV), Criterion validity (CrV), Construct validity (CsV)
Sensitivity (Sen), Specificity (Sp), Positive Predictive Value (PPV), Negative Predictive Value (NPV), Receiver Operating Curve (ROC), Likelihood Ratio (LR), Odds Ratio (OR)

CANADIAN NEURO SCALE (CNS)

STROKE ASSESSMENT SYSTEM (S.A.S.)

Observation Record

Section A- **Patient Alert Or Drowsy**

		Date	
		Time	
MENTATION	LEVEL CONSCIOUSNESS:	Alert(3)	
		Drowsy(1.5)	
	ORIENTATION:	Oriented(1)	
		Disoriented or Non Applicable(0)	
	SPEECH	Normal(1)	
		Expressive Deficit(.5)	
		Receptive Deficit(0)	
MOTOR FUNCTIONS:			
	WEAKNESS:		
SECTION A_1 NO COMPREHENSION DEFECT	FACE:	None(.5)	
		Present(0)	
	ARM:PROXIMAL	None(1.5)	
		Mild(1)	
		Significant(.5)	
		Total(0)	
	ARM:DISTAL	None(1.5)	
		Mild(1)	
		Significant(.5)	
		Total(0)	
	LEG:	None(1.5)	
		Mild(1)	
		Significant(.5)	
		Total(0)	
SECTION A_2 COMPREHENSION DEFECT	**MOTOR RESPONSE:**		
	FACE:	Symmetrical(.5)	
		Asymmetrical(0)	
	ARMS:	Equal(1.5)	
		Unequal(0)	
	LEGS:	Equal(1.5)	
		Unequal(0)	

GRAPH FOR TOTAL SCORE

10
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5

FIGURE 1. *Scoring Sheet.*

Appendix

Level of Consciousness

— Alert: Normal consciousness

— Drowsy: Patient when stimulated verbally remains awake and alert for a short period of time but tends to doze even when examined.

— Stuporous: Patient responds to loud verbal stimuli and/or strong touch; may vocalize but does not become alert or completely wake up.

— Comatose: Patient responds to deep pain (i.e. sternum pressure).

(1) Only by purposeful movement of limb towards noxious stimuli and/or grimacing and/or moaning (no verbal response).

(2) By nonpurposeful movements, flexion of upper limbs (i.e. decortication) or extension of upper limbs (i.e. decerebration).

(3) No response to noxious stimuli.

* If patient alert or drowsy monitor progress with Section A.

* If patient stuporous or comatose monitor progress with Section B.

Section A

I. Mentation

1) Orientation

— Oriented: Patient is oriented to both place (i.e. city *or* hospital) *and* to time (i.e. patient must give at least correct month and year). If early in month (i.e. first 3 days) previous month is acceptable. Speech can be dysarthric (mispronounced or slurred) but intelligible.

— Disoriented or non applicable: If for any reason patient cannot answer the preceding questions on orientation (i.e. does not know answer, gives wrong answer, answers only partially, cannot express himself either by lack of words or unintelligible speech or finally ignores questions).

2) Speech (Language and Pronunciation):

a) Receptive Language:

— Patient is asked:

(i) Close your eyes.

(ii) "Does a stone sink in water?"

(iii) Point to the ceiling. Repeat twice if necessary.

— If patient obeys 3 commands continue to b) expressive language.

— If patient obeys only 2 or less commands, score receptive defect in Speech Scale, and then proceed directly to motor function testing.

b) Expressive Language:

— Objects needed: pencil, key, watch.

— In this section pay special attention not only to answer but also to word pronunciation (i.e. dysarthria or slurred speech).

1) Ask patient to name each object. Make sure patient sees objects.

— If patient names only two or less of the objects, patient is scored expressive defect in Speech Scale.

— If patient names correctly 3 objects, proceed to #2 below.

2) Ask the patient the following questions

— What do you do with a pencil?

— What do you do with a key?

— What do you do with a watch?

— If patient answers correctly 3 questions, he/she is scored normal speech.

— If patient answers only two or less questions he/she is scored expressive defect in Speech Scale.

N.B. The above scoring system relates to language only, problems with pronunciation of words (i.e. dysarthria or slurred speech) is graded directly on Speech Scale below.

* Patient should always be scored according to worst speech deficit (i.e. language score or mispronunciation).

* Do not mimic commands in Section a) on Receptive Language.

Speech Scale

— Normal Speech: Answers all commands and questions in speech section, patient can have slurred speech (dysarthria) but still intelligible.

— Expressive Defect: Patient obeys command in re-

ceptive language section but makes one or more errors in section on expressive language and/or mispronunciation of words (slurred speech), with speech totally or partially non intelligible (severe dysarthria).

— Receptive Defect: Patient obeys only two or less commands in section on receptive language.

II. Motor Function

* When evaluating strength and range of motion in limbs always submit both limbs to same testing (i.e. apply same resistance at same position bilaterally).

Section A1 This section to be used if patient does not have comprehension problems (i.e. normal speech or expressive defect only).

1) Face:

— Test: Ask patient to show teeth or gums.

— Grading of deficit

— No weakness: Symmetrical grin, no asymmetry in smile.

— Weakness: Facial asymmetry. One corner of mouth lower than other, either at rest or while showing teeth.

2) Upper Limb (Proximal):

* Patient should be tested in sitting position if possible.

— Test: Abduction arms (to 90°).

* If patient lying in bed.

— Test: Elevate arms to approximately 45° to 90°.

— Strength in both arms tested simultaneously. Resistance applied at midpoint between shoulder and elbow at all times.

3) Upper Limb (Distal):

* Patient tested in sitting or lying position arms elevated.

— Test: Patient asked to make fists and to extend wrists.

* Compare range of movement in both wrists simultaneously.

— If full range of extension in both wrists proceed to test strength by applying resistance separately to both fists while stabilizing patient's arm firmly.

4) Lower Limb:

* Patient lying in bed for testing should always be scored according to worst deficit either a) or b).

— Test: (a) Hip flexion. Ask patient to flex thighs toward trunk with knees flexed at 90°. Movement in both thighs tested separately.

(b) Dorsiflexion foot. Ask patient to point toes and foot upwards. Compare both feet simultaneously (i.e. complete or partial movement).

* In both a) and b) apply resistance alternately to each thigh and foot after the full movement has been completed to test strength.

— Gradation of Motor Deficit

— No weakness: No detectable weakness.

— Mild weakness: Normal range of motion against gravity, but succumbs to resistance by observer either partially or totally.

— Significant weakness: Cannot completely overcome gravity in range of motion (i.e. partial movement).

— Total weakness: Absence of motion in movement tested or only contraction of muscles without actual movement of limb.

Section A2 — This section to be used for patients *with* comprehension problems (i.e. receptive defect in Speech Scale).

* Motor function in this section can be monitored in *one* of two ways:

a) The ability of the patient to maintain a *fixed posture* in upper or lower limbs for a few seconds (3–5 seconds). The observer will alternately place the limbs in the desired position.

(1) Upper limbs: Place arms outstretched at 90° in front of patient.

(2) Lower limbs: Flexion of thighs with knees flexed at 90°.

(3) Facial Power: Have patient mimic your own grin. If patient does *not* cooperate then one proceeds to:

b) Comparison of motor response to a noxious stimuli (i.e. pressure on nailbed of fingers or toes alternately with a pencil). Facial response (grimacing) to pain is tested by applying pressure on sternum.

(1) Face (grimacing).

— Symmetrical

— Asymmetrical (note side)

(2) Upper Limbs:

— Equal motor response: Patient *can* maintain the fixed posture equally in both upper limbs for a few seconds or withdraws equally on both sides to pain.

— Unequal motor response: Patient *cannot* maintain equally on both sides the fixed posture, weakness is noted on one side or there is an unequal withdrawal to pain. Note side where withdrawal not as brisk.

(3) Lower Limbs:

— Equal motor response: Patient *can* maintain the fixed posture equally in both lower limbs for a few seconds or withdraws equally on both sides to pain.

— Unequal motor response: Patient *cannot* maintain equally on both sides the fixed posture, weakness is noted on one side or there is an unequal withdrawal to pain. Note side where withdrawal not as brisk.

III. Symptomatology

(1) Presenting symptoms (recurrence)	(2) New Symptoms
—Type	—Type
—Localization	—Localization
—Duration	—Duration
—Frequency	—Frequency

* The above symptoms and any remarks should be noted in the progress notes.

* Side of weakness should be identified by "R" or "L" on scoring sheet.
* On scoring sheet, modalities graded with different numerical values.

If patient stuporous or comatose, monitor progress with Section B.

Section B

Use Glasgow Coma Scale.

Qu'est-ce que BEST ?

BEST pour Belgian Screening Tools est le nom d'une étude réalisée par l'Université de Gand, service des Sciences Infirmières, à la demande du Service Public Fédéral de la Santé Publique, Sécurité Alimentaire et Environnement.

Objectif de BEST ?

Le but de ce projet est de construire une base de données contenant des instruments de mesures validés scientifiquement. Dans le but d'objectiver les diagnostics et résultats des interventions infirmières, des instruments de mesures fiables et valides doivent être disponibles pour démontrer l'efficience des soins infirmiers.

Notre attention se porte sur les instruments de mesure utilisables pour scorer les interventions infirmières du nouveau Résumé Infirmier Minimum ou DI-RHM.

Que pouvez-vous trouver dans ce rapport ?

Le rapport décrit les différents instruments de mesure. En plus, si nous en avons reçu l'autorisation des auteurs, l'instrument est mis à votre disposition. Les instruments de mesure présentant une fiabilité et une validité élevées ont également fait l'objet d'une traduction vers le néerlandais et le français.

Les chefs de projet UGent
Prof. dr. T. Defloor
Prof. dr. M. Grypdonck

Les collaborateurs du projet UGent
M. Daem
Dr. K. Vanderwee

Le chef de projet UCL
Dr. M. Gobert

Le collaborateur du projet UCL
C. Piron

Le chef de projet FOD
B. Folens

Le collaborateur du projet FOD
M. Lardennois

Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Spittaels, H., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Mettre à disposition une base de données d'instruments de mesure validés: le projet BEST. Bruxelles: Service Publique Fédéral Santé Publique, Sécurité de la Chaîne alimentaire et Environnement.