Supplemental materials 1

Questionnaire

"For each ICF category, please indicate on a scale of 1 (very inappropriate) to 9 (very appropriate) the appropriateness of the following three questions.
(1-3: not appropriate, 4-6: undecided, 7-9: appropriate)"

Questionnaire items

1) Appropriateness of ICF 43 category scoring descriptions.

2) Appropriateness of existing assessment batteries linked to each ICF categories.

3) Appropriateness of the scoring methods for each ICF categories linked to existing assessment.

b110: Consciousness function

General mental functions of the state of awareness and alertness, including the clarity and continuity of the wakeful state.

Inclusions: functions of the state, continuity, and quality of consciousness; loss of consciousness; coma, vegetative states, fugues, trance states, possession states, drug-induced altered consciousness, delirium, stupor

*Exclusions: orientation functions (**b114**); energy and drive functions (**b130**); sleep functions (**b134**)*

1) Appropriateness of b110: consciousness function scoring descriptions.

 Ratings

 0 No problem

  1 Mild problem: May include problems with consciousness functions that do not affect the patient's daily activities.

  2 Moderate problem: May include a problem with consciousness functions that exceeds 1, but remains a relatively minor problem (<50%).

  3 Severe problem: May include a major problem ($\geqq$50%) in consciousness functions.

  4 Complete problem: May include a complete problem with consciousness functions, such as coma.

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

2) Appropriateness of existing assessment batteries linked to b110: consciousness function

Existing assessment battery linked to b110 consciousness function: Japan Coma Scale

 Japan Coma Scale

JCS0 (alert)

JCS Ⅰ (not fully alert but awake without any stimuli)

 1: Almost clear consciousness, but not clear.

 2: Disorientation (not knowing places, times or dates)

 3: Cannot say his/her name or date of birth

JCS Ⅱ (arousable with stimulation)

10: Easy eye-opening with a normal call.

20: Eyes open with loud voice or body shaking

30: Eyes open by repeated calls with pain stimulus.

JCSⅢ(unarousable)

100: Movement to repel the pain stimulus.

200: Slight limb movement or frowning in response to the pain stimulus

300: Does not respond to pain stimulus

[Reference]

1. Ohta T, Waga S, Handa W, et al. New grading of level of disordered consiousness (author's transl). No shinkei geka. Neurol Surg 1974;2:623–7.

2. Ohta T, Kikuchi H, Hashi K, et al. Nizofenone administration in the acute stage following subarachnoid hemorrhage. Results of a multi-center controlled double-blind clinical study. J Neurosurg 1986;64:420–6.

3. Shigemori M, Abe T, Aruga T, et al. Guidelines for the Management of Severe Head Injury, 2nd edition guidelines from the Guidelines Committee on the Management of Severe Head Injury, the Japan Society of Neurotraumatology. Neurol Med Chir 2012;52:1–30

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

3) Appropriateness of the scoring methods for b110 consciousness function linked to Japan Coma Scale.

Ratings

0 No problem: JCS 0

1 Mild problem: JCSⅠ-1 ～ JCSⅠ-3

2 Moderate problem: JCSⅡ-10 ～ JCSⅡ-30

3 Severe problem: JCSⅢ-100 ～ JCSⅢ-200

4 Complete problem: JCSⅢ-300

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

b114: Orientation functions

General mental functions of knowing and ascertaining one's relation to time, to place, to self, to others, to objects, and to space.

Inclusions: functions of orientation to time, place and person; orientation to self and others; disorientation to time, place, and person

Exclusions: consciousness functions (b110); attention functions (b140); memory functions (b144)

1) Appropriateness of b114: Orientation functions scoring descriptions.

Ratings

0 No problem

1 Mild problem: May include problems with orientation functions that do not affect the patient's daily activities.

2 Moderate problem: May include a problem with orientation functions that exceeds 1, but remains a relatively minor problem (<50%).

3 Severe problem: May include a major problem ($\geqq$50%) in orientation functions.

4 Complete problem: May include a complete problem with orientation functions.

Answer: Please tick the number that best applies

Very inappropriate								Very appropriate
1	2	3	4	5	6	7	8	9

2) Appropriateness of existing assessment batteries linked to b114: Orientation functions

Existing assessment battery linked to b114: Orientation functions: Mini-Mental State Examination

Mini-Mental State Examination

Orientation: time

  Year, Month, Day, Date, Time: ___/5

Orientation: place

  Country, Town, District, Hospital, Ward: ___/5

[Reference]

1. Folstein MF, Folstein SE, McHugh PR. Mini-mental state. A practical method for grading the cognitive state of patients for the clinician. J. Psychiatry Res. 1975; 12: 189–198.

Supplemental material

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Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

3) Appropriateness of the scoring methods for b114: Orientation functions linked to Mini-Mental State Examination

Ratings

0 No problem: MMSE; orientation score 5 (Adopt low scores of time or place)

1 Mild problem: MMSE; orientation score 4 (Adopt low scores of time or place)

2 Moderate problem: MMSE; orientation score 3 (Adopt low scores of time or place)

3 Severe problem: MMSE; orientation score 2 (Adopt low scores of time or place)

4 Complete problem: MMSE; orientation score 1-0 (Adopt low scores of time or place)

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

[Reference]

Vriendt PD, Gorus E, Bautmans I, et al. Conversion of the Mini-Mental State Examination to the International Classification of Functioning, Disability and Health terminology and scoring system. Gerontology. 2012;58(2):112-9. doi: 10.1159/000330088.

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b130 Energy and drive functions (Mental functions that cause self-driven activities in daily life.**)**

General mental functions of physiological and psychological mechanisms that cause the individual to move towards satisfy specific needs and general goals in a persistent manner.

Inclusions: functions of energy level, motivation, appetites, craving (including craving for substances that can be abused), and impulse control

*Exclusions: consciousness functions (**b110**); temperament and personality functions (**b126**); sleep functions (**b134**); psychomotor functions (**b147**); emotional functions (**b152**)*

1) Appropriateness of b130 Energy and drive functions.

   Ratings

0 No problem

  1 Mild problem: May include problems with energy and drive functions that do not affect the patient's daily activities.

  2 Moderate problem: May include a problem with energy and drive functions that exceeds 1, but remains a relatively minor problem (<50%).

  3 Severe problem: May include a major problem ($\geqq$50%) in energy and drive functions.

  4 Complete problem: May include a complete problem with energy and drive functions, such as having no motivation or appetite any time.

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

2) Appropriateness of existing assessment batteries linked to b130 Energy and drive functions

Existing assessment battery linked to b130 Energy and drive functions: Vitality Index

   Vitality Index

1．Wake up	
Always waking up on time.	2
Sometimes they don't wake up unless you wake them up.	1
They never wake up on their own.	0
2．Communication	
Greet and talk to them yourself.	2
Responding to greetings and calls for help and smiles are observed.	1

No response.	0
3．Feeding	
Willing to eat on their own initiative	2
Attempts to eat when prompted	1
Lack of interest in eating, unwilling to eat at all	0
4．On and Off Toilet	
Always communicate bowel movements and urination on their own, or urinate and defecate on their own	2
Occasional urinary and bowel movements.	1
No interest in excretion at all.	0
5．Rehabilitation, Activity	
Go to rehabilitation on their own and seek out activities.	2
Participate in rehabilitation and activities when prompted	1
Rejection, indifference.	0
Total	/10

[Reference]

1. Kenji Toba, Ryuhei Nakai, Masahiro Akishita et al: Vitality Index as a useful tool to assess elderly with dementia. Geriatr Gerontol Int 2002; 2: 23-9.

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

3) Appropriateness of the scoring methods for b130 Energy and drive functions linked to Vitality Index

Ratings

0 No problem: Vitality Index; Total 10

1 Mild problem: Vitality Index; Total 9-7

2 Moderate problem: Vitality Index; Total 6-4

3 Severe problem: Vitality Index; Total 3-1

4 Complete problem: Vitality Index; Total 0

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

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b134 Sleep functions (Extent and frequency of the problem, such as shortage of sleep or irregular sleep schedules**)**

General mental functions of periodic, reversible and selective physical and mental disengagement from one's immediate environment accompanied by characteristic physiological changes.

Exclusions: Attention functions (b140), Consciousness functions (b110), Energy and drive functions (b130), Psychomotor functions (b147)

1) Appropriateness of b134 Sleep functions.

Ratings

0 No problem

1 Mild problem: May include problems with sleep that do not affect the patient's daily activities.

2 Moderate problem: May include a problem with sleep that exceeds 1, but remains a relatively minor problem (<50%).

3 Severe problem: May include a major problem ($\geqq$50%) in sleep.

4 Complete problem: May include a complete problem with sleep, such as being incapable of sleeping, or a complete day–night reversal every day.

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

2) Appropriateness of existing assessment batteries linked to b134 Sleep functions.

Existing assessment battery linked to b134 Sleep functions: Pittsburgh Sleep Quality Index

Prepared with reference to the Pittsburgh Sleep Quality Index.

1. Amount of sleep: During the past month, how hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed)	
Over 7 hours	0
6-7 hours	1
5-6 hours	2
Less than 5 hours	3
2. Onset of sleep: During the past month, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes	

Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3
3. Maintenance of sleep: During the past month, how often have you had trouble sleeping because you wake up in the middle of the night or early morning	
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3
4. Quality of sleep: During the past month, how would you rate your sleep quality overall?	
Very good	0
Fairly good	1
Fairly bad	2
Very bad	3

[Reference]

1. Buysse DJ, Reynolds CF, Charles F, et al (1989). The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. Psychiatry Research, 28 (2), 193–213.

2. Doi Y, Minowa M, Uchiyama M, et al. Psychometric assessment of subjective sleep quality using the Japanese version of the Pittsburgh Sleep Quality Index (PSQI-J) in psychiatric disordered and control subjects. Psychiatry Res. 2000 Dec 27;97(2-3):165-72. doi: 10.1016/s0165-1781(00)00232-8.

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

3) Appropriateness of the scoring methods for b134 Sleep functions linked to Pittsburgh Sleep Quality Index

Ratings

0 No problem: All items scored 0.

1 Mild problem: Lowest item scores 1

2 Moderate problem: Lowest item scores 2

3 Severe problem: Lowest item scores 3

4 Complete problem: Lowest item scores 1 and use of sleeping pills does not improve the problem

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

b164 Higher-level cognitive functions

Specific mental functions especially dependent on the frontal lobes of the brain, including complex goal-directed behaviours such as decision-making, abstract thinking, planning and carrying out plans, mental flexibility, and deciding which behaviours are appropriate under what circumstances; often called executive functions.

Inclusions: categorization, concept formation, cognitive flexibility

Exclusions: Calculation functions (b172), Memory functions (b144), Mental functions of language (b167), Thought functions (b160)

1) Appropriateness of b164 Higher-level cognitive functions.

 Ratings

 0 No problem

 1 Mild problem: May include problems with **higher-level cognitive functions** that do not affect the patient's daily activities.

 2 Moderate problem: May include a problem with **higher-level cognitive functions** that exceeds 1, but remains a relatively minor problem (<50%).

 3 Severe problem: May include a major problem ($\geqq 50\%$) in **higher-level cognitive functions**.

 4 Complete problem: May include a complete problem with **higher-level cognitive functions.**

 Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

2) Appropriateness of existing assessment batteries linked to b164 Higher-level cognitive functions.

Existing assessment battery linked to b164 Higher-level cognitive functions: Frontal Assessment Battery

 Frontal Assessment Battery

 [Reference]

1. Dubois B, Slachevsky A, Litvan I, et al. The FAB: a Frontal Assessment Battery at bedside. Neurology. 2000 Dec 12;55(11):1621-6. doi: 10.1212/wnl.55.11.1621.

2. Nakaaki S, Murata Y, Sato J, et al. Reliability and validity of the Japanese version of the

Frontal Assessment Battery in patients with the frontal variant of frontotemporal dementia. Psychiatry Clin Neurosci. 2007 Feb;61(1):78-83. doi: 10.1111/j.1440-1819.2007.01614.x.

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

3) Appropriateness of the scoring methods for b164 Higher-level cognitive functions linked to Frontal Assessment Battery

Ratings

0 No problem: FAB Total scores18-16

1 Mild problem: FAB Total scores15-14

2 Moderate problem: FAB Total scores13-9

3 Severe problem: FAB Total scores8-5

4 Complete problem: FAB Total scores4-0

Answer: Please tick the number that best applies

Very inappropriate							Very appropriate	
1	2	3	4	5	6	7	8	9

This is followed by questions on b410: Heart function, b415: Blood vessel function and others and a total of 43 ICF categories.