Addendum

Recovery Evaluating System: RES-5 (2008)

Medical rehabilitation of stroke patients was newly entried in the revised medical service fees in 2006. We revised RES-4, using data stored in RES database of Narugo Branch Hospital of Tohoku University and Nozomi Hospital from January 1984 to July 2007, the data utilized were those of the patients with the time since onset were below 161 days and Barthel Index score below 90.

Table 1　Characteristics of the patients in RES-5

Variables	Category	Number of subjects
Sex	male : female	658 : 477
Time since onset	0 : 1 : 2 : 3 : 4 : 5 *1	128 : 374 : 309 : 178 : 71 : 21
Operation	− : +	927 : 208
Attack number	1 : ≧ 2	868 : 267
Diagnosis	Cerebral hemorrhage Cerebral infarct Subarachnoid hemorrhage	420 669 46
Visual field defect	− : +	975 : 160
Ocular movement disorder	− : +	960 : 175
Nystagmus	− : +	1073 : 62
Aphasia	− : +	805 : 330
Flaccid *2	− : +	621 : 514
Spasticity	− : +	372 : 763
Exaggerated tendon reflex	− : +	125 : 1010
Pathological reflex	− : +	164 : 971
Paretic side	none : left : right : both	55 : 487 : 500 : 93
Sensory disturbance	− : +	230 : 905
Ataxia	− : +	868 : 267
Involuntary movements	− : +	1077 : 58
Bladder and/or bowel dysfunction	− : +	825 : 310
Cognitive disorders	− : +	589 : 546
Diabetes mellitus	− : +	864 : 271
Hypertension	− : +	332 : 803
Cardiac disease	− : +	857 : 278
Joint contracture	− : +	966 : 169

*1　0 = 0～4 weeks, 1 = 5～8 weeks, 2 = 9～12 weeks, 3 = 13～16 weeks, 4 = 17～20 weeks, 5 = 21～24 weeks

*2 added item in RES-5

Table 2　Demographic data of the patients in RES-5

Variables	Means ± S.D.
Age (years)	65.2 ± 10.8
Time since onset (weeks)	9.2 ± 4.7

Table 3　Functional status at set times

Functional measure	MOA	AMFS	BI	HDS-R	SLTA
Score range	0～72	0～100	0～100	0～30	0～100
at admission	17.0±11.3 (1132)	31.2±31.7 (1132)	42.0±25.2 (1047)	18.7±7.9 (1131)	42.3±31.0 (308)
4 weeks (after admission)	22.7±14.5 (1132)	37.9±33.7 (1132)	57.3±28.6 (1047)	20.1±7.6 (1131)	46.1±30.0 (174)
8 weeks (ibid)	24.6±15.4 (991)	37.6±33.4 (1001)	60.4±28.5 (843)	20.4±7.7 (974)	45.7±29.8 (149)
12 weeks (ibid)	24.1±14.8 (729)	35.7±32.7 (754)	62.5±27.9 (607)	20.6±7.6 (707)	49.1±29.9 (80)

Mean±S.D.　(　　) = n

Table 4　The variables of RES-5

Variables	Abbreviation	Code
Motor Age Test	MOA	0～72
Manual Function Test Score (affected side) *1	AMFS	0～100
Barthel Index	BI	0～100
Hasegawa's Dementia Scale - Revised	HDS-R	0～30
Standard Language Test of Aphasia	SLTA	0～100 (mean of five categories)
Age	AGE	(years)
Sex	SEX	male＝0, female＝1
Time since onset	TOA	0, 1, 2, 3, 4, 5 *2
Operation (brain-surgery)	OPE	none＝0, present＝1
Attack number	ATTACK	first time＝0, reattack＝1
Diagnosis Cerebral hemorrhage	ICH	none＝0, present＝1
Cerebral infarct	CI	none＝0, present＝1
Subarachnoid hemorrhage	SAH	none＝0, present＝1
Visual field defect	VF	none＝0, present＝1
Ocular movement disorder	OCULAR	none＝0, present＝1
Nystagmus	NYSTAG	none＝0, present＝1
Aphasia	APHASIA	none＝0, present＝1
Flaccid	FLACID	none＝0, present＝1
Spasticity	SPASTIC	none＝0, present＝1
Exaggerated tendon reflex	DTR	none＝0, present＝1
Pathological reflex	REFLEX	none＝0, present＝1
Left hemiplegia	LHEMI	none＝0, present＝1
Right hemiplegia	RHEMI	none＝0, present＝1
Double hemiplegia	DHEMI	none＝0, present＝1
Sensory disturbance	SENSORY	none＝0, present＝1
Ataxia	ATAXIA	none＝0, present＝1
Involuntary movements	INVOL	none＝0, present＝1
Bladder and/or bowel dysfunction	RECTO	none＝0, present＝1
Cognitive disorders	COGNT	none＝0, present＝1
Diabetes mellitus	DM	none＝0, present＝1
Hypertension	HT	none＝0, present＝1
Cardiac disease	CD	none＝0, present＝1
Joint contracture	CONTR	none＝0, present＝1

*1 In case of double hemiplesia: the score of the more affected side.

*2

0-4 weeks	TOA = 0	13-16 weeks	TOA = 3
5-8 weeks	TOA = 1	17-20 weeks	TOA = 4
9-12 weeks	TOA = 2	21-24 weeks	TOA = 5

Table 5　Equations for the prediction of functional status in RES-5

at 4 weeks

MOA1 ＝ 25.163＋0.990×MOA0－1.357×TOA－0.168×AGE－2.291×RECTO－2.013×DTR－1.904× ATTACK
－1.353× FLACID－1.597× COGNT－1.641× OCULAR－0.870×SEX－0.907×ICH—1.422× REFLEX
＋0.817×LHEMI
［n=1132, R=0.916, R^2=0.839］

AMFS1 ＝ 20.222＋1.009×AMFS0－1.816×TOA－2.61×COGNT－0.141×AGE＋2.29×SPASTIC
－1.781×ATTACK－1.736×SENSORY－1.821×OCULAR＋1.058×SEX－1.889×OPE＋2.813×SAH
［n=1132, R=0.969, R^2=0.939］

BI1 ＝53.609＋0.810×BI0－7.353×RECTO－2.259×TOA－0.243×AGE－4.433×COGNT
－3.702×OCULAR－3.360×FLACID－2.125×ATTACK－2.887×CONTR＋5.934×SAH
－3.120×VF＋1.838×APHASIA－1.789×SEX－2.514×REFLEX－3.135×DHEMI
［n=1047, R=0.920, R^2=0.846］

HDS-R1 ＝ 10.211＋0.695×HDS-R0－0.366×TOA＋1.432×SAH－0.560×COGNT－1.137×APHASIA
－0.032×AGE－0.540×ATTACK－0.625×REFLEX－0.538×OCULAR－0.504×VF
［n=1130, R=0.940, R^2=0.883］

SLTA1 ＝ 11.675＋0.951×SLTA0－1.246×TOA－3.301×RECTO－3.041×OPE－3.344×ATTACK
＋4.990×ATAXIA＋1.979×SEX
［n=174, R=0.978, R^2=0.956］

at 8 weeks

MOA2 ＝ 29.453 ＋1.028×MOA0－2.173×TOA－3.365×RECTO－0.181×AGE－2.475×ATTACK
－3.549×REFLEX－1.868×OCULAR－1.716×SEX－1.731×COGNT＋4.073×SAH
＋1.250×LHEMI＋1.280×CD－1.390×VF
［n=991, R=0.887, R^2=0.787］

AMFS2 ＝ 30.730＋1.001×AMFS0－2.332×TOA－3.748×COGNT－0.215×AGE＋2.714×SPASTIC
－2.699×SENSORY－2.451×ATTACK－2.505×OCULAR－2.981×OPE＋4.394×SAH
［n=1001, R=0.949, R^2=0.900］

BI2 ＝75.345＋0.715×BI0－9.821×RECTO－2.426×TOA－0.344×AGE－7.327×COGNT
－5.548×OCULAR－7.635×DHEMI－3.839×REFLEX＋3.447×APHASIA－3.603×VF
＋7.337×SAH－2.483×SEX－3.269×CONTR－2.391×FLACID
［n=843, R=0.886, R^2=0.786］

HDS-R2 ＝ 11.671＋0.671×HDS-R0－0.416×TOA＋2.059×SAH－1.343×APHASIA－0.642×COGNT
－0.039×AGE－0.602×VF－0.602×CONTR－0.541×ATTACK－0.433×FLACID
［n=974, R=0.931, R^2=0.867］

SLTA2 ＝ 14.400＋0.983×SLTA0－2.929×TOA＋4.341×SEX－3.765×FLACID＋3.255×OPE
［n=149, R=0.957, R^2=0.917］

at 12 weeks

MOA3 ＝ 26.752＋1.091×MOA0－2.191×TOA－4.216×RECTO－0.146×AGE－3.151×ATTACK
－3.117×OCULAR－2.008×SEX－2.615×REFLEX＋4.412×SAH＋1.553×CD
［n=729, R=0.864, R^2=0.747］

AMFS3 ＝ 37.027＋1.007×AMFS0－2.543×TOA－4.333×COGNT－0.267×AGE－2.975×OCULAR
－3.047×ATTACK－3.319×SENSORY＋2.272×SPASTIC－3.668×OPE＋5.963×SAH
［n=754, R=0.936, R^2=0.877］

BI3 ＝98.266＋0.669×BI0－8.579×RECTO－6.778×OCULAR－2.895×TOA－0.549×AGE
－6.860×COGNT－8.337×DHEMI－5.879×REFLEX－6.812×NYSTAG－4.334×VF
＋3.705×CD＋8.385×SAH－3.411×ATTACK－2.883×FLACID
［n=607, R=0.847, R^2=0.718］

HDS-R3 ＝ 13.849＋0.652×HDS-R0－0.515×TOA－0.992×VF＋2.109×SAH－0.998×COGNT
－1.248×APHASIA－0.046×AGE－1.051×REFLEX
［n=707, R=0.923, R^2=0.852］

SLTA3 ＝ 21.372＋0.956×SLTA0－4.263×TOA＋12.775×ATAXIA＋11.888×SAH－4.583×RECTO
［n=80, R=0.960, R^2=0.922］