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Geriatric Rehabilitation after stroke: Condition on admission indicative for discharge destination?

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Faculty disclosure
- There are no conflicts of interest
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Learner and session objectives
- to understand the way stroke care in the Netherlands is given
- to learn about geriatric stroke rehabilitation
- to learn about patient-grouping

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- 8 hospitals
- 1 Rehabilitation centre: specific stroke care unit
- 9 Nursing homes: specific stroke care units
- Community care: 1) nurses and 2) therapists

- Pathways
- Chain protocol
- Aim:

  To realize a high quality of life for every stroke patient in the Rotterdam area, according to the most recent (scientific) standards. Deliver excellent fitting care, on the right place, at the right moment and delivered by the most skilled professionals

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Geriatric Rehabilitation stroke

Target group

- Elderly
- Frail
- Multimorbidity
- Disability (multi- causal)
- Intervening disorders leading to adjustment of treatment and goals
- Lack of evidence
- After acute phase in hospital
- Specific rehabilitation unit: skilled nursing facility (SNF) in nursing home (n=15)

Nijmegen GRAMPS study

Geriatric Rehabilitation in AMPutation and Stroke

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Aim of this study

- Expectation number of patients with stroke will rise in the future
- Because of the ageing of the population
- Growing demand for rehabilitation services

The aim of this study was:

To investigate the condition on admission of patients after a stroke and the course of their rehabilitation.

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My grandmother

My grandmother suffered a severe stroke at the age of 88 years. She had hemianopsia, aphasia and left side hemiplegia with unilateral neglect. The physiatrist (rehabilitation specialist) in the hospital told us that she was going to be referred to a specialized rehabilitation unit in a nursing home. But he expected that she would not be able to go back home and probably would be referred permanently to a unit for long-term care in a nursing home. And I said “well, we shall see….!”

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Identifying patients on basis of data on admission: cluster analysis

- Identifying patient-groups with stroke on basis of data on admission: functional abillities, balance, behaviour

- Explore what the course is of sub-groups during rehabilitation and discover the reasons for discharge or long stay admission

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Methods

- Longitudinal, multicenter, observational study
- Data collection on admission and discharge:
  - Patient characteristics
  - Comorbidity (Charlson Index)
  - ADL (Barthel Index)
  - Arm function (Frenchay Arm Test)
  - Balance (Berg Balance Scale)
  - Walking (FAC score)
  - Neuropsychiatric symptoms (Neuropsychiatric Inventory: Nursing Home)
  - Depression (Geriatric Depression Scale)

- Cluster-analysis was used to reveal meaningful groups

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Results 1

- n=127
- A total of 66% was discharged, 34% was referred for long-term care
- Two groups of patients
- Cluster 1 $n = 52$ (40.9%)
- Cluster 2 $n = 75$ (59.1%)
- Cluster 1 : poor condition on admission
- Cluster 2: fair/good condition on admission

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Results 2

- Patients in both groups improved in balance, walking abilities and ADL
- Patients in cluster 1 (poor condition) improved also in hand function
- Patients in cluster 1 (poor condition) who were discharged: less depression
- Patients in cluster 2 (good condition): 80% of the patients were discharged
- Patients in cluster 1 (poor condition): 46% of the patients were discharged

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Sample and clusters

Table 1 Description sample and clusters

Variable	Total sample Median (IQR) n = 127	%	Cluster 1 (poor) Median (IQR) n = 52	%	Cluster 2 (good) Median (IQR) n = 75	%	Significant difference between clusters
Berg Balance Scale (range 0–56)	31 (5, 46)		3 (0, 17)		44 (33, 50)		**
Functional Ambulation Categories (range 0–5)	3 (0, 4)		0 (0, 2)		4 (3, 4)		**
Barthel Index (range 0–20)	12 (6, 16)		5 (2, 9)		14 (13, 18)		**
Frenchay Arm Test (range 0–5)	4 (1, 5)		1 (0, 4)		5 (4, 5)		**
Charlson Index (range 0–27)	2 (1, 3)		3 (2, 3)		2 (1, 2)		**
Global Depression Scale (range 0–8)	1 (0, 3)		2 (1, 4)		1 (0, 2)		**
Neuropsychiatric Inventory: Nursing Home version (range 0–144)	0 (0, 5)		4 (0, 12)		0 (0, 2)		**
Gender: male		48		35		57	*
Localization of stroke on right		58		65		54	
Ischemic stroke		85		90		81	
First stroke		83		87		80	
Age (years)	80 (76, 85)		81 (76, 86)		79 (76, 85)		

Cluster 2 $n = 75$ (59.1% of the patients).
Cluster 1 $n = 52$ (40.9% of the patients).
Asterisks indicate significant differences between groups Mann–Whitney-*U* Test and Chi-squared Test (**$p < 0.01$, *$p < 0.05$).
Variables that best separate are at the top of the table and descending.

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Course of rehabilitation

Table 2 Changes in scores between admission and discharge

Variables		Cluster 1 (poor) median (IQR)		Cluster 2 (good) median (IQR)		Cluster 1 (poor) Discharged median (IQR)		Cluster 1 (poor) Long Term Care median (IQR)		Cluster 2 (good) Discharged median (IQR)		Cluster 2 (good) Long Term Care median (IQR)
BI admission (ADL)	n = 52	5 (2, 9)	n = 75	14 (13, 18)	n = 24	6 (3, 10)	n = 28	4 (2, 7)	n = 60	15 (13, 18)	n = 15	13 (11, 17)
BI discharge	n = 41	11 (6, 15)**	n = 70	18 (16, 20)**	n = 23	14 (13, 16)**	n = 18	5 (3, 9)	n = 60	19 (17, 20)**	n = 10	10 (5, 13)
BBS admission (balance)	n = 52	3 (0, 17)	n = 75	44 (33, 50)	n = 24	9 (1, 25)	n = 28	2 (0, 4)	n = 60	44 (35, 50)	n = 15	35 (27, 47)
BBS discharge	n = 39	28 (3, 39)**	n = 66	48 (41, 52)**	n = 22	38 (28, 45)**	n = 17	3 (0, 15)*	n = 56	49 (44, 52)**	n = 10	26 (17, 53)
FAC admission (walking ability)	n = 52	0 (0, 2)	n = 75	4 (3, 4)	n = 24	0 (0, 2)	n = 28	0 (0, 1)	n = 60	4 (3, 4)	n = 15	3 (3, 4)
FAC discharge	n = 39	3 (0, 4)**	n = 69	5 (4, 5)**	n = 22	4 (3, 4)**	n = 17	0 (0, 2)	n = 58	5 (4, 5)**	n = 11	3 (3, 5)
FAT admission (arm function)	n = 52	1 (0, 4)	n = 75	5 (4, 5)	n = 24	1 (0, 3)	n = 28	1 (0, 5)	n = 60	5 (4, 5)	n = 15	5 (4, 5)
FAT discharge	n = 38	1 (0, 5)*	n = 65	5 (5, 5)	n = 21	3 (0, 5)**	n = 17	0 (0, 4)	n = 57	5 (5, 5)*	n = 8	5 (1, 5)
GDS-8 admission (depressive complaints)	n = 52	2 (1, 4)	n = 75	1 (0, 2)	n = 24	1 (0, 4)	n = 28	2 (1, 5)	n = 60	0 (0, 1)	n = 15	1 (0, 2)
GDS-8 discharge	n = 35	1 (0, 2)	n = 61	0 (0, 1)	n = 20	1 (0, 2)**	n = 15	1 (0, 4)	n = 54	0 (0, 0)	n = 7	4 (1, 5)
NPI-NH admission (neuropsychiatric symptoms)	n = 52	4 (0, 12)	n = 75	0 (0, 2)	n = 24	2 (0, 8)	n = 28	7 (0, 18)	n = 60	0 (0, 1)	n = 15	0 (0, 4)
NPI-NH discharge	n = 40	0 (0, 6)	n = 70	0 (0, 1)	n = 22	0 (0, 1)**	n = 18	4 (0, 15)	n = 60	0 (0, 0)	n = 10	2 (0, 7)

Asterisks indicate significant changes between admission and discharge within the four groups, Wilcoxon Signed- Rank Test (**$p < 0.01$, *$p < 0.05$).
BI: Barthel Index (range 0–20).
BBS: Berg balance Scale (range 0–56).
FAC: Functional Ambulation Categories (range 0–5).
FAT: Frenchay Activities Index (range 0–5).
GDS-8: geriatric Depression Scale (range 0–8).
NPI-NH: NeuroPsychiatric Inventory Nursing Home version (range 0–144).

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Discussion/Conclusion

- Cluster-analysis seems meaningfull
- Expectation that patients in poor condition on admission are referred to a long stay ward
- Certainly not for all patients!
- Almost half of them could be discharged back home!
- Other studies: patients in good condition on admission receive more therapy
- Which patients need more therapy?

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My grandmother

My grandmother was very motivated to comply with her low intensity rehabilitation program. What she wanted the most was to go back home. Fortunately, after four months rehabilitation in the skilled nursing facility, my grandmother was discharged home. She was not able to walk anymore, but used her wheelchair quite easily. Her hand- and arm function restored not completely, but she managed herself in daily life through compensation strategies. In her wheelchair she was able to do her shopping in the grocery store in the building she was living in. Communicating with her was like playing a word game that resulted in guessing and sometimes laughing until we found the right word.

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We were happy she was able to live her life independently, and that she could maintain a relatively good quality of life.

Until she died in her sleep, 2 years after she suffered a stroke.