Symptom Clusters of Stroke Patients by Rehabilitation Stages

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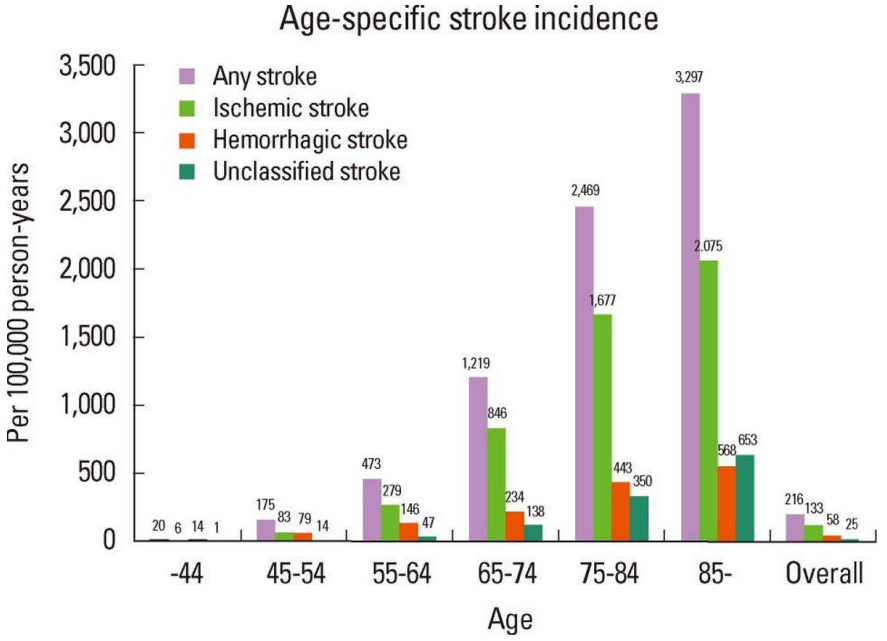
Stroke Statistics

- About 16 billion people were diagnosed with stroke every year and up to 6 billion deaths from stroke over the world (Strong et al, 2007).

- About 105,000 Korean people experience a new or recurrent stroke every year; prevalence = 795,000 in people aged older than 30 years
- The second leading cause of death in Korea; mortality rate = 53.2 per 1000,000 individuals



Retrieved from Hong et al (2013)

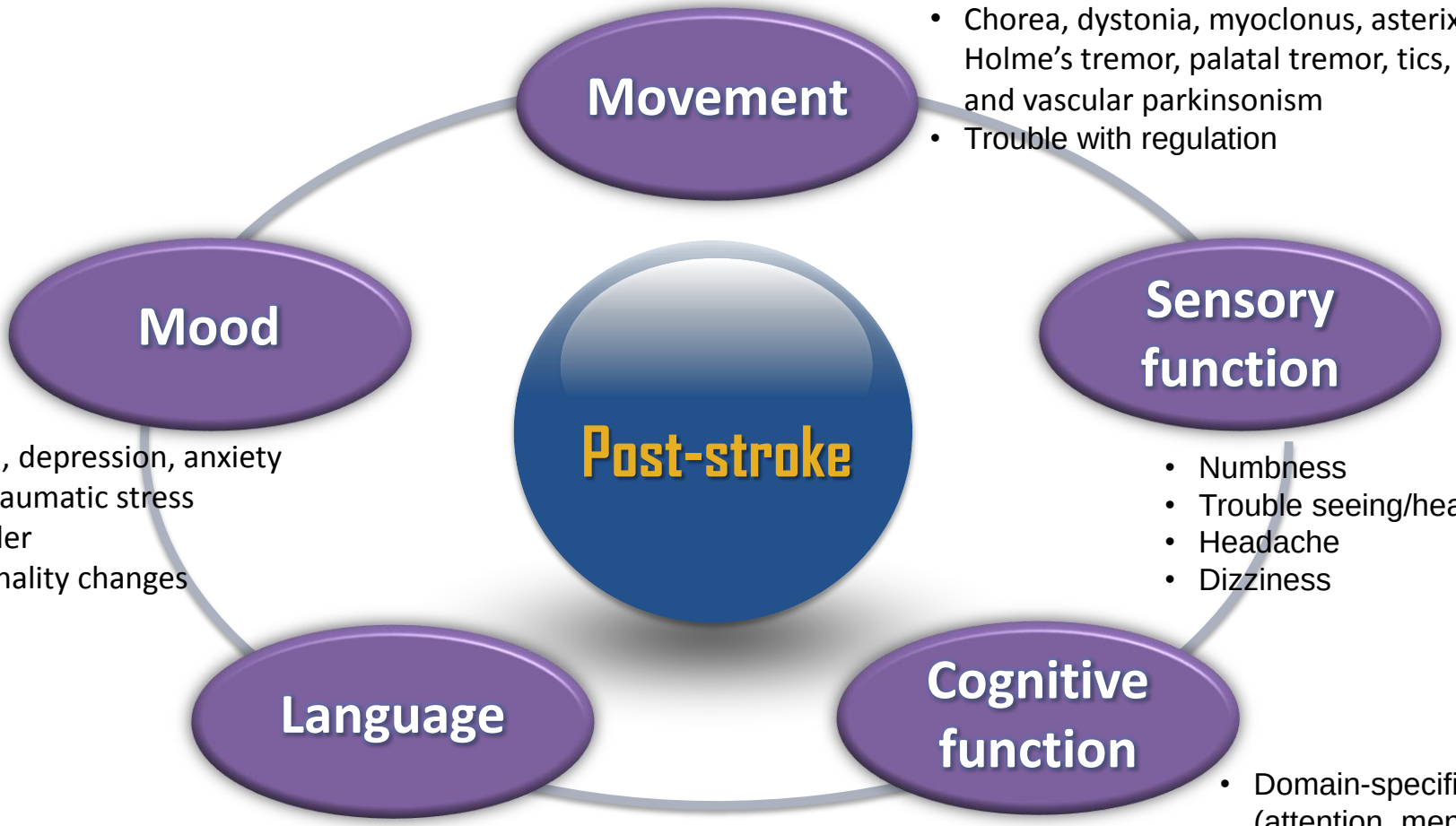
Hong et al , 2013;Strong et al, 2007;

Impact of Stroke

- stroke survivors with persisting deficits showed impaired health-related quality of life (Adamit et al, 2015). The most frequent problems were related to mobility and pain/discomfort (Min & Min, 2015).
- Disability after stroke is an important burden to patients, their family, and society. Disability-adjusted life year lost due to stroke. Direct and indirect cost for stroke care = $3.3 billion in 2005 (Hong et al, 2013).

Adamit et al, 2015; Hong et al. 2013; Jokinen et al, 2015; Min & Min, 2015

Post-stroke Symptoms



- Chorea, dystonia, myoclonus, asterixis, Holme's tremor, palatal tremor, tics, and vascular parkinsonism
- Trouble with regulation

- Mania, depression, anxiety
- Posttraumatic stress disorder
- Personality changes

- Numbness
- Trouble seeing/hearing
- Headache
- Dizziness

- Difficulties in reading & writing
- Phonological disorders, lexical sematic impairments, and syntactic impairments

- Domain-specific (attention, mental speed, memory)
- Global deficits in multiple domains

Movement

- Occurs uncommonly after stroke and tend to resolve over time, depending on the lesions, type, and size of stroke
- The frequency of movement disorders is unclear; however, this was reported with a range of 1% to 3.7% of stroke patients and survivors
- Includes chorea, dystonia, myoclonus, asterixis, Holme's tremor, palatal tremor, tics, and vascular parkinsonism after stroke or in delayed setting or in progressive conditions
- The time course for the development of movement problems varies depending on a type of problems

Bansil et al, 2012; Siniscalchi et al, 2012

Sensory Function

- Making sense of sensory impairment
  - Insight and understanding
  - Articulating lived experience
- Interplay of sensory impairment in performing basic tasks
  - Describing sensory impairment in terms of functional impairment
  - Associating physiotherapy with motor recovery and lower limb
  - Perseverance versus learned non-use
  - Pragmatic approach to adaptations

Connell et al, 2014

Cognitive Function

- Neuropsychological problems versus cognitive complaints
  - No explicit definition for patient-reported impairment
  - Various prevalence of objective and subjective cognitive dysfunction
    - Deficits can manifest in the areas of attention, memory, working memory, spatial abilities, verbal abilities, and executive function.
    - 28.6% - 92.0% with subjective impairment about memory, mental speed, and concentration from 1 month to 54 months after stroke.

- Typically mild and "hidden" which increases the difficulty of identifying them unless specifically examine.
- Linked with language function and mood changes (i.e., worry, depression, and irritation)

Adamit et al, 2015; Rijsbergen et al, 2014

Language

- Perceived difficulties in reading, writing, and speaking
- Includes phonological disorders, lexical sematic impairments, and syntactic impairments --- show substantial recovery in the first few months following a stroke

- How to recover …
  - Truly due to reorganization of language abilities to other functionally capable regions
  - Due to utilization of abnormal cognitive strategies

Kiran, 2012

Mood

- Approximately 20 -30% of patients were experienced
- Emotional impairment after stroke includes poststroke mania, poststroke depression, poststoke anxiety disorders, posttraumatic stress disorder, personality changes with focus on apathy and disturbances of emotional expression control
- Some patients recover spontaneously but symptoms may persist in subset of patients related to lesions in the anterior parts of the left hemisphere

Ferro etal, 2009; Fure, 2007; Kiran, 2012, Murray & Martensson, 2004

Unanswered questions

- What are patients' perspectives on post-stroke symptom trajectory in terms of frequency, severity, and impact on their everyday activities over time?
- How can we select valid instruments that would be consistent with patients' symptom experiences?

Study Purpose

To explore specific post-stroke symptoms of stroke survivors to deeply understand them according to their rehabilitation stages of acute, sub-acute, and chronic conditions

Data Collection

- Semi-structured interviews which was developed with the guideline of accurately assessing symptom burden
- The question was flexible, opened-ended
- The interviews which were carried out by the principle investigator and research assistants and took about one hour and were audio-taped using recording equipment

Open-ended Questions

- During the past month, what kind of symptoms do you experience?
- How much have your symptoms affected your daily activities?

Sample Characteristics

Characteristics	0 – 3 months (n = 7)	4 – 6 months (n = 4)	7 – 12 months (n = 7)	13 – 24 months (n = 5)	After 24 moths (n = 4)
Gender					
Male	5	2	1	2	2
Female	2	2	6	3	2
Age	55 (40 – 73)	69 (53 – 82)	60 (46 – 74)	60 (40 – 80)	63 (56 – 75)
Education					
1					
2					
3					
4					
5					
Type					
Bleeding	4	3	7	1	2
Infarction	3	1	0	4	2
Side					
Left	3	0	4	3	1
Right	4	4	3	2	3
Comorbidity					
Hypertension	4	1	4	2	3
Diabetes	2	0	1	1	1
Cardiac problems	1	0	0	0	2

Data Analysis

- Qualitative content analysis was used to analyze the data from each interviewee.
- All interviews were audio-recoded and transcribed
- Each transcript was independently coded by two researchers and codes were compared
- Themes that emerged from the data were organized to develop a conceptual model of post-stroke symptom burden; The first transcript was read a number of times making a note of significant pieces of text; The transcript was then re-read transforming these initial notes into emergent themes

Frequency of symptom categories

Symptom category	0 – 3 months (n = 7)	4 – 6 months (n = 4)	7 – 12 months (n = 7)	13 – 24 months (n = 5)	After 24 moths (n = 4)
Movement	7 (100)	4 (100)	7 (100)	4 (80)	3 (75)
Sensory function	7 (100)	4 (100)	7 (100)	4 (80)	4 (100)
Mood	6 (86)	3 (75)	7 (100)	3 (60)	3 (75)
Cognitive function	4 (57)	4 (100)	5 (71)	5 (100)	1 (25)
Language	3 (43)	2 (50)	3 (43)	2 (40)	0 (0)

- Impairment in movement, sensation, and mood still persisted over time while cognitive and language-associated dysfunction were alleviated two years after their diagnosis.

Description of symptom categories

- **Movement**
  - Difficulties in walking, lifting arms, chewing food, bending and stretching out fingers
  - Mobility problems due to
    - Time dependent stiffness
    - Extra burden related to a leg with paralysis, such as a sense of heaviness, perceived feebleness

Patient responses:

"I feel stiffness in the morning when I get up… However, I continue my routine exercise…so I think no injection to treat pain is needed…"

"I feel like… carrying a heavy sack of rice on my left leg all the time [Her left leg was paralyzed]… Even when I sit still in the chair or am in bed, I feel heaviness. It was the most agonizing symptom."

Description of symptom categories

- **Sensory function**
  - Changes in sensation:
    - absence of sensation, dull sense
    - Itching or burning sensation, a sense of tearing at flesh
    - Hyperstimulation on the paralyzed site of the body i.e., severe pain when touching something cold
  - Articulating sensory impairment in performing tasks which require sensory information, in terms of losses of visual, thermal, and taste senses

Patient responses:

"My pain is almost uncontrollable… I feel a burning sensation in my left leg… feel like a sense of tearing at flesh… A stinging pain moves around my leg and face."

"After stroke, my sensation changed… I cannot feel temperature change… however, I become very sensitive to touch especially something cold, leading to feeling a nip in the cold air"

"When something even gazes my skin, I have unbearable pain… like pricking the skin with a awl… even when taking a shower"

"I lose my palate… so I had trouble in serving meals to my family"

Differences in perceiving symptoms

- **Cognitive Function**
  - Difficulties in understanding what I've seen or heard
  - Uncontrolled mind wandering
  - Domain-specific cognitive complaints: attention, speed in cognitive processing, face recognition, calculation, comprehension, time recognition

Patient responses:

"I have short-term memory problems… such as when to take medication, names of others that I knew before… However, I think it's getting better."

"Although I watch TV drama, I cannot understand from time to time and remember what I've seen…"

"My forgetfulness is out of my control."

"I cannot control day dreaming"

Differences in perceiving symptoms

- **Language**
  - Frequently reported in survivors with a left-side stroke
  - Closely linked with cognitive function and muscle movement
- **Mood**
  - hot-temper, anger, lowered stress threshold
  - Depression, hopelessness, sense of shame, endless despair, suicidal thinking
  - Being unable to control their emotions
  - Perceived shortage of abilities to cope

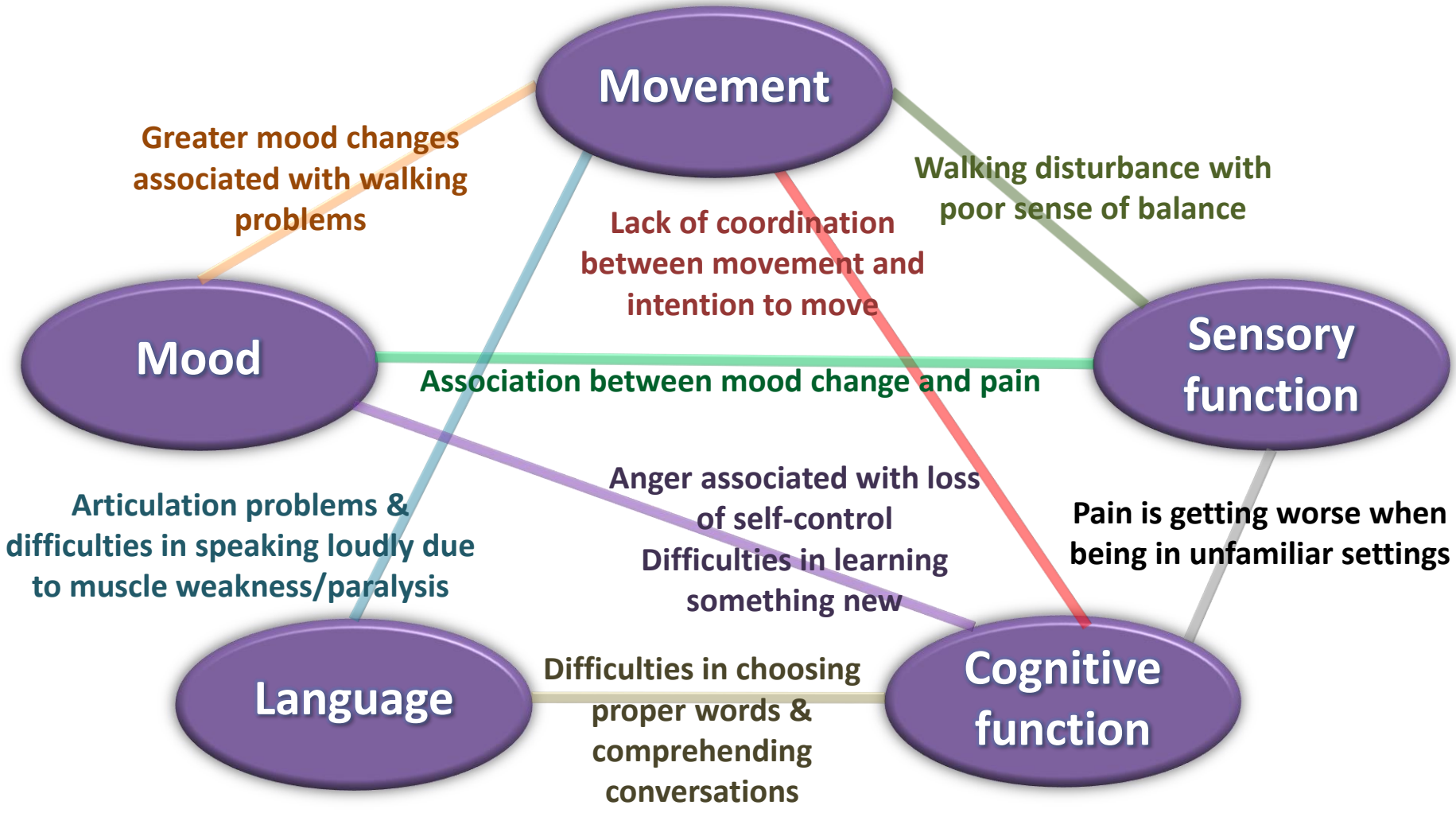
Patient responses:

"My tongue wasn't often in accordance with my thought… because I cannot speak as I think"

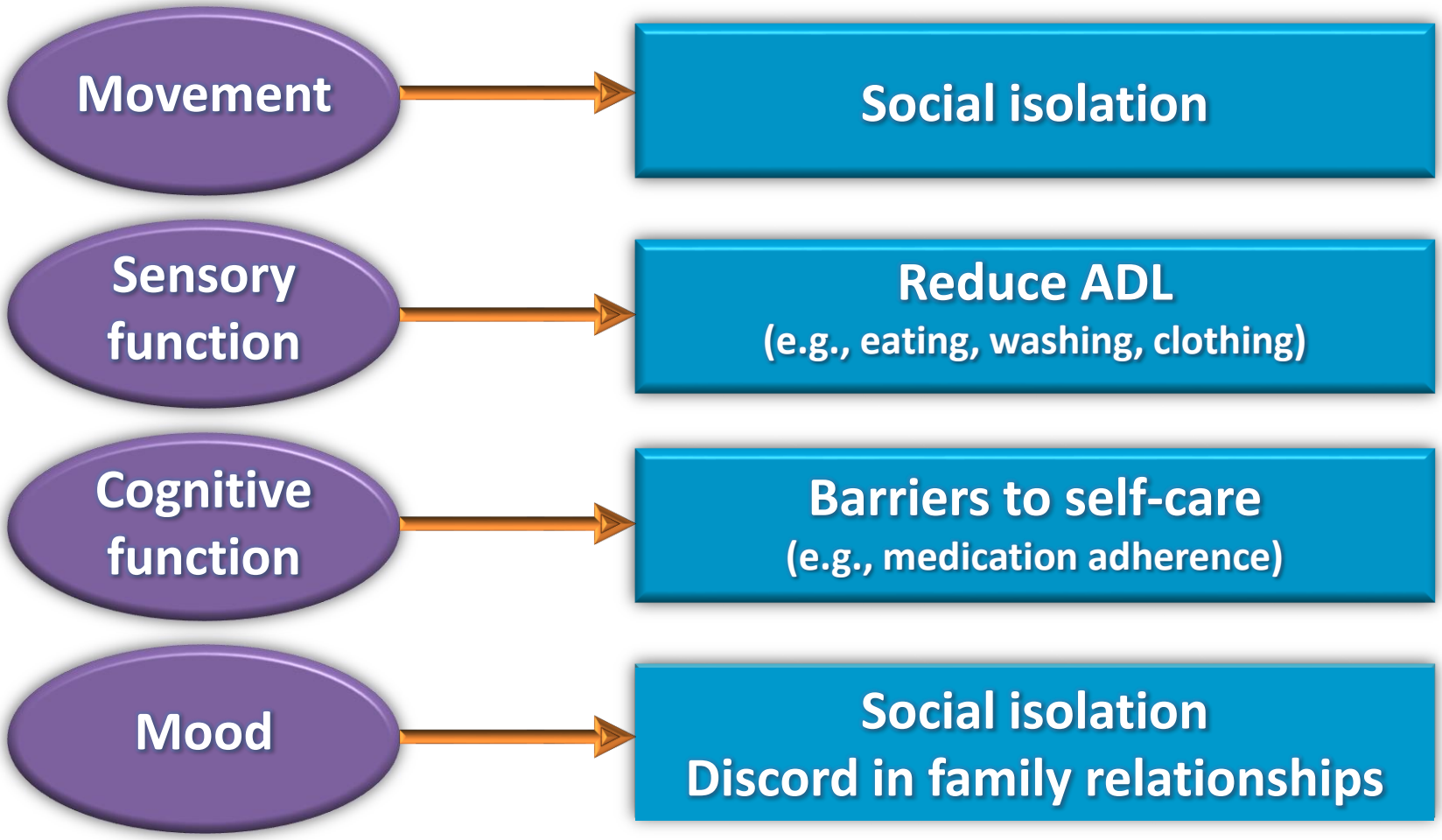
"Severe depression might occur recently… It is not rare to me... When I was hospitalized to treat stroke, I suffered from illness of mind. As time passed, the fact that I could not walk by myself drove me nuts… like panic disorder. It was extremely serious and made me want to die "

"I think I was fully in control of my emotion before stroke. Now I cannot stand for something that I let go before… very stressed out… depressed… mood changed after stroke"

Connectedness among symptoms



Consequences of symptom distress



Summary

- Except for language dysfunction associated with the effect of stroke in the left hemisphere, patterns of symptom experiences was not related with gender, age, having a job before stroke diagnosis, and region of injury (not shown).

- Impairment in movement, sensation, and mood still persisted over time while cognitive and language-associated dysfunction were alleviated two years after their diagnosis.

- We found interesting connection among symptoms. Movement disorder was closely linked to sensory, cognitive, and emotional problems. However, language problems were connected with cognitive and mobility problems.

Summary

- Each symptom categories showed distinctive impacts on daily lives although there seemed to be slightly shared consequences among symptom categories.

- Our increased knowledge of poststroke symptom may contribute to a better understanding of patient's perspective on symptom distress, improve communication between healthcare professionals, patients, and caregivers, and establish multidisciplinary collaboration for therapeutic management that meets the needs of the patients.