Considerations for Establishing Community Liaison for Stroke: From a rehabilitation perspective

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Abstract

Each stage of stoke requires different approach in treatment. In the acute phase, treatment is centered on the "disease" itself according to the critical path specific to the disease. In the convalescent phase, treatment is centered on the "impairments" through rehabilitation programs to treat functional impairments such as motor paralysis and aphasia as well as disability in walking and activities of daily living (ADL). In the chronic phase, the focus is on the "life quality," and patients receive disease management mainly from primary care physicians to prevent the recurrence of stroke and to control comorbidities, while taking advantages of social welfare services and undergoing rehabilitation management that aims at preventing the deterioration of walking ability and ADL. Since the approach to stroke patients shifts from "disease" to "impairment" and then to "life quality" according to the disease stage, therefore, it is necessary to formulate a system that facilitate appropriate treatment and care across disease stages with mutual understanding and consent among involved parties. Such system will entail close collaborative relationships among the various care facilities to share awareness, information, assessment procedures, etc., and should provide rational explanations to patients and their families who transfer from one facility to another. In this regard, a community liaison path can serve as a tool to smoothly connect various facilities designed for particular stages of disease. This paper describes the concept of a community liaison path for stroke from a perspective of rehabilitation medicine.

Key words Overview path, Database, Activities of daily living (ADL), Functional impairment

Introduction

To overcome issues accompanying the functional differentiation of medical facilities, it is important to establish a smooth system of treatment and care for stroke patients, and a community liaison path (or pathway) for stroke serves as a tool for that purpose. When treating a stroke patient, the focus of attention changes from the "disease" itself of the patient to the "impairment," and then to the "life quality," meaning that different approaches are required as the disease stage changes. This fact calls for ideas to link the treatment and care needed in acute, convalescent, and chronic phases in a smooth and uninterrupted manner. Below, a community liaison path for stroke will be described from the perspective of rehabilitation medicine.

The Flow of Stroke Care and the Need for a Liaison Path

Figure 1 shows the flow of stroke care from the rehabilitation viewpoint.[1] Patients admitted to acute hospitals undergo specialized treatment of the organ and, in parallel, rehabilitation proce-

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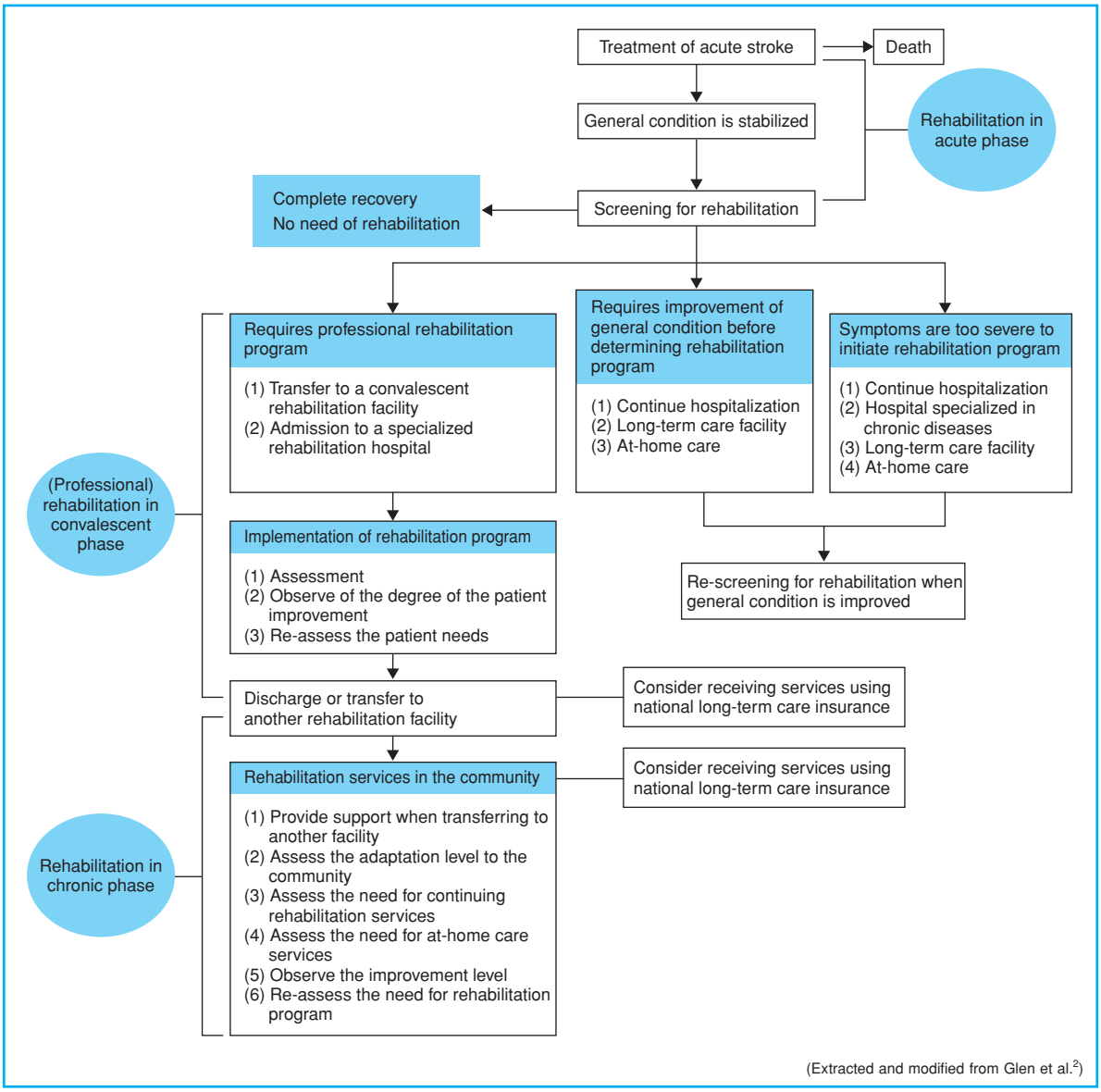


Fig. 1 Flow of rehabilitation for a stroke patient

dures aimed at functional restoration and prevention of disuse syndrome and complications. At the end of the acute phase, patients are discharged to their home if they have recovered sufficiently that rehabilitation programs are no longer necessary. If the patient's general condition is unstable or if symptoms are too severe, the patient may remain in hospital or be transferred to facilities designed for the chronic phase. On the other hand, when professional rehabilitation programs are deemed necessary, the patients undergo intensive rehabilitation programs in convalescent rehabilitation facilities* to improve remaining impairments and to be able to return home eventually. In the Japanese healthcare system, the criteria for admission of patients to convalescent rehabilitation facilities apply to patients within 2 months after onset.

After intensive in-hospital rehabilitation programs, patients may: (1) return home, (2) be

admitted to healthcare facilities for the elderly and then return home, or (3) be admitted to long-term care facilities or other facilities. Patients who return home are to undergo rehabilitation programs to maintain or improve their performance in activities of daily living (ADL), while taking advantages of the services available through national long-term care insurance (and possibly using individually purchased insurance plans). When using insurance, such rehabilitation programs are available mainly through two means; one is to use outpatient hospitals/clinics or at home with visiting healthcare staff (but within certain period of time since onset and up to limited number of times), and the other is to use ambulatory or at-home rehabilitation or care services as needed.

As described above, because proper care for stroke patients requires different treatment approaches for each disease stage (acute, convalescent, or chronic phase), functional differentiation of medical facilities is inevitable for the efficient operation of human and material resources including medical staff and equipment.[2] However, transfer to another ward or hospital places a large burden on patients and their families. In addition, patients may have to be electively admitted for a prolonged time when the next receiving facilities cannot be found, which becomes a problem in hospital management. From the medical aspect, lack of sufficient rehabilitation before transfer to another facility can result in so-called disuse syndrome. There is also a possibility that poor communication of patient information between hospitals leads various problems.

To overcome these issues accompanying the functional differentiation of medical facilities, it is necessary to enhance cooperation among facilities and to establish a healthcare system in which smooth and uninterrupted stroke care is provided. In other words, it is crucial to facilitate close cooperation among the various care facilities, share awareness, information, and assessment procedures, and provide rational explanations to patients and their families for frequent transfers in order to formulate a system that allows patients to receive treatment and care with understanding and consent. In this regard, a community healthcare liaison path can serve as a tool to smoothly link various medical and care facilities designed for particular stages of stoke.

Characteristics of Disease-Stage Specific Healthcare Plans

The existing liaison path for femoral neck fracture enables patients to stay in one path from beginning to end, from the time of injury to hospital admission, implementation of surgery, transfer to another ward/facility, implementation of rehabilitation programs, and eventually discharge to home.

For stroke patients, on the other hand, various liaison systems have been developed in many parts of the nation to meet their local healthcare requirements, however, there is no unified model that can serve as a template as of yet. The difficulty in producing a liaison path for stroke lies in the fact that the variety of approaches are required to treat stroke patients in relation to their disease stages.

In the acute phase, treatment is focused on the primary disease, stroke, and patients are treated according to the disease-specific clinical path that describes the flow of acute care, such as assessment of the patient's general condition and intravenous infusion management. In the convalescent phase,** on the other hand, the focus is on treating functional impairment such as motor paralysis and aphasia as well as disabilities in walking and ADL, and patients receive rehabilitation programs that are prescribed based on medical assessment. Thus, the key in the acute stage is "disease," while it is "impairment" in the convalescent phase.

In the chronic phase, the key becomes the "life quality" of the patients. In this stage, the patient's primary care physician and other healthcare professionals work on rehabilitation management to deal with prevention of the recurrence of the primary disease, control of comorbidities, and prevent deterioration of walking ability and ADL.[3]

Because the focus of approach in stroke care shifts from "disease" to "impairment" and then to "life quality" according to disease stages, making a clinical liaison path in a single temporal sequence as in the femoral neck fracture care is not possible. Instead, liaison paths in which convalescent rehabilitation facilities that bridge acute-stage care and maintenance-stage care play the central role are being established and operated in various communities. In this system, facilities are connected through the achievement degree of the rehabilitation program, with ADL

Table 1 Barthel Index

Activity	Score
Feeding	0, 5, 10
Bathing	0, 5
Grooming	0, 5
Dressing	0, 5, 10
Bowels	0, 5, 10
Bladder	0, 5, 10
Toilet use	0, 5, 10
Transfers (bed to chair and back)	0, 5, 10, 15
Mobility (on level surfaces)	0, 5, 10, 15
Stairs	0, 5, 10
Total	100 points (complete independence)

Table 2 FIM™

Evaluation items	
Movements	
Self-care	Eating Grooming Dressing (upper body)
Bladder/bowel control (sphincters)	Bladder management Bowel management
Mobility (Transfers)	Bed/chair/wheel chair Toilet Bathtub/shower
Mobility (Locomotion)	Walking/wheel chair Stairs
Cognition	
Communication	Comprehension Expression
Social cognition	Social interaction Problem solving Memory

Scoring standards	
No assistance required	7 points: Complete independence 6 points: Modified independence
Assistance required	5 points: Supervision/standby assistance 4 points: Minimal assistance 3 points: Moderate assistance 2 points: Maximal assistance 1 point: Total assistance

and mobility capability as a common language. Such system represents a desirable form of liaison path for stroke.[4,5]

Assessment of ADL

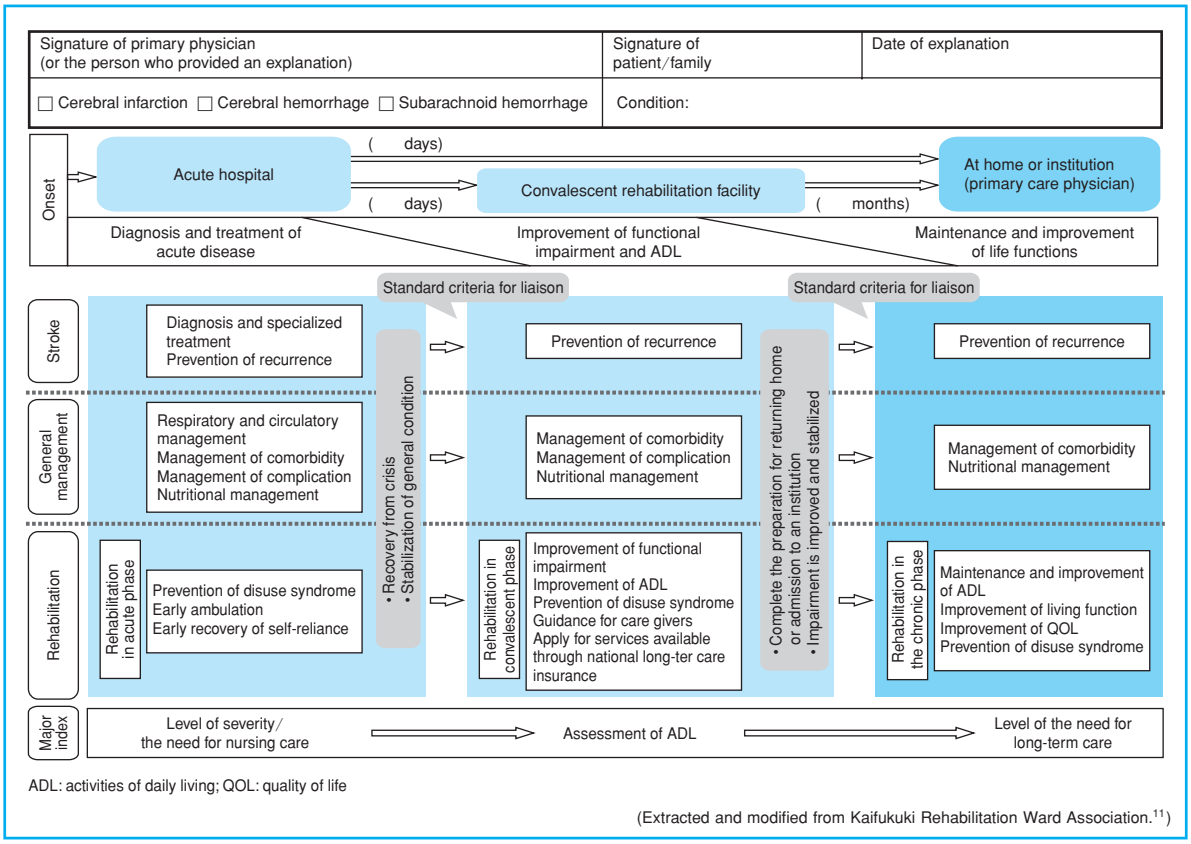
The ultimate goal of stroke care is to improve the patient's disability (activity limitations) like ADL as far as possible and to improve the quality of life (QOL). As mentioned previously, the ADL assessment serves as a common language that bridges the acute, convalescent, and chronic phases, and therefore the use of a standardized rating scale is essential.

One of the oldest rating scales for ADL is Rankin Scale, developed in the 1950s. The modified Rankin Scale (mRS)[6] is still used widely in clinical studies as a rating scale for the treatment of acute stroke. Developed in the 1960s, Barthel Index[7] is also commonly used as a simple rating scale for ADL (**Table 1**) even today.

In the 1980s, the American Congress of Rehabilitation Medicine and the American Academy of Physical Medicine and Rehabilitation led the discussion of requirements for the standard ADL rating scale, from which FIM™ (Functional Independence Measure) was developed.[8,9] At present, FIM™, now being used in many countries, is the international standard of the ADL rating scale (**Table 2**). FIM™ aims to measure the quantity of required care in order to assess the "actual ADL," namely, the activities that a patient is actually undertaking. More specifically, how a patient does ADL in daily life is rated through observation. Although the rater should be familiar with the basic principles and assessment procedures of FIM™, no special training or quantification is required. In the future, the application of FIM™ is expected to progress internationally—, for example, formulating an international database on stroke rehabilitation using FIM™ or international comparative studies of expected prognosis and treatment efficacy evaluation.[10]

Overall Concept of Liaison Path for Stroke[3]

The formation of liaison path has been attempted in many areas of Japan. Two requirements for a community liaison path that such efforts revealed are: (1) constructing an overview map of liaison path (hereafter, overview path) and



ADL: activities of daily living; QOL: quality of life

(Extracted and modified from Kaifukuki Rehabilitation Ward Association.[11])

Fig. 2 A treatment plan of community liaison system for stroke

(2) compiling a database of patient information based on the standard evaluation items.

Constructing the overview map of liaison path (overview path)

The overview path is used to provide patients and their families to explain the course of future treatment in an easily comprehensible manner. In acute hospitals, the overview path is used during early explanations to the admitted patient along with the information on convalescent rehabilitation and long-term care facilities, while in convalescent rehabilitation or long-term care facilities it is used at the time of discharge. It is also essential for healthcare professionals. The overview path shows the ultimate goal and the flow of treatment procedures in the acute, convalescent, and chronic phases, clarify the share of responsibility among various professions in each stage, and also clarify the criteria for patient transfer/discharge between care facilities of different stages — all of which are important in performing smooth triage for stroke patients and in formulating a smooth and uninterrupted stroke care system. **Figure 2** shows a conceptual diagram of the overview path produced by Kaifukuki Rehabilitation Ward Association.[11]

Since the circumstances of healthcare services vary among different regions of Japan, it is not possible to decide on one uniform set of criteria when transferring patients to convalescent rehabilitation facilities. **Table 3**, however, shows one example from the medical viewpoint. On the other hand, when patients in the convalescent phase are discharged to home or moved to another facility, social conditions as well as medical criteria for discharge should be satisfied adequately. Unlike in the acute phase, in the convalescent phase it is difficult to apply a single clinical path in a temporal sequence. Therefore, ADL should be assessed monthly, and in-hospital rehabilitation should be continued if improve-

Table 3 An example of the transfer criteria for stroke patients to a convalescent rehabilitation facility after completion of acute care

Required
(1) Completion of acute care for stroke
Criteria to consider
(1) Almost clear consciousness (0 to 10 on JCS*)
(2) Continued rehabilitation is likely to improve walking ability and ADL
(3) Nursing care guidance is likely to reduce some burden on those who provide nursing care

*JCS: Japan Coma Scale.

Table 4 An example of transfer criteria for discharge from a convalescent facility

(1) ADL has reached the goal set prior to admission.
(2) Improvement of ADL (by FIM™ or Barthel Index) has almost reached a plateau.
(3) Preparations for returning home or admission to another facility are completed.

Table 5 Examples of evaluation items to be included in the patient information database

Patient information	Patient name/ID, date of birth, age, gender, address
Hospital information	Name, address, date of admission, date of discharge
Social background	Key person, family structure, occupation, housing, place to go after discharge or a transferring facility, physical disability certificate, physical disability pension, long-term care insurance
Course of treatment	Major diagnosis, past history, day of onset, consciousness level, severity, treatment process, surgical technique, date of surgery, prescription content, complications and comorbidities during treatment, lab test results, images Any issues to consider when conducting rehabilitation Content of explanations provided to the key person or patient
Present status of medical management	Height, weight, tracheostomy, tube feeding, intravenous infusion, oral feeding, artificial denture, bladder catheter, voiding, sleeping, supervision/restraint, problematic behavior, depression, pain, decubitus
Rehabilitation status	1) Status before onset: presence/absence of dementia, means of mobility, status of ADL 2) Impairment: motor paralysis, ataxia, aphasia, unilateral spatial neglect, cognitive dysfunction, pain, muscle tone, range of motion (ROM), grip power, muscle strength on non-paralysis side, trunk function, basic motion 3) Disability (activity limitation): ADL assessment, major means of mobility, practicality of arms 4) Handicap (participation restriction): burden of care, QOL 5) Problems of rehabilitation and cautions for the future

ment is seen. **Table 4** shows an example of criteria for discharge from convalescent rehabilitation facilities.

The purpose of using a liaison path for patients in the chronic phase is to maintain the community life at home or in a long-term care facility and to improve the QOL. Primary care physicians or care managers serially evaluate the effectiveness of care plans designed during hospitalization, and add or modify the contents of long-term care insurance services as necessary. In particular, the first three months after discharge warrants caution because the patient's functional ability is likely to decrease during this period. It is also important to cooperate with rehabilitation specialists and specialized rehabilitation facilities to avoid overlooking the potential of falling into the "in need of care status, by false assessment," in which patients continue to use the same care services even though the intervention of professional rehabilitation may improve the ADL ability.[12]

Compiling a database of patient information based on standard evaluation items

The database of patient information should be used in place of conventional medical information forms. Evaluation items should include items with validated reliability and adequacy, such as personal information, hospital information, social background, course of treatment, medical management status, specifics of the rehabilitation program, and levels of ADL. The tasks of evalu-

ation should not be restricted to physicians; it should be shared among various professions to avoid increasing the workload for one particular profession. **Table 5** shows an example of evaluation items.

Determining the evaluation items and timing of evaluation require cautions for circumstances vary among regions. One should not thrive for perfectly completed entries in the beginning, and the database should start with the available contents first and be modified in a liaison path through practice. In realizing information sharing and standard outcome evaluation among facilities, minimum required items of evaluation are; NIHSS (National Institutes of Health Stroke Scale) score in acute stroke,[13] Barthel Index[7] or FIM™[8,9] in the convalescent phase (at the times of admission and discharge), and mRS[6] or Barthel Index[7] in the chronic phase (at 3 months after returning home).

Conclusion

Since the treatment approach for stroke patients differ among the acute, convalescent, and chronic phases, it is difficult to develop a liaison path in the same one temporal sequence. In addition, there are certain healthcare particularities in large cities or remote country areas, and some regions have specific difficulties such as the scarcity of convalescent rehabilitation facilities that are supposed to play a pivotal role in the liaison. Therefore, it is difficult to design a completed model that can apply to any parts of the nation. However, the essence of such liaison path is to facilitate a mutual understanding among all professions working at acute, convalescent, and maintenance facilities, and to clarify the division of roles and share patient information efficiently and appropriately among different professions toward a common goal.[3]

In general, the idea of a liaison system for stroke may initially bring up the image of emergency transport or triage for acute treatment. However, as concluding remark, I wish to emphasize that the mainstay of stroke care is rehabilitation therapy by a team of multiple professions, and that the ADL is the common language for the acute, convalescent, and chronic phases. Additionally, since the importance of convalescent rehabilitation facilities that bridge the acute and chronic phases will increases further in the future, it would be desirable that convalescent rehabilitation facilities lead the efforts to develop and improve liaison paths in the local communities as a driving force.

* Convalescent rehabilitation facility: a hospital ward or facility for a patient who suffered diseases like stroke or femoral neck fracture and has completed acute treatment, specifically designed to provide intensive rehabilitation during the convalescent phase in order to improve the ADL abilities and to achieve returning home.

** Convalescent phase: a period after the completion of the acute treatment for disease like stroke or femoral neck fracture, in which a patient is admitted to a convalescent rehabilitation facility and undergo intensive rehabilitation to improve his/her ADL abilities and return home eventually; in general, within a half year from the time of onset or surgery.

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