REFERENCES

- Wolf PA, Kannel WB, Verter J. Current status of risk factors for stroke. Neurol Clin 1983;1:317-343.
- Viriyavejakul A, Vannasaeng S, Poungvarin N. The epidemiology of cerebrovascular disease in Thailand. Abstract 6th Asian and Oceanian Congress of Neurology. Taipei, Excerpta Medical, Asian Pacific Congress Series No. 22, 1983:10.
- Viriyavejakul A, Poungvarin N, Vannasaeng S. The prevalence of stroke in urban community of Thailand. J Neurology 1985; 232(suppl):93.
- 4. Poungvarin N, Viriyavejakul A, Kamontri C. Siriraj stroke score and validation study to distinguish supratentorial intracerebral hemorrhage from infarction. Br Med J 1991;302:1565-7.
- 5. Stallones RA, Dyken ML, Fang HCH, Heyman A, Selser R, Stamler J. I. Epidemiology for stroke facilities planning. Stroke 1972;3: 360-371.
- 6. Anderson E, Anderson TP, Kottke FJ. Stroke rehabilitation:
 Maintenance of achieved gain. Arch. Phys. Med.
 Rehabil 1977;58:345-352.
- Smith DS, Goldenberg E, Ashburn A, et al. Remedial therapy after stroke: a randomized controlled trial. Br Med J 1981;282: 517-520.
- 8. Strand T, Asplund K, Eriksson S, Hagg E, Lithner F, Webster PO. A non-intensive stroke unit reduces functional disability and the need for a long term hospitalization. Stroke 1985;16: 29-34.
- Wade DT, Langton-Hewer R, Skillbeck CE, Bainton D, Burns-Cox C. Controlled trial of a home-care service for acute stroke patients. Lancet 1985;1: 323-326.
- 10. Mather HG, Pearson NG, Read KLQ, et al . Acute Myocardial Infarction: Home and Hospital Treatment. Br Med J 1971;3: 334-338.

- 11. Hill JD, Hampton JR, Mitchell JRA. A randomized trial of home-versus-hospital management for patients with suspected myocardial infarction. Lancet 1978;22: 837-841.
- 12. Anderson TP. Rehabilitation of patients with completed stroke. In: Kottke FJ, Lehmann JF. Krusen's handbook physical medicine and rehabilitation. Philadelphia: WB Saunders, 1990:657.
- 13. Mohoney FI, Barthel DW. Functional evaluations: Barthel Index. Md State J Med 1965: 14-61.
- 14. Granger CV, Albrecht GL, Hamilton BB. Outcome of comprehensive medical rehabilitation: measurement by Pulse profile and the Barthel Index. Arch Phys Med Rehabil 1979:60-145.
- 15. Granger CV, Albrecht GL, Hamilton BB. Outcome of comprehensive medical rehabilitation: Measurement by pulses profile and the Barthel Index. Arch Phys Med Rehabil 1979;60-154.
- 16. Kane RA, Kane RL. Assessing te elderly. Lexington, MA: DC Health, 1981
- 17. Gresham GE, Phillips TF, Labi MLC. ADL status in stroke: Relative merits of three standard indexes. Arch Phys Med Rehabil 1980; 61-358.
- 18. Granger CV, Albrecht GL, Hamilton BB. Outcome of comprehensive medical rehabilitation: Measurement by pulses profile and the Barthel Index. Arch Phys Med Rehabil 1979;60-154.
- 19. Wylie CM.Measuring end results of rehabilitation of patients with stroke. Public Health Rep 1967;82:893-898.
- 20. Carroll D. Disability in hemiplegia caused by cerebrovascular disease: Serial studies of 98 cases. J Chronic Dis 1962:15:179-188.
- 21. Granger CV, Sherwood CC, Greer DS. Functional status measures in a comprehensive stroke care program. Arch Phys Med Rehabil 1977;58: 555-561.

- 22. Granger CV, Greer DS. Functional status measurement and medical rehabilitation outcomes. Arch Phys Med Rehabil 1976;57:103-108.
- 23. Vatanasapt V, Kosuwan W, Pengsaa P, Unit cost analysis in a university hospital: an example from Srinagarind Hospital, KhonKaen. J Med Ass Oc Thai 1993;76:647-653.



APPENDIX

Barthel Index

- 1. Feeding (10)
 - 10 = Independent. The patient can feed himself tray or table when someone puts the from a food within his reach. He must be able to put on an assistive device. if this is needed, food, use salt and pepper, spread cut up butter, etc. He must accomplish this in a reasonable time.
 - 5 = Some help is necessary (for instance, with cutting up food, as listed above.)
- Moving from wheelchair to bed and returning
- Independent in all phases of this activity. Patient can safely approach the bed in his wheelchair, lock brakes, lift footrests, move 15 = safely to bed, lie down, come to a sitting position on the side of the be, change the position of the wheelchair, if necessary, to transfer back into it safely, and return to the wheelchair.
 - 10 = Either some minimal help is needed in some step of this activity or the patient needs to be reminded or supervised for safety of one or more parts of this activity.
 - Patient can come to a sitting position without the help of a second person but needs 5 = a great deal of help to be lifted out of bed.
- 3. Personal toilet (5)
 - Patient can wash hands and face, comb hair, clean teeth, and shave. He may use any kind of razor but must put in blade or plug in razor without help, as well as get it from drawer or cabinet. Female patients must put on own make-up, if used, but need not braid or style hair.
- Getting on and off toilet (10)

 10 = Patient is able to get on and off toilet, fasten and unfasten clothes, prevent soiling of clothes, and use toilet paper without help. He may use a wall bar or other stable object for support if needed. If it is necessary to use a bedpan instead of a toilet, he must be able to place it on a chair, empty it, and clean it.
 - Patient needs help because of imbalance or in handling clothes or is using toilet paper.

5. Bathing self (5)

- Patient may use a bathtub or shower or take 5 = acomplete sponge bath. He must be able to do all the steps involved in whichever method is employed without another person
- Walking on a level surface (15) 6.
- Patient can walk at least 50 yards without 15 = help or supervision. He may wear braces or prostheses and use crutches, canes, or walkerette but not a rolling walker. He must able to lock and unlock braces if used, assume the standing position and down, get the necessary mechanical aids into position for use, and dispose of them when he sits. (Putting on and taking off braces is scored under dressing.)
 - Patient needs help or supervision in any of 10 = the above but can walk at least 50 yards with a little help.
- Propelling a wheelchair (if appropriate) (5)

 5 = A patient cannot ambulate but can propel a wheelchair independently. He must be able to 6a. go around corners, turn around, and maneuver the chair to a table, bed, and toilet. He must be able to push a chair at least 50 yards. Do not score this item if the patient gets score for walking.
- Ascending and descending stairs (10) 7.
 - Patient is able to go up and down a flight of stairs safely without help or supervision. may and should use handrails, crutches when needed. He must be able to carry canes or crutches as he ascends or descends stairs.
 - Patient needs help with or supervision of any one of the above items.
- Dressing and undressing (10) 8.
- Patient is able to put on and remove and fasten all clothing, and tie shoelaces (unless it is necessary to use adaptations for this). The activity includes putting 10 = on and removing and fastening corset or braces when these are prescribed. Such special clothing as suspenders, loafer shoes, or dresses the open down the front may be used when necessary.

Patient needs help in putting on and removing or fastening any clothing. He least half the work himself. He must do at He must accomplish this in a reasonable time. Women need not be scored on use of a brassiere or girdle unless these are prescribed garments.

Continence of bowels (10)

is able to control his bowels and 10 = Patient have no accidents. He can use a suppository or take an enema when necessary (as for spinal cord injury patients who have had bowel training).

Patient needs help in using suppository or 5 taking an enema or has occasional accidents.

Controlling bladder (10) 10.

Patient is able to control his bladder 10 = and night. Spinal cord injury patients who wear an external device and let-bag must put them on independently, clean and empty bag, and stay dry day and night. Patient has occasional accidents or cannot

wait for the bedpan or get to the toilet in time or needs help with an external device.

> 0 - 60 dependence 61 - 100 Independence



VITAE

Mr. Nuttaset Manimmanakorn was born on August 10, 1968 in Bangkok. He graduated as a General Physician from Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand in 1980 and further study in Physical Medicine and Rehabilitation, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand and got the degree in 1983.

He has been enrolled in the Master's degree in Health Development at Faculty of Medicine, Chulalongkorn University, Bangkok under the THAI CERTC Consortium since June 1996. Now. He is a staff and lecturer in Physical Medicine and Rehabilitation Department, Faculty of Medicine Khon Kaen, University, Thailand.

