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Compiled by

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1. Stålhammar, D.¹, Starmark J.-E.¹, ² (¹ Department of Neurosurgery, Sahlgren’s Hospital and ² Department of Psychiatry III, Lillhagens Hospital, Göteborg, Sweden): Assessment of Responsiveness in Acute Cerebral Disorders. A Critical Review of Current Practice.

In 1978 Langfitt pleaded for consistent use of the Glasgow Coma Scale for a five year period and as well for thoroughly testing of that scale. In order to find out the result of this plea we have performed a systemic review of four major neurosurgical journals, during 1983–1985, regarding methods for assessment of overall responsiveness in acute cerebral disorders. 52 of 74 studies some version of the Glasgow Coma Scale sum score was used. In 29/52 papers the GCS sum score was collapsed to “sum score scale” in three to five steps. 31 different aggregations were found and information on methodological issues is very scarce.

We concluded that current “coma-scaling” still is very inconsistent and since we consider the main reason being the constructional weaknesses with multi-scale methods and the lack of directions for their application we will present proposals on these matters.


The Reaction Level Scale (RLS85) developed by two of the authors (D. S. and J.-E. S.) was tested in four Scandinavian neurosurgical departments regarding inter-observer agreement and coverage. In a balanced study 49 observers performed 164 paired tests in 88 patients. The data were analyzed by means of Kappa statistics. A Kappa value of ≥ 0.6 is generally considered to reflect a good correspondence. The present study showed an overall Kappa value of 0.69 ± 0.04. There were no significant differences between the participating clinics. The assistant nurses performed more consistent assessments (K = 0.77) than the doctors (K = 0.60) and the registered nurses (k = 0.70). The Kappa values for trauma (K = 0.76) and vascular diseases (k = 0.71) were better than those for tumour cases (K = 0.50). The Kappa values for the separate levels in RLS85 were all above 0.65 except for withdrawing (K = 0.51) and flexor response (K = 0.55). There was an excellent observer agreement in delineation of coma (K = 0.71).

In conclusion the RLS85 proved to be easily learnt, it showed full coverage without pseudoscoring, and it was consistently utilized by all kinds of personnel in four different neurosurgical departments in two countries.

3. Starmark, J.-E.¹, ², Stålhammar, D.¹ (¹ Department of Neurosurgery, Sahlgren’s Hospital and ² Department of Psychiatry III, Lillhagens Hospital, Göteborg, Sweden): Assessment of Responsiveness in Acute Cerebral Disorders. A Comparison Between the Glasgow Coma Scale and the Reaction Level Scale (RLS85).

Reaction Level Scale (RLS85) is based on the same information as the Glasgow Coma Scale (GCS), but the separate responses are directly weighted together to a scale in 8 steps. In a study, balanced over order of scales, order of raters, professional categories and reaction levels, 72 pairwise observations on 48 neurosurgical patients were made by 12 observers.

By the sign test the RLS85 had a significantly better reliability than the GCS sum score and the EMV profile. A significant effect of order was noted in GCS Eye Scale and sum score. The Kappa values for GCS sum score was 0.43 ± 0.06 and for RLS85 0.60 ± 0.06. GCS segments 6–10 and 9–12 had no reliability better than chance. The coverage in RLS85 was 100%, but 43/72 observations in GCS needed pseudoscoring.

Thus, the study shows that the information in the GCS eye, motor and verbal scales can be combined directly with the RLS85. This scale has better interobserver agreement and better coverage than the GCS sum score because pseudoscoring or exclusions due to untestable features are avoided.
**4. Sundbärg, G. (Department of Neurosurgery, University Hospital, Lund, Sweden): Which is the Best Way to Organize Intensive Care in Neurosurgery?**

The neurosurgical department in Lund has 63 beds (42 beds during 15 weeks per year) divided into three identical wards and serving around 1.5 mill inhabitants. The number of annual admissions exceeds 1,800, whereof 56% are as emergency cases. The mean rate of occupation of the beds is 88%. Average bed days per patient are 9.6. Each ward executes its own intensive care on an average of 6 patients (range 0–12) each day.

Different proposals to concentrate the intensive care within the department to one (or two) sectors instead of the present three have recently been actively discussed. In order to further elucidate this problem all registered and all state enrolled nurses were confronted with a confidential questionnaire. 83 day working (D) and 34 night working (N) persons replied, making an answer incidence of about 95%. Only 18% of all thought that the present system was definitely superior to all other possibilities. 59% of D and 50% of N decidedly looked forward to a future concentration of the intensive care, another 25 and 15%, respectively, were vaguely positive. Only 13% of D and 0% of N wanted to work within a calmer sector of the department, while another 25 and 9%, respectively, thought that it was, perhaps, interesting. 49+27% of D and 25+16% of N were definitely or vaguely positive to a system of periodic rotation between intensive and calm sectors. 32% of D and 18% of N meant that the work, as a rule, was mentally distressing. The corresponding figures for the physical part of the work were 37 and 26%, respectively.

In conclusion the study showed that a change of system might be hazardous, although many of our co-workers were dissatisfied with the present conditions.

**5. Smith-Erichsen, N. (Department of Anaesthesiology, Akershus Central Hospital, Nordbyhagen, Norway): Head Trauma in the Intensive Care Unit—an Analysis of Costs and Results.**

During a 7 year period 156 head trauma patients were admitted to the general intensive care unit (ICU) of Akershus Central Hospital. 63% were associated with multiple trauma. 62% of the patients were below the age of 30 years, and 78% were men. 35 patients (22%) died during intensive care, 34 while on mechanical ventilation; the mortality thus being 45% among the respirator treated patients. Mechanical ventilation was applied in 54% of the multiple trauma patients, and in 40% of the patients with only head trauma. The duration of mechanical ventilation as well as the mortality were, however, similar in the two groups of respiratory patients. The survivors of multiple trauma stayed for a longer period of time in the ICU than survivors of only head trauma.

The head trauma patients' demand on ICU-resources were modest, being less than 10% of the total costs of intensive care. 80% of these expenditures were, however, claimed by the patients in need of mechanical ventilation. The ICU-costs per patient were for the whole head trauma group of patients calculated to NOK 27800 which is at the level of the average ICU patient in our hospital. For the mechanically ventilated patients the ICU-costs amounted to NOK 46300 per patient. The estimated costs per predicted year of remaining life-span were also very favourable, being NOK 1400 for all patients, and NOK 3100 for mechanically ventilated patients. These figures are far below values calculated for other groups of patients commonly treated in the ICU.

The head trauma patients should thus be given high priority for ICU resources. The high frequency of associated multitrauma, furthermore, points in favour of treating these patients in a multidisciplinary ICU.

**6. Wester, K. 1, Aas-Aune, G. 2, Syvertsen A. 2 (1 Department of Neurosurgery, Rikshospitalet, Oslo, Norway, 2 Departments of Surgery and Radiology, Vestfold County Hospital, Tonsberg, Norway): Severe Head Injuries in a Norwegian County Hospital 1982–1985. Effects of Introducing Computer Tomography.**

Introducing computer tomography in a county hospital resulted in a marked re-distribution of the handling of severe head injuries.

Before having a CAT scanner, the hospital referred a substantial number of these patients to the regional neurosurgical department. After having acquired its own scanner, the county hospital took over most of the diagnostic and therapeutic tasks concerning these patients.

This resulted in a reduced mortality from severe head injuries and, as was to be expected, reduced delays for surgery. Rather unexpectedly, the number of surgically treated patients increased considerably, from 25% to 68%.

These and other findings indicate a need for additional training of the county hospital staff. This is a task for the neurosurgical society.

**7. Nordström, C.-H., Messeter, K., Sundbärg, G. (Departments of Neurosurgery and Anaesthesiology, University Hospital, Lund, Sweden): Aggressive Neurosurgical Intensive Care Improves Outcome in Patients with Severe Head Injuries.**

It is well established that early surgical evacuation of extradural and subdural haematomas significantly improves outcome. The impact of aggressive neurosurgical intensive care (i.e. ICP monitoring and pharmacological treatment of increase in ICP) is however still controversial. The present investigation was initiated to study of a more active management of patients with severe traumatic brain lesions would significantly change overall outcome and in what patients improvements were possible to achieve.

**Material:** During a six year period (1977–82) 425 patients treated in the Department of Neurosurgery in Lund for severe traumatic brain injuries (coma > 6 hrs) were studied regarding epidemiology, management, and outcome. From 1983 a more aggressive management protocoll was introduced. This included education of all personnel in the local hospitals and the introduction of a more uniform treatment protocoll in the Southern Region. Simultaneously, in the neurosurgical department ICP recording was started early in most patients and barbiturate coma therapy was used in patients with a dangerous increase in ICP. During 1983/84 162 patients were included in the study.

**Results:** Overall mortality was 48% in the first part and 35% in the second part of the study. Good recover/moderate disability was achieved in 39% of the patients in the first and 54% of the patients in the second part of the study. Both changes were statistically highly significant. No differences in age or the types of lesions occurred explaining the improvements. Improved outcome was observed in all kinds of lesions. This was partly explained by a better management