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# Guidelines in Neurotrauma: Conclusions for Multidisciplinary Management in Europe

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## Introduction:

It has become clear that scientists and various medical associations, as well as other organisations have recently started introduce more or less specific guidelines for physicians of different faculties in daily practice (1-5) and that this has been due not least to socio-economic, health-political questions but also to ethical issues. This applies especially to neurotraumatology and here in particular to the treatment of head injury (HI) (6-13). TBI severity is classified today world-wide according to Teasdale's Glasgow Coma Scale (GCS) (14). For multiple injuries, severity is classified by a variety of scales and scores (15-23) for decision-making and comparison of treatment modalities. However, there are too many of these scoring systems and some have not yet been really accepted. The same applies to spinal cord trauma on the basis of neurological and functional classification criteria, e.g. of the American Spine Injury Association (ASIA) and the International Medical Society of Paraplegia (IMSOP), both of which are used for the scoring of acute spinal cord injuries with the aid of a motor, sensory and sphincter function impairment scale (25). All of these efforts are aimed at checking clinical experiences and personal scientific results for their reliability and thus their actual value by means of literature searches and meta-analyses. Evidence-based medicine has become the magic formula of the last decade.

## Material and methods:

According to the degree of clinical reliability in the sense of *evidence-based medicine*, follows the differentiation into three categories as proposed by the AANS and BTF in 1995 (6): *Standards* represent generally accepted principles of patient management, thereby reflecting a very high degree of clinical reliability which is based on so-called Class I evidence, which means prospective, randomised, controlled trials. *Guidelines* represent a particular strategy or range of management strategies, by reflecting moderate clinical certainty. They are usually based on Class II evidence, which means that they are only proved by clinical studies of prospectively collected and retrospectively analysed data. *Options* apply to the remaining strategies for patient management by reflecting uncertain clinical reliability. They are usually based on Class III evidence, which means unclear clinical certainty because of retrospectively collected data. Most of our neurotrauma management belongs to Class III, some to Class II, but only two therapies to Class I. This is because carefully and well designed clinical studies are still scarce, they include an inadequate number of patients, or involve methodological errors. Taking this into consideration, why should we follow guidelines which are based on uncertain management concepts and/or new-fangled ideas? Moreover, it is not only evidence-based medicine which must be taken into account but also quite a

number of attributes when developing or following new guidelines, as underlined by the AMA (26). Otherwise these cannot be adequate, practical, reliable and effective! So this work should only be done by or in conjunction with physician organisations. It should be characterised by scientific and clinical expertise in the content areas of the parameters, with broad-base representation of physicians likely to be affected by the parameters, as formulated in Attribute I. As described in Attribute II, a review of relevant scientific literature and expert clinical opinion should be given, including at least two-thirds of clinical experts (reviewers) actively involved in clinical practice in relevant clinical areas. Attribute III states that the practice parameters should be as comprehensive and specific as possible. In accordance with Attribute IV, these should be based on current information, also including periodic reviews and revisions. And, last but not least, Attribute V states that there should be a wide dissemination and acceptance of the given Guidelines by physicians, medical specialists and the societies involved.

## Discussion:

All the basic science on Guidelines sounds in fact brilliant and promising. However, daily practice and our previous discussions tell us quite a different story about *Guidelines in Neurotrauma*. For example, the Americans must take into account the various socio-economic and health care facilities and different circumstances of cultural and religious behaviour existing in the European countries, despite their political union. Can Guidelines which were developed in economically rich parts of the world be adopted and followed also in other parts of the world? Do they respect the different technical modalities and costs of diagnosis and management strategies? We have learnt that the alarm time for emergency rescue in head injury may differ

from only 10 – 15 minutes in Tenerife (27) or Turin up to 90 – 120 minutes in Poland, for instance (28). This is due to the sparse and therefore insufficient distribution of telephones available in rural regions before mobile phones became available! So what can we expect from rescue Guidelines? The same applies to different rescue transportation modalities in mountainous and in urban regions, and so on. And what about personnel? In Denmark this involves paramedics, in Austria and Germany doctors, intensive care physicians, anaesthetists, general and trauma surgeons.

What may be the standard rescue team, the standard hospital for neurotrauma patients, and the specialists concerned?

In reviewing the previous papers of Dr. Sahuquillo from Spain, Dr. Maas from the Netherlands, Dr. Neugebauer from Germany, Dr. Servadei from Italy, Dr. Truelle from France, Dr. Zitnay from the USA and recalling the statement by Prof. Jennett, we may conclude that even if we were all willing and interested in developing novel Guidelines to improve the quality of neurotrauma management we would in fact be far away from any realistic consensus concerning obligatory Guidelines in this delicate field. We have become aware that Guidelines are needed mostly due to specific regional, national and continental, socio-economic as well as cultural and historical peculiarities, and that they may depend upon the special interests and reservations of the faculties, medical societies and politicians involved. Moreover, legal aspects are of utmost importance and may differ from one country to another but have strictly to be followed. I would like to recall the discussion and the national report of the European survey "Doctors' attitudes on the management of patients in persistent vegetative state (PVS)" as part of the research project "The moral and legal issues surrounding the treatment and health care of patients in persistent vegetative state" (29, 30).

And what about the regulations for accident prevention? Although seat belts and helmets are

compulsory in many countries, they are often not used although their protective value for TBI is evident. How do we behave at home and on Tenerife? The temperament of Swedish people differs to that of the Italians or the British, for instance, and their health care system and their behaviour and policy of family tradition concerning patient care and public welfare are different, too. That is why I would like to continue working in a multidisciplinary and multinational capacity.

### **The American Guidelines can be used as a model to be tailored to local requirements and possibilities.**

For well known reasons, it is hard to come by data for the purpose of analysis and comparison. In Europe, Graham Teasdale succeeded in motivating a small group of experts trying to reconcile neurotrauma care within their own regions and countries or in the countries of task force members to compare their treatment protocols in respect to early and late outcome in the future (9, 10, 24). I consider this to be the right approach and one which is imperative for quality control in neurotrauma aetiology. However, we have to be critical concerning the liability and applicability of all the Guidelines that have been published so far because they are usually based on Class II or a preponderance of Class III evidence. Moreover, they may follow special concepts of the working groups developing them. For example, concerning the treatment of ICP in severe HI the Lund Concept (30) has not yet been involved in the American or the EBIC Guidelines although the results are evidence-based and promising. And we have comparable problems regarding the purpose of the numerous scoring systems for various particular situations in emergency and intensive care management (14-23). Different rescue protocols and emergency room charts of various societies, including different scales and scores with regional and/or faculty specific strategies,

are proposed and used even in the same place or town. And who should be responsible for the treatment of cranio-cervical and fronto-basal injuries? The conclusions drawn from our discussion were promising: experienced physicians and a team of transdisciplinary neurotrauma specialists. We should focus our questions on a more comprehensive and patient-orientated attitude to rescue emergency and acute management, as well as early and late rehabilitation and social reintegration, and we should also work on practical Guidelines in neurotraumatology together. To my knowledge, was the first time that physicians from different faculties, scientists and neuropsychologists from different countries and continents came together to listen to and to discuss the philosophy and applicability of different Guidelines from different groups and countries. It became clear that we all need more information from each other and from the other faculties involved. We also need more insight into research work and clinical practice to understand the complex tasks of neurotraumatology and to learn more about solutions that have already become available. In clinical practice this means following one or other of the Guidelines that will fulfil the specific regional, national or even continental requirements of a special legal and socio-economic situation at a given time.

### **Conclusions:**

Guidelines in neurotraumatology are intended to be a powerful means of changing daily practice, of increasing effectiveness and regional resource allocation as well as of improving the quality of patients' care. However, international experience shows that the complex process of development, implementation and dissemination of Guidelines must be designed purposefully to attain impact on the quality of care. Up to now the development and publication of new Guidelines and the request to use them in daily practice by specialised

societies and authorities generally has not influenced good medical practice according to the report of J. Kosecoff et al (4). Evidence-based Guidelines meeting the criteria of international standards and adequate for practical application are needed on a multidisciplinary basis, to improve the quality of management from rescue through to rehabilitation at the end of the *decade of the brain* and at the threshold of the next millennium.

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