Neurosurgery Certification in Member Societies of the WFNS: Europe

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OBJECTIVE: **To objectively compare the complexity and diversity of the certification process in Neurological Surgery in European member societies of the World Federation of Neurosurgical Societies.**

MATERIALS AND METHODS: **The attention of this study centers on Europe. We provide here a subgroup analysis based on the responses provided to a 13-item survey. The data received were analyzed and three regional complexity scores (RCS) were designed. To compare national board experience as well as eligibility requirements to access the certification process and obligatory nature of the examinations, a RCS Organizational score was created (RCS-O, 20 points maximum). To analyze the complexity of the examination a RCS Components score was designed (RCS-C, 20 points maximum). The sum of both is presented in a Global RCS score (RCS-G). In addition, a descriptive summary of the certification process per responding society is also provided.**

RESULTS AND CONCLUSIONS: **Based on the data provided by our RCS system, the highest RCS-G was obtained by the United Kingdom (19/40 points) followed by European Association of Neurosurgical Societies, Poland, and Sweden (16/40 points each), Portugal (15/40 points), and Switzerland (14/40 points). The experience from these leading countries should be of value to all countries of the European Union.**

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INTRODUCTION

The aim of this work is to provide knowledge compiled about the structure, components, and application of the certification examination process in neurological surgery in Europe. To begin such an assessment we must first discuss the origins of neurosurgical certification examinations in Europe, which began with the United Kingdom (UK) and European Association of Neurosurgical Societies (EANS) examinations in the 1990s (12).

The EANS was formed in 1971, and by 1989 a committee was created in the EANS (which would eventually be called the Examination Committee of the EANS) with the aim of developing a European certification examination comparable to that provided by the American Board of Neurological Surgery (4). From its inception, the EANS certification examination was designed to follow loosely the program and format of the American examinations (4), including a written examination in multiple choice format and an oral examination.

In 1992 the EANS certification examination was the second neurosurgical certification examination to take shape in the European region (the UK examination was the first, in 1991) (12), and although the EANS examination is available to all residents in accredited neurosurgical programs in Europe and to all European-certified neurosurgeons, it is—and has been—strictly voluntary (4).

Both the UK and EANS neurosurgery certification examinations were born amid considerable criticism and skepticism regarding the value of such certification examinations and the motives of those seeking to implement them. Initially, the UK examination was vigorously opposed by the Neurosurgical Senior Registrar Association, in part due to the lack of standard neurosurgical curricula, training courses, or educational objectives in place, as well as the considerable amount of time spent in acquiring the Fellowship of the Royal College of

Key words
- EANS
- Neurosurgery certification
- Neurosurgery training Europe
- WFNS

Abbreviations and Acronyms
EANS: European Association of Neurosurgical Societies
EU: European Union
MCQs: Multiple choice questions
OSCE: Objective Structured Clinical Skills Examination
RCS: Regional Complexity Scores
SNLF: French-Speaking Society of Neurosurgery
UK: United Kingdom
WFNS: World Federation of Neurosurgical Societies
WHO: World Health Organization

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Surgeons, a professional qualification for surgery practice in the British Isles (21). At present the UK is home to one of the least-dense and most-active neurosurgical workforces in the region, with one neurosurgeon for every 294,000 citizens and each neurosurgeon performing approximately 300 cases per year (22).

The Belgian Society of Neurosurgery was formed in 1960 with 12 founding members, and has now grown to include 90 neurosurgeons and 20 neurosurgical trainees (6) with 1 neurosurgeon for every 71,000 Belgians (22). In 1974, the first neurosurgical postgraduate training program in Europe was organized in Brussels, by the president of the EANS at the time, Jean Brihaye (6), yet certification in Belgium remains limited to voluntary participation in the EANS examination and certification process.

The Croatian Neurosurgical society was founded in 1993 and currently consists of 64 members (26). Croatia employs a single neurosurgeon for every 72,600 Croatians, and each neurosurgeon performs an estimated 99 cases per year (22).

Neurosurgery originated in the Czech Republic as early as 1882 with the work of Karel Maydl, the first Czech neurosurgeon. The neurosurgical subspecialty in the Czech Republic has since grown to consist of 55 neurosurgeons in 1993 (11) and approximately 80 neurosurgeons in 2006 (22).

Neurosurgery first began to develop as a medical subspecialty in Germany in the early 1930s (9), but the initial expansion of neurosurgical interest and practice arrived after World War II, when the number of specialized neurosurgery units grew from 12 pre-War to 18 in 1950, 42 in 1972, and more than 100 in 2006 (7). Although Germany does not yet have a national written examination for neurosurgery certification, since 1978 the German Board has required a compulsory oral examination to complete training. At present Germany employs a single neurosurgeon for every 63,000 citizens, and each neurosurgeon performs approximately 150 operations per year (22).

The formal practice of neurosurgery in Israel originated with the 12-bed service at the Hadassah Hospital in Jerusalem in 1942 (24). By 1986 there were six Departments of Neurosurgery in Israel with such a profound development of neurosurgical interest and practice that some feared an approaching surplus in neurosurgical manpower due to perceived overtraining of new neurosurgeons (24). The present-day Israeli neurosurgical certification process is fairly advanced, as well, with the Israeli board having more than 20 years of certification experience and a certification examination consisting of both written and oral components. At present Israel employs one neurosurgeon for every 120,700 citizens (22).

In 1929 the first neurosurgical wing in the Netherlands was opened at the University Hospital of Amsterdam, and after World War II, the number of practicing neurosurgeons grew from 9 to 33 in 1970 and to 51 in 1981 (8). In 2006 the Netherlands housed one neurosurgeon for every 151,000 citizens (22). The training of young neurosurgeons also evolved in the post-War period as strict rules were established by the Dutch committee in cooperation with the "Specialisten Registratie Commissie," including 1 year in neurology, 1 year in general surgery, and 4 years in a neurosurgical clinic (8).

Norwegian neurosurgery began in the late 1800s with the work of pioneers Johan Hjort, Julius Nicolaysen, and Wilhelm Magnus (14). At present the Norwegian neurosurgical workforce consists of one neurosurgeon per 85,000 Norwegians (22).

Neurosurgery as a specialty was first established in Poland in 1936 with the formation of the neurosurgical ward in Warsaw (15). Since World War II, the number of neurosurgeons in Poland has expanded from 3 to 118 in 1984. At present Poland employs one neurosurgeon for every 118,000 citizens (22) and is home to more than 30 neurosurgical centers functioning in multiple locations across the country. The first Polish national written examination in neurosurgery certification originated in 1999.

The Portuguese Neurosurgical Society (SPNC) was founded in 1990 (1). At present the Portuguese neurosurgical workforce consists of one neurosurgeon for every 61,000 citizens (22).

Slovenian neurosurgery has developed at the hands of Vinko Dolenc and others to include one neurosurgeon for every 143,000 citizens in 2006 (22).

Sweden, with a population of more than nine million (July 2008 estimate), has advanced from a single neurosurgery unit at the Serafimerlasarettet in 1912 to a multicenter neurosurgery practice with more than 300 beds (20) and one neurosurgeon per 90,000 Swedes (22). Sweden implemented its first national written examination for neurosurgery certification in 1998.

The practice of neurosurgery began in Switzerland in the early twentieth century with the work of pioneers such as Hugo Krayenbühl, the first Swiss surgeon to operate on a brain tumor in Zurich in 1937 and the head of the first independent neurosurgical clinic in Switzerland in the "Hegibach" ward of the Clairmont clinic in 1948 (23). The Swiss Society of Neurosurgery was founded in 1954 in Basel, and Switzerland organized its first national written examination for neurosurgical certification in 1997 (10, 23). At present the Swiss workforce consists of one neurosurgeon per 71,000 citizens (22).

The first Turkish neurosurgery department was established in Istanbul in 1923, and the first neurosurgery training program started in the late 1940s (19), but neurosurgical techniques were applied in Turkey by general surgeons as early as the late nineteenth century (19). The Turkish Neurological Society was founded in 1968 by 11 neurosurgeons in Istanbul, and later become a member of the World Federation of Neurosurgical Societies (WFNS) and the EANS (3). There are now more than 50 neurosurgery training centers and more than 500 neurosurgeons in Turkey (1 per 79,000 citizens) (22), as well as a Turkish national written examination for neurosurgery certification (begun in 2006).

At present, much diversity in examination methods exists among the 30+ European countries with neurosurgical certification examinations, due to differences in culture, priorities in neurosurgical training, and other factors (12). Some countries participate in the EANS process, but many provide their own national neurosurgical certification examination. Analysis of the wide spectrum of neurosurgery certification examination techniques and processes is indicated to understand

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