AAN Neuroendocrine Section
Strategic Plan

I. Introduction
A. Definition of the subspecialty or section
The subspecialty deals with disorders in which interactions between the endocrine system and the nervous system play an important role in pathophysiology or treatment.

B. General statement on conditions it covers and pertinent procedures
Neuroendocrinology covers unidirectional and reciprocal brain-hormone interactions as they pertain to the pathophysiology and treatment of neurological, neuropsychiatric, endocrine and gynecologic/andrologic disorders. Procedures involve 1) the measurement of hormonal levels in serum, urine or CSF as well as challenge tests to assess hormonal regulatory systems, e.g. cosyntropin stimulation test to assess adrenal sufficiency or to diagnose congenital adrenal hyperplasia, and 2) the imaging of endocrine glands and brain.

C. Overview of interactions with other subspecialties
Neuroendocrinology impacts substantially a number of neurological subspecialties, including epilepsy, headache, stroke, behavioral neurology & dementia, movement disorders, neoplasms, sleep and immunological disorders including multiple sclerosis. The relationship may be reciprocal such that hormones may impact the neurological disorder and the neurological disorder may impact hormonal regulation. Hormones play a role in both the pathophysiology and treatment of neurological disorders.

D. Purpose of the document
This document is a detailed description of the purpose of the AAN Neuroendocrine Section, its membership, detailed goals and methods of operation to achieve these goals in advancing neuroendocrine education, science and clinical practice.

E. Overall mission statement
The purpose of the Section is to further clinical care, research and education in the area of neuroendocrinology. The mechanism to accomplish this goal will include meetings, publications, presentations at scientific sessions of the Academy, and any other events that encourage or increase the level of interest in neuroendocrinology among Academy members.

The last two decades have seen the rapid evolution of Clinical Neuroendocrinology from a discipline that dealt almost exclusively with pituitary tumors to one that now deals with the role of hormones in the pathophysiology and treatment of a wide assortment of neurological and neuropsychiatric disorders, as well as the impact of some of these disorders on the endocrine system. The AAN annual scientific meeting has hormonally related platform presentations in a number of subspecialties such as clinical neurophysiology, headache, movement disorders, sleep disorders, behavioral neurology, dementia, immunology and others. There is relatively little neuroendocrine cross-talk, however, among clinicians and investigators who are in these various subspecialties e.g. clinicians/investigators who work on hormonal mechanisms in epilepsy rarely discuss hormonal issues or ideas with clinicians/investigators who work in dementia, immunology or movement disorders.

A number of neurologists and neuroscientists, including both members and nonmembers of the AAN have discussed with me the possible formation of a Section on Neuroendocrinology that would meet each year at the annual AAN scientific meeting in order to develop a program to further interest and interaction in clinical care, research and educational aspects of Neuroendocrinology. The Section would also put out a quarterly newsletter summarizing important developments in the field and progress in Section activities. Members would be encouraged to present their latest research findings at the annual AAN scientific
meeting. Issues such as practice parameters and diagnostic codes would be discussed. The formation of a Section on Neuroendocrinology at the AAN could serve as a mechanism and forum to achieve broader interaction among neuroendocrinologists to achieve these goals.

II. History/Background
A. Landmark early works/milestones
The Section on Neuroendocrinology of the AAN held its first meeting on Tuesday April 27, 2004 from 8:00-9:00 AM at the Moscone Convention Center Room 200-212 in San Francisco. The meeting was called to order by its founding chairman Andrew G. Herzog M.D., M.Sc., Professor of Neurology at Harvard Medical School and Director of the Harvard Neuroendocrine Unit at the Beth Israel Deaconess Medical Center in Boston, MA.

B. Growth of the subspecialty or section to its present status
The section has had a small membership starting at 50 and has expanded over 4 years to 84 in 2008.

C. Genesis of pertinent journals and societies
Neuroendocrinology, Psychoneuroendocrinology

D. Current board certification and other subspecialty organizations/boards
There is no certification for this section at the time of this plan.

E. Other professional organizations relevant to the subspecialty
International Neuroendocrine Federation and American Neuroendocrine Society. These are more basic science oriented organizations that attract clinicians who might have a greater clinical impact if they presented their work at AAN.

III. Current State of the Subspecialty or Section
A. Patient care/practice
Although highly relevant to the clinical care of patients with some of the most prevalent disorders in psychiatry, gynecology/andrology and endocrinology as well as neurology, clinical neuroendocrinology remains in its early formative stages. There is relatively little class 1 evidence, in comparison to more established neurological subspecialties, to guide clinical evaluations and treatment, but the field is growing rapidly in knowledge and practical utility.

B. Research
Research historically focused principally on:
1) the role of hypothalamic peptides in the regulation of the pituitary and peripheral endocrine system
2) the identification and measurement of tropic hormones, especially as markers of pituitary tumors and ectopic neoplasms
3) the neuroactive properties of peripheral endocrine gland hormones and their neurological sites of action.

Current research has extended the scope of research to:
1) investigate the role of hormones in the pathophysiology and treatment of common disorders in all subspecialties of neurology, e.g. headaches (menstrual migraine), epilepsy (catamenial epilepsy), sleep disorders (apnea and other forms of sleep disordered breathing), stroke (different risks and outcomes in men and women), neoplasms (meningiomas, neurofibromas and gliomas), movement disorders (dystonias, Parkinson’s), etc.
2) extend the scope to all major classes of psychiatric disorders (bipolar disorder, premenstrual dysphoric disorder, male-female differences in schizophrenia), gynecology (neurological relationships of PCOS and infertility) and endocrinology (reproductive endocrine disorders).
Funding of neuroendocrine investigations and sex differences in the risk, pathophysiology and treatment of disorders is also gaining momentum although no specific dollar amount is known. The only research that has been done in this subspecialty over the last twenty to thirty years has been that listed above.

C. Education
Neuroendocrine education of residents and fellows as well as certified neurologists still lacks a formal designation and curriculum and is just mixed in with the teaching of other subspecialties. Having a residency coordinator present the subspecialty formally could help generate interest. Medical education of neuroendocrinology in a more formal fashion has been one of the major goals of the AAN Neuroendocrine Section which has prepared a core curriculum and is currently preparing for publication a volume for the prestigious AAN Continuum® series for continuing education. The Section sponsors courses at the AAN Annual Meeting and is planning awards for best abstracts in the field. Having these awards could help promote education and support educational research in the field of neuroendocrinology. There is a small amount of neuroendocrine fellowships in the country.

D. Medical Economics issues
Clinical neuroendocrinology has lacked recognition as such by the medical industry, insurers and designers of medical services and diagnostic coding. Currently, there is no recognition or reimbursement for taking a good neuroendocrine history, i.e. adding a history that screens for endocrine as well as neurological disorders (the relationship between menstrual disorder and epilepsy, or oral contraceptive use and migraine, hyperandrogenism and sleep apnea.) There are no specific neuroendocrine diagnostic codes. There is no neuroendocrine practice that has been recommended for pay for performance guidelines, which could provide initiatives for pay for performance. These areas need to be addressed by the Section.

E. Legislative Issues
There have been no legislative issues since the creation of the section.

IV. SWOT Analysis of the Subspecialty
A. Current Strengths in each of the 5 areas (patient care, research, education, economics, legislative)

Patient care/practice
Research supports the relevance of hormones in the pathophysiology and treatment of a wide range of neurological disorders and that brain disorders (e.g. epilepsy) can impact hormone regulation. There are neurologists in each subspecialty with interests in clinical neuroendocrine issues. The Neuroendocrine Section could be instrumental in bringing neuroendocrinology into clinical decision pathways, in terms of diagnosis and approaches to treatment for neurologic disorders with endocrine pathophysiology, features or influences.

Research
Research grants are available for the investigation of brain-hormone relationships and have included a focus on women’s issues. The Neuroendocrine Section is in a position to cultivate collaboration between basic science and clinical investigators.

Education
The Neuroendocrine Section members have a great interest in participating in the various aspects of the AAN teaching programs, e.g. courses, abstracts, Continuum. AAN and national subspecialty societies have been supportive of educational programs that deal with neuroendocrine topics.

Medical Economics Issues
No particular strength

Legislative Issues
No particular strength

B. Weaknesses in the 5 areas

Patient care/practice

No particular strength
There are few qualified clinical neuroendocrinologists nationally and internationally. The AAN Neuroendocrine Section membership is small. There is little cross talk among specialties. There is little class 1 evidence to guide clinical management.

**Research**
The is a paucity of translational neuroendocrine research. Research dollars are growing but are insufficient for rapid meaningful advancement of the field.

**Education**
1. Clinical Neuroendocrinology still lacks residency and fellowship training programs. Educational opportunities at meetings are growing but are still small in size and scope

**Medical Economics Issues**
There are few billing codes that pertain to the clinical assessment, diagnoses and procedures involved with the neuroendocrine assessment of a patient

**Legislative Issues**
There are no identified legislative issues for advancement of the field

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**C. Opportunities for growth in each area**

**Patient care/practice**
The Neuroendocrine Section should bring neuroendocrinology into clinical decision pathways in terms of diagnosis and approach to treatment of neurologic disorders that involve neuroendocrine or hormonal pathophysiology or outcomes. With the rapid growth of neuroendocrine information, there is an opportunity to form and test hypotheses that could provide class 1 evidence to develop guidelines for the neuroendocrine or hormonal treatment of a wide range of neurological disorders such as migraine, seizures, dementia, stroke, sleep disorders and MS.

**Research**
There is a great opportunity for the development of translational research programs that will assess the potential roles of newly discovered neuroendocrine peptides in clinical pathophysiology and treatment of clinical disorders, e.g role of orexin and leptin in eating disorders such as anorexia and bulimia. This could be fostered by the development of a liaison with basic science oriented neuroendocrine associations, e.g. the American Neuroendocrine Society.

**Education**
The Neuroendocrine Section has a Core Curriculum that is available to neurology residency and fellowship training programs but marketing and implementation need to be undertaken. The Section needs to develop these programs in order to qualify for AAN certification exams in neuroendocrinology. The neuroendocrine section is planning to assemble a slide set that can be integrated into the AAN residency training program set. Clinical Neuroendocrinology is still in its early formative stages. The rapid growth of clinically relevant neuroendocrine information warrants the growth of educational opportunities to disseminate this information. The Section needs to pursue expansion of educational opportunities in the AAN, other neurological associations and non-neurological associations, e.g psychiatry, endocrinology & metabolism, OB/GYN, andrology.

**Medical Economics Issues**
There is an opportunity to develop ICD diagnostic codes for neuroendocrine diagnoses and billing codes for neuroendocrine evaluations as well as “pay for performance” guidelines that include evaluations of neuroendocrine systems, e.g. reproductive function in patients with epilepsy.

**Legislative Issues**
None identified at present

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**D. Threats to achieving goals in each area**
The biggest threat may be that failure to take advantage of the present opportunities for growth in a highly competitive clinical and pharmaceutical environment may result in a failure to achieve the critical mass of
interested clinicians, scientists, available research grants and educational sponsors that is required for
neuroendocrinology to become a widely recognized and well established field of clinical medicine.

E. Current status of AAN input to each area
Since the inception of the Neuroendocrine Section in 2004, the AAN has been very supportive in promoting
neuroendocrine care of patients and education by providing

- an on-line venue for our Section and core curriculum
- Section liaison
- publication of newsletters
- provision of a time slot for a neuroendocrine course
- provision for a neuroendocrine TWG member
- Continuum issue to cover neuroendocrinology

Research
We are attempting to set up through the AAN a research award to allow a neuroendocrine investigator to
attend the AAN meeting and present his/her work.

V. Specific Vision, Goals and Objectives for the Section
A. Short Term Goals
1. Specific defined goals and targets: To establish an award as discussed above and to publish a
concise primer for neurologists on clinical neuroendocrinology and management by neurologists
2. Operational strategies: We will solicit funding for the award and seek a publisher for the book
3. Specific action items: We will solicit funding starting with the Milken Foundation for the award and
present the possibility of publishing a concise book with the AAN publishing arm.
4. Role of AAN-The AAN could support the publishing of the primer
5. Benefit to AAN and subspecialty: The AAN could be established as the only body to support a
clinical neuroendocrine group, and could potentially make money from the primer. Having a publication from
an AAN section would also establish the impact and potential of a section.
6. The success would be completing these projects. The failure would be not to do them within 5
years

B. Long Term Goals
1. Specific defined goals and targets: To establish criteria for a fellowship program in
neuroendocrinology
2. Operational strategies: We need to ask our members to start building a curriculum toward this goal
as the section matures
3. Specific action items: Ask the officers of the section to begin compiling an initial set of criteria that
meets both the educational and ACGME criteria for such a program
4. Role of AAN-The AAN would be vetting the process on an ongoing manner
5. Benefit to AAN and subspecialty: The AAN could continue its role as providing guidance for
fellowship training criteria. The section would benefit from the legitimacy the AAN provides.
6. The success would be to have an established ACGME accredited fellowship. The failure would be
not to do them within 10 years.

VI. Summary/Concluding Statement
1. The mission of the neuroendocrine section is to further clinical care, research and education in the
area of neuroendocrinology. It is now a small and enthusiastic group of largely clinical researchers who are
excited by the complex multidisciplinary nature of this subspecialty. We plan to increase recognition of the
section and the field by recognizing neuroendocrine achievements within the AAN, and aggressively pursuing
our educational mission.
2. The AAN is the sole seat of this endeavor and the success of the neuroendocrine section directly reflects on the AAN. The AAN is the nurturer of this section and could do much to advance the goals of the section.

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