The Resident and Neurosurgery

ANTHONY J. RAEMONDI, M.D.
Professor and Chairman, Division of Neurological Surgery, Children's Memorial Hospital, Chicago, Illinois

The fact that the chairmen (or their designates) of 94 of the 95 approved residency training programs in neurological surgery in the United States and Canada are here today attests to the seriousness with which we take our responsibility to the resident and to the extent which we are aware of the need to take stock at this time. As I began to prepare this paper, I looked through the literature for factual information, I spoke with program directors for a consensus, I listened to residents for suggestions. However, it soon became apparent that there are no facts, there is no consensus, there are suggestions, but without plans. Consequently, I shall present to you, my colleagues, my own thoughts, as opinions, the thoughts of just one person, just one program director. These thoughts will be expressed as questions concerning the resident, neurosurgery, the university. I shall present no answers since I have none, and I shall resist the temptation to formulate theories. The optimism which permeates the soul of every neurosurgeon will not be repressed, and so, I shall have some hopes to offer.

There can be little doubt but that the perspective which the resident has of neurosurgery is quite different from that which neurosurgery has of him. He sees general neurosurgery as being highly disciplined, completely compartmentalized, intellectually and technically well within his grasp. Early in his training he superimposes the figure of a teacher onto that of a practitioner, seeing the entire field as one in which teaching and learning are experiences common both to the professor and to the resident. The acquisition of technical skills, accepted initially as a challenge soon becomes a privilege and then, all too quickly, a right, as accomplishment and excellence become identified with the performance of what is currently considered the most difficult of operations, whether it be the resection of a meningioma, the removal of an angle tumor (without sacrificing the seventh nerve), the clipping of an aneurysm. Time spent in the laboratory whets his appetite for investigative work, and contact with medical students, interns and junior residents exposes him to the experiences of the teacher. The resident is well on his way to becoming a neurosurgeon, to completing his training, and to entering his chosen professional world. By the time this occurs the process of natural selection has funneled most residents off into private practice, many into institutional neurosurgery, some into an investigative career, and a few into the ethereal world of academic neurosurgery. No goals have, as yet, been defined by the resident, by the program director, or by the university. No consideration has, as yet, been taken of man-power needs or individual aptitude. No relationship has, as yet, been struck between the training which the resident has received and the role which he will fill in the neurological world or the manner in which he will serve the needs of his society.

As we define our goals for the education of a neurosurgeon, we must look to the neurological needs of our society, to the neurosurgeon's responsibilities to his patients and students, to the obligation which each practicing physician has to become competent in all phases of his field of activity, to the aptitudes and desires of the individual resident, independent of the service needs of the parent institution. We must look upon the resident as a postgraduate student, for this is what he is. I find it particularly fitting that the leitmotif for this talk is specialization, as it pertains to the resident and neurosurgery, since he, the resident, is a very special person, and, when successful, his relations with
The Resident and Neurosurgery

his chief are very special indeed. They are often life long, and they go beyond the learning situation.

Some of the very pressing questions demanding answers at this time concern neurosurgery itself. Specifically, what comprises the field of neurological surgery today? What areas within this field are developing, and what areas are passing into oblivion? What effect does the administrative position of neurological surgery in universities and hospitals have upon the resident, upon his access to patients and facilities? Is each neurosurgeon, each program director, each training program necessarily able to offer all things to all residents... should they? Apparently not, for there is pressure being exerted to institute change in the form, content, and duration of graduate educational programs in the medical and surgical specialties. This comes from medical students and the Council on Academic Societies today, and will come from the resident and the neurosurgical training programs tomorrow.

Presently, we are engaged in the task of defining our goals for the education of a neurosurgeon. Major consideration will be given to the identification of the field of neurological surgery and the specialties within it, to an evaluation of the surface and in-depth knowledge (cognitive and technical) which the neurosurgical resident must acquire in his field of activity.

The development of areas of primary activity (specialization) within the field of neurological surgery may be compared with those which occurred within the field of general surgery during the first 50 years of this century, so that now men are concentrating their activities within limited, well defined areas. The trend towards institutional (full time) medicine, with the creation of centers as in the Veterans Administration system, such legislation as Titles 18 and 19, the ever increasing need of special equipment and facilities to treat special problems, the success of the clinic type of practice, cause us to focus our attention upon specialization within our field. Today, the neurosurgeon considers accessible to his theoretical and technical competence everything within the confines of what I shall, for the sake of clarity, refer to as general neurosurgery. His training prepared him to diagnose and treat all surgical diseases of the central nervous system, and provide him with the theoretical background to understand the anatomical, physiological and pathological ramifications of the disease and its treatment. His certification by the American Board of Neurological Surgery attests both to his having satisfactorily completed this training and passed an examination designed to measure his competence in the field: If seen in perspective, the residency program and the Board Examination occur as integral parts of the development and recognition of the professional capabilities of today's neurosurgeon.

However, both neurosurgery and the neurosurgeon are continually undergoing change, as social and scientific progress are realized. The elimination of charity institutions dedicated to the care of the indigent, the organization of research and clinical centers for the study and treatment of special disease problems, an ever increasing number of full time neurosurgeons, and an almost unbelievable accumulation of new information, encourage the trend toward specialization. These pressures for individuals to devote themselves primarily, or exclusively, to an area of specialization gain momentum from such diverse socio-economic factors as an increasing urbanization of the nation's population, and the opinion of the citizenry that the utmost in medical care is the right of all and not the privilege of a few.

As areas of specialization develop within the field of neurological surgery, the specialists serve as a focus point for the teaching of precise concepts and techniques to students and residents. Examples of such developing fields in neurosurgery are traumatology, microscopic surgery, stereotaxic surgery, pediatric surgery, and aneurysm surgery. All of these would qualify as specializations by classical standards. However, today's student may consider them artificial... based upon etiology, technique, instrumentation, age range, or disease entity. For him specialization entails an intellectual exercise which is, in essence, a project oriented activity directed toward answering specific questions with a specialist being master in all phases of knowledge pertinent to this field. Examples would be movement, blood flow, neoplasia, cerebrospinal fluid dynamics, etc.

The questions which I would raise then,
Consideration must also be given to the resident's need to manage completely, from admission to discharge, all aneurysm patients, irrespective of whether they are treated surgically or medically, and exposing him to a "loading number" of these patients. In this way it will be possible to determine whether, and in what circumstances, the performance of aneurysm surgery becomes a "right," irrespective of any other considerations, of the resident during his residency years, and to evaluate the safeguards which may be built into the educational experiences which permit a resident to treat surgically an aneurysm with the teacher serving as the first assistant.

Questions, then, which I would raise regarding the matter of aneurysm surgery and the resident, are 1) how does one reconcile the responsibilities of the program director to his patient with those which he has toward his resident staff, and 2) should a resident, who may see one or two aneurysms a year throughout his professional life, be taught to operate on them? Are we, for example, to consider all surgeons who finish their training in neurological surgery as aneurysm surgeons?

Moving next to a discussion of neuroradiology as it pertains to the resident and neurosurgery, I think we would all agree that one of the most characteristic attributes of neurological surgery is that diagnosis and treatment represent a continuum of the cycle observations, problem solving, application of technical skills. It is not possible to determine when the diagnosis is made and precisely when the treatment begins, nor is it possible to consider surgery in any way other than as a series of diagnoses. An attempt to compartmentalize patient evaluation, diagnostic studies, therapeutic procedures, patient care, for the purpose of arriving at a division of labor, results in fragmenting the patient and in converting the individual phases into mechanical activities performed by technicians.

It is not possible for a neurosurgeon to operate effectively, to manipulate or to resect portions of the brain, without being expert in topographical and functional neuroanatomy. He cannot acquire this knowledge without exposure, in an involved manner, to the structure and function of the central nervous system as it exists in the particular patient in
question. Is it then advisable for him to app-
roach an intracranial lesion without know-
ing precisely where the lesion is, what struc-
tures it borders upon, the extent of its vascu-
larity, the origin and course of the vessels
running to and around it, the relationship
between the lesion and the ventricular sys-
tem, what portion of the brain will have to
be retracted or traversed in order to gain ac-
to the lesion? Is it conceivable that this
information can be acquired by the neuro-
surgical resident by means other than neuro-
radiology? Is it acceptable for the neurosurg-
cial resident to learn less neuroradiology
than a neuroradiologist. Surely, both the
practice of neurological surgery, and many of
the advances being made in its technique,
are totally dependent upon neuroradiologic
principles and instrumentation, so that any
attempt to split x-ray equipment from the
neurosurgeon, in essence, would amount to
splitting the treatment of those clinical enti-
ties from him.

Returning then to a concept developed
during the discussion of specialization, one
may wish to reconsider whether instrumenta-
tion determines specialization and, if so, how
does the progress realized through cross fer-
tilization occur? Accepting the limitations
imposed by instrumentation, one would then
forego the progress recently made, for exam-
ple, in stereotaxic surgery, pain surgery, an-
eurysm surgery, chemo-therapy of tumors
and so on.

The questions, then, which I would raise
are: 1) What is the relationship in the train-
ing programs between neuroradiology and
neurosurgery? 2) Does the patient become
the responsibility of the neuroradiologist
when he enters the x-ray department and, if
so, what is the role of the neurosurgical resi-
dent in the decision making and perform-
ance of neuroradiologic procedures? 3) Is
neuroradiology a specialization within the
field of neurological surgery, within the field
of radiology, in a field of its own? Should pa-
ients be referred directly to the neuroradi-
ologist by either the internist or the neurologist
and, if so, how will a neurosurgical resident
learn to evaluate clinical problems, to select
contrast studies, to determine when one
study should be abandoned and another be-
gun? 4) If the involvement of the neurosurg-
cial resident in neuroradiologic procedures is
less than total, how will he learn to see the
brain as a three dimensional model consist-
ing of parenchyma, ventricles, and vessels
which he must approach through a limited
opening in the skull or spatial coordinates?
5) Will there develop a specialization of sur-
gical neuroradiology in which the specialist
will serve as a clinician, a diagnostician, and
one who treats the lesions he diagnoses, stere-
cotaxically, with radioisotopes, or with te-
lemetry.

A consideration of academic neurosurgery
entails many factors. It appears that the ten-
dency towards centralization and specializa-
tion, that the increasing movement of the na-
tion’s population to urban centers, that vast
social reform, that the entry of government
in one form or another into the practice of
medicine, and that the banding together of
hospital, university, and academic societies
for the purposes of providing and supervis-
ing continuing education, will most certainly
bring far reaching changes upon the neuro-
surgical world as we know it today. We need
only look at the changes in general medicine
and geriatrics which resulted from medicare,
at the proposed plans for changes in resi-
dency training and man power distribution
being readied for the arrival of pedicare, to
understand that neurosurgery will soon find
it necessary to readjust its posture to fit the
needs of society. John S. Millis, President,
Western Reserve University, stated in the in-
troduction of the now famous Millis report
that, and I quote, “the informed public also
know, however, that a wide gap exists be-
tween the best that medicine can offer and
the lesser services actually available to many
patients. Medical practice has changed
greatly. Yet the judgment is widely ex-
pressed in and out of medicine that the
changes have not been profound enough to
keep pace with the growth of medical knowl-
edge and the rise in society’s expectations
and demands. The current problems of med-
icine are, in large measure, problems created
by its own success.” Therefore, it is obvious
that we will, during the present decade, un-
dergo many changes and that we will, ac-
cordingly, redirect and redefine our special-
ity.

As this pertains to the resident, we have
now come to see that it is not possible to
consider residency appointments on the basis
of service needs but rather that each ap-
pointment must be determined by the ability
Neurosurgical Training Program Workshop II

of the training program to provide optimal teaching personnel, consultation services, laboratory space, patient load, and so forth. The resident is becoming a postgraduate student.

What then do we mean when we speak of an academic neurosurgeon? Certainly not only those men associated directly with universities, for approximately 20 of the 93 training programs reported on by Dr. Guy Odom in "The Role of the University in Graduate Medical Education" were either military hospitals, Veterans Administration hospitals, or general hospitals without university affiliations. The academic neurosurgeon is not only the one associated with a neurological training program since neurosurgeons in many universities which do not have training programs are engaged actively in the teaching of neurological surgery to medical students and in the pursuit of neurological research. An academic neurosurgeon is not only one who belongs to a particular society since all five of the national neurological societies in the United States have wide representation among their membership, with most of the men in this room belonging to a majority of them.

Neurosurgery, in essence, has resisted the temptation to allow the formation of an academic hierarchy within its ranks. It has long been understood that the private practice neurosurgeon certainly is engaged primarily in the care of patients but may, and often does, spend varying amounts of his time teaching; that the academic neurosurgeon certainly has as his primary mission the teaching of his specialty to residents and students, but, equally often, cares for neurological patients. Does this mean then that an academic neurosurgeon is one who teaches?

The questions which I would raise at this time are: 1) Is the academic neurosurgeon necessarily an experimental investigator, a teacher, a practitioner who cares for patients? 2) What are the responsibilities of the academic neurosurgeon to the university and to his students? 3) Are academic neurosurgery and economic full time neurosurgery synonymous? 4) Is it desirable to provide special training to those interested in academic neurosurgery? 5) Is academic neurosurgery, as all of neurosurgery, a vocation or an avocation?

My hope is that the sense of excitement which exists in all of us about the future of neurosurgery will continue, and that we will remain at home in, and in control of, our changing world of neurosurgery.