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**For a faculty neurologist who usually practices in a northern outpost of the Dartmouth-Hitchcock Clinic, a two-week stint as an “attending” at Dartmouth-Hitchcock Medical Center offers an opportunity to reflect on the complexity and the promise of modern academic medicine.**



ALL: PATRICK SAINE

**Neurologist Parker Towle**

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I have been a member of the Dartmouth Medical School faculty ever since I moved to New Hampshire in 1980 to practice neurology in the northern reaches of the state. But until I became a full-time employee of the Hitchcock Clinic in 1995, my faculty service had been limited to volunteer preceptorships for an average of half a day a week.

When I joined the Clinic staff in 1995, however, a major additional duty became “attending”—something that can be considered a title, a process, or an action. It’s not a word much used by those outside of medicine. Patients just call an attending “the doctor.” But each specialty service in a tertiary-care medical center is supervised—around the clock, seven days a week—by a fully trained and

the opportunity to supervise the care of patients with the sorts of acute disease that I ordinarily refer to DHMC.

The young physicians who actually manage the care of these patients—under the eye, responsibility, and advice of the attending—are the residents and interns, supported by medical students. During my latest turn as an attending the cast of characters on the service included:

Vanessa Tseng, M.D., a first-year resident in neurology. She went to college and medical school in Canada and interned last year in New York City. She was “first call” on the inpatient admission service—that is, the first person notified of a new admission or a potential problem.

Lucas Beerepoot, M.D., a second-year neurolo-

# Reflections on attending

qualified specialist who is known as an attending because he or she “attends” to, or oversees, whatever arises on the service.

An attending’s length of duty varies, but in neurology at Dartmouth-Hitchcock Medical Center it is a continuous two weeks. On our service, the duty falls to each member of the faculty between one and three times a year—though less often for me, because I live and practice 50 miles to the north and must find housing in the Upper Valley for each of my stints as an attending.

My regular practice is mainly office-based, and it includes weekly travel within a radius of 60 miles to a number of small communities with hospitals of 30 to 60 beds (compared to about 400 at DHMC). During my periodic fortnights at Dartmouth, I have

gy resident. Here on a Dutch visa, he interned in New York and had also done some training beyond medical school in the Netherlands. He was in charge of the inpatient consult service during my fortnight as an attending.

Tamer Saad, M.D., a third-year neurology resident. He plans to do a fellowship next year and was in charge of the inpatient service during my first week.

Lore Garten, M.D., a third-year resident. Lore (pronounced “Laura”) plans to practice next year in Hudson, N.Y., and was in charge of the inpatient service my second week.

Heather Marks, M.D., an intern in medicine. She and her husband both graduated from the University of Massachusetts Medical School in June of 2001. She was assigned to the neurology service my first week.

Douglas Marks, M.D., like his wife, an intern in medicine. My first week he was on the consult service under Lucas and my second week he was on a cardiac unit where we often were called to consult.

Hugh Mirolo, M.D., an intern in medicine. He will be a neurology resident at DHMC next year

**By Parker Towle, M.D.**

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*Parker Towle, an adjunct associate professor of medicine at DMS, is a graduate of the University of Vermont College of Medicine and did his residency at Yale-New Haven Medical Center. He has practiced neurology in the northern New Hampshire town of Littleton for 22 years. This is his first prose contribution to DARTMOUTH MEDICINE, but he is also a poet and his work in that genre has appeared in these pages several times in the past. In this article, the residents and students are identified by their real names, but identifying details about all patients have been changed.*

and has already completed a residency in psychiatry; he was on the inpatient service during my second week.

Karen Bradley, a fourth-year medical student. She plans to start an obstetrics internship in July and was assigned to the inpatient service.

Stephen Toothaker, a fourth-year medical student. He was on the inpatient service my first week.

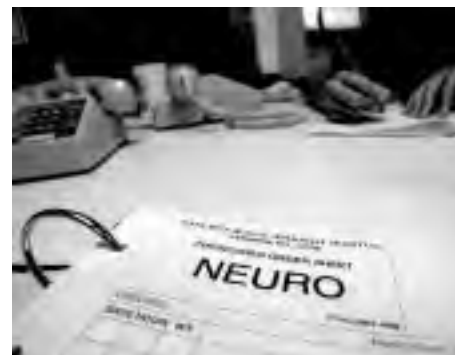
Marta Melendez, a fourth-year medical student. She was on the inpatient service both weeks.

Jennifer Hewett, a fourth-year medical student. She was on the consult service both weeks and was an “acting intern” during the second week.

status. Every member of the team will have this two- to four-page printout in hand during rounds. But cyber-rounds goes beyond this. Every doctor on the service has a patient list. If you sign in on a computer with your password, then click on a patient’s name, you see a menu: old records from previous hospitalizations and clinic visits, up-to-the-minute lab results, x-ray results, other test results, pharmacy profiles, and much more. The patient is now fully digitized.

By 8:11 a.m., most of the team has gathered: Tamer, Vanessa, Stephen, Heather, Karen, and Marta are there, and Vijay Thadani, M.D., the out-

**As arranged with the outgoing attending, I arrive in the conference room at 5 West promptly at 8:00 a.m. for joint resident-attending rounds. I find that the residents are out on “the floor.”**



**Click on a patient’s name and you see records from previous visits, up-to-the-minute lab results, x-ray results, other test results, pharmacy profiles, and more. The patient is now fully digitized.**

Stella Lee, a freshman at Dartmouth College. She’s interested in medicine and “shadowed” me one day during my stint as an attending.

**A**s arranged with the outgoing attending, I arrive in the conference room at 5 West promptly at 8:00 a.m. for joint resident-attending rounds. Only Heather, Karen, and Marta are there; I soon learn that meeting times are flexible. The residents are out on “the floor” (in the patient rooms and the nursing areas), where they have been for at least an hour—checking on acute problems with the nurses, dictating discharge summaries, taking care of other administrative issues, and conducting a special activity that I shortly name “cyber-rounds,” an activity that has been significantly enhanced since my last stint as an attending.

Sometime within the past 12 hours, the intern has composed a summary of each patient on the neurology service; it includes up-to-date test results, diagnostic impressions, and the patient’s treatment

going attending, will join us shortly. First, the student or intern or junior resident most involved in each patient’s care presents a sentence or two as to why that patient was admitted, what abnormalities are evident on examination, whether or not there has been a change (for the better or the worse) in the preceding 12 hours, what testing has or has not shown, what testing is pending, and what questions remain to be answered. The senior resident often modifies or amplifies one or more of these assertions. As this occurs, we are standing at the nursing station with the chart (a large loose-leaf notebook) cradled in the arms of one of us or lying open on the high counter. Someone is probably also leafing through a separate, somewhat smaller loose-leaf notebook containing vital signs and other minute-to-minute nursing data.

Next, we advance on each patient’s bed en masse. I am introduced and shake hands with the patient, or, if the patient is comatose, at least grasp a hand. We chat with the patient in large, well-ar-

ticulated voices. One of us, often me, examines the key findings. On the neurology service, these may involve the eyes; other cranial nerves; or the movement, tone, or reflexes in one or more limbs. The intern or a resident may listen to the lungs, check the skin, or percuss the abdomen. We chat among ourselves, trying to involve the patient. Pleasantries and asides are bandied about. Nurses, care coordinators, therapists, and social workers who have also joined the entourage chime in with pertinent information and questions. Then the group retreats to the nursing station to enter new notes and orders in the patients' charts and to make more inquiries.

In short, my rounds with residents, interns, and students will usually start at 10:00 a.m. At 1:00 p.m., I will supervise a student, intern, or resident who is seeing outpatients. And at 3:00 p.m., I will see hospital consultations—inpatients on other specialty services whose conditions potentially include neurological consequences. A variety of conferences—from resident-run “journal clubs” to a specialized “brain cutting” neuropathology session—are interspersed throughout the day.

I return to 5 West to familiarize myself with the neurology patients, write a daily note about each one in their charts, and check the gold-colored

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Today, Vijay summarizes each patient's status for my benefit, and I add a few queries that later, with the benefit of hindsight, seem to be of variable appropriateness—the patients being not nearly as familiar to me at this point as they are to the others. A patient who had had a stroke had been placed on the anticoagulant heparin, for example, and I ask if another blood thinner had been considered. We have insufficient time just then to debate this rather complex decision that has already been executed. Nevertheless, such points of educational interest are often expressed in this setting. We move on.

We visit five patients this morning (there are six on the service right now, but one is down at Physical Therapy). Vijay then conducts me back to my clinic office to go over a mass of small details, such as how to dictate over the hospital phone system, how to answer and receive pages, how to page others, how to phone people inside and outside the hospital. Finally, he explains the daily schedule and the unpredictable processes that lie ahead.

sheet on which all care delivered by a staff physician (and the accompanying diagnosis) is entered for billing purposes. I'm in the midst of these chores when Vanessa calls me from the Emergency Department (ED). She recounts an interview she's just had with a patient, the results of her examination, her tentative conclusions, and the studies she has initiated. I tell her I will be right down.

Let me digress here. At least once each day and/or night, this ED activity will be repeated. It is not really like the television show *ER*, however. There is very little running about or anguished conversation. Drama, no; humanity, yes. The best description of what goes on in an ED might be Brownian movement—a term for the random action of microscopic particles suspended in a liquid or a gas. Or another way to think of it is like motes of dust in a ray of sunlight.

Generally, except during the remote hours of the night, every patient space in the ED is full. The corridors even contain numbered waiting spaces for

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wheelchair and stretcher cases. Behind a motorized sliding door is a waiting room staffed by a receptionist and a security officer. And then there is the nurses' station, with its chart rack spinning in the center like some internal radar system seeking to direct the unending flow of caregivers: emergency doctors, nurses, clerks, ambulance attendants, consultants, residents, interns, students. Many are writing, more are talking on the phone, many confer about cases. But a few are always chatting about matters irrelevant to the business at hand such as off-hour staff parties, past and planned, or families, young and old. Some wander about looking for

share with two other staff neurologists. The three of us play musical chairs around two desks and two computers. I have a few minutes to myself until Doug finishes seeing an urgent outpatient who was fit into a scheduling category known as "drop-slot." I use the time to research two disease categories that are represented in the current neurology inpatient population: brain-stem infarction (a blood clot in the brain's basilar artery) and thalamic hemorrhage (bleeding in the brain's signaling center). These will be the subjects of "talks"—informal, one-hour teaching sessions—that I'll give for my students and house officers (otherwise known as residents).

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**And then there is the chart rack spinning in the center like some internal radar system seeking to direct the unending flow of caregivers: emergency doctors, nurses, ambulance attendants.**

some paper form or other, for some person or other who has the solution to some problem or other. Empty chairs and counter space are scarce. Stretchers slide by and are whisked away.

Our patient had arrived in the ED for the second time in as many weeks, complaining of constant headaches and vertigo after a fall at work. By the time I arrive he has already had a CT scan of his head. The results were normal. He will eventually be discharged home, after a very detailed assessment by the otolaryngology service (or ear, nose, and throat, also known as "ENT"), with suggestions from us as to a change of medication.

It is already time for lunch. I stop by the cafeteria and get a take-out sandwich on my way back to the department library for a journal club session presented by the longtime chief of neurology. In a display of the athleticism for which he is well known, he gesticulates himself through the vestibular system.

At 1:00 p.m., I return to the small office that I

Another digression. I am seated at the computer. The screen before me says "DHMC Runway." I click. "Library Services." Click. "OVID Database." Click. "Continue," it says, and I click again. "Medline Search—1966 to November 2001." Suddenly, presto, the world's medical literature lies at my fingertips! In just five minutes I have located several key, recent reviews of brain-stem infarction and thalamic hemorrhage and the articles are humming out of the printer. Some of them are not just abstracts—a summary of a study's conclusions—but the article's entire text, including references, tables, graphs, and, with a few extra clicks, accurate full-page reproductions of the photos. Using these articles, plus a book titled *Critical Care Neurology* that I'd slipped from the shelves of the department library, I am well into the outline for my "talk" when my pager beeps. Doug is ready to present the "drop slot" case.

A 50-year-old man, quite fit, has been getting pressure headaches whenever he exercises for the

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past few months. Doug says the examination was normal, and he details the pertinent negative findings. We enter the exam room. I review the history in some detail and confirm Doug's negative exam. We consult with one of our headache specialists down the hall, who recommends magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA). Arrangements for both tests are made and the patient is on his way.

At 3:00 p.m., my beeper goes off again. Lucas informs me that we have several consultations to see, starting with a man in the intensive care unit (ICU). He has been comatose following a head in-

jury, and proceed to meet Vanessa and Stephen in the ED. We admit a stroke case; the other patient has not yet arrived. After one final walk down the long central "mall" of the Medical Center, I gather some papers from my clinic office and proceed to the parking lot. It's 6:30 p.m.

During the evening, I am called back to the ED. An outreach neurologist (someone like me when I'm in my usual role) had called earlier about a patient in a northern township who had progressive leg weakness of three weeks' duration. Vanessa determines, and I confirm, that the symptoms have actually been of several months' duration. We ad-

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jury and had required cardiopulmonary resuscitation (CPR). Jennifer presents the salient facts of the case. Then, after examining the patient, we sit down in the ICU conference room with the family and the unit doctor and nurses. We try as best we can, based on the bedside findings, to determine what area of his brain has been damaged—the CT scan not being helpful in this case. We try to convey both the seriousness of the situation and a glimmer of hope. We try to respond accurately to questions posed from all places around the table. Thereafter, I proceed to the nurses' station and record a one-page note in the chart. We move on.

Jennifer presents a case in psychiatry and Lucas one in oncology, then we review two more whom Vijay had seen with them the previous week. We often speak with the house officers on each patient's ward. My pager beeps again. There is a potential neurology admission in the ED and another one is expected. I bid adieu to the consult group, making a few summary remarks about tonight and tomor-

mit the patient but decide that we can defer an MRI scan until tomorrow morning. Routine preliminaries are arranged. I receive no further calls that evening but later learn that the resident fields several during the night.

**B**y 7:30 a.m., I am in my clinic office to complete my "talks." Vijay has left for a meeting in Philadelphia, so the office is left to my colleague, Elijah Stommel, and me. He is already at work at his computer preparing a lecture when I arrive. Now I know the routine. Rounds at 10:00 a.m., my talk with the entourage at 11:00, "drop slot" patient at 1:00 p.m., and consultations at 3:00, with conferences and emergencies interspersed. We find ourselves in the radiology department at least twice a day and occasionally in other laboratories—electroencephalography in particular.

One of today's patients—a woman in her forties who came in to the ED—is especially perplexing. She's had problems since a surgical procedure 10

months before. In recent weeks, she has noticed some unsteadiness on her feet and some patchy numbness that's difficult to define on her torso and extremities. She does not appear too acutely ill, but we decide urgent testing is required to determine a cause which, it seems, might be in the central or the peripheral nervous system.

Another patient presents with an obscure history of visual spells and vague headache, thought to be migrainous. The intern and I are not so sure about that diagnosis, for the patient is a woman in her fifties with no prior or family history of migraines. An MRA shows a tight narrowing of the

On the consult service, I see a case of subacute bacterial endocarditis (an infection of the heart valves) with septic embolus to the middle cerebral artery (meaning an infected clot has floated into the wall of the artery and caused a stroke). It's a classic syndrome that I'd read about in old textbooks and seen once or twice early in my 40-year career: a teaching masterpiece and a condition potentially curable with modern antibiotics.

We see yet another spinal-cord emergency and another CPR coma case in the ICU. Patients are admitted, patients are discharged. Our ward census on 5 West grows to nine and the residents declare

**Another patient presents with an obscure history of visual spells and vague headache, thought to be migrainous. I am not so sure. An MRA shows a tight narrowing of the basilar artery.**



**We see yet another CPR coma case in the ICU. Patients are admitted, patients are discharged. Our ward census on 5 West grows to nine and the residents declare the service busy.**

basilar artery. We reflect on the condition of a 5 West patient who has paralysis of three limbs and of the eyes due to occlusion of this artery and determine to admit this woman immediately for contrast angiography with radiopaque dye.

Around dinnertime we see a young man who had been admitted for a lung biopsy but then suddenly and inexplicably developed weakness in both legs. This almost seems like an epidemic. Lucas works through various administrative complexities to obtain appropriate and immediate x-ray studies for him. From the onset of symptoms until pressure on the spinal cord is surgically released, mere minutes may be critical in preventing permanent paralysis. The patient has emergency spine surgery before the following morning.

As the first week wanes, I have to make one late-night ED visit and get a few additional evening calls that do not require visits. The residents face a potential weekend coverage crisis when one of them has a death in the family, but this is resolved.

the service busy. I am getting three meals a day, a reasonable amount of sleep for me, and a substantial dose of hospital neurology.

**A**t the beginning of my second week, Stella, a Dartmouth undergraduate who will "shadow" me for a day, arrives in my office at 7:45 a.m. She has been briefed on important issues such as confidentiality. We proceed to rounds.

The patient from the northern township is transferred to neurosurgery and eventually has decompressive neck surgery. Angiography confirmed an ominous narrowing of the basilar artery in the woman we saw earlier. She is transferred to a hospital in Massachusetts for angioplasty, a procedure which, in that part of the brain, is barely beyond the experimental stage and is performed by only a scattering of interventional radiologists worldwide. This particular doctor had been recommended by our neuroradiologists.

I present two more talks: one on lumbar root

compression (pressure on the nerves in the lumbar region of the spine) and one on treating stroke with thrombolysis (a new clot-dissolving drug).

At the same time, my efforts in OVID Medline intensify—particularly in behalf of the woman in her forties with the limb problems. She has had extensive infectious and immunological studies. Consultations abound, yet the nature of peculiar dye-enhancing lesions seen on her MRI scans remains elusive. We propose a 100-year-old diagnosis, Foix-Alajouanine syndrome, but that doesn't help us find a true cause any more than do the pathologic observations of this long-dead French neurologist. I

rology and the neurosurgery services. We do not disappoint. The discussion is good. A plan of treatment is formulated.

I gather my stethoscope, ophthalmoscope, percussion hammer, and tuning forks; fill my briefcase with accumulated notes and articles; and depart. It has been, as I later tell my 94-year-old mother on the phone, rather like a two-week mountain-climbing expedition. For the prior three to four months I had prepared myself diligently for this stint in critical-care neurology, which I have only on occasion done this intensely since completing my own training nearly 40 years ago. Much has changed, but

**I borrow some obscure journals from the library on Dartmouth's Hanover campus and copy more articles from the section's library. We consider cancerous, infectious, and vascular causes.**



**We present our puzzling case at the weekly teaching conference called “megarounds.” Here, a large gathering of doctors, residents, and students discuss the most interesting cases that week.**

borrow some obscure journals from the Dana Biomedical Library on Dartmouth's Hanover campus, find some more recent citations in the Matthews-Fuller Health Sciences Library on the fifth floor at DHMC, and copy many more articles from the neurosurgery section's library. We consider cancerous, infectious, and vascular causes. After accumulating at least 30 references, I arrive at a personal opinion about the case. Lore and Vanessa make multiple copies of the pertinent references, one set of which I provide to Alex Mamourian, the neuroradiologist who has kindly been following the progression of our investigation.

As my last day on the service arrives, the inpatient neurology census has fallen to five. Vanessa and Hugh are preparing to present our puzzling case at the weekly teaching conference called “megarounds.” Here, a large gathering of doctors, residents, and students, plus a number of outside physicians and surgeons, convene to discuss the most interesting cases that week—one each from the neu-

much more is the same. My accumulated experience of so many years has served me well. My steepest learning curve occurred at the computer. Fortunately, I'd had enough prior contact to have the facility to learn the new aspects.

It was a successful expedition, I believe. My group and I learned much, and we brought the best that modern medicine can offer to the bedside. The young doctors and students were delightful. One sent me an e-mail thank-you. It will be an adjustment to return to my everyday itinerant neurology practice. Yet my patients can only benefit from my experience, as have I.

Indeed, within two weeks of my return to the North Country, I have occasion to order a new and obscure enzyme assay on the blood of a patient with atypical dementia whom I had previously examined and treated. My basis for this action, which I hope may produce a definitive diagnosis, was an article that Lucas had flipped onto my desk during my two weeks as an attending. ■