

Blood (which is the subject of the first letter below) may be thicker than water (which is the subject of the second letter), but make no mistake about it—the proper general term for both blood and water is “liquids,” not “fluids,” as the second letter points out. Other recent communiqués came from a noted New Hampshire journalist (who is kind enough to suggest that he finds our writing . . . well, fluid) and from a member of the Dartmouth Medical School faculty (who makes an . . . ahem, solid case for the specialty of family practice).

Not bloody likely!

I enjoyed the Spring issue of DARTMOUTH MEDICINE. Timothy Rooney [author of a story titled “One March Morning”] is my twin sister’s son-in-law, so it was fun to read his piece.

However, the reason for my writing is a number on page 28, in the box “A Few Significant Facts About Blood.” It states that there are a billion red blood cells in two or three drops of blood. A red cell measures seven microns in diameter and about one micron in width. One billion of them would be 1×10^9 times 7×10^6 —about 7,000 meters if the cells were laid end to end, or 1,000 meters if the cells were laid side by side.

Perhaps my math is wrong. However, I don’t believe there could be a billion red blood cells in two or three drops of blood! As a surgeon, I sometimes use 10-0 sutures. A 10-0 suture is 22 microns in diameter—only three times the diameter of a red cell. Yet a 10-0 suture can be seen by the unaided eye in good light.

We’re always glad to hear from readers—whether it’s a letter from a longtime subscriber who’s weighing in with an opinion, or a note from someone who would like to become a longtime subscriber. In fact, we are happy to send DARTMOUTH MEDICINE—on a complimentary basis—to anyone who is interested in the subjects that are covered in the magazine. We regret, however, that the complimentary subscription offer can be extended only to addresses in North America. Both subscription requests and letters to the editor may be sent to: Editor, DARTMOUTH MEDICINE, One Medical Center Drive (HB 7070), Lebanon, NH 03756, or via e-mail to: DartMed@Dartmouth.edu. Letters for publication may be edited for clarity or length.



Please let me know where you got that calculation. Thank you.

WILLIAM BABSON, JR.
DC CLASS OF 1963
Plymouth, Mass.

Our source for that number was the American Association of Blood Banks. We asked Dr. James Aubuchon, the director of DHMC’s blood bank and the subject of the article in the Spring issue, if he could confirm it, and he replied as follows: “The number you quoted is indeed (approximately) correct. The normal red cell count is about 5 million per microliter of blood. This is the same as 5 billion per milliliter. The nominal size of a drop is usually taken as 1/20 of a milliliter, so each drop would contain about 250 million red cells. Three drops would bring the number close to a billion.” But Babson’s figure for the size of a single red cell is also correct; the reason for the apparent discrepancy is that cells aren’t laid end to end in a drop, but are packed in.

Water, water, everywhere

My compliments on your fine publication. But I must take you

to task on your use of the word “fluids.” I often see the general terms fluids, liquids, and gases used incorrectly. Again and again, the word “fluid” is used when the correct word would be “liquid.” Why, I ask you, does the medical profession, in particular, speak of “body fluids” when air, which is a fluid, is not included? The correct, restrictive phrase is “body liquids.”

Even in DARTMOUTH MEDICINE, the use of these terms is, at best, poor. In the Fall 2002 issue, an article on the “8x8” rule about water intake used the word “water” correctly. But one poor sentence read, “That report said people need about 64 ounces of fluids a day.” It was written without quote marks, so the editor would have been free to correct the word “fluids” to either “water” or “liquids.” Almost everything we drink, in any quantity, is mostly water. Even most alcohols are at least 90% water. And in the next-to-last paragraph of the article, DMS physiologist Valtin refers to “those who persist in advocating the high fluid

intake.” This is imprecise thinking—the correct general word is “liquid,” or the specific one is “water.” Everywhere else in this article, the word used, correctly and clearly, is “water.”

An article in the April 28 issue of the *Valley News* was even worse in that the author implies that air is *not* a fluid, which, of course, it is. The author writes, *inter alia*, “when an object flows through a fluid or through air.” His use of the word “flows” is also poor; the object doesn’t flow, the fluid does. A better choice would have been “moves.”

Such poor word choice does not serve the unthinking public well. Will you join me in correcting this muddy thinking and writing?

R. HEATHCOTE RUSSELL
Hanover, N.H.

Russell, an adjunct staff engineer at Dartmouth’s Thayer School of Engineering, is correct. Do we get 40 lashes with a liquid-soaked noodle?

Steal away . . .

As an outdoor writer and columnist (and former owner and editor of three weekly newspapers), I was ready to be . . . well, bored when I picked up a copy of your Fall 2002 issue in the Pain Clinic waiting room. Medical periodicals aren’t exactly known for their riveting content. However, it was the only magazine around at the moment. But you never know, I thought, as I sat down expecting to be put to sleep.

What a delight to find in your pages not only a wide range of interesting subjects, but fine writing and editing to bring

them to your readers. Emily Transue did a nice job on the withdrawn World War II pilot. It was interesting to get a look back at the smallpox inoculation controversy at Dartmouth in 1776. I even enjoyed (stick me with a pin!) the profile on John Modlin and post-September 11 immunization strategies.

In fact, I didn't want to put the magazine down. I asked permission to filch it from the hospital grounds, and it is now with me at my office in Colebrook, nine miles south of the Canadian border, where I write and raise sheep. I kept it as a reminder to write you this note because (to sort of quote Shakespeare) the good deeds of writers and editors are oft, as with those of farmers, interred (yes, that's a pungent pun).

What with the bangs and bumps from farming and the ravages of advancing age, I'll no doubt find myself at Dartmouth-Hitchcock again sometime soon. I'll look for the same friendly personal attention and medical professionalism that several generations of Harrigans have come to expect there—and I'll look for your fine magazine to keep me company.

Actually, maybe I should avail myself of your offer of a free subscription so I won't have to keep stealing it.

JOHN D. HARRIGAN
Colebrook, N.H.

In addition to publishing newspapers and raising sheep, Harrigan has long been a regular on the public television program New Hampshire Outlook. We assure him that

we think it's grand, not grand theft, when patients take home copies of DARTMOUTH MEDICINE from DHMC—that's what they're there for. But we're delighted to add him to our subscription rolls, too.

All in the family

As immediate past president of the New Hampshire chapter of the American Academy of Family Physicians (AAFP), I recently prepared for our parent organization a Granite State response to a study by the University of Arizona that the AAFP commissioned. This study sought reasons for the staggering 35% decline in recent years in the number of U.S. medical school graduates choosing to enter family practice (FP) residencies.

I thought DARTMOUTH MEDICINE's readers of might be interested in how the state and national situations compare. New Hampshire was the 48th state to establish an FP residency; two programs (including one based at DHMC) were established in 1995, and they were later consolidated into one program based in Concord. The program has continued to be filled, and filled well, each year. And at DMS—the state's only medical school—the percentage of graduates choosing FP has declined from a high of 18% to just under 10%.

Our experience, in a state with seven quite rural counties out of 10, resonates with the Arizona finding that students from rural and lower-income backgrounds are more likely to choose FP. And despite DMS's reputation as a school with a national draw and a track record of

“prestigious” residency placements, the School's commitment to community-based education—the placement of students in the offices of family physicians—is strong and vigorous. DMS recently formed a faculty committee called the Community Preceptor Education Board (CPEB), and half of its members are family physicians. Community education seems to be valued by the primary-care departments at DMS, and the required courses have strong community-based components. Truly, DMS is a national leader in community-based education.

Nonetheless, the percentage of DMS graduates choosing FP remains below 10%; therefore, we find ourselves reluctantly agreeing with the Arizona assertion that senior administrative support is more important than school initiatives. DMS still may have, we fear, a “hidden curriculum” of disdain for the prestige and academic rigor of community practice, despite the strong evidence-based teaching that the CPEB and Dartmouth's Office of Community-based Education and Research have been able to document. (Last summer's supplement to the *Journal of Academic Medicine*, on community-based education, contained four articles from DMS!) And, unfortunately, we don't see a strong positive correlation between the existence of Dartmouth's required seven-week FP clerkship and FP residency choice.

Despite this, New Hampshire family physicians and our state AAFP chapter have a powerful commitment to serving as pre-

ceptors for DMS students. In addition, our organization regularly sponsors record numbers of DMS students so they can attend the national FP conference.

We concur with the researchers' uncertainty about a link between income potential and career choice. As preceptors, however, we are certain that students are aware of the fact (in light of the continued escalation in the cost of medical education) that family physicians make less than the average income for physicians in all specialties and far less than those in procedure-based specialties.

As individuals and as an organization, we remain committed to contributing to the community-based education of Dartmouth students and to the continued existence of a strong and successful New Hampshire residency program—many of whose graduates end up practicing in the state.

DONALD KOLLISCH, M.D.
Hanover, N.H.

Kollisch is an associate professor of community and family medicine at DMS. The community education and research program he mentions was the subject of a feature in our Summer 2001 issue, and this year's residency placements—including in family practice, for both incoming residents and DMS graduates—are in this issue on pages 8 and 9.

A family tradition

I have just seen a borrowed copy of your Winter 2002 issue and would like to request a copy of that issue.

I found several articles of in-

terest, including the one titled "A Long-Running Hit," about the Dartmouth-Hitchcock Clinic; the note about Paul Uhlig, M.D., on page 19; and items on several other pages.

Paul's maternal grandfather, Henry Nelson Tihen, M.D., and nine others founded the Wichita Clinic in Kansas in 1948. It's not as old as Dartmouth-Hitchcock but has a similar proud tradition. As a cousin of Paul's, I am very pleased to see how, in a way, he has come home to a similar, even older clinic, than the one in Wichita.

JOHN D. LEITH, M.D.
Auburndale, Mass.

In search of chaos

There was an article recently, probably in the Winter issue, about chaos and the body's efforts to deal with it. My copy of the issue containing that article got out of my reach before I could cut the article out.

I'm anxious to get hold of it because I think it explains my husband's sudden death two years ago, due to sepsis.

I live in Hanover and volunteer once a week at DHMC. Can you help me in my quest? Thank you—DARTMOUTH MEDICINE is a good magazine.

PAULINE MARRAN
Hanover, N.H.

We're glad to send readers a copy of a back issue or an article. The essay on the effect of chaos on bodily systems was in our Spring 2003 issue.

Testament to excellence

It was with great pleasure and some pride that I read the Spring

Be sure to tell us when you move! If your address changes and you want to continue to receive the magazine, just tear off the back cover of the most recent issue, write your new address next to your old one, and mail it to: DARTMOUTH MEDICINE, One Medical Center Drive (HB 7070), Lebanon, NH 03756. It helps us greatly—since our mailing list is drawn from seven separate databases—if you send the actual cover (or a photocopy), rather than just your new address. Note, too, that if you receive more than one copy of the magazine, it's because of those seven databases (which are in different formats, so they can't be automatically "de-duped"). We're happy to eliminate duplications, but again it's a great help if we have the address panel from *all* the copies you receive, not just the one(s) you'd like deleted.



"Student Notebook" essay by David Bauer (DMS '05), detailing the establishment of the DMS students' Excellence in Teaching Awards. During my time as president of DMS Student Government, the membership decided, as Bauer wrote, "to formalize the process and give even greater recognition to those outstanding individuals."

This effort to broaden the teaching awards was largely built on the efforts of two people who were not recognized in the article for the great work they did in establishing the awards.

Y. Avery Ching (DMS '04) dedicated himself to seeing these awards come to fruition. Without his commitment to recognizing excellent teaching, and the effort thus motivated, I do not believe the awards would have become what they have over the last three years.

Secondly, Sue Ann Hennessey, assistant dean for student affairs at DMS, was the key impetus for the establishment of the awards. It was her vocal support for having students voice their opinions of faculty and for

us to recognize excellence that inspired us to broaden the teaching awards beyond just the fourth year to all the classes at DMS.

It is a testament to DMS students that they come together each year to acknowledge the very best educators here. Those who are honored are recognized by the students as models whom others may seek out as resources in medical education.

PAUL TESTA, M.P.H.
DMS CLASS OF 2004
Hanover, N.H.

Right on!

Thank you for the Spring edition of DARTMOUTH MEDICINE. The magazine is great! Dr. Koop's "Grand Rounds" essay was so true! And Dr. Paul Manganiello is absolutely right!

My son lives in Vermont. His job is seasonal and so he has no health insurance. It would be wonderful to have one source of insurance that everyone could afford. Also, why does Medicare not pay for yearly physicals? A physical would catch ailments before they become serious and then end up costing much more.

Thank you, DHMC, for being there for us. We love our Dr. Friedman.

ALFRED & GLORIA BOURASSA
Littleton, N.H.

Emergency request

I am an avid reader of DARTMOUTH MEDICINE, and I don't want to miss a single issue. Our town has renumbered all of our streets for emergency purposes, so please note my new address.

Thank you, and be proud of your publication!

KATHY KOZIKOWSKI
New London, N.H.

DM on the brain

I have had the pleasure of reading DARTMOUTH MEDICINE this year, while I have been a visiting scholar in Dartmouth's Department of Psychological and Brain Sciences. I am interested in continuing to receive the magazine on my return to Mount Holyoke College, where I am on the faculty. I believe my premedical advisees would also enjoy it.

WILL J. MILLARD
South Hadley, Mass.

A material matter

I would like very much to receive a subscription to DARTMOUTH MEDICINE. Recently, as a patient at Dartmouth-Hitchcock, I read the Spring 2003 issue. It was very informative and provided really enjoyable reading material.

JANET HOUGH-PEDUZZI
East Montpelier, Vt.

As noted in the box on page 26, we're delighted to add to our rolls anyone who's interested in the subjects that we cover. ■

Heavy duty

By Mary Margaret Andrews, M.D.

Like it or not, most physicians have bought in to the concept that long resident duty hours are a rite of passage synonymous with a strong work ethic and sense of professionalism. I was a schoolgirl when the *New York Times Magazine* ran a feature about the arduous life of resident doctors. I took the magazine up to my bedroom, closed the door, and lay on the floor, fully absorbed in the fantasy of hospital life. To this day, I can see the photographs of the '60s-era dark-rimmed glasses on a young doctor with ruffled hair and tired eyes bending over a patient's chart. He'd no doubt been working for 30 hours straight. I didn't know it then, but I had already formed a value judgment about physician duty hours by admiring the sleep-deprived resident in the article. These judgments are proving hard to undo.

Quirk: In fact, they are proving so ingrained in the graduate medical education culture that we forget it may be "a curious quirk of history and personality," as Massachusetts General Hospital medical resident Siddhartha Mukherjee, M.D., recently argued in *The New Republic*. There, he recounted the frenetic history of William Halsted, a cocaine-fired Baltimore surgeon. Halsted set the pace for generations to come—"exertion to the point of collapse." When Medicare was enacted in the 1960s, that pace was a setup for abuse in dollar-poor university hospitals looking for an inexpensive physician labor force—which they found in residents. Such is the making of history. The educational value of residents working long hours and observing the evolution of a patient's disease process appears to have been a fortuitous by-product of this system. Similarly, patient "ownership," a willingness to take responsibility for patients and see problems to completion, is an artifact rather than a requirement of long duty hours—100-plus hours per week in many instances.

Effective July 1, 2003, this era in medical training ends with the implementation of mandatory reductions in resident-physician work hours. The new rules set an 80-hour-per-week maximum, with one day out of every seven free from work, a minimum of 10 hours off between shifts, and a maximum of six hours that a resident can stay to complete and hand off work following a 24-hour admitting period. These work-hour restrictions, which were prompted by new rules from the Accreditation Council for Graduate Medical Education, follow growing documentation regarding the pitfalls of sleep deprivation and medical errors.

To all involved—except the affected residents—it is easy to see why duty-hour reform has not come sooner or more easily. In our hospital, like in many others, residents have typically provided all the in-house, overnight coverage. These new rules resulted in complex scheduling challenges, like moving pieces on a chessboard, with a



Is it arrogance or fear of change that keeps physicians adhering to the belief that long duty hours must be part of medicine?

checkmate at every turn. Replacing that resident-physician coverage with more senior provider coverage will come at a tremendous dollar cost, estimated to be a minimum of three times the amount of paying one resident. Similarly, innovative and labor-intensive methods will now be required to document and track residents' work hours.

Challenges: Despite these various logistical and financial challenges, our greatest challenge is changing the physician culture. Around DHMC these days, discussions about duty hours reveal a great deal of raw emotion from both resident and attending

physicians. Many attendings openly scorn moving toward "shift work" and talk repeatedly about the experience they survived to become professional and capable clinicians (as if this was the only possible route to that outcome). Many express outright anger about regulatory evils. And almost all are anxious about how their work schedules may be impacted. Surprisingly, even residents who are already immersed in the night-call culture are finding it hard to think of creative ways to hand off patient responsibilities post-call. All these concerns are understandable and require study.

Have the new regulations gone far enough? Unfortunately, I don't think so. Working 80 hours a week may be possible for short periods of time, but over the long haul it wears on one's body and psyche. There is a price to pay: The adrenaline-fueled, out-of-body feeling. The extraordinary concentration required to hear and then relate a patient story or to remain pleasant to a colleague or to a patient's family member. The sheer number of calories needed to stay awake that many hours—the reason for countless tales about scavenging for food (especially unhealthy food) while on-call. But the good news for the future is that someone has finally noticed.

Effects: As several recent articles in the *New England Journal of Medicine* have noted, the data on the deleterious effects of sleep deprivation is clear in the transportation and nuclear power industries. Is it arrogance or fear of change that keeps physicians adhering to the belief that long duty hours must be part of medicine? Or is it the economic impact that the health-care industry will now be forced to confront? In any case, we must accept the fact that medical education is not static. We must take steps to reduce duty hours even further below the new 80-hour requirement. To all non-believers, I recommend staying up all night, two or three nights a week, for the next few years to remind yourself of how it feels. For the safety of patients and the health of medicine, we must embrace these new rules now. ■

"Grand Rounds" covers a topic of interest to the Dartmouth medical faculty. Andrews, an assistant professor of medicine (infectious disease), also did her residency in internal medicine and a fellowship in infectious disease at Dartmouth-Hitchcock.