

WORCESTER medicine

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Editorial

Jane Lochrie, MD



Jane Lochrie, MD

A mentor has been defined as “a person or friend who guides a less experienced person by building trust and modeling positive behaviors.” Over the past decade, the idea of mentoring has become increasingly fashionable. Many companies now offer formal mentoring programs to support their more junior colleagues.

The literature is ripe with information about the qualities of an effective mentor. A successful mentor should display a positive attitude and act as a positive role model, exhibit enthusiasm, value the opinion of others and motivate

by setting a good example. This issue of *Worcester Medicine* explores what opportunities are available in the Worcester medical community for students, residents and junior faculty.

The first article is a summary of the Annual Oration, *Symphony of the Brain*, which was delivered on Feb. 10, 2016, by my mentor, Dr. Joel Popkin. He investigates how music evolved as an integral part of every culture, how music is processed by the brain and how we are affected by it. He looks at the use of music in health and disease and questions if music can slow cognitive decline in the elderly.

Dr. Spanagel describes the Learning Communities at the University of Massachusetts Medical School, which was started as part of the curriculum redesign in 2010. Students are randomly assigned to one of the five Learning Communities houses for all four years of their education. Each house consists of faculty mentors (who receive intense faculty development) and students from all four years. Students organize social and academic events, service projects and community outreach, and faculty emphasize professional career development, history, physical exam and communication skills and assist with career choice.

The faculty mentoring programs at UMass were described by Drs. Thorndyke, Cain, Ockene and Milner. These programs include the weekly Junior Faculty Development Program, which includes a project guided by a faculty mentor, and the Peers for Promotion, which helps faculty attain promotions. Departments are strongly encouraged to have a mentor for all new faculty appointments. The authors conclude by saying that there is not one perfect mentor and faculty are encouraged to invest in a network of mentors.

An innovative coaching program for residents at St. Vincent Hospital is described by Dr. Hoag. She emphasizes that medicine is a calling and the importance of maintaining the excitement of learning and the joy of medicine. The Coaching Program provides emotional and professional support to residents during one of the most challenging periods of their lives. The program uses non-supervisory faculty to help residents reflect on their experiences and use their strengths to maximize their potential. This has been very well-received by the residents.

Massachusetts College of Pharmacy and Health Sciences (MCPHS) has a well-developed faculty development and mentorship program for its near-300 full-time faculty. Dr. Cooper states that, like most schools of pharmacy, the assistant professors at MCPHS are clinically trained and have little experience with teaching, scholarship and service. The Pharmacy Academic and Leadership Support Committee guide and mentor faculty to meet their academic responsibilities while promoting professional growth. The New Faculty Orientation Program is a longitudinal mentoring program that includes a roundtable discussion series. New faculty members are paired with at least one mentor to adjust to academic life.

Our last three theme articles were written by UMass medical students. Sarah Palmer describes her mentors over her nontraditional path to medical school and, finally, how her mentor, Dr. Tim Gibson, at UMass was different – there was no pressure, just lunch! He taught her the joy of learning by the example he sets, rather than following a syllabus.

Supreetha Gubbala, a student who just finished her first year at UMass, describes a very different experience that almost ended her medical career when her classmates questioned the validity of racism in Massachusetts. The faculty was aware of this and reached out to her in a way that totally transformed the experience to a positive learning opportunity.

Christopher Libby, a fourth-year student, opines that there are mentors all around us and that we should take advantage of our peers, as well as formal assigned mentors. Peers can teach you the “hidden curriculum” that requires inside knowledge.

Please don’t forget to read our usual feature articles, the President’s Message, Legal Consult and Society Snippets. In addition to our standard features, we have a great book review by Regina Raboin, associate director of the Lamar Soutter Library. She compares *A History of Present Illness* by Dr. Louise Aronson to Dr. Oliver Sacks’ case studies. This is a collection of short stories with the underlying theme of the importance of communication. Finally, please don’t leave the Berlin Writing Award-winning article unread. “Farewell to a Stranger,” written by Dr. Laurel Dezieck, is a heart-wrenching account of a resident’s experience with withdrawing life support.

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President's Message

James Broadhurst, MD



James Broadhurst, MD

I suspect all who read this issue of *Worcester Medicine* will find, as I did, that they pause and discover that they are reflecting on a mentor who had particular impact on their life. That impact could be in a variety of areas, among which might be personal relationships, work-life balance, time management or figuring out priorities. Dr. David Hatem, co-director of the Learning Communities at the UMass Medical School, introduced me

to the concept of professional identity formation and the academic literature supporting that concept. As I read this *Worcester Medicine* issue and paused, I thought of a physician who has provided enormous help and guidance to me as I formed my professional identity.

Augustine Warner Lewis, III. Just the name struck me as aristocratic and unapproachable. I was assigned to Dr. Lewis in Aylett, Va., for my third-year rotation in family medicine. I am a “northerner,” born in Boston and raised in a Boston suburb. While I had lived for several years in Richmond and Norfolk, Va., as part of graduate and medical school, I knew nothing of rural Virginia. Aylett is a small town on the banks of the Mattaponi River on the boarder of King William County and King and Queen County. Gus, as I was later able to call him, was following in the footsteps of his father and grandfather, who both had practiced family medicine in this community. He had tried to stray, having trained as a surgeon for two years at Emory in Atlanta, and then moving to Colorado to complete a family medicine residency. The pull to come home to Aylett and to practice family medicine was too strong.

I knew nothing of Dr. Lewis and Aylett as I travelled out of Richmond in the middle of my third year. It took me about an hour in my '67

VW bug heading northeast on Route 360 – the office was on the right adjacent to a pharmacy (how convenient!). The place was bustling with staff and patients. There was an X-ray machine and a procedure room and many exam rooms. And Dr. Lewis: tall, warm smile, relaxed and seeming to be both calm and busy at the same time. A few highlights of my reflections on an experience nearly 35 years ago: assessing, cleaning and suturing soft tissue injuries from the farm and how to do a pelvic exam (“talk to the patient – let her know what you will be doing so that she is not surprised – be gentle but have confidence”). How was I supposed to be confident? One of the most striking memories is how fast he could dictate notes for his charts. We did those at the end of the morning before lunch and at the end of the day. “That way you keep up and you are done.”

I returned to Gus’s office both for an elective in my fourth year and in my third year of family medicine residency. My family medicine residency at UMass included a community practice experience, during which residents left their health center and practiced for a rotation in the community. Residents rarely left the state, and none, to my knowledge, have been to Aylett. I lived in Gus’s house and took care of his goats, as he decided that he could leave his practice in my hands while he went away for five days to a NAPCRG meeting. He trusted me. He had faith in me. A trust and faith I felt was severely tested when, during my first “alone” day, a family brought in an older gentleman who had fallen and “just didn’t seem right.” I noticed as he sat on the exam table that he had a hard time sitting up – he seemed to be falling to his right. After a worrisome neurologic exam, I arranged for an ambulance to take him to the ER in Richmond, and it turned out he had a subdural hematoma.

Dr. Augustine W. Lewis, III is a person who had a profound influence on my “professional identity formation,” and I will always be grateful for that gift. He is a mentor and a friend. My hope is that as you pause and reflect with this issue of *Worcester Medicine*, you will enjoy similar reflections.

Reject Violence and Search for Peaceful Solutions

Michael Hirsh, MD



Michael Hirsh, MD

The dust has not yet settled on the events of this past week in our country. On our 240th anniversary this past July 4, the Brady Campaign Massachusetts Chapter invited me to participate in a march in Sudbury for Independence Day. Wearing my white coat, leading with a banner saying “Enough,” I marched alongside members of the Million Mom March in front of a pick-up truck bedecked with

the LGBT rainbow on it and “Black Lives Matter” and “ASK – Asking About Guns Saves Kids.” As we rolled the 3-mile route slowly, over about an hour and a half, between a fife and drum band ahead of us and a German “Oompah” band behind us, I was so encouraged to see young and old rise up from their lawn chairs and even run out to greet us or hand us water bottles in the 90 degree heat to say “Thanks for what you are doing.” Only a few heckles as we passed by.

Maybe the Orlando shooting had created the tipping point on “Gunsense” we have been looking for – the middle ground that would put public health and safety over the overzealous defense of the 2nd Amendment.

And coupled with the encouraging news that on June 21, the entire 11th Circuit Court of Appeals heard a riveting defense of the doctor’s right to discuss gun safety with any patient while the State Of Florida, three days after Orlando, barely defended its “gag law,” I could only conclude Reason was winning. Maybe this will embolden our physician community to embrace the unique privilege as wellness promoter for patients and to counsel about the risks of gun ownership, the responsibility of safe storage that goes with gun ownership and to suggest patients with depression,

suicidality or history of domestic violence consider disarmament.

Then three days after the parade, we witnessed the horror of watching young black men in Baton Rouge and Minneapolis lose their lives at the hands of the police. This then was made even more sorrowful by the loss of five police lives at the hands of a disgruntled ex-Army vet, who apparently wanted revenge on white police officers. With these events, we have the making of a race war in a summer of climate change-induced drought and presidential rhetoric filled with hate and lack of civility. Is this the perfect storm?

I think not. Our community held a Peace Rally at the Winslow Street Peace Park on June 29, led by U.S. Congressman Jim McGovern, fresh off his participation in the House sit-in to force action on gun violence. In the audience were about 250 people of all races, religions, gender affiliations and ethnicities. The voices there all were one – our populace is over-abundantly armed, and that reality is making our entire community feel unsafe – the community of color and the community of law enforcement. It was our time to rise up and say what we as a country want to be.

I continue to be optimistic that the dialogues these tragic events we are enduring will let that voice of reason shine through. The common denominator in all these events that raise them to lethality is the under-restricted access to firearms.

That is the message for us as the Greater WORCESTER Community – reject violence and search for peaceful solutions. Let the spirit of that Peace Rally and the Fourth of July shine through so we can all enjoy Life, Liberty and the Pursuit of Happiness.

Michael P. Hirsh, MD, FACS, FAAP, is a professor of Pediatrics and Surgery, director of the Goods for Guns Coalition of Greater Worcester, and chairman of the Public Health Committee of the Worcester District Medical Society.

Symphony of the Brain

A Summary of the WDMS Annual Oration, February 10, 2016

Joel Popkin, MD, FACP



Editor's Note: A non-condensed video of the oration, recorded at Grand Rounds, St. Vincent Hospital, is available at WDMS.org.

Some years ago, my wife Zenie and I attended a concert by the Shanghai Symphony, which played a glorious Beethoven's 7th Symphony. We talked about her being able to speak with the orchestra members in her native language and my being able to speak them in mine. They would understand both of us perfectly, although her symbols would be more accurate in language and my symbols more accurate in emotion. Magically, it would have been a great conversation for all of us.

Joel Popkin, MD, FACP

How – and maybe more importantly why – did the truly international language of music – this lingua franca – develop? After all, music is one language the world over, whereas, according to the BBC, it's estimated that there are up to 7,000 different spoken languages in the world.

Why Did Music Evolve?

First of all, music has been around an awfully long time.

Apollo was god of the sun, healing and music. But music was around a lot longer than the Greeks, or the ancient Egyptians, or even the Chinese, whose flutes from more than 7,000 years ago seem contemporary compared to a Neanderthal bone flute from 43,000 years ago, which fits the holes of a modern flute. (Fig. 1) And who knows when reed flutes and animal skin drums preceded the Neanderthal flute?

Theories abound as to why music has evolved and been an integral part of every culture, bar none.

Josef Rauschecker, director of the Laboratory of Integrative Neuroscience and Cognition at Georgetown University, says this: "The idea that the brain gives specialized treatment to music recognition, that it regards music as fundamental a category as speech, is very exciting to me. ... There are theories that music is older than speech or language. Some even argue that speech evolved from music. ... Music works as a group cohesive. Music-making with other people in your tribe is a very ancient, human thing to do."¹ This makes sense, since hunter-gatherers' communities may have well been inspired by communal music and dancing.

The socialization and creation of communities were enormous evolutionary advantages. Most other animals (except birds, which are musical) don't live in big communities. It took music to do that – what turns out to be a very human trait.²

Which evolved first – music or language? Literacy was not "invented" until about 5,000 years ago, so it's much younger than music and must be

taught. Music is universal, however. Babies develop music and dancing spontaneously. And they babble. No other animal does. And they do it even if congenitally deaf.²

Then, there's this whole human thing regarding the ability to enjoy music and take part in the emotion, the memories it elicits, the socialization it enhances. We are exposed not only to our thoughts and emotions but share those of others. And that was all said – and more – in nine words by Leonard Bernstein: "Music can name the unnamable and communicate the unknowable."

How Does Music Get to the Brain, and How is It Processed?

The auditory pathway begins with a vibrating ear drum, which delivers the vibrations to the snail-shaped, fluid-filled cochlea. Here, hair-like receptors that capture various frequencies turn music into electrical impulses, which then link via the auditory nerve to begin a remarkable journey deep into the brain via the auditory brain stem.

At the first relay station, the cochlear nuclei receive *tonotopic* (think, keyboard) projections and send fibers to the olives, which localize sound by calculating the difference in time of arrival of the sound as well as intensity – especially critical information in the days of hunter-gatherers. Farther up the pathway, changes in volume and background noise let them know about any saber-toothed tigers lurking nearby. It's this early in the pathways that motor centers are activated, well before awareness in the conscious brain.³

Higher up in the primitive brain stem (the mid-brain), harmony actually gets analyzed; discordant sounds activate this area. Very precise sets of sound data then move on to the auditory cortex, where, as Dr. Psyche Loui describes, "music makes the leap into the soul." Musicality is now extending to regions far beyond the auditory cortex, connecting sound processing to other things the brain does: moving, planning, remembering, imagining, feeling, co-activating all these other systems.^{2,3} (Fig. 2)

Until now, the precise representation of music in the auditory cortex was poorly understood: Is processing of music, speech and other sounds based on shared or distinct neuronal paths? But in December 2015, an extraordinary group from MIT may well have transformed our understanding of music processing using a new calculation of voxel morphometry (think of voxels as three-dimensional pixels). We now know that the auditory cortex doesn't share pathways with linguistics but has its own dedicated, hard-wired music pathway.⁴ (The implications of this technique for delineating and understanding other brain structures are staggering.)

Rhythm

Rhythm is terribly complex. Clapping to the beat requires *anticipating* the beat, not clapping once it's happened. Animals don't have rhythm. They can be taught to "dance," but it's not spontaneous, nor do non-human animals adjust to a change in tempo – except for a remarkable cockatoo named Snowball. (Fig. 3) Dr. Aniruddh Patel, a brilliant neurocognitive scientist at Tufts, studied thousands of claimed talents, but his close examination of the tapes consistently revealed inability to respond to variations, coaching by the owner or music layovers to match the animals' performance. But then he met up with Snowball, who spontaneously taps to rhythms, and, amazingly, with faster rhythms than he can manage, he taps every other beat! It turns

out that parrots are one of the few vocal learners, other than humans, and this is probably the key to Snowball's and several other parrots' impressive performances. But even these champion musicians in the animal kingdom can't recognize transposed music or relative pitch, which simply might be exclusively human characteristics.²

Music-Evoked Emotional Responses

A large part of "Why music?" is the emotional response, rewards and pleasures. Happy or sad music, consonant (pleasant) or dissonant (harsher) music, and joy- or fear-evoking music all activate diverse areas of the brain in response to the differing music. Thus, music can arouse activity in the very core brain regions that underlie all emotion.⁵

Three of the major emotion centers of the brain are the amygdala, the nucleus accumbens and the hippocampus.

Amygdala: The superficial amygdala is sensitive to faces, sounds and music, suggesting that this crossover conveys signals of basic socio-affective information.⁵ (Back to the hunter-gatherers.) But not only pleasurable or unpleasant music activates the superficial amygdala. Even unexpected or less pleasant single chords can do so. This is relevant because affective disorders, such as depression or pathologic anxiety, have been associated (among other causes) with amygdala dysfunction, so that modulation by music perception has implications for therapeutic approaches for the treatment.⁶

Nucleus Accumbens: Several studies have shown activation by pleasant music, leading to chills and so called "musical frissons" – experiences of shivers or goosebumps. The area is also sensitive to primary rewards (food, drink and sex) and secondary rewards (money and power).⁵

So can measurement of activity of the nucleus accumbens tell us how much a subject is enjoying a particular piece of music? And can it therefore even predict how much money the listener would be willing to spend on his or her preferred selection? Amazingly, the answer to both questions is yes.⁷ So for those who worry that Google seems to know our every movement, ponder more about the power of functional MRIs!

Hippocampus: The hedonistic rewards that activate the nucleus accumbens do not fire up the hippocampus, even though music-evoked emotions do. By regulating the hypothalamus-pituitary-adrenal axis, the hippocampal formation reduces emotional stress via lower cortisol levels. Hippocampal activity stimulated by musical activity additionally supports social engagement and the communal sense of "we."⁵ And it has been well shown that overall health is much better with socialization.⁸

Emotional Results and Rewards

Dr. Psyche Loui, a dazzling cognitive neuroscientist and mentor to me, has related this experience: "I was in a friend's dorm room in my third year as an undergraduate. ... Rachmaninov's Piano Concerto No. 2 came up on the radio, and I was instantly captivated. ... There are these slight melodic and harmonic twists in the second half that always get me! The aesthetic experience can be so intense that you can't do anything else."⁹ The physical feelings – chills, tingles or "frissons" – can be felt so powerfully, these sensations are sometimes described as "skin orgasms."⁹

These feelings may become yet more powerful, even after knowing a song well. While the sense of surprise may have dissipated, a Pavlovian type of conditioning may lead to frissons. And singing and dancing can make people more cooperative, and chill-inducing songs effectively encourage altruism.¹⁰

Brain Chatter

So how do these disparate areas of the brain talk with one another?

When I was in medical school, in what now seems like the Dark Ages, knowledge about nerve pathways was based on myelin staining of brain tissue. This involved the pesky problem of requiring whole brains for pathology sectioning, for which volunteers were lacking. And, of course, it was not possible to follow up serially.

Back then, neuroplasticity was an unknown concept. The teaching was that the neurons we were born with went on to decline inexorably. For those who were more fortunate, decline was a slower process. But the advent of CT and MRI imaging of brain structure has shown that such is not the case. Moreover, functional MRI and other techniques represent even more staggering technological leaps by delineating *where* things happen in the brain and *how* these areas communicate with each other.

Progress continues, and at the Massachusetts General Hospital and other institutions, neurocognitive workers have pushed brain imaging toward the realm of science fiction, using purpose-built scanners – the most powerful in the world. The magnets consume 22MW of electricity – enough to power a nuclear submarine – to create a process called diffusion tensor imaging, or *tractography*, which allows us to visualize actual nerve tracts and demonstrate that communication can be enhanced in response to certain stimuli, one of the most important of which is music.¹¹ (Fig. 4)

For this discussion, we will touch upon only one representative, but vital tract, the arcuate fasciculus. (Fig. 5) This is the superhighway of language and music, and the newly modeled grid is part of recent data that suggest a novel view of the brain's organization. The arcuate fasciculus connects the two major language centers in the brain – Broca's and Wernicke's areas.¹¹

How Does the Processing Affect Us?

Musical activity shapes the organization of the developing brain and also produces long-lasting changes. It sends visual, auditory and motor information to a specialized brain network consisting of fronto-temporo-parietal regions, which overlap with a "hearing-doing" or "seeing-doing" action-observation network. This is commonly known as the mirror neuron system – a critical component in learning and recovery from injury.¹²

Fetuses pick up sounds and move in response at about 37 weeks. They move more to familiar tunes, and the newborns who heard the tunes respond with higher heart rate, movement and alertness than those not exposed.²

And the reason they respond to familiar tunes is this: Using functional MRIs, newborns *1-3 days old* listening to tonal consonant music showed distinct right auditory cortex activation, whereas dissonant alterations of the music significantly reduced those activations, meaning that newborn brains have built-in specialization in processing music.¹³ At age 6 months, starting music classes not only improves tonal pitch structure, etc., but also leads to a more positive *social trajectory*.¹⁴

As children get older, the pro-socialization advantages continue. Four-year-olds playing games linked with music-making show significantly increased spontaneous helpfulness and cooperation compared to those playing the same games without a music context.¹⁵

Children from underserved backgrounds stand at high risk for academic and social problems. With two years of musical training, they show a marked improvement in differentiation of syllables. So here we see a translation of the crossover of music and language that we see in brain imaging.¹⁶

Many gray matter structures are more prominent in musicians, as seen and measured by MRI. These structural differences appear to be more pronounced in those musicians who began training early in life, but functional improvements in older students beginning music studies are also impressive. Changes of white matter – the nerve tracts that we're now seeing with tractography – have now also come to light. Let's now return to the arcuate fasciculus.

In Fig. 6A and 6C, we see similar baseline arcuate fasciculi of two 8-year-olds. One then went on to study a string instrument while the other did not study music. Two years later, the size difference of their right arcuate fasciculi was striking, with the musician, and now others like her, demonstrating comparatively dramatic growth. (Fig. 6B and 6D) Other studies have shown that in adults, the amount of practice time correlates directly with arcuate fasciculus size.¹²

Work from a decade ago using PET scanning demonstrated the overlap of

brain structures in music and language, in this case, comparing generation of melodies and sentences.¹⁷ (Within the confines of this discussion; we won't even get to mention other central neurocognitive studies, such as EEG, MEG and SPECT scanning.) With this known overlap of music and language, we shouldn't be surprised that in development, children who have problems with music have problems with *prosody* – the patterns of stress and intonation in language. Prosodic cues are a fundamentally important aspect of communication.¹⁸

Can Musical Training Slow Cognitive Decline in the Elderly?

In short, yes. Practicing musicians have greater gray matter volume in the left inferior frontal gyrus compared to that of matched non-musicians. Age-related reductions in total brain volumes in matched non-musicians were not seen as frequently in musicians. This may translate into the observations that piano lessons seem to help age-related cognitive decline in musically naïve adults from 60-85¹⁹ and that older professional musicians do better on a number of cognitive tests than matched non-musician controls.²⁰

And who's to argue with Einstein, who predicted gravitational waves 100 years before their discovery? During his struggles with the extraordinarily complex mathematics that led to his general theory of relativity, Einstein often turned for inspiration to the simple beauty of Mozart's music. "Whenever he felt that he had come to the end of the road or into a difficult situation in his work, he would take refuge in music," recalled his older son, Hans Albert. "That would usually resolve all his difficulties." Einstein himself and his wife confirmed the same.

How Do We Use Music in Health and Disease?

Let's again start with the little ones, and in this case, among the most challenging and heartbreaking of problems: autism.

Auditory-Motor Mapping Training: AMMT is a process in which singing of words along with motor activities seems to employ the pathways that overlap language function. Children with autism process music the same way we do, *including* emotion. What we have to learn how to do (and just maybe we are getting there) is to transfer the music emotion to non-musical emotional responses.^{21,22}

Recent data have added support to this concept by showing that connectivity in these children is preserved with song but not spoken words. What may actually be the problem is *hyperconnectivity* for music at the expense of language, an area where Dr. Loui and others have contributed much important work. Song may be able to overcome the structural deficit for speech in autism.²³ And a recent paper suggests just that. In a pilot study, it was found that increased socio-communicative responsiveness in autistic children was brought about by sung vs. spoken directives.²⁴

Alzheimer's Disease: We have long known that some patients have striking memory of music from earlier days and they retain words better if they learn them to music.⁵ This is not really surprising, since many studies of Alzheimer's Disease have shown that the music areas of the brain are generally better preserved than the rest of the brain.²⁵ We don't yet know why.

Can we prevent Alzheimer's? An intriguing twin study has shown that the co-twin who played an instrument in older adulthood was 64 percent less likely to develop dementia or cognitive impairment.²⁶ While music is unlikely going to improve cognition in established Alzheimer's, it has been shown that music therapy decreases anxiety and depression, although it takes more than three months to do so, and it must be with music the patient likes.²⁷

Strokes

Melodic Intonation Therapy: For strokes involving speech, MIT is a promising therapy. Patients can learn to speak through a kind of singing speech – without overt singing – presumably by utilizing language-capable areas of the right brain. Congresswoman Gabrielle Giffords, following a

horrific gunshot to her head, credits MIT for return of her speech.²⁸

Actual increases in gray matter volume in frontal areas of the brain are seen in patients by simply listening to music after strokes, with the areas of increase correlated with enhanced recovery of verbal memory, attention, language skills and improvement of mood.²⁹

Rhythmic Auditory Stimulation: RAS is a technique that provides impressive results for gait disturbances secondary to strokes, as well as Parkinson's. Videos from Spaulding Rehabilitation Hospital show us post-stroke patients who underwent weeks of intense physical therapy, but still required a walker and assistants. After just one hour of RAS, they were walking unassisted! Parkinson's patients, struggling mightily to do a simple step exercise, can do the task essentially normally during accompanying rhythmic music!

I end our adventure with the symphony of the brain with the hope that someday we will discover yet a new neurological pathway: one that maps out *resilience*. How were Beethoven, Mozart and other geniuses who suffered so mightily throughout their lives able to create music of such beauty that it has yet to be surpassed? If only we knew how to channel the maniacs of our world to *sublimate* their frustrations from destruction to creativity. Who knows? Maybe more study and understanding of music will get us there. ...

Joel Popkin, MD, FACP, is a clinical professor of medicine at UMass Medical School and the director of Special Services at St. Vincent Hospital, preserved in advanced Alzheimer's disease." *Brain*. 2015; 138; 2438–2450.

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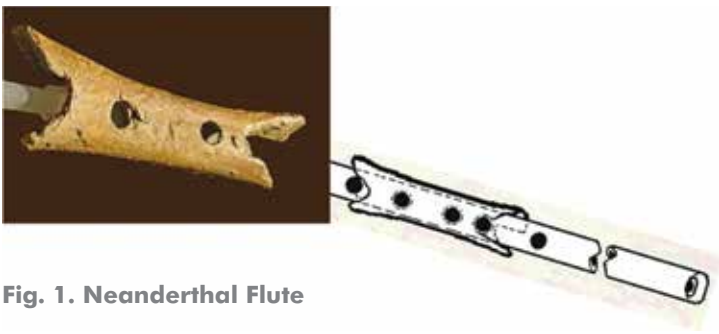
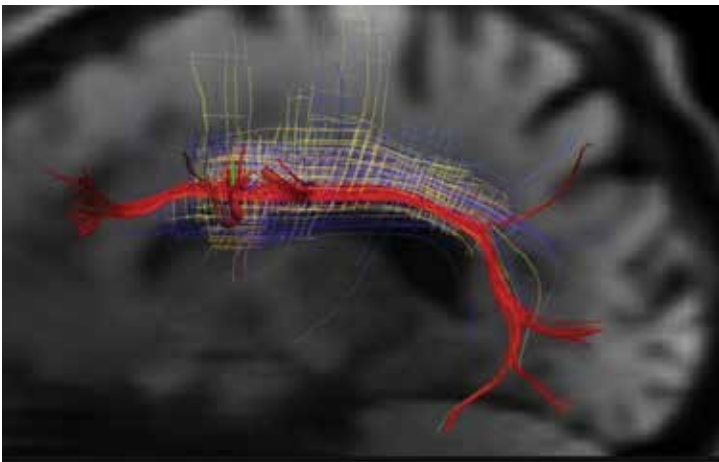


Fig. 1. Neanderthal Flute

Fig. 3. Dr. Aniruddh Patel and Snowball



Fig. 5. Arcuate Fasciculus (see text)



<http://www.bbc.com/news/science-environment-21487016>

Alternate References 1

Alternate References 2

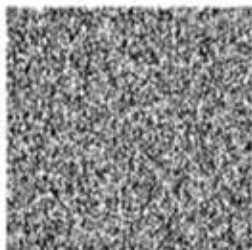
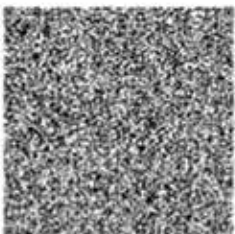
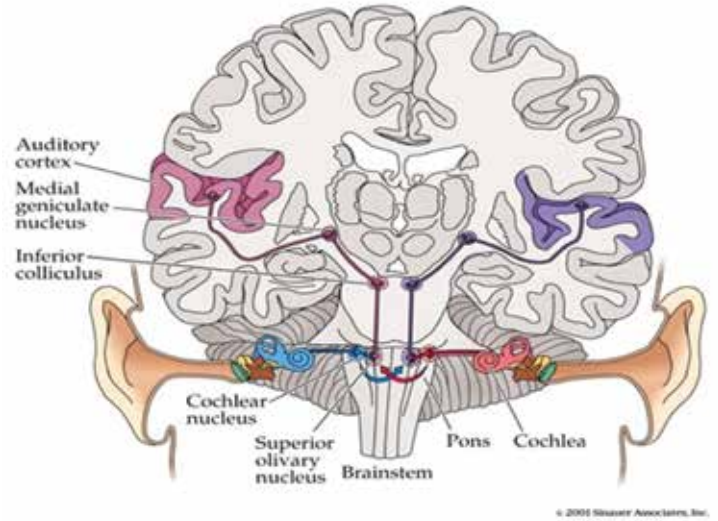
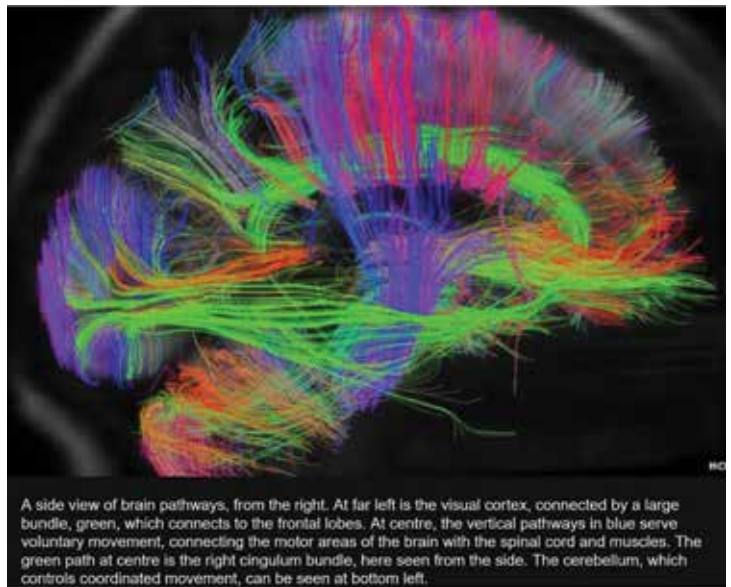


Fig. 2. Auditory Cortex



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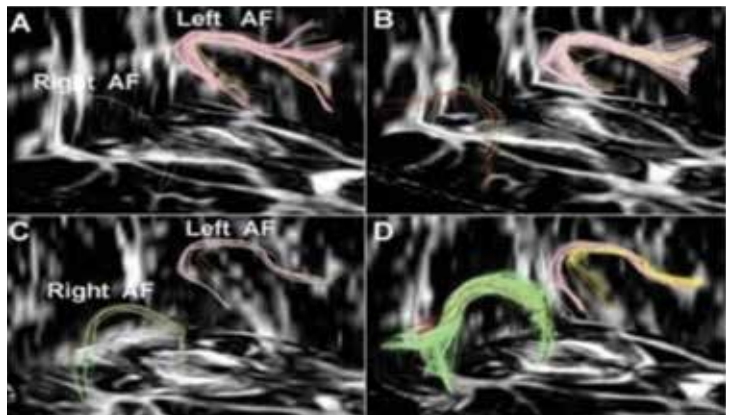
Fig. 4. Tractography (see text)



A side view of brain pathways, from the right. At far left is the visual cortex, connected by a large bundle, green, which connects to the frontal lobes. At centre, the vertical pathways in blue serve voluntary movement, connecting the motor areas of the brain with the spinal cord and muscles. The green path at centre is the right cingulum bundle, here seen from the side. The cerebellum, which controls coordinated movement, can be seen at bottom left.

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Fig. 6. Arcuate Growth (see text)



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Learning Communities at UMass Medical School

L. Rebecca Spanagel, MD, FACP



2013 Mentor Group

Medical school is a time of immense academic, personal and professional growth. Students arrive with excellent academic ability, yet need support to thrive in the changing medical education environment. Prior to the implementation of Learning Communities at UMMS, mentoring and support happened on an ad hoc basis, which could be meaningful for some, but not for all, students. Learning Communities (LCs) bring back the apprenticeship model of medical education, using a more systematic and deliberate process as opposed to expecting each student to seek and find a faculty mentor, as was the case of medical training in the previous century.¹ An idea first suggested by UMass students, LCs became part of the curriculum redesign that was implemented in 2010.

Dividing students into smaller groups enhances engagement in learning. Recognizable as the British House System – popularized in the fictional Harry Potter stories – this approach enables stronger faculty-student relationships. Through LCs, faculty and students become dedicated to a set of shared goals, principles and values, promoting caring, trust and teamwork.² LCs at UMMS established a new context for medical education. Students now embark on their journey of becoming a doctor with the support of a faculty mentor, fellow students from all four years of medical school and a broad range of other key faculty. This developmental process is fostered through the curriculum of the Doctoring and Clinical Skills (DCS) course; a robust array of student-organized social, academic and service activities; and a longitudinal mentoring program that engages faculty and peers to promote each student’s professional growth and career decision-making.

Upon arrival at UMass, each student is randomly assigned to one of five LC houses. To foster a stronger sense of community connection for students, all the houses are named after Worcester neighborhood landmarks – Blackstone, Burncoat, Kelley, Quinsigamond and Tatnuck. Each house has designated space in the new Albert Sherman Center for informal community interactions, mentor offices and conference rooms. Roughly 25 students in each class belong to each house, so informal and formal integration between class years can also happen. Elected student representatives from each house organize social events, career events, academic events, service projects and community outreach, and – as at Harry Potter’s Hogwarts – there is an annual House Cup competition that goes to the house with the most points in these areas!

The longitudinal mentoring program provides personal mentoring to each student throughout their time at UMMS. Each mentor is assigned six to seven students per year. Weekly faculty development sessions provide training needed to serve as mentors, career advisors, teachers in the first- and second-year DCS courses and, most importantly, as student advocates. Mentors meet individually with every student three times year, more as needed. During these individual sessions, the domains of personal adjustment, academic progress, professional development and career guidance are covered. Mentors also bring students from

all years together to enrich every student’s experience; older students gain the opportunity to mentor and teach their junior colleagues.

Mentors participate in the formal teaching of students through the DCS courses in the first and second year. These teach students the fundamental clinical skills of the medical interview and clinical communication, physical examination, clinical problem-solving, professionalism and medical ethics, while nurturing personal and professional development for the student. The first-year Physical Diagnosis course is taught by the mentors in the Sherman Center, with the students working in pairs. Mentors are the primary teachers for their students in the second-year Physical Diagnosis course, which takes place in the hospital, where students learn how to take a full history and perform a full physical exam in preparation for the clinical years.

As students enter the clinical years, mentors assist in the transition to the hospital setting. More emphasis is now placed on professional career development and career choice. Mentors help students identify what specialties would be a good fit and assist them in planning for their fourth year. They help students prepare their residency applications, research programs and help with mock residency interviews.

Advisors and students form relationships and come to know one another quite well through the multiple roles LC mentors serve: clinical teachers, role models, partners in community service and participants in milestone events. After observing mentees’ clinical skills, strengths and areas where they are challenged, LC mentors are in a unique position to provide student-centered career advice.

Mentors assist students in troubleshooting at every step of the way during medical school: on academic, professional and personal fronts. It is challenging, enormously gratifying work. Mentors hood their mentees on graduation day, celebrating this accomplishment with the students and their families.

The student experience in medical school is much enhanced by this level of support and advocacy. While students learn from mentors, mentors also learn and grow. Improving clinical teaching skills, learning best practices from other mentors and being part of an enthusiastic community of educators fosters professional development and helps prevent burnout. My time as a mentor in Blackstone House has been one of the most gratifying aspects of my career.

My mentor, Dr. Jane Lochrie, continues to inspire me daily. To Dr. David Hatem and Dr. Michael Ennis, all of the other LC mentors and, most importantly, my mentees, who have taught me so much, I owe many thanks. I am also deeply indebted to Drs. Ennis and Hatem for their assistance with this article.

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End Notes:

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Mentoring Faculty at UMass Medical School

Luanne E. Thorndyke, MD; Joanna M. Cain, MD; Judith K. Ockene, Ph.D., M.Ed.; Robert J. Milner, Ph.D.

Mentoring is strongly associated with career success. But when surveyed in 2012, one-third of all faculty respondents at the University of Massachusetts Medical School (UMMS) – 40 percent of clinical faculty – stated that they were not receiving guidance but wanted mentoring. The majority of these faculty also said they did not even know how to find a mentor. How can we enable our faculty to receive the mentoring they need for success? We will describe the multiple strategies used by the UMMS Office of Faculty Affairs (OFA) to meet this goal.

First, we incorporate mentoring wherever possible in OFA-sponsored programs. We target programs to groups of faculty with specific needs and ensure that each includes a mentoring component. For example, the Junior Faculty Development Program, designed to provide young faculty with a strong foundation for academic success, combines an intensive weekly curriculum with work on a project guided by a faculty mentor. We help the junior faculty select their mentors through the process of functional mentoring, matching the specific needs of the mentee with the particular expertise of a senior faculty member. The Peers for Promotion Program, a structured program that helps faculty achieve promotion to associate professor, as well as to full professor, combines mentoring by senior OFA faculty with peer mentoring between participants in the program. Faculty share their experiences, provide mutual support and celebrate each other's achievements. We also require mentoring for our award and scholarship programs. Candidates for the Faculty Scholar Award, which enables faculty to navigate times of increased family responsibility, and the Faculty Vitality Award, which sponsors faculty to take a new academic direction, must have mentors and a mentoring plan. All of these programs have been highly successful. Participants continue to develop productive academic and professional careers, achieve promotion and advance in leadership. By deliberately incorporating mentoring, we ensure the success of the individuals we support and justify the investment in the programs.

But our office cannot reach the 3,000+ employed and affiliated UMMS faculty through targeted programs alone. There are simply not enough resources. Therefore, a second strategy is to partner with others, particularly departments, to broaden access to mentoring. Mentoring in departments starts with the newly hired faculty. We encourage department and division leaders to identify an Onboarding Mentor for each new faculty member to guide them through their first year at UMMS, introduce them to colleagues and help them navigate the system. These mentors are part of our Onboarding Program for Faculty, which also includes a welcome packet for new recruits and a new faculty orientation. Since this program was started in 2012, 75 percent of new faculty have been paired with an Onboarding Mentor, a testament to the willingness of departments and chairs to invest in their new faculty. Several departments at UMMS have long-standing faculty mentoring programs, notably the departments of Biochemistry & Molecular Pharmacology and Quantitative Health Sciences. We have also worked with other departments, particularly Family Medicine & Community Health and Pediatrics, to establish mentoring programs for their faculty. Our goal is to extend these efforts and encourage all departments

to invest in faculty mentoring with the principle that, "Mentoring begins at home."

A third strategy is to enable individual faculty, who may not be reached by OFA or department programs, to identify mentors and manage a mentoring relationship. Find a Mentor divides this process into steps, based on the principle of functional mentoring. Faculty first identify their needs for mentoring in areas of skills development (coaching), psychosocial needs (counseling) and career development (sponsorship). They then use personal contacts and faculty databases to identify individuals with the expertise to meet their needs. The next step – contacting that person and starting the mentoring relationship – is often the most challenging. We offer guidance and tips. For example, we recommend not making a broad request for mentoring but asking for help on a specific issue with the goal of sparking a connection. Finally, we provide advice on maintaining a productive mentoring relationship. Like many OFA programs, faculty can navigate these steps in workshops, by individual consultations with OFA faculty and online through the OFA website, which has extensive resources on mentoring (www.umassmed.edu/ofa/mentoring).

Underlying all these strategies is our aim to dispel the many myths that surround mentoring and replace them with evidence-based reality. Mentoring is no longer restricted to the traditional junior-senior pairing but may come in many forms: in teams, among peers and within communities. There is no one perfect mentor. Instead, faculty should invest in a network of mentors to meet their needs for coaching, counseling and sponsorship. Mentoring doesn't just happen, but it can be sought by a deliberate process, as we have described. Mentoring is not an inherent skill for most faculty, but the competencies practiced by effective mentors can be learned through educational programs. Demystifying mentoring enables us to provide realistic and practical guidance to both mentees and mentors.

We are very fortunate at UMMS that Chancellor Michael Collins has a passion for mentoring and serves as a mentor to many individuals, from students to academic leaders. He likes to observe that, "Mentoring is a gift both given and received." His advocacy and the efforts of the OFA to enhance the mentoring culture at UMMS came together this spring with the inaugural Chancellor's Award for Excellence in Mentoring to Dr. Celia Schiffer, professor of Biochemistry and Molecular Pharmacology. This award is a milestone, but not a rest stop, in our journey to instill mentoring as a core value and activity at UMMS.

Luanne E. Thorndyke, MD, is vice provost for Faculty Affairs and professor of medicine at the University of Massachusetts Medical School. Joanna M. Cain, MD, is director of talent management, Office of Faculty Affairs, and professor and vice-chair of Obstetrics & Gynecology, UMMS. Judith K. Ockene, Ph.D., M.Ed., is associate vice provost for Gender and Equity, professor of medicine, chief of Preventive and Behavioral Medicine and Barbara Helen Smith Chair in Preventive and Behavioral Medicine, UMMS. Robert J. Milner, Ph.D., is associate vice provost for Professional Development and professor of Neurology, UMMS.

Adopting a New Support System for Residents in Training

Brandi Hoag, DO



Brandi Hoag, DO

Medicine is not only a job – or even a career – it is a calling. And it is that calling that motivated me to wake up every day throughout residency, be excited to work long hours, cram my brain with intense amounts of knowledge and information, and overwork my body, mind and spirit with stressful life-and-death situations. Residency is often portrayed as a harsh reality. It is difficult to explain to people outside of medicine why we do these things and pursue medicine as a career. It is often challenging for our friends and family to understand the pressures that we deal with on a minute-to-minute basis, and therefore, our built-in support system is limited. Often, we deal with unintended consequences of

residency, such as emotional overload, fatigue, rigid scheduling, moving to a new location and the strain this puts on our relationships. We tend to lose purpose and our calling evaporates as we move from rotation to rotation, breeding discontent, disengagement and burnout. It is critically important to emphasize and focus on the positives of our experiences to maintain our engagement, the excitement of learning and the honor that is bestowed upon us to care for patients. We can reduce negative impressions and reinforce the joy of medicine and residency by focusing on the thrill of discovery, the sense of accomplishment of diagnosing and treating an interesting patient, the empathy and kindness that our patients require and the knowledge that what we do to care for patients makes a difference in their lives.

It is with these thoughts and ideals that the St. Vincent Hospital Internal Medicine Residency has incorporated a program developed through Massachusetts General Hospital called the Coaching Program. An innovative and proactive trailblazer in medical education, Dr. Kerri Palamara created this program at her own institution, where she was a former resident and chief resident and then moved on to become a faculty leader and the primary care program director for the Department of Medicine.

Dr. Palamara states, “We designed this program to support residents as they begin to develop their professional identity while also being in an intense stage of their personal lives. Many will have moved to start residency. For many, this is their first real job. Relationships in their life are starting, ending and changing as they do this – life happens during this formative time, while they are also expected to work 80 hours a week and feel competent and confident in new roles.”

Dr. Palamara describes The Massachusetts General Hospital Internal Medicine Professional Development Coaching Program as being designed to provide emotional and professional support to residents during one of the most challenging periods of their lives. She states that it matches residents with non-supervisory faculty who, using the principles of

positive psychology, help residents reflect on their experiences, develop an understanding of their strengths and use those strengths to help them reach their potential. Dr. Palamara has been quite active in assisting other institutions across the country to incorporate her program into their residencies, and we are honored to have been a part of such a pioneering program with 15 other institutions. At St. Vincent Hospital, we have outreached to our physician community and, through volunteers, have been able to pair our categorical internal medicine residents with a faculty coach for the entire three years of residency. Residents and faculty coaches meet quarterly and are able to talk about their long- and short-term goals, events in their personal lives, their struggles, their areas for improvement, and do so in a confidential and protected manner where they feel supported. Dr. Palamara and her colleagues have also studied the effect of this program on residents and physician coaches at her own institution, and recently published data, which demonstrates reduced burnout rates among both interns and coaches, in the *Journal of Graduate Medical Education*.

Our own residents at St. Vincent Hospital respond very positively to the Coaching Program. One resident, Dr. Simant Thapa, shared his thoughts on his interactions with his coach by stating, “I view the Coaching Program concept as a protective cocoon, wrapping every participating resident, making them feel protected under any circumstances during residency life, so they can finish the residency with phenomenal experience and fly out of residency program like a beautiful butterfly. Through the Coaching Program, I have been able to discuss any issues, professional or personal, that may haunt during residency life. For me, my coach, Dr. Blanchard, has been like my brother when I need advice regarding decisions to balance both my professional and personal life during residency.”

Dr. Majed Najjar also had positive comments about his experience with the Coaching Program. “I think the Coaching Program has been a great success. It has broken down the barrier between residents and attendings, allowing both sides to familiarize themselves with each other on a personal level. It has also given residents an opportunity to work through and voice problems faced off-the-record, without the concern of being evaluated. Lastly, it has served to better guide us first-year interns towards our future career paths, with the comfort of bouncing ideas off an experienced attending.”

It is clear that this program is providing residents with an alternate source of support and guidance not otherwise provided through residency and that it has long-standing implications throughout our physician community, both for our residents and our community physicians. With the initiation of this program, we can make more concerted efforts in focusing on resident well-being. In doing so, we can reinforce what, for me, was the primary reason for joining St. Vincent Hospital: the feeling of family and community. It is a built-in support system for our residents, in which they can lean on a senior physician who has lived through the angst and joy of residency. Senior physicians can be pillars of support, advice, commiseration or even just be present to listen to residents’ joys, successes and/or disgruntlements over a cup of coffee. We are excited to offer this program to our residents and faculty and hope to breed even more interest in physicians across our community to engage more with our residents.

Brandi Hoag, DO, is an associate program director for the St. Vincent Hospital Internal Medicine Residency, director of The St. Vincent Ambulatory Care Center and an assistant professor of medicine at the University of Massachusetts Medical School.

Faculty Mentorship Experience in a School of Pharmacy

Maryann Cooper, PharmD, BCOP

Faculty mentorship in higher education is key to building a successful academic environment that fosters professional growth. The need for well-developed mentorship programs is essential due to the complexity of higher education, as well as the need for faculty to balance teaching, scholarship, service and personal responsibilities.¹

MCPHS University is a private institution with a focus on health care education. The mission of the university is to prepare students for successful careers through excellence in teaching, scholarship, service and community engagement.² With close to 300 full-time faculty, robust faculty development and mentorship programs have been key to the ongoing successful achievement of this mission. At the university level, the Faculty Development Committee (FDC) offers workshops to meet the ongoing needs of the faculty. In addition, the Faculty Mentoring Institute (FMI) assists faculty with the development and attainment of goals related to the tripartite mission of academia. Collaboratively, the FDC and FMI offer an orientation program for all new full-time and adjunct faculty, as well as distinct grant programs to foster the scholarly pursuits of all faculty.

The School of Pharmacy-Worcester/Manchester (SOP-W/M) is one of the 12 schools that make up MCPHS University. This large (approximately 300 students) school offers an accelerated Doctor of Pharmacy program to students on two campuses approximately 70 miles apart, with classrooms linked via video conferencing technology. The school is comprised of two departments, the Department of Pharmaceutical Sciences (11 faculty) and the Department of Pharmacy Practice (38 faculty). The SOP-W/M has unique faculty development needs due to the complexity of the program and lack of formal academic training of many new faculty members. As with many other schools of pharmacy, most assistant professors are clinically trained, with post-graduate training that focuses on patient care, with little emphasis on teaching, scholarship and service.¹ Without a formal mentorship program, these faculty can become isolated, stressed and can experience job dissatisfaction as they attempt to navigate the multiple demands of academia.

In 2008, a needs assessment survey was administered to the faculty revealing that 90 percent of faculty agreed or somewhat agreed on the need for mentoring in all aspects of academia. As a result, the Pharmacy Academic and Leadership Support (PALS) Committee was formed by junior and senior faculty members from both departments with the charge of devising a process to guide and mentor faculty to meet their academic responsibilities while promoting professional growth. The goal of PALS is to empower faculty to become leaders and influence the practice and teaching of pharmacy by exhibiting the highest standards of quality in education, scholarship, practice and service.

At its inception, the PALS Committee developed several principles that guide faculty mentoring efforts: (1) foster professional socialization, (2) enhance intra-faculty collaboration, (3) optimize professional development and (4) seek methods to continuously improve. These guiding principles have led to the implementation of several programs, including a new faculty orientation (NFO), a longitudinal mentoring program and a faculty roundtable discussion series. In addition, PALS has offered programs to support faculty scholarship efforts, developed a physical and online faculty Resource Center and created a resource binder for new faculty.

The first efforts on behalf of PALS were the development of a NFO and longitudinal mentorship program. The goals of these programs are to orient new faculty to the culture and responsibilities of academia that are specific

to the SOP-W/M, in addition to the orientation provided by the university. As part of the NFO, the faculty is provided with a binder that contains resources and supporting literature in the areas of academics, teaching and scholarship. The faculty meets with the dean and department chairs to learn the structure, accreditation requirements and academics of the program. In addition, course coordinators provide syllabi to offer an overview of the content of the curriculum. Additional sessions with student services, advisors for student organizations and information services provide a general overview of faculty advising and available resources.

To optimize professional development, each new faculty member is paired with at least one mentor to help with the adjustment to academic life. The mentor offers guidance on aspects of teaching, scholarship and/or service through informal or scheduled meetings. To foster the mentor/mentee relationship, PALS created a series of modules that are housed on the university's online learning management system. The self-paced modules are designed to create opportunities for mentor/mentee conversations and learning activities in various academic areas. The PALS Resource Center offers a physical location to house resources (books, DVDs, etc.) that aide in mentoring, as well as ongoing faculty development needs.

PALS is committed to bringing faculty together to promote professional development and discussions about teaching and learning, assessment, professional service, research and community engagement. The Faculty Round Table (FRT) series was established to help generate in-depth pedagogical discussions amongst faculty. FRTs are held on a monthly to semi-monthly basis, with topics chosen based on the needs and interest of the faculty.

In 2011, the Faculty Advisory Network in Scholarship (FANS) Collaborative was established to extend the activities of PALS, with the goal of creating a network of resources that support faculty development specifically in scholarship. Under the FANS umbrella, Faculty Scholarship Seminars are held on a biennial basis to provide a venue for faculty to present their scholarly work. The FANS Collaborative offers a statistics boot camp, a longitudinal program that fosters faculty growth in understanding and using statistics.

Since one of the core values of PALS is to continuously improve, all activities of the committee are assessed. Faculty participating in the NFO and mentoring programs are surveyed for utility of these programs, and roundtable discussions are evaluated with standardized questions to allow for assessment. Since the inception of PALS, the majority of NFO and roundtable discussions have been viewed favorably by the faculty and assessments of these programs have allowed the committee to improve its efforts to best meet the needs of the faculty.

In summary, establishing a formal mentoring program at academic institutions is essential for faculty growth and development.

Maryann Cooper, PharmD, BCOP, is an associate professor of Pharmacy Practice and chairperson of the Pharmacy Academic and Leadership Support Committee, MCPHS University, School of Pharmacy-Worcester/Manchester.

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Medical Student Perspective: Learning Without Working

Sarah Palmer, BA



Sarah Palmer, BA

I started off far away from the world of medicine. In 2006, I moved into a gothic dorm room and immersed myself in the study of Medieval literature. As an English major, my mentor's purpose was to help me find my editorial voice and discover a direction within a broad field of study. The result was that I changed majors mid-degree and, six years after that, started medical school. At UMASS, I expected a narrower, more goal-focused approach to mentorship. My experience, however, was unexpected.

"Good Morning Dr. Gibson,"

I began my first e-mail to my official, bona-fide medical school mentor.

"Please call me Tim. People will look at you funny if you call me Dr. Gibson since no one else does!" was his reply.

As a person who took a journey outside of academics to find the path to medicine, I have relied on mentorships wherever I could find them. While my undergraduate mentors focused on my role within a field, my professional mentors saw me on a more human level. Rather than help me navigate up a ladder, they encouraged me to develop my ideas so that I could find the right ladder to climb. Some of these mentorships were born out of institutional requirements, but the majority and the best of them were found by chance: a conversation that started in an elevator, after a poster presentation, or because we were the only two people on a vast expanse of protected land on the border with Canada counting the species of plants.

One of my most influential mentors was a plant biologist who managed my work for the USDA-ARS. His fiercely independent approach to applied science and ill-concealed anger toward the modern world brought some much-needed cynicism to my gestalt. Another mentor was the one who made my life miserable during my work at a law firm and challenged me to see that my personality should direct my career just as much as my intellect directs my goals. He became one of my closest friends after I quit that job. A third mentor is a chief medical officer who taught me to lead with openness and to always remain inquisitive. I understand these lessons in retrospect. At the time, however, I could not have chosen who these mentors would be, much less predict how they would affect my life.

With the decision to go to medical school came a new confidence in myself and in my path. I was unsure of what I could expect from a mentor. No other job ever started with a mentor assignment, and I worried that the pressure to make this institutionally assigned mentorship fruitful would result in the opposite. I was relieved, then, by the relaxed demeanor of my first meeting with Tim. There

was no pressure, just lunch.

Throughout my years of medical school, I would get stressed or frustrated and I would know that I could email Tim and there would just be lunch. We'd pass the time amidst the swarms of assignments and lectures lurking in the shallows. We would swap stories, and he would share advice with great generosity, but I learned something more than strategy through these lunches with Tim. Amidst the stress and the busy days, there is also joy in the learning and in the validation that we have arrived. Sometimes, it is good to just eat for a minute and to think about that.

No amount of effort on Tim's part could have made him such a great mentor. The actual advice he gives is useful. But the true mentorship is the example he sets, rather than the syllabus he follows. He shows his dedication on many levels: to his family, to his patients, to his students and to himself. Every medical student needs to witness a doctor who is capable of such balance, but I am not sure how many of them have that privilege. So, when Tim eagerly collects a plate of cookies straight from the oven in the hospital cafeteria to share with his mentor group after a long afternoon at hospital sessions, I feel that it is truly unusual and unusually lucky that "we got, like, all the chocolate chip!"

The art of appreciating the small joys, as well as the big responsibilities, will be my next goal.

Sarah Palmer, BA, is a third-year medical student currently completing the internal medicine rotation at the University of Massachusetts Medical School in Worcester.

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Medical Student Perspective: On Imperfect Love

Supreetha Gubbala, MS1



Supreetha Gubbala, MS1

I sat bewildered in a room of well-intentioned peers, participating in a doctoring discussion on the topic of privilege. To say the discussion had gone poorly would be factually accurate. In reality, the discussion made me seriously consider ending my medical career. The space shrank around me while fellow classmates, without hesitation, questioned the validity of racism in Massachusetts, in the medical profession and even in the personal experiences I shared.

To this day, I do not know how to navigate the biases of good people. By the end of the discussion, I had already surrendered, holding back tears and questioning my decision to

come to UMass. The many warnings I was given of widely prevalent unconscious biases were beginning to hold truth, and suddenly, I felt completely alone in my frustration.

I arrived at UMass Medical School last fall from a racially and culturally diverse neighborhood in Boston. Witnessing a frightening year of dismal race relations in the United States led me to protest with the Black Lives Matter movement. The red silk banner spanned my bedroom door and served as a daily reminder not to become complacent. As I returned home that evening, I stared at my door and felt like a fraud. Was medicine a community I could, in good conscience, choose to be a part of?

During this time, I was taking a creative writing elective taught by Dr. David Hatem, the director of Learning Communities at UMass. The first assignment asked us to write about an impactful experience within our first few months of medical school. I decided to unpack the immense hopelessness I was beginning to feel regarding racism in medicine – a pervasive American habit I had naively hoped we, as a community, might be immune to at UMass.

What followed dramatically influenced my choice to stay in medicine and sparked my now-growing love for the UMass community. Mary Philbin, my small-group Doctoring and Clinical Skills leader, sent me an e-mail asking me how I was doing, apologizing for how the previous discussion session had gone and asked if I wanted to meet to discuss how future privilege conversations could be improved. Shortly after, Dr. Hatem reached out regarding my writing piece, empathizing for the past few challenging weeks and inviting me to meet with him and the other course director to ensure I was being supported in the ways I needed.

The conversations that followed reminded me of the important role of doctors – not only as healers, but as navigators and mentors. Despite being prominent in their fields, they demonstrated true humility, approaching me with an open mind and a genuine desire to learn from my experiences. They did not doubt my frustration; instead, they listened, validated and advised on transforming the circumstances at UMass, not just for myself but for future students like me. They edified the reason I chose to study medicine, demonstrating actual fortitude of character and strength of moral fiber in the confines of real life.

Many things we love in life are far from perfect, and medicine is becoming my own imperfect love. There are parts of the profession that I now accept I may never be able to change. However, this no longer takes away from how the people within medicine move me to remain here. In fact, helping each other bring our experiences into medicine may be the only way we begin to address biases that many of us cannot see. As I enter my second year, I reflect on those first two months quite differently. I have begun to see in moments like these, filled with frustration and loneliness, the value of sincere guidance and its incredible power to move towards a profession I am proud to be a part of.

Supreetha Gubbala, MS1, is a medical student at the University of Massachusetts, class of 2019.

Medical Student Perspective: Mentorship All Around Us

Christopher Libby, MPH



Christopher Libby, MPH

The first day of medical school is exciting and frightening, but there is always a lecture on how to succeed as a medical student. In that lecture, no matter where you attend medical school, is advice on how to find a mentor.

What is a mentor? The concept goes as far back as ancient Greece, to the story of when Odysseus left his son with an old man who would help him grow up along his 10-year journey in Odysseus's absence. This man was named Mentor. As the concept developed in the Middle Ages, an established mentor-apprentice relationship

became common in many professions. Today, the literature typically defines a traditional mentoring relationship as a dyadic, hierarchic and face-to-face relationship between a more experienced person and a protégé. (Leidenfrost, et al., 2014) I can't say that I haven't found these relationships over the years, but is this the only way to learn from others?

I want to challenge this assumption that mentorship is something that needs a formal bond between a mentor and a mentee. If you can accept the premise that everyone around you can teach you something, you will begin to see how your peers have also mentored you in some aspect of your life. As I am entering my fourth year of medical school and think back to who influenced my personal development, the people that come to mind are not just professors. They are former bosses, residents who were students when I knew them, and my peers, whose previous experiences helped inform me on how to grow as a person. While they may not have the professional networks more established physicians have, they provide psychosocial support and guidance on decisions that they themselves made only a short time ago. (Loots, 2009) These are the people that we do not feel intimidated going to for guidance or to ask questions on things often long forgotten by older mentors.

Looking back over my medical school career, I can identify many "peer mentors" who pushed me to do more than I would have on my own. I'm not talking about studying tips or people who showed me the best way to take notes; I am referring to people who helped me grow professionally outside the classroom. Two of my first peer mentors were third-year students I met in Washington, D.C., at a national conference just after starting medical school. Meena Davuluri was a student leader on a committee tasked with

looking into the economics and quality of medicine in the U.S. and providing education to students at the meeting. Eli Freiman was another student from my medical school who pushed others to get involved in organizations that interested them while balancing their educational obligations. At the conference, I attended a session on health care quality and was in awe of the knowledge all the medical students at the presentation had. We even discussed how students are educated on the complexities of health care delivery at each of our medical schools. At the end of the session, Meena took me aside to push me to become a member of the committee and contribute to future educational programs. I conferred with Eli, questioning whether I would be competitive for the committee. He assured me that every student is similarly skeptical of his or her ability and that I should apply. So I did, and since then, I have looked to Dr. Davuluri, who is now a resident in urology, and Dr. Freiman, who is now a resident in pediatrics, for guidance on everything from how to advocate for a patient to how to succeed in my fourth-year clerkships. They taught me about the "hidden curriculum" in both the advocacy world and medical school that requires inside knowledge to impart. (Bergenhengouwen, 1987) Dr. Davuluri is not a world-renown leader in health care economics, nor is Dr. Freiman a famous pediatrics advocate, but they took their experiences and helped me find my own path. Some would call them friends, but to me, they are also mentors.

There are people all around us in medical school who help develop our social networks and learning styles, skills which are typically attributed to a formal mentor. (Pascarella and Terenzini, 2005) So as we develop our professional identities, I want everyone to think about what we can learn from formal mentors, as well as each other. Instead of solely relying on the experience of a traditional mentor, try to learn from the collective experiences of the students, health care professionals, patients, family and friends all around you.

Christopher Libby, MPH, is a fourth-year medical student at the University of Massachusetts Medical School.

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Review: *A History of the Present Illness*

Regina Fisher Raboin



Regina Fisher Raboin

A History of the Present Illness, introduces us to the world of Dr. Louise Aronson, MD, MFA – a world of drama, humor, wisdom and questions surrounding communicating medical issues and decisions to patients, families, friends and the medical community. The theme of communication is effectively woven throughout the book’s stories, and this theme is buoyed by those of love, friendship, hope, affliction, culture and others. Each story addresses communication, or a lack thereof, between physician and patient, patient and loved ones, and even communication of health issues within and outside the broader community. Each story stands on its own: The structures and intent are unique to each.

In the first piece, “Snapshots of an Institution,” Dr. Aronson draws the reader into this “play” and to a place that is grim, conjuring little hope. And yet, even with the reader’s frustration with the family, professionals and, yes, even the patient, there is hope – because there was no hope from where the family had immigrated. There are many “whys” in this story, but the reader soon realizes that culture plays the key role in this story. It’s the realization that growing old, aging, maturing, or whichever phrase is used to describe senescence, is, as commonly quoted, “not for the faint of heart” in this business of medicine.

Not unlike Oliver Sacks’ case studies, Dr. Aronson’s stories give a “snapshot” of how illness, medical and personal decisions, and the ethics and realities surrounding them are communicated and understood – even between a physician and his wife. “The Psychiatrist’s Wife” is set on a tropical island where the psychiatrist is attending a medical conference, accompanied by his wife, a former surgeon. It is evident [that] the couple’s marriage has devolved into a “doctor-patient” relationship and his constant analysis of her, coupled with the phrase “Do something. Do anything,” is not having the hoped-for response. It’s quite terrifying, really; when a medical professional is questioning her entire being, who is there to help her?

What a pleasure it is to add *A History of the Present Illness* to the shelves of medical, academic and personal libraries.

Regina Fisher Raboin is the associate director for library education and research, Lamar Soutter Library, University of Massachusetts Medical School. She is also a member of the school’s Humanities in Medicine Committee and associate editor for the peer-reviewed, open access *Journal of eScience Librarianship (JeSLIB)*.

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Farewell to the Stranger

Laurel Dezieck, MD, PGYI



Laurel Dezieck, MD, PGYI

The Gerald F. Berlin Creative Writing Award at the University of Massachusetts Medical School honors the poetry, fiction and essays of medical students, physicians in training (interns, residents, fellows), graduate students, and nursing students from the medical school. The award was established to encourage creative writing by health professionals-in-training and to honor the father of Richard M. Berlin, MD, who sponsors the award.

The page is only two words long. “It’s time.” No callback number. It didn’t matter. I know where I am being summoned and for what. I stand up and, after hesitating, shrug on the white coat that is

draped unceremoniously on the chair behind me, half hanging off. There are piles of frayed papers in one pocket, a stethoscope in the other. I tell my colleagues that I’ll be a while. They nod acknowledgement from behind their computer monitors, typing furiously.

I walk out into the main hallway, my usual hurried, long-legged stride intended for efficiency, effectiveness, responding to emergencies. Then I stop abruptly. This evening, right now, I can walk slower, more evenly. Tonight there is no hurry. A nurse looks up from her station, startled by my sudden stop, so I give her a waning smile and wave my hand to indicate that there is no need for concern. Then, I start walking again. Gently, I thought, I’ll walk gently tonight. I want everything about this to be gentle. My hands swing at my side, empty. The unit is quiet for once, and I can hear my own footsteps, the murmuring of staff, monitors humming. Tonight warrants presence – soft steps, loose features, mellow thoughts. Tonight there is no hurry.

I get to the end of the hallway and step into the last room. It’s a good room to die in. There’s a big glass window opposite the bed, and outside, the night is starry and cold and vibrant. Traffic whirs by in the distance, and the fluorescence of billboards and storefront signs, blurred by falling snow, make for a lively light show. The nurse is in the corner hanging clear, liquid-filled bags; the therapist on the other side is fiddling with the ventilator, which suddenly starts beeping madly, fighting the command to shut off, to stop breathing for its charge. He unplugs it. The chairs in the corner, a little more padded and comfortable than the other chairs in the hospital, are empty, and they sit at odd angles, not the way they’d be set up if visitors had been in to sit at the bedside.

He lies in the middle of the room, surrounded by lines and tubes and pumps, silent, still, the only way I had ever known him; he had come to us like this. Everything I knew about him, his life, his illness, had come from his proxy, an old, leathery-skinned, wheezing friend who had come and gone. He had smelled like tobacco and wet dog and had sat in our waiting room long enough to tell a sad story and dutifully hand

over stained, crumpled papers that delineated his friend’s last wishes. It had been a brief, but kind, visit. He had shuffled in to this room earlier, bowed his head a little and taken a few deep breaths. He didn’t sit down. He didn’t want to be called when it was over. He didn’t want to stay, he had told me. He’d been present when his father had died, in a room like this one, and he couldn’t stand to hear the sounds of a dying man again.

Sticky blue gloves on, I pick up the syringe on the bedside table and attach it to the tubing coming out of the patient’s mouth. Gently I pull out the air inside, deflating the cuff. Then, I pull out the endotracheal tube. I know that the staff would do this for me if I wanted, that I don’t need to be here, but I feel responsible for this task. I wrote the order. Comfort measures only. Fentanyl for pain. Midazolam for agitation. Glycopyrrolate for excessive secretions. Extubate now. I am responsible for helping him to die tonight. Somehow, pulling the tube myself makes this knowledge more tangible.

Gloves, tubing, tape, syringe and catheters go into the trash. The therapist wipes down the ventilator, wishes me goodnight and wheels the machine out; there’s nothing else for him to do here. What place is there for a respiratory therapist when the only task left is to watch the breathing stop? The nurse fusses with the sheets, the bags of medication pumping benzos and opiates into his veins, gently dabs his cracked lips with Vaseline. She asks me if I need anything. I thank her and tell her I’m all set. I’m going to stay for a while. She looks surprised but simply tells me she’ll be down the hall and leaves. Now it’s just the two of us.

I feel awkward for a moment, as though I’m imposing on something intimate. Death must be as momentous a milestone as any other, certainly. Like all the passages of time we mark, it is the most significant. The way we’re remembered, the acts we’ve committed, the memories we collect become set and unchangeable. Even first impressions, which are held with such high regard, don’t have the same finality as the last because there is no going back, no more crafting or creating. Only that which already exists, the structures of a lifetime we have built. How long they stand, or crumple and decay, is beyond our reach in death. And here I stood, alone with him, a stranger, to orchestrate and note his departure. To sign the book and close it.

The monitor alarms, and I reach over to shut it off.

He’s still breathing on his own, for now. It’s shallow and wet, but unlabored. His eyes are still closed, hands by his side. He hasn’t stirred.

The window is cold when I walk over and put my hand against it. I look out at the street lamps, the snow-covered concrete, cars rushing by, people going about their evenings. They’re probably rushing home at this hour to get dinner on the table so they can sit down with a sigh, another long day over. For a fleeting moment I think about going home to my dinner and family and bed, but I know that they will wait for me, and I will wait here for the man in the bed. My hand leaves fingerprints when I take it away. I drag one of the corner chairs over and position it next to the bed, so its back is to the door. Sitting down, I hesitate, and then I reach under the sheet and take his hand with mine. His feels rough and calloused, except for the pads of his fingers, which are soft. They feel as cold as the icy window, flesh dying into frozen glass. I wonder if he’d mind if he knew a stranger was holding his hand as he died, and then I

wonder for whose benefit I had decided to reach for it.

He'd been healthy until last summer, his friend had told me. And then the cough started. The friend, who was also his landlord, was named John or Joe or something that was one syllable and forgettable. He had known something was truly amiss when he had come to collect the September rent and noticed how haggard and tired his tenant looked. His father had looked like that, he explained in a raspy Boston drawl, before he died.

When he had come to collect the December rent, his tenant had asked him for a brief postponement of that month's payment and whether the other man would mind being his health care proxy. John/Joe agreed to both, albeit with some surprise. It was a little sad, he told us, because they were friends but only the kind that kicked the threshold and shot the breeze, talked about last night's game and the best way to fix a leaking pipe. It was something he thought a wife or a child should do. Since his friend didn't have a wife, and his daughter was too strung out on something, maybe heroin this time, he would have to do. If he has any siblings, they weren't in touch.

In January, things got even worse. The patient – whose name I didn't know for sure, but whose hand I was clutching – must have known how much worse because he signed a do-not-resuscitate form. He had told his landlord not to let anyone keep him alive on machines and let him in on the secret: He was dying. That was a small blessing for everyone. It was a brave and generous parting gift, for the living strangers and the friend he barely knew: his reassurance and willing goodbye. It was a reprieve for us, knowing we wouldn't have to torture him with futile heroics, as is so often the case with silent, damaged bodies that come up to the unit without wishes attached.

His breathing starts to slow down; it is dry and shallow now. I can feel his pulse, sluggish and fatigued on the tips of my fingers. He doesn't squeeze my hand back. There's a mark on his chin from where the tube was taped. He's clearly shaved recently, maybe only a day or two ago.

The paramedic who brought him in earlier had told me he was laughing, joking in the ambulance. That he was a pleasant guy. He didn't look like he was dying then. If he knew that he was leaving in a few short hours, he didn't tell anyone, but then again, he had kept the news of his decline so quiet and unheralded for so long. It wasn't until he got to the ED that he had decompensated, that we realized that the labored breaths that prompted him to call the ambulance were his last. They were the dregs, pulled laboriously from him, the bottom of the bottle, diluted and unsatisfying.

Sitting with the dying man, my bleary thoughts of task lists and hectic days ahead, for once, clear away to the back of my mind like so much fog. They can wait until later. Tonight, there is no hurry. I think about this man's wayward daughter, his parents, perhaps long gone or maybe only a few miles away, a woman out there he might have loved sometime back, maybe a brother or sister who moved elsewhere – to Pennsylvania or Oregon, out of reach. Did he ever hold their hands? Maybe, in his mind, he's with them now; maybe my hand is a young girl's or a middle-aged woman's. I wonder if any of them will find out that he died tonight, if they'll wonder about what his face looked like the way I wonder about theirs.

The nurse steps back in, asks me how he's doing. I tell her I don't think it will be much longer. She tells me I don't need to stay; she'll grab me when it's time to perform an exam and pronounce him. I shrug. I want to be here right now. His breaths are turning into sighs, cool and slow and grounding. I lean back in my chair. Tonight there is no hurry.

Laurel Dezieck, MD, PGY1, is a doctor of emergency medicine at University of Massachusetts Medical School.



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False Claims Act Liability – It’s a Material World

Peter J. Martin, Esq.



Peter J. Martin, Esq.

About a year ago, I wrote in these pages (May-June 2015 *Worcester Medicine*, page 21) about a federal court case in which False Claims Act liability was based upon a provider’s failure in a claim for payment to disclose non-compliance with regulatory requirements that are material to the payer’s decision to pay a claim. At that time, I asked, “How can providers know what’s material to a government payer’s decision to pay a claim?” Now that the United States Supreme Court has taken up this case, providers have more tools at hand to resist arguments that a non-disclosed violation was “material” to the payment decision and, thus, can form the basis for FCA liability.

As described last year, the Escobar case involved failures to disclose that providers rendering services to a MassHealth beneficiary were unlicensed or were inadequately supervised. Even though the licensure and supervision regulations were not designated explicitly as “conditions to payment,” the First Circuit Court of Appeals ruled that compliance with those regulations was a “material precondition of payment.” Thus, misrepresentation by failing to disclose non-compliance with them can give rise to FCA liability. Other federal courts took different approaches. One Circuit Court ruled that failure to disclose non-compliance is not enough – the provider has to expressly or affirmatively state a falsehood. Other courts determined that the failure to disclose had to concern a requirement that was expressly designated as a condition of payment. Given the diversity of these decisions, the Supreme Court decided to hear the case, and on June 16, 2016, issued a unanimous decision.

The Court rejected the two extreme approaches to this question offered by the parties. On the one hand, Universal Health Services wanted the Court to rule that a provider could face FCA liability for not disclosing non-compliance with a regulatory requirement only if that requirement is expressly made a condition of payment by the government payer. The Court rejected this position, in part by reasonably pointing out that it is too narrow: What if the provider was violating a condition of participation in the Medicare or Medicaid program, rather than a condition of payment under those programs? Shouldn’t lack of eligibility to participate in the government program that pays claims be a necessary prerequisite that is material to that program’s decision whether to pay claims submitted by that provider?

The Court also rejected the government’s claim that any violation of a statute, regulation or contractual provision is material if the defendant knows that the government would be entitled to refuse payment were it aware of the violation. The Court found this construction to be too broad. What if the government routinely paid claims despite such violations? What if the government decided all claims for payment contained an implied

certification that the provider complied with the entirety of the U.S. Code and Code of Federal Regulations? The Court declined to “adopt such an extraordinarily expansive view of liability” under the FCA.

Instead, the Court sought to strike a middle ground, in which a failure to disclose non-compliance in a claim for payment can give rise to FCA liability if two tests are met: first, that the claim makes specific representations about the goods or services provided; and second, that the failure to disclose that non-compliance is “material” to a government payment decision in the sense that the provider knew or had reason to know that the government payer attaches importance to the specific matter that is being misrepresented in determining the payer’s course of action. Since payment claims commonly contain specific representations about the providers and the services they provide (for example, in the Escobar matter, claims contained misrepresentations that services were rendered by licensed social workers), the first part of that test will usually be met.

It is with respect to the second part of the test, that concerning “materiality,” that this decision has special significance. Because the FCA is not a “vehicle for punishing garden-variety breaches of contract or regulatory violations,” this materiality standard is “demanding.” It is not enough that the government labels compliance with a particular requirement as a condition of payment, though such labeling is relevant to a determination of materiality. It is also not enough that the government could choose not to pay the claim had it known about the non-compliance. If the provider can prove that the government paid a particular claim even though it knew about the non-compliance with a particular requirement, or if the provider can prove that the government commonly pays a type of claim despite knowledge of the non-compliance, that is strong evidence that the requirement is not material. Finally, the non-compliance is not material if it is minor or insubstantial.

What this decision does is identify ways in which providers can challenge the blanket claim of the government (or of a *qui tam* relator) that the provider’s failure to disclose some form of non-compliance makes an associated claim for payment “fraudulent” under the FCA. The provider could seek to show a pattern of governmental acquiescence in paying claims submitted by providers the government knows are not in compliance with some requirement. The provider could seek to characterize the non-compliance as “garden variety” or insubstantial. The provider could point to the fact that the requirement is not explicitly made a condition of payment as evidence that the requirement is not considered “material” to the government agency’s payment decision. At the same time, the decision removes from the provider’s hands the argument that only non-disclosure of violations of requirements expressly made conditions of payment can lead to FCA liability.

The practical result of the decision is that providers will more likely and more vigorously contest allegations of FCA liability based on failure to disclose non-compliance with legal or contractual requirements. This will likely result in more and longer litigation, as providers seek to discover information along the lines indicated in the Supreme Court’s decision that shows the non-compliance is not “material” to the governmental payer.

Peter J. Martin, Esquire, is a partner in the Worcester office of Bowditch & Dewey, LLP, his practice concentrating on health care and nonprofit law.

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