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AUGUST 2014 VOLUME 97• NUMBER 8 ISSN 2327-2228

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The Physical Exam

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As all clinicians know, the physical exam has become increasingly undervalued in the evaluation of sick patients. Perhaps most doctors consider it a screening evaluation. If the liver seems enlarged, an ultrasound or imaging study is obtained. If a heart murmur is heard, an echocardiogram is obtained. I believe there are smart phone apps that can be used to interpret cardiac auscultations.

I have often lamented the decreasing importance attached to the physical exam in general medicine. In this column I have contrasted it with the preserved importance we neurologists continue to attach to our neurological exam. Non-neurologists consider it an arcane skill. "Neuro consult needed prior to discharge," is not an uncommon request in teaching hospitals because the internist, or other specialty physician, can't perform a reliable one and, usually for risk-management reasons, a documented exam is thought necessary. Recently I was taken aback when a neurology colleague admitted that he didn't consider our exam very important anymore, except in certain fields, like movement disorders, my own little niche. In his field, the MRI determines everything. In movement disorders, there are rarely tests that make a diagnosis. Even for the genetic disorders like Huntington's disease, the presence of an abnormal gene does not indicate that the person has the disease, only that he/she will get the disease. So what do I think when my colleagues and I see the same patient and find different abnormalities in our exams?

Recently I saw a patient with a very odd syndrome whom I had trouble even putting into the general classification of movement disorders. The referring neurologist, an excellent clinician who has a different area of specialization, found weakness in the legs, but I did not. While I wonder about his exam, he is wondering about mine. In another puzzling patient with a different disorder, I also found weakness, in this case a hemiparesis, which was not found on the exam by an esteemed movement disorders specialist in another city. It is not rare for us to disagree on whether a movement is organic versus psychogenic. We may disagree whether a twitch is a tic or a dystonic spasm, whether the rigidity is due to poor relaxation or extrapyramidal dysfunction; but weakness? We think of ourselves as pretty good at differentiating suboptimal effort, whether due to psychogenic reasons, poor compliance or pain. So, disagreements among experts on weakness in patients who are not limited by pain is a real problem for us. It shouldn't happen, like cardiologists disagreeing on whether there's a murmur.

It's one thing not to know. It's another not to look.

There is a well known, allegedly true, but perhaps apocryphal tale of a simmering dispute between a famous British neurologist and his equally famous neurosurgical colleague in the days before angiography and CT scans, when neurosurgical planning was based on clinical judgment and ventriculography. The two clinicians strongly disagreed on the location of the presumed tumor but the surgeon, who obviously was performing the operation, got to choose the site, and, of course, chose his own. When it turned out that the surgeon was correct, he gleefully told the waiting neurologist, who disappointedly remarked, "perhaps I should give up neurology." The neurosurgeon quickly responded, "On the contrary, why not take it up?"

Every clinical neurologist thinks his neurological exam is accurate. We'll defer, of course, to other specialists in their subspecialty. If my eye exam differs from that of a neuro-ophthalmologist, I'd assume my exam was suboptimal and not correct. If I thought a tongue was not fasciculating and a neuromuscular expert in motor neuron

disease thought it was, I'd also think I was incorrect. Experience is important. But every first-year neurology resident can identify weakness. We may disagree on whether or not a patient is giving full effort. Sometimes we may simply assume the patient has full strength, since we may have come to a diagnosis before completing the exam, and not perform a complete and meticulous exam, but rather go through the motions, reducing the chance of finding a subtle abnormality. I like to think that I don't do that much, but, of course, I do it sometimes. I may say to myself, consciously or unconsciously, that the diagnosis is clear-cut, and if I find weakness or numbness, I'm not going to believe it, so why try to find something I won't believe?

In our CME courses, we rarely, if ever, brush up on our examination techniques. With video, we neurologists do get to see eye-movement abnormalities that we rarely see otherwise, and with the voiceover of the knowledgeable neuro-opthalmologist who both describes and explains the findings. This is one of the ways in which we do learn to improve our exam. We also see seizures, epileptic and non, with concurrent EEG, which help us distinguish and understand these spells better, thus leading to better history taking and diagnosis. In the movement disorders field, videos can be crucial for teaching us how to recognize and better interpret abnormal signs. In movement disorders this is crucial. How a muscle jerk is labeled determines the differential diagnosis, which determines the testing and treatment. When a gait disorder is thought to be Parkinson's disease but is really due to a cervical myelopathy, the wrong treatment is given and time is lost in fixing a potentially treatable problem. There is no scan to do it for us.

It's one thing not to know. It's another not to look. And it's different still when you look and don't see. I hate being wrong, but hate even more the idea of not learning from my mistakes. I am beside myself waiting to see these patients in follow-up, to see which of their doctors was wrong.

What I know will not make me a good doctor if I don't see, or if I do see but don't interpret correctly. I think that if I had an app to check a tremor or a muscle jerk, I wouldn't hesitate to use it. ❖

Author

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Erratum

The Brown University Traumatic Brain Injury Research Consortium and the Norman Prince Neurosciences Institute.
Rogg J, Spader H, Wilcox BJ, Ellermeier A, Correira S, Chodobski A, Szmydynger-Chodobska J, Raukar N, Machan JT, LaFrance WC Jr, Crisco JJ; Brown University Traumatic Brain Injury Research Consortium.
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ABSTRACT: This article provides an overview of the Brown University Traumatic Brain Injury Research Consortium (TBIRC) and summarizes the multidisciplinary basic and clinical neuroscience work being conducted by investigators at Brown University and the affiliate hospitals in association with the Norman Prince Neurosciences Institute (NPNI).
KEYWORDS: Traumatic brain injury (TBI); biomechanics of head impact; concussion
PMID: 24791263 [PubMed - in process]

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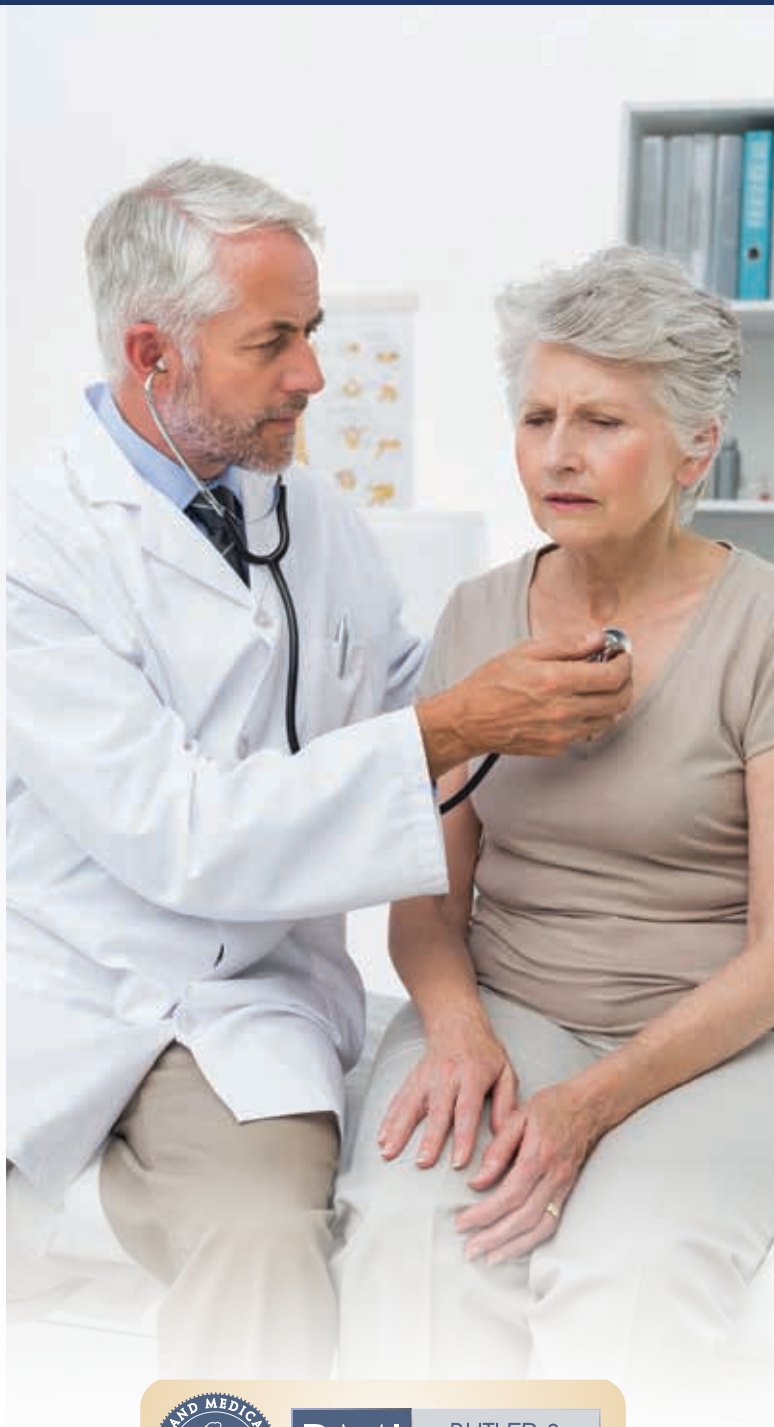

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Time and its Many Divisions

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The passage of time, amongst primitive peoples, was first given dimension when they exploited a visible instrument of measurement, the recurring phases of the moon (lunation). The prehistoric language, called Indo-European, then created a single word – *menes* – to give definition to the moon, its visible cycle, the word month as well as still other recurring phenomena such as menstrual cycles. A Latin word, meaning shining, *lucere*, evolved into *lunaris*, also meaning the moon. The subsequent European languages then devised variants of these two root words.

The recurring perigee and apogee of the sun then defined the duration of the year. But the declared beginning of the year varied amongst the many Eastern Hemisphere cultures. Thus, the Egyptian and Phoenician civilizations began their year with the autumnal equinox; the early Greeks inaugurated their year with the winter solstice; and the Mesopotamians, about 2000 BCE, began theirs with the vernal equinox.

The Romans established the onset of their year in the month of March, spelling it as *Martius*, thus honoring the Roman god of war. April, the second month of the Roman year, derived its name from *Aphro,* the Greek goddess of love (in English, Aphrodite). And the month of May is named after *Maia*, the wife of Vulcan and the Roman goddess of fertility.

Juno, wife to Jupiter and goddess of marriage, was the source of June's name, first as *Junius mensis*, then in Old French as *juin*, and in English as June. July had originally been called Quintilius, literally the fifth month since their year began in March. But after his assassination in 44 BCE, Julius Caesar underwent deification by senatorial decree and the name of the month was then altered to *Julius*; thence in Old French to *Julie*; and in English to July.

The Roman Senate, in 27 BCE, gave their emperor Octavian, the honorary title of Augustus; and then named their sixth month as *Augustus*; and in English, August.

The Latin names given to the months of September, October, November and December all reflect their earlier statuses as, respectively, the seventh, eighth, ninth and tenth months of the pre-Julian Roman year. Thus, the Latin words, *septem, octobris, novembris* and *decem* form the etymological basis for the final four months of the Gregorian year.

The Romans assigned different numbers of days to their months and then declared certain days to be given a specific title. Thus, the first day of each month was called *kalendae*, Latin for account-book, the time when bills and other contractual agreements were due. Then there were the *ides*, which is either the thirteenth or fifteenth day of the month ("Beware the ides of March," prophesized Caesar.). And finally the *nones,* the ninth day before the ides. These three calendric sentinels provided the citizens of Rome with unchangeable and reliable dates. ("We'll begin our journey three days after the *nones* of *novembris*.")

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In this mankind-oriented civilization of ours, it is well to recall that the duration of our months, the length of our seasons and the span of our years are all determined by observing and measuring cosmological forces well beyond our control.

The same cannot be said for the week or its duration. The word, week, is of Germanic origin and has no counterpart in Latin. And the length of the week was determined by some cultures to best fit with their religious and socioeconomic customs. In the earliest of recorded data in the Babylonian, Jewish and Zoroastrian theological documents, for example, there was agreement on seven days, approximately one-fourth of the lunation interval.

The days of the week, in Western Cultures, are named after celestial bodies or mythological figures. Sunday, for example, honors the sun: in Latin, *dies Solis*; in Spanish, *domingo*; in Italian, *domenica*; in Irish, *An Domhnach*; and in Welsh, *dydd sul*.

Consciousness of time must have been an early resource for sentient humans even before they climbed out of trees. And so, fulfilling a scriptural instruction, they gave names to time and its many cosmological and human-contrived subdivisions. But even giving names to the parts of time did not slow its relentless advance. And as humankind evolved, time became one of its many adversaries. An obscure poet said:

Times goes, you say, Ah, no!
Alas, Time stays; we go. ❖

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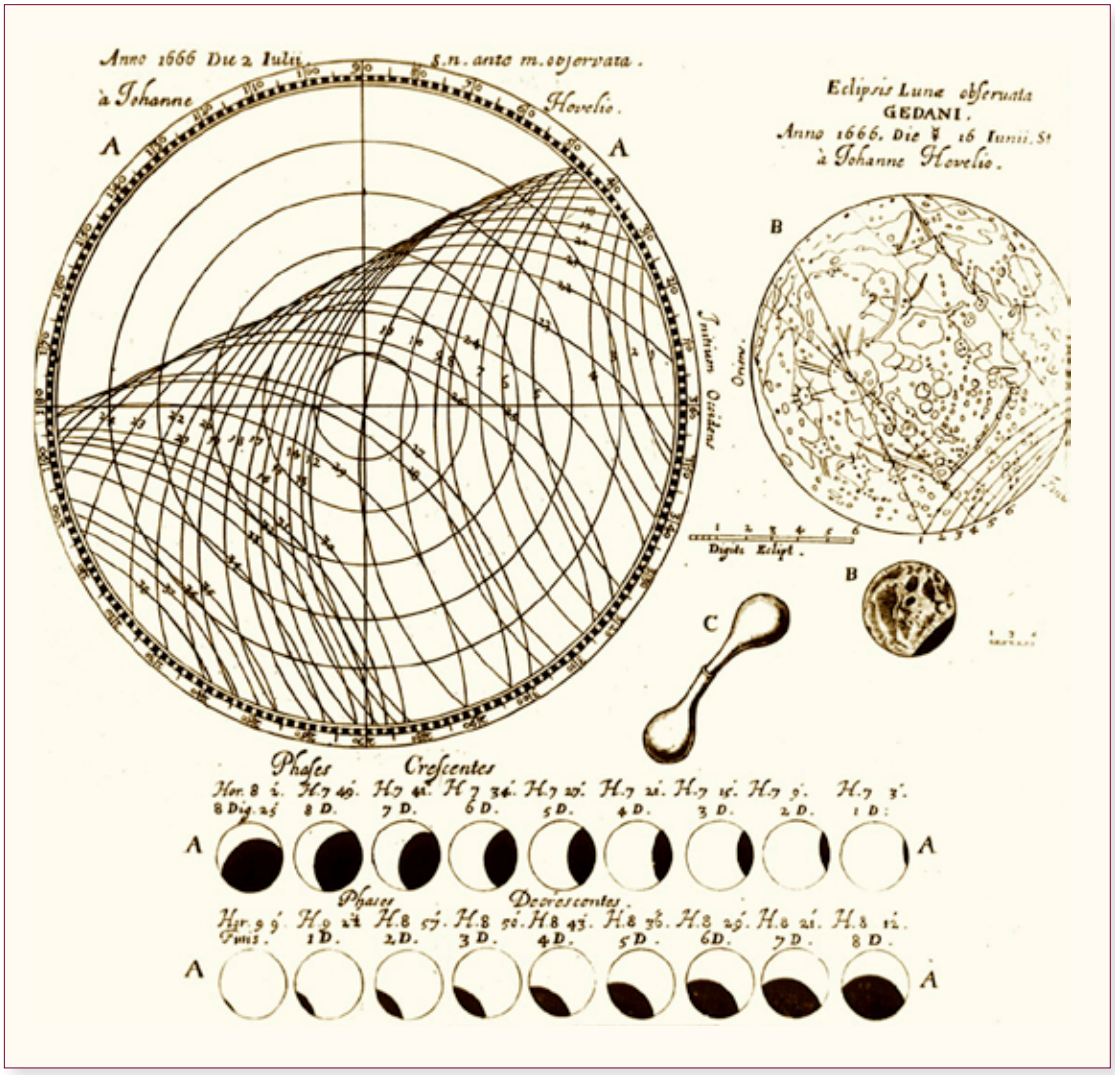

The sun and the moon with the 'phases' of the progress of a solar eclipse in a 1667 British journal.

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Reflections on 30 years with the Rhode Island Medical Society

NEWELL E. WARDE, PhD
RIMS EXECUTIVE DIRECTOR

To be honest, my preference would have been that nobody noticed, but somehow the cat slipped out of the bag. Yes, it was 30 years ago June that I first reported to work for the Rhode Island Medical Society. I had hardly given the anniversary a second thought until a bunch of former RIMS presidents and other good friends, some of whom came from as far away as Chicago, Maine and even Belgium, shocked me with a wonderful surprise party in July. (I wondered a little if it was a hint.)

On that festive evening someone naturally put the question to me, "What's the biggest change you've seen in 30 years?" It's a good question, and one I myself might be asking if the 30-year shoes were on other feet.

Given that I have had 30 years to think about it, it surprises me that it's so hard to answer. In a way, it's akin to a question I get when non-physicians learn what I do for a living. They ask, "What does the Medical Society do?" The fact that RIMS does so much (maybe too much) makes that answer difficult, too. RIMS is in at least 10 different "businesses": the government relations business, the advocacy business, the peer review business, the association management business, the insurance business, the education business, the public relations business, the community service business, the publishing business, the meetings and conferences business, the networking business, etc.

I know I need to come up with a profound-sounding answer eventually, but 30 years offer way too many candidates for the "biggest change." Actually, a chief reason I love my work is the fact that hardly anything I do is routine. The novelties and challenges never cease – and they are never trivial. Maybe the means and speed by which we move and store information would qualify as the top mega-trend of the past 30 years.

But at least as impressive as the changes, and possibly more instructive to contemplate, are the constants. After 30 years (indeed, after a full century and more), we are still struggling with the question: How to pay the doctor? Lately we have been circulating a good deal of old wine through new bottles we call "innovative payment models." The Affordable Care Act's ACOs include features of what used to be known as managed care, managed competition, capitation, bundled payments and gain-sharing. And oh, what a payment apparatus we have constructed with relative value scales, geographic adjustment factors, tens of thousands of diagnostic codes, episodes of care, utilization review, etc.

Despite the enormous, creative energy that has gone into rationalizing payments and controlling costs, we have been hearing for decades that Americans pay more for healthcare and get less than people in other developed countries. The validity of those comparisons may be debatable, but I do believe that three historical factors have combined to massively distort the US healthcare system. Each of these three factors is uniquely American, and we pay a heavy price for them every day.

After 30 years (indeed, after a full century and more), we are still struggling with the question: How to pay the doctor?

The first is the application and misapplication of antitrust law to healthcare. No other single factor has done so much to rob physicians of their voice and prevent them from asserting not only their value in the marketplace but also their professional values in the healthcare system, where their role is to advocate for patients. The consequences include fragmentation of care and the fact that physicians and patients alike are quite impotent in the face of insurance monoliths and hospital systems, both of which continue to consolidate.

The antitrust imbalance could even take a sweeping turn for the worse next fall when the U.S. Supreme Court is expected to rule on a case that pits

the Federal Trade Commission (FTC) against the North Carolina Dental Board. The FTC reasons that because that board is dominated by practicing dentists, its efforts to stop non-dentists from practicing dentistry violate anti-trust. The ramifications of the case are unsettling and potentially enormous. Depending on how the high Court comes down, Rhode Island's medical board could be the only one in the nation left standing. That is because, as it happens, Rhode Island is the only state with a medical board where physicians are not in the majority. (By a law passed in 1986, the RI Board of Medical Licensure and Discipline is fifty-fifty lay/professional.)

The second distorting factor, of course, is our American system of liability. That intractable monster hurts us at every turn. It drives up costs, diminishes access, and creates barriers to improving quality. Every state's attempts to tame the monster are never safe from challenge. After two epic battles in the past 30 years, we in Rhode Island remain effectively checkmated in the state legislature. But this is a national problem, not just a Rhode Island one.

The third factor is the linkage between employment and health insurance coverage, which by an accident of history became ingrained in America during World War II. As a result, the US has been the only developed western nation where a person who loses a job also loses health coverage. We have cobbled some safety nets, but every major attempt to universalize coverage, from Hillarycare in the 1990s to Romneycare and Obamacare, has found it necessary to accept this linkage as a building block and invent ways to fill the gaps. As a result, we have a complicated and confusing system of "exchanges," graduated subsidies, mandates and potential fines for employers and individuals.

Every developed nation struggles with the crushing cost of healthcare, and clearly nobody has the answer. But most would agree that America's cost problem is the world's worst, thanks largely, I would argue, to the three factors above. Concern about cost, of course, is another perennial of the last 30 years. I recall hearing the Princeton economist Uwe Reinhardt address the AMA House of Delegates in June 1985. He showed a graph of cost trends in Medicare and Medicaid, and said, "This is what makes [Ronald Reagan's budget director] David Stockman's hair go gray: it's this little line right here." Back then everyone was alarmed that US healthcare spending had grown to 10.1% of GDP. Today we are at 17.9% and counting.

There is another thing I have noticed. It may seem trivial, but I suspect it contains meaningful clues to the evolution of our concept of healthcare – much as the shift in American usage after the Civil War from "the United States are" to "the United States is" reflected a fundamental shift in our concept of ourselves as a nation. Thirty years ago, we talked about "health care." In the last several years, it has mysteriously become one word: "healthcare." What does that say about the evolution of our concept of health in relation to caregiving? That's a question for a wiser man than I – like Stan Aronson! – to reflect upon. ❖

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One WaterFire Torch, One Life Remembered

MARY KORR
RIMJ MANAGING EDITOR

I WAS INVITED BY DR. Lynn Taylor to be a torchbearer at WaterFire last Saturday night, along with many other more worthy individuals who are on the forefront of hepatitis C research, testing and treatment.

It was an honor to represent the *Rhode Island Medical Journal* at the event. But as we ringed the basin of Waterplace Park, and lit one torch at a time, I thought of my brother Johnny. A flicker here, a flicker there, memories of when we were kids ignited with the flames.

He died of hepatitis C in 2000; contracted several decades prior, it is assumed, after a possible tainted blood transfusion following an auto accident when he was a teenager. He was on the waiting list in Boston for a liver transplant when he died.

To be honest, when we were little, he was what was then called a "brat." My older brother and I were the well-behaved ones. Once the principal of our grammar school summoned me to her office. Johnny sat on a big chair fidgeting and looking quite guilty. The principal held up a ribboned ponytail he had cut off from the student who sat in front of him. "Mary, you are to tell your mother she must get control of him," the principal directed me. That's what they did in New York City schools then. Call in the big brother and sister. "You better not tattle," he said as we left the office.

Then there was the time my mother went into labor prematurely. They rushed the three of us kids over to our grandfather's house nearby. He was on his way to the courthouse, where he was a judge. He put us in the back seat of his Buick and at the court, sat us in the front row with a stern admonition to be mum when the proceedings began. I sat with my doll and combed her hair. My older brother read a book. It was not long before Johnny shot rubber bands at the plaintiffs.

Grandfather signaled to the security officer. He locked us up in a holding cell behind grandpa's chambers. On our way home in the Buick, I protested neither I nor my doll nor Jim had done anything to deserve jail time. "You are known by the company you keep," grandfather said sternly. "And you and Jim are your brother's keepers. You both are older."

As I extinguished the WaterFire torch, I thought of my late mom in her very old age who had lost her recent memory. "Where's Johnny?" she would often ask. "He doesn't come to see us anymore."

"Oh, you know him, he's probably getting into some kind of trouble somewhere," I would answer. My siblings and I were/are Baby Boomers, most at risk for Hep C as I learned while helping Dr. Taylor with RIMJ's July special theme: RI Defeats Hep C. Thanks to Dr. Taylor and her colleagues, the July 26th WaterFire raised awareness for so many of the tens of thousands who attended, with information and screening sites set up.

I told my sister she should get tested, since she cared for my brother at the end. She is afraid to. Then I told her there is a cure although it is expensive, right now at $1,000 a pill, for a total cost of over $80,000. "I don't think my health insurance will cover it," she said. "I will wait until the price drops to get tested." ❖

Johnny, who died of Hep C many years after this photo was taken, is on the far right; siblings Mary and James are on the left. The children in the center are the neighbors on 97th Street in New York.

We are read everywhere

For the month of June, RIMJ welcomed thousands of readers from around the world. While most of them hailed from the Northeast, Mid-Atlantic and California, outside of the U.S. the top 9 other locations included:

2. The United Kingdom: England, Scotland, Wales and Northern Ireland
3. Canada
4. Germany
5. India
6. Italy
7. Australia
8. Spain
9. France
10. China

Other interesting notes

The majority read RIMJ on their personal computers, but among those who used tablets and smart phones, the No. 1 device of choice was the Apple iPad and iPhone. We also had several readers accessing the Journal on the Apple iPod. Who knew you could do that? And what's an Opera mini? Someone used that.

CLICK-it:

Wherever your travels take you, be sure to check the latest edition of RIMJ on your mobile device and send us a photo.

Alert: Looking for one from Africa and the Arctic world. Send to mkorr@rimed.org.

PHOTOS BY LOU-ANN REGAN

SPAIN – Daniel L. Regan, MD, of Barrington, an emergency medicine and primary care physician, checked out the June issue of RIMJ on a visit to Spain with his daughter, Kiera Regan, MA, an educational psychologist (K–12) and mental health counselor in the Lahaina school system in Maui, Hawaii.

Among the top sites they enjoyed were the iconic Catalan architect Antoni Gaudi's fantastical façade of **Casa Batllo**, an architectural treasure designed in 1904-'06 in Barcelona. The **Alcazaba**, an 11th-century Moorish fortress, overlooks the Andalucian city of Malaga and just below it is the Roman ruin, the **Teatro Romano**.

Quality Improvement in EMS: A Unique and Challenging Necessity

DEVIN TSAI, DO; BRYAN CHOI, MD; FRANCIS SULLIVAN, MD; KENNETH A. WILLIAMS, MD

ABSTRACT

Quality Improvement (QI) is required in all aspects of the healthcare field. Emergency Medical Services (EMS) poses unique QI challenges. This article explores some of these challenges and provides some points to consider when performing QI in EMS services.

KEYWORDS: Quality Improvement, pre-hospital emergency medical services

INTRODUCTION

As a medical provider, consider the following scenario. A patient shows up who may or may not be critically ill, but requires immediate assistance. You examine the patient and perform a few diagnostic tests. You give the patient treatment based upon what you think the patient's diagnosis is. Then, you hand the patient off to another provider and never find out what subsequently happened. You don't know if your assessment was accurate, if your treatment was appropriate and, ultimately, what the patient's outcome was. Unsettling, right? How can you assess the quality of your care?

EMS providers experience this scenario every day with just about every patient they see. How can an individual emergency medical technician (EMT) or ambulance service be expected to perform quality improvement in this setting?

In almost all areas of health care, there is constant evaluation of quality with a goal of continual improvement. There are accrediting bodies and healthcare commissions that review hospitals and health care professionals on how effectively they meet standards set by these entities. While many of those assessments are records-based, outcome knowledge and opportunities for direct observation abound. However, quality evaluation for EMS may not be quite as simple. Listed below are challenges faced when implementing QI programs for EMS:

1) The data-driven metrics typically relied upon by accrediting bodies are hard to develop for EMS.[1]
2) Many states have EMS protocols (standards of practice, guidelines) that vary by county, city, or even individual ambulance service. Therefore, EMTs may be held to different treatment standards across a statewide system.
3) Small or volunteer services with limited resources may not have the resources to have a fully functioning QI program. Many services have severe budgetary constraints.
4) Unlike physicians, EMS providers have different levels based on their training (EMT, Advanced EMT, Paramedic). This creates the problem of whether one level of provider should be held to the same standards as another when caring for the same patient and a similar concern exists related to the best provider to review care. Should review be by peers, or by those with a higher level of training? If by peers, what is the proper role for a physician medical director?
5) EMS agencies are not typically given access to other patient records (hospital, nursing home, dialysis, office, etc.), creating an obstacle to measuring outcomes.
6) With rare exception, EMS care is not directly supervised by the physician medical director, and QI review is based on chart audits and review of recorded data (radio transmissions, ECGs, etc.).

Despite these challenges, when it comes to EMS it is recognized that quality improvement should be performed[2] and that it does work.[3] Overcoming the unique challenges posed by EMS requires creativity and diligence. Core principles for implementation of EMS QI should include the following:

1) EMS is part of the health care team. EMS focuses on transport of patients to and between health care facilities, and in many areas is expanding its role to include prevention and follow-up activities (Mobile Integrated Healthcare/Community Paramedicine). Accepting EMS as crucial component of any comprehensive health care system is an essential first step in any QI program. In developing countries, individuals might walk, bike or hitch rides on the backs of motorcycles to come to a hospital (potentially travelling days to weeks). In such settings, precious care time is lost and patients may deteriorate due to this delay as well as any risk imposed by the transport itself. This situation occurs in the United States when patients choose to bypass the 911 EMS system when their situation indicates its use, and it is important to recognize the valuable service that EMS provides when properly used.

A focus of the National Highway Traffic Administration's *EMS Agenda for the Future* [4] is the integration of EMS with other healthcare organizations to identify and improve community health and safety issues. This integration

further solidifies EMS's place as part of the health care team. Describing what EMS does and where it is heading helps justify why EMS quality improvement is necessary. As EMS becomes recognized as a larger part of the health care milieu, it will be important to maintain high standards of care by performing QI. Resources that are exclusively dedicated to EMS quality improvement may be needed.

2) Augment the Feedback Process. When performing quality improvement, one simple model is to evaluate "structure, process, and outcomes." Evaluation of structure and process are possible within EMS services alone. However, evaluation of outcomes requires partnership with receiving facilities – access to records and relationships with individuals. Knowledge of outcomes is critical to effective quality improvement. There is no way to know which interventions are effective or appropriate when EMS providers are not given feedback on their care that is based on outcome measures. Ultimately, data must flow across agency and provider boundaries.[5] Typically, an EMS service medical director is well positioned to create a hospital-to-EMS liaison at hospitals where they are medical staff members, but EMS services typically transport to multiple hospitals, complicating even physician intervention to obtain outcome data. Methods must also be implemented to evaluate compliance with the established goals in conjunction with a feedback system to provide redirection towards them or recognition of attaining them.[6]

In Rhode Island, some effort has already begun to improve the feedback from in-hospital care and patient outcomes back to the pre-hospital providers. Specific efforts have been performed in stroke, myocardial infarction, and trauma care that have been well received in the EMS community.

3) Data collection. The old axiom that "numbers never lie" holds true in quality improvement. Defining quality is difficult because there are very few objective measures that apply in all circumstances. In addition, quality metrics are not very well defined in EMS. Despite these issues, there are some EMS metrics that can and should be measured. Response and scene times are measurable once clearly defined, as are metrics such as the percentage of patients with suspected cardiac chest pain, the percentage receiving aspirin, etc. As record keeping through electronic charting becomes more sophisticated, data collection will become less daunting of an endeavor.

Recently, in Rhode Island, a state-sponsored electronic patient care reporting system has become available to all EMS systems. Service chiefs, medical directors, and the Department of Health will now be able to have access to many metrics needed to improve data driven change. Computers are powerful QI tools, useful for gathering, storing, manipulating, and reporting data.[7]

In addition to the data collection that occurs at the state, county, or regional level, there is a national EMS data collection program called NEMSIS (National EMS Information System, www.NEMSIS.org). The primary goals of NEMSIS are:

1) Implement an electronic EMS documentation system in every EMS system
2) Implement a state EMS information system for every state
3) Implement a national EMS database

This powerful database approach is useful for both broad and narrow comparison of EMS systems. Growing since inception over 10 years ago, NEMSIS now accepts data from almost all states and thousands of EMS agencies, boasting a database that documents several million patient encounters.[8] In addition to the obvious quality improvement benefits of a powerful database engine with audit tools, the research implications of access to several million records are significant as well.

4) Quality organizations follow similar principles, healthcare industry or not. Quality organizations share several common characteristics: strong, visionary leadership to guide the organization and employees, prioritization of knowing and meeting client needs, planning for the future with a degree of flexibility, collection of relevant data coupled with fact-driven decision-making and measurable results, valuing employees and demonstrating this with appropriate assignment, and continuous quality improvement efforts.[9] Parallels from health care to the manufacturing and hospitality service industries have been made in the past and are in some cases appropriate.[10] However, it is inappropriate to apply the exact same quality paradigms to EMS. Unpredictability and variability in the prehospital care environment as well as varied presentation of even common disease processes are not factors in the manufacturing and service industry, and errors in judgment and patient care are held to an ethically different and much stricter societal standard.

Rather, EMS may be more closely compared with High Reliability Organizations (HROs), which are organizations where failure leads to catastrophic consequences.[11] Examples are nuclear power plants, commercial piloting, or air traffic control. However, EMS operates in a highly uncertain environment, with care often unwitnessed by supervisory personnel. Commercial pilots undergo quality improvement assessment in simulators and during check flights with experienced instructors. EMS is just beginning to use high-fidelity simulation, and cost is a significant limiting factor. QI supervisory presence is rare in EMS, although it occurs routinely due to emergency physician staffing on LifePACT, the pediatric and adult critical care transport team at Rhode Island Hospital/Hasbro Children's Hospital.[12] Both EMS systems and HROs often adopt the Incident Command System (ICS) for scene management, and many EMS systems have a "commitment to resilience," which blends an appreciation of a practiced routine and following orders with the ability to improvise or divert from protocol to complete a necessary

task. Also, quality EMS organizations routinely perform after-action meetings or debriefings and mortality and morbidity conferences, examining "near-misses" in particular to improve processes. In a HRO, this is called the "preoccupation with failure."

An organizational culture and infrastructure promoting excellence must be in place for any quality EMS organization. The culture must promote values that allow for both flexibility as well as consistency, recognize talent, and reward expertise. The infrastructure must be supported with personnel and technology to collect meaningful data, and results from data collection must be used to continually improve the organization. Every event requiring improvisation or a leading to a near miss should be examined closely for ways to improve performance or improve systems. Creating a quality EMS organization requires continual effort but reaps considerable reward.

CONCLUSION

As the evolution of EMS continues, it is important that growth occur in a manner that is safe and effective. The constant evaluation of change is the core of quality improvement in the EMS arena. EMS services, providers, and their physician medical directors face substantial challenges while providing error-intolerant care in a highly uncertain environment. Appreciation for these challenges and the unique QI issues faced by EMS services can help both to devise new approaches and to understand the limitations of EMS QI.

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False-Negative Chest Radiographs in Emergency Department Diagnosis of Pneumonia

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ABSTRACT

BACKGROUND: Emergency department (ED) patients frequently undergo chest x-ray (CXR) to evaluate for pneumonia. The rate of false-negative CXR in patients with pneumonia is unclear.

OBJECTIVES: Identify patients admitted with pneumonia who were diagnosed by CT despite nondiagnostic CXR.

METHODS: Retrospective analysis of quality improvement data on adult ED patients admitted with pneumonia over 21 months. Primary outcome was percent of patients diagnosed by CT despite normal CXR. Patients were classified as CXR-diagnosed if they had CXR and no CT, or if antibiotics were ordered after CXR and before CT. CT-based diagnosis was indicated by administration of antibiotics only after CT was completed.

RESULTS: 49 patients (11.4%) were diagnosed by CT ($p<0.001$). These patients were younger ($p<0.001$) and more often complained of chest pain ($p<0.001$).

CONCLUSIONS: Patients with pneumonia may present with normal or nondiagnostic CXR, although false negatives may be less common than previously reported.

KEYWORDS: pneumonia, chest radiograph, computed tomography, false negative

INTRODUCTION

Pneumonia is a common illness in the United States, particularly among elderly and immunocompromised populations. It is associated with significant morbidity, mortality, and costs. In 2011, there were 1.1 million inpatient hospital discharges with a principal diagnosis of pneumonia.[1] Associated inpatient mortality was 3.3% and total charges exceeded $35.3 billion.

There are no formal consensus guidelines for the diagnosis of pneumonia. Rather, the diagnosis is based on symptoms, physical exam, laboratory studies and radiographic imaging. Since no exam findings can definitively confirm its presence, chest x-rays (CXR) have been used to confirm pneumonia in the right clinical context.[2] However, research has suggested that CXR may lack sensitivity for diagnosing pneumonia at initial presentation.[3]

It has been documented that computed tomography (CT) can identify pneumonias not seen on CXR, particularly those in upper lobes or the lingula, or in patients with nosocomial or atypical pathogens.[4,5] Literature suggests CT may be diagnostically superior for pneumonia in ICU and ED patients.[6] However, there is no evidence that CT imaging for pneumonia improves clinical outcomes. In this study we report on our experience with both CXR- and CT-based diagnosis of pneumonia in the ED, as well as the comparative clinical outcomes.

METHODS

Purpose

The primary aim was to determine how frequently CT scans diagnosed pneumonia when standard CXR was nondiagnostic. Second, we sought to investigate the clinical outcomes of these patients on the basis of whether pneumonia was visualized on CXR or CT.

Study design and population

This study is a retrospective analysis of quality improvement data collected on all adult ED patients admitted with diagnosis of pneumonia from February 2005 to October 2006. The study was performed in a large, urban academic hospital in Providence, Rhode Island, with an annual ED volume of 78,000 patients during the study period. Patients under age 18 and those discharged from the ED were excluded. This project received IRB approval with waiver of informed consent.

Data collection

All ED physician orders were entered electronically using the MedHost™ Information System (Medhost Corporation, Addison, TX), which performed patient tracking and physician documentation. All staff members were educated regarding the department's quality improvement program, which included recommendations for pneumonia management from the Joint Commission and the Centers for Medicare and Medicaid Services. Specific focal elements included antibiotic selection and timeliness of administration.

Chief complaint data and emergency severity index (ESI, version 3) were prospectively determined by ED triage nurses. ED quality-assurance nurses who were blinded to study aims reviewed ED admitting records on a daily basis for patients admitted with pneumonia. For each patient, pertinent clinical data were abstracted onto data sheets, including

demographics, medical history, vital signs, and clinical outcomes. This information was entered into an Access™ database (Microsoft Corporation, Redmond, WA). A 5% sample of charts was abstracted by two staff members to measure inter-rater reliability.

Outcome measures

The primary outcome was the percent of pneumonia diagnoses made by chest radiograph or CT scan. Patients were classified as diagnosed by CXR if they were admitted with a diagnosis of pneumonia, and (a) no chest CT was performed or (b) antibiotics were started after CXR but before CT was performed. Patients were classified as diagnosed by CT if antibiotics were not administered after CXR but were given after chest CT, or if physician documentation noted that antibiotics were held after CXR until additional imaging could clarify the diagnosis. Patients were also included in this group if antibiotics were administered after abdominal CT and before a normal CXR, as pneumonia may be visualized in lung bases by abdominal CT. Secondary and clinical outcomes included intubation, ICU admission, length-of-stay (LOS), and in-hospital mortality.

Data analysis

Statistical analysis was performed using independent samples t-test (with adjustment for unequal variance where appropriate) and chi-square test. Given the multiple comparisons between groups, the likelihood of a statistically significant result due to random chance was high, so an alpha probability of 0.01 was selected a priori.

For a dependent variable of imaging by CXR vs. CT, explainer variables resulting in p-values <0.1 were entered into a multiple logistic regression model. Covariates included patient demographics and medical comorbidities. We employed Wald and likelihood ratio testing to iteratively remove non-contributory variables from the model. Continuous data are presented as medians with interquartile range. Means are presented with standard deviations. Statistical analysis was performed using Stata v.10 (Stata Corp., College Station, TX).

RESULTS

A total of 428 patients were admitted with a diagnosis of pneumonia. While 379 patients were diagnosed using CXR, 49 patients (11.4%) were diagnosed by CT. This fraction was significantly lower than the 27% value reported in prior retrospective literature (X2=15.2, p<0.001).[6]

Table 1 summarizes demographics, clinical characteristics, and outcomes among patients in both groups. Patients in the CT-diagnosed group were significantly younger than the CXR-diagnosed group (60 years vs. 77 years, p <0.001). There were no significant differences in gender composition or insurance status.

Patients in the CT-diagnosed group were more likely to present with chest pain (24% vs. 7%, p <0.001) than patients in the CXR-diagnosed group. There was also a trend toward tachycardia in the CT-diagnosed group (105 vs. 96 beats per minute, p<0.02). Presenting complaints and triage vital signs were similar between groups. There were no differences regarding triage ESI, the proportion of patients triaged to a resuscitation/trauma room, or clinical outcomes. Inter-rater agreement was moderate with a Cohen's kappa coefficient of 0.71.

DISCUSSION

For many years, chest x-rays were considered the gold standard for diagnosis of pneumonia. In recent years, literature has documented that CXR may miss a significant number of pneumonias visible on CT. In a prospective study of 47 patients with suspected pneumonia who underwent both CT and CXR, 31% of pneumonias diagnosed by CT were not visualized on CXR.4 In a large retrospective study of 1057 adult ED patients with pneumonia, 97 patients underwent both CXR and chest CT. Twenty six (27%) of these patients

Table 1. Patient Characteristics and Outcomes

	CT-diagnosed	CXR-diagnosed	P-value
Demographics			
Number of patients	49	379	
Age	60 (49, 77)	77 (62, 86)	**<0.001**
Female gender % (n)	51 (25)	47 (178)	0.59
Insured % (n)	86 (42)	92 (349)	0.12
Comorbidities			
Congestive heart failure % (n)	10 (5)	21 (80)	0.07
Coronary artery disease % (n)	8 (4)	15 (56)	0.21
COPD % (n)	4 (2)	15 (55)	0.04
Diabetes % (n)	22 (11)	27 (101)	0.53
Chief complaint			
Fever % (n)	47 (23)	48 (181)	0.91
Cough % (n)	61 (30)	64 (241)	0.75
Shortness of breath % (n)	61 (30)	59 (222)	0.72
Chest pain % (n)	24 (12)	7 (28)	**<0.001**
Other % (n)	25 (12)	26 (98)	0.84
Vital signs			
Systolic blood pressure	133 (115, 153)	131 (114, 151)	0.66
Heart rate	105 (86, 124)	96 (80, 111)	0.02
Respiratory rate	21 (18, 26)	20 (18, 24)	0.35
Temperature (F)	99 (97.8, 100)	98.5 (97.7, 99.7)	0.21
Pulse oximetry at arrival	97 (93, 99)	96 (93, 98)	0.4
ED Triage			
ESI at triage	2 (2, 3)	2 (2, 3)	0.71
Triaged to critical care room % (n)	37 (18)	33 (125)	0.6
Outcomes			
Intubated % (n)	6 (3)	5 (20)	0.81
ICU admission % (n)	31 (15)	22 (80)	0.14
Complications % (n) [b]	35 (17)	26 (97)	0.18
In-hospital mortality % (n)	10 (5)	6 (24)	0.32
Hospital LOS (days)	4.5 (3, 10)	4 (3, 7)	0.3

[a] Continuous variables presented as median ± IQR. [b] Intubation, ICU admission, or death.

had CT-visualized pneumonias despite nondiagnostic CXR.[6]

Our study examined ED patients who were provisionally diagnosed by CT scan rather than CXR. In our population, 11% of patients were diagnosed by findings on CT. While this rate is lower than prior studies, it does not eliminate the need for consideration of further evaluation or treatment. Although our data were several years old, pneumonia remains a common condition and CXR remains the standard of care for diagnosing pneumonia. As such, our results remain relevant to contemporary emergency medicine practice.

Several reasons may contribute to diagnostic inaccuracy of early CXR. Early pneumonia may not produce significant findings on CXR. Basi reviewed 92 patients admitted with diagnosis of pneumonia who had normal initial radiographs and repeat radiographs within 72 hours.[7] Of this group, 7% developed infiltrates on follow-up radiographs within 72 hours. Hagaman studied 22 patients admitted for pneumonia with negative initial radiographs.[3] Of the nine patients in that study who had follow-up imaging within 48 hours, a majority (55%) had radiographic infiltrates, although the significance of this finding is limited by sample size, selection bias, and use of CT for repeat imaging in one patient. It is important to note that CT may reveal infiltrates that represent causes other than bacterial pneumonia (e.g., viral lower respiratory infections) for which CXR may also be insensitive. Dehydration has been linked with absence of CXR infiltrates in patients with pneumonia, although this assertion has limited supporting literature.[8-9] Prior literature suggested CXR may be less sensitive for infiltrates in certain anatomic regions such as the lingula. Unfortunately, our data lacked these details on radiologic interpretations and thus these hypotheses could not be tested.

In our study, there were several differences between CXR-diagnosed and CT-diagnosed groups. First, patients with chest pain and tachycardia were more likely to be diagnosed by CT. This difference may reflect high CT use among patients who had a higher apparent risk of pulmonary embolism. Banker and colleagues examined ED patients diagnosed with pneumonia by CT and compared them to age- and sex-matched controls diagnosed by CXR.[10] Their data noted more patients in the CT-diagnosed group presented with chest pain, but the results did not reach statistical significance. Second, our CT-diagnosed patients were younger that those diagnosed by CXR, but this subgroup nonetheless had similar morbidities and mortality as the older patients. Since age at diagnosis is a strong predictor of mortality, it is possible that unmeasured comorbidities exerted a clinically relevant impact upon outcome in this subgroup.

LIMITATIONS

This study is limited as a retrospective analysis. The study was not designed to measure sensitivity and specificity of CXR as not all patients underwent CT scan. Conclusions regarding diagnosis were based on timing of diagnostic tests and orders for antibiotics. We did not include patients who were diagnosed with pneumonia and discharged from the ED, or patients admitted with an alternative diagnosis and later diagnosed with pneumonia. CT findings consistent with pneumonia may have been noted incidentally during clinical investigation for other diagnoses. Inpatient and discharge data were not included in our data set and thus we could not correlate admission diagnosis with inpatient treatments, laboratory tests, or discharge diagnosis. However, we sought to mimic real-world practice by examining information available to emergency physicians at time of treatment.

CONCLUSIONS

More than 11% of ED patients admitted to the hospital with provisional diagnosis of pneumonia were diagnosed by CT imaging rather than chest radiograph. Infiltrates consistent with pneumonia may be missed by CXR alone in a significant minority of ED patients. In the appropriate clinical context, clinicians should consider advanced imaging in patients with negative CXR. Our results suggest a smaller proportion of infiltrates are missed by CXR than reported in prior studies.

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Insertion and Use of Arterial Catheters: A Survey of Clinician Antiseptic Technique

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ABSTRACT

RATIONALE: Recent studies have shown that the incidence of bloodstream infections (BSIs) associated with arterial catheters (ACs) is comparable to that of central venous catheters (CVCs). In 2011, the CDC published guidelines recommending the use of limited barrier precautions during AC insertion. The goal of this study was to assess the attitudes and current antiseptic techniques employed by physicians who place arterial catheters in intensive care units.

METHODS: An anonymous, web-based survey was sent to critical care physicians from multiple specialties at six teaching hospitals in Rhode Island.

RESULTS: Survey response rate was 33% (27/83). Only 44% of participants reported using CDC-recommended barrier precautions during AC insertion, and only 15% reported using full barrier precautions.

CONCLUSIONS: Use of barrier precautions for arterial catheter insertion was inconsistent in the cohort surveyed. Less than half of physicians surveyed were in compliance with CDC guidelines. Further studies are warranted to determine the optimal preventive strategies for reducing BSIs associated with ACs.

KEYWORDS: arterial catheters, bloodstream infections, sepsis, ICU, critical care

INTRODUCTION

Peripheral arterial catheters (ACs) are commonly used in the ICU setting for accurate measurement of blood pressure and serial arterial blood gas sampling. It is estimated that six million ACs are placed in the US each year.[1] Arterial catheters represent a potential source of blood stream infection (BSI), as they provide a direct, indwelling pathway between the skin and blood stream. Infection of intravascular devices is associated with significant increases in morbidity, length-of-stay and hospital costs.[2] Infection control efforts have focused predominately on preventing infections associated with central venous catheters (CVCs, or "central lines"). The results of the *5 Million Lives Campaign* showed a significant (66-74%) reduction in the rate of central venous catheter-related BSIs through the use of a five-part program which includes hand hygiene, full barrier precautions (sterile gloves, sterile gown, surgical cap, surgical mask and full body sterile drape), chlorhexidine skin anti-sepsis, optimal site selection and daily review of catheter necessity with prompt removal.[3] Due to the success of this campaign, it is now considered standard of care to implement these precautions for the insertion of all CVCs.

Previously assumed to be benign compared to CVCs, arterial catheters also pose a significant infectious risk to patients. Recent studies have shown that the incidence density of BSIs (new infections per 1,000 catheter-days) associated with ACs is 40-90% of the incidence density associated with CVCs.[1,4-6] However, antiseptic guidelines for arterial catheters have lagged behind those for CVCs. Prior to 2011, there were no guidelines regarding which barrier precautions should be used for AC insertion.[7] In 2011, the CDC updated their infection- prevention guidelines for ACs, recommending that a cap, mask, sterile gloves and a small sterile fenestrated drape be used during all peripheral arterial catheter insertions.[8] To date, there are no published studies evaluating which antiseptic techniques are actually employed by physicians during AC insertion in clinical practice; it is unknown whether critical care physicians are aware of, or in compliance with CDC guidelines for AC insertion.

We hypothesized that considerable inter- and intra-institutional practice variability exists among physicians who place arterial catheters in Rhode Island. Furthermore, based on personal experience and anecdotal accounts, we speculated that, in general, clinicians underestimate the infectious risks posed by arterial catheters. The objective of this study was to formally assess the attitudes and current practice patterns of clinicians who place peripheral arterial catheters in the intensive care setting of hospitals in Rhode Island.

METHODS

Study Design and Instrument Development

An anonymous, web-based survey was used to assess the aseptic technique of physicians in Rhode Island practicing in critical care settings. The survey was developed by a focus group consisting of one infectious diseases specialist, three medical intensive care specialists, one surgical intensive care specialist, a medical resident, and a biostatistician. Prior to dissemination the survey was reviewed and approved by the Institutional Review Board (IRB) at Rhode Island Hospital.

Participants

Survey participants consisted of attending physicians who practice medical, surgical, or pediatric critical care at six teaching hospitals in Rhode Island. Adult pulmonary/critical care fellows, adult cardiology fellows, and senior surgical residents (PGY3-PGY5) from three teaching hospitals (Rhode Island Hospital, Miriam Hospital, Providence VA Medical Center) and one attending neurointensivist were also included in the study. All attending physicians included in the survey had fellowship training and board certification in critical care within their specialty. An initial email list was generated from the Brown University Pulmonary and Critical Care grand rounds mailing list, which was then reconciled and augmented with published department listings at hospitals in Rhode Island to create the final distribution list. All together, survey participants spanned six teaching hospitals (Hasbro Children's Hospital, Miriam Hospital, Memorial Hospital of Rhode Island, Providence VA Medical Center, Rhode Island Hospital, Roger Williams Medical Center), covering a total of 160 ICU beds.

Survey Instrument and Administration

The survey consisted of 13 questions. Twelve multiple choice questions assessed demographic information, frequency of arterial catheter use, antiseptic techniques employed during arterial catheter insertion, and attitudes regarding mandatory use of full barrier precautions for AC insertion. In one question, participants were asked to provide a numerical estimate (percentage) for the relative risk of BSIs associated with ACs as compared to CVCs, in terms of incidence density. All data were non-identifiable. The survey was conducted via REDCap™, an online survey and data capture tool.[9] Each participant received the research invitation and survey link via email. Implied consent was obtained by the informational letter and taking part in the survey. Participants were sent a total of three invitation emails over a period of 10 days in October of 2013.

Analysis

Data were analyzed using Excel (Redmond, Washington: Microsoft, 2003). Data are reported as percentages. Pearson chi-squared test and independent samples t-tests were used to compare categorical and continuous variables (respectively) between different specialties.

RESULTS

The survey was sent to 83 doctors (43 attending critical care physicians, 24 adult cardiology and pulmonary/critical care fellows and 16 senior surgical residents). The response rate was 33% (14 attending critical care physicians, 9 fellows and 4 senior surgical residents). Over 60% of responses were from critical care physicians specializing in internal medicine, with the remainder of participants from surgery, pediatrics and neurology. The participant response rates and demographics are summarized in **Table 1** and **Table 2**, respectively.

Twelve respondents (44%) were in compliance with CDC-recommended antiseptic precautions for arterial catheter insertion, consisting of hand hygiene, sterile gloves, a surgical cap, surgical mask, and a small sterile fenestrated drape. Four respondents (15%) reported use of full barrier precautions, consisting of hand hygiene, skin prep with alcoholic chlorhexidine solution, sterile glove, sterile gown, surgical cap, surgical mask, and a full body sterile drape. Survey responses are summarized in **Table 3**.

The mean estimation of relative risk of bloodstream infections associated with arterial catheters as compared to central venous catheters was 46%, indicating that clinicians in this study had a realistic conception of the infectious risk posed by arterial catheters. There were large variations observed between surgical and non-surgical specialties in terms of both perceived risk of infection from arterial catheters, as well as attitudes regarding the use of full barrier precautions for arterial catheter insertion. However, these differences did not achieve statistical significance (**Table 4**).

Table 1. Survey Response Rates

Variable	Responses (%)
Level of Training	
Attending	14 (33)
Fellow	9 (38)
Senior surgical resident	4 (25)
Specialty	
Medicine	17 (30)
Surgery	6 (27)
Pediatrics	3 (75)
Neurology	1 (100)
Anesthesiology	0 (0)
Overall	27 (33)

Table 2. Characteristics of Respondents

Variable	N (%)
Level of Training	
Attending	14 (52)
Fellow	9 (33)
Senior surgical resident	4 (15)
Specialty	
Medicine	17 (63)
Surgery	6 (22)
Pediatrics	3 (11)
Neurology	1 (4)
Anesthesiology	0 (0)
Critical Care Training	
Yes	22 (82)
No	5 (18)
Frequency of Arterial Catheter Insertion	
once per Day	8 (30)
once per Week	13 (48)
once per Month	5 (18)
once per 3 Months	1 (4)
once per Year	0 (0)

DISCUSSION

In this study, there was significant variability in which barrier precautions were employed by different physicians during arterial catheter insertion. The most significant finding was that less than half of physicians surveyed reported using CDC-recommended barrier precautions during arterial catheter insertion. If the results of this study are representative of clinical practice on a large scale, then our current level of compliance with CDC guidelines for AC insertion represents a "missed opportunity" to prevent BSIs in the intensive care setting. Efforts to increase compliance with the new guidelines should be escalated accordingly.

Compared to the infection prevention guidelines for CVCs, the new CDC guidelines for ACs are both less evidence-based and less stringent. In light of the multiple recent studies suggesting that the risk of BSIs associated with ACs is comparable to CVCs, one could make a compelling argument that insertion of arterial catheters should require the same barrier precautions as CVCs. To date, only one small randomized, controlled trial has examined implementing full barrier precautions for the insertion of ACs.[10] Although this trial showed no difference in colonization and a non-significant decrease in AC-related infections in the full barrier precaution group (RR=0.4, p=0.11), with only 272 randomized participants the study was underpowered.

Participants in our survey provided, on average, accurate estimates for the relative risk of infection associated with ACs, as compared to CVCs. Despite this, only 56% of participants reported that they believed full barrier precautions should be mandatory for AC insertion, as they are for insertion of CVCs. Only 15% of those surveyed reported that they routinely use full barrier precautions during AC insertion. The major limiting factor in adoption of full barrier precautions by physicians in this study was use of the full body sterile drape, which was employed by only 19% of respondents. No randomized controlled trials have compared the effectiveness of different drape sizes in decreasing BSIs associated with ACs. However, it seems unlikely that a small area drape can ensure equivalent sterility of both the proceduralist and procedural field, especially when ultrasound guidance is used for arterial catheter insertion. In summary, although the new CDC guidelines for AC insertion published in 2011 are clearly a step in the right direction, large prospective studies are now warranted to develop an evidence-based infection-prevention guideline for arterial catheter insertion.

One important aspect of this study is that, to our knowledge, it is the first detailed survey about AC insertion practice by critical care specialists. Another is that it documents significant practice variation in Rhode Island with regards to a very commonly performed procedure in critically-ill patients. Potential limitations of this study were the small sample size (27 respondents), the use of only teaching hospitals in the greater Providence area and the low overall response rate (33 %). There is a high likelihood that a selection bias exists among those who elected to participate in the

Table 3. Insertion and Use of Arterial Catheters: A Survey of Clinician Practice Patterns

Variable	%
Barrier and Antiseptic Techniques Employed	
Hand hygiene	89%
Skin prep using alcohol	4%
Skin prep using alcoholic chlorhexidine solution	96%
Allow alcohol and/or chlorhexidine to dry before proceeding	81%
Non-sterile gloves	0%
Sterile gloves	100%
Sterile gown	74%
Surgical mask	89%
Surgical cap	78%
Shaving the area prior to insertion	7%
Small sterile drape (only covering area around insertion site)	78%
Full body sterile drape (including head, feet and hands)	19%
None of the above	0%
Routinely discuss appropriateness of arterial catheter removal every day on rounds for each patient	78%
Employ an "absolute removal" policy of all arterial catheters after a pre-determined number of days	4%
Compliant with CDC-recommended antiseptic techniques (hand hygiene, skin prep with alcoholic chlorhexidine solution, sterile gloves, surgical cap, surgical mask, small sterile drape)	44%
Use full barrier precautions (hand hygiene, skin prep with alcoholic chlorhexidine solution, sterile gloves, sterile gown, surgical cap, surgical mask, full body sterile drape)	15%
Would support mandatory use of full barrier precautions during arterial catheter insertion	56%

Table 4. Variation between surgical and non-surgical specialties

Variable	Non-surgeons	Surgeons	p-value
Estimation of relative risk of bloodstream infections associated with arterial catheters as compared to central venous catheters	50%	32%	0.33
Would support mandatory use of surgical cap, surgical mask, sterile gown, sterile gloves and a full body sterile drape during arterial catheter insertion	62%	33%	0.21

survey as well as in the selection of the hospitals. It is possible that the statistics cited above may overestimate the prevalence of barrier-precaution usage during AC insertion. Critical care physicians from specialties other than internal medicine were underrepresented in this study. Finally, these results were based on provider self reports and may not accurately reflect true clinical practice.

CONCLUSIONS

This pilot survey of critical care physicians in Rhode Island suggests that barrier precautions are employed inconsistently during arterial catheter insertion in clinical practice. Less than half of physicians surveyed were in compliance with the new CDC guidelines for arterial catheter insertion. Further studies are warranted to estimate practice patterns on a larger scale, and to determine the optimal preventive strategies for reducing bloodstream infections associated with arterial catheters.

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Epstein-Barr Virus Associated Hemophagocytic Lymphohistiocytosis in a Rheumatic Patient Receiving Abatacept Therapy

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ABSTRACT

Hemophagocytic lymphohistiocytosis (HLH) is a life-threatening hyperinflammatory disease that causes extensive organ damage. It is generally triggered by viral, fungal, or parasitic infections in the setting of hematologic disease-induced immune deficiency. Occurrences in rheumatologic disease are less frequent, with the syndrome developing most often in patients with systemic lupus erythematosus and adult-onset Still disease. It is believed that the immunosuppression induced by rheumatologic disease itself and exacerbation by immunomodulatory therapies predispose to infection and subsequently HLH. Abatacept is a relatively new disease-modifying agent for rheumatoid arthritis (RA) that has been associated with varicella zoster virus, cytomegalovirus, and Epstein-Barr virus (EBV) infections, but not previously in the setting of HLH. Here we report a unique case of EBV-associated HLH in a RA patient receiving abatacept therapy.

KEYWORDS: Hemophagocytic lymphohistiocytosis, Epstein-Barr virus, abatacept, rheumatoid arthritis.

INTRODUCTION

Hemophagocytic lymphohistiocytosis (HLH) is a rare and often-fatal hyperinflammatory syndrome caused by impairment in the down-regulation of immune cells. Most patients exhibit dysfunction of natural killer (NK) cells and cytotoxic T-lymphocytes, with excessive macrophage activity. This results in hypercytokinemia with overproduction of interleukins (ILs) 6, 10, and 12, soluble IL-2 receptor, interferon gamma (IFN-γ), and tumor necrosis factor alpha (TNF-α), leading to extensive tissue damage and multi-organ failure.[1,2]

The predominant signs and symptoms of HLH include persistent high fever, cytopenias, and hepatosplenomegaly. Patients less commonly exhibit edema, rash, lymphadenopathy, and jaundice. Associated laboratory findings include elevated triglycerides, ferritin, bilirubin, transaminases, lactate dehydrogenase, soluble IL-2 receptor, and low fibrinogen with coagulopathy, and specific clinical diagnostic guidelines for HLH (Table) have been set forth by the HLH-2004 trial.[3] For critically-ill patients, prompt treatment with dexamethasone and etoposide, with intrathecal methotrexate and hydrocortisone for those with central nervous system involvement, is crucial after diagnosis, as untreated patients have a survival of only months.[3]

The syndrome has both familial and acquired forms, originally distinguished by age of presentation. However, genetic cases have been identified in both children and adults, and a recent study found familial HLH gene mutations in 14% of 175 adults presenting with this condition.[4] Acquired HLH can also occur at any age and is often secondary to illnesses that modulate the immune system, including systemic infection, autoimmune disorders, and malignancy.[5] In the last decade, there have been increasing reports of HLH in systemic lupus erythematosus (SLE), Still disease, rheumatoid arthritis (RA), and other autoimmune diseases.[6-8]

Both familial and acquired HLH are commonly triggered by infection, with Epstein-Barr virus (EBV) as the leading cause.[4] EBV-associated HLH has been reported in patients with chronic active EBV and infectious mononucleosis, among other manifestations of EBV infection.[9,10] Interestingly, EBV-associated HLH is associated with infections of NK cells and T–lymphocytes in addition to B-lymphocytes.[11,12] The viral infections thought to induce HLH occur commonly as reactivations, which occur relatively frequently in

Table. Diagnostic Guidelines for HLH (adapted from Henter et al.[3])

A diagnosis of HLH requires (1) or (2) to be satisfied

1) A molecular diagnosis consistent with HLH (mutations of BIRC4, Munc18-2, PRF1, Rab27a, SH2D1A, STX11, or UNC13D)
2) Fulfillment of five of the diagnostic criteria below
   - Fever ≥ 38.5 °C
   - Splenomegaly
   - Cytopenias affecting ≥2 of the 3 cell lineages below
     - Hemoglobin <90 g/L (for infants <4 weeks: hemoglobin <100 g/L)
     - Platelets <100 x 10^9/L
     - Neutrophils <1.0 x 10^9/L
   - Hypertriglyceridemia and/or hypofibrinogenemia
     - Fasting triglycerides ≥265 mg/dL
     - Fibrinogen ≤1.5 g/L
   - Hemophagocytosis in bone marrow, spleen, or lymph nodes
   - No evidence of malignancy
   - Low or absent NK-cell activity
   - Ferritin ≥500 ng/L
   - Soluble IL-2 receptor ≥2,400 U/mL

rheumatic patients receiving immunosuppressive therapy. Abatacept, a T-lymphocyte co-stimulatory molecule inhibitor, is a relatively new treatment for RA that has been associated with reactivation of varicella zoster virus, cytomegalovirus, and EBV, but not yet in the setting of HLH.[13] We report a unique case of EBV-associated HLH in a RA patient receiving abatacept therapy.

CASE REPORT

A 48-year-old man with a history of RA, on methotrexate and abatacept, presented with several weeks of malaise, fever, and upper respiratory symptoms. He was treated with azithromycin as an outpatient but his symptoms worsened. He subsequently developed jaundice and confusion and was admitted to the hospital, where he was found to have ALT 161 U/L, AST 153 U/L, alkaline phosphatase 404 U/L, total bilirubin 13.4 mg/dL, direct bilirubin 8.6 mg/dL, hemoglobin 8.3 g/dL, platelets 122 x 109/L, creatinine 1.5 from a baseline of 0.9 mg/dL, international normalized ratio 1.5, ferritin 19,278 µg/L, fibrinogen 71 mg/dL, triglycerides 207 mg/dL, sIL-2R 7304 U/mL, melena, and ongoing fevers of 102-103°F despite broad-spectrum antimicrobials. CT scans revealed diffuse axillary, mediastinal, right hilar, and mesenteric lymphadenopathy in addition to splenomegaly; there was no evidence of liver or bile duct abnormalities.

Liver biopsy showed lymphohistiocytic granulomatous inflammation and hypertrophy of Kupffer cells, with frequent phagocytosed red blood cells, consistent with HLH (Figure 1). A bone marrow biopsy revealed a histiocytic infiltrate with erythrophagocytosis and emperipolesis (Figure 2). Both bone-marrow biopsy and a lymph-node biopsy were negative for malignancy. EBV IgM was positive and PCR for EBV DNA returned with 127,000 IU/mL. Serologies for anaplasma, babesia, lyme, herpes simplex virus, and parvovirus were negative. Cerebral spinal fluid gram stain and culture were both negative with no evidence of pleocytosis, phagocytosed erythrocytes, or elevated protein to suggest HLH involvement of the central nervous system.

Given the patient's clinical presentation, laboratory, and histological data, he was diagnosed with EBV-associated HLH and started on a regimen of daily dexamethasone and twice weekly etoposide.[3] In addition, given his EBV-positivity, he was given weekly rituxan over four weeks. His course was complicated by liver failure, renal failure requiring hemodialysis, respiratory failure requiring a brief period of intubation, pancytopenia, and disseminated intravascular coagulation requiring multiple cryoprecipitate, packed red blood cell, and plasma transfusions. Over the remainder of his seven-week hospitalization, his international normalized ratio (INR) slowly improved but he remained transfusion-dependent. Persistent melena prompted an upper endoscopy that found diffusely friable gastric and duodenal mucosa but no overt gastrointestinal hemorrhage. He became progressively leukopenic, reaching an absolute neutrophil count

Figure 1. Liver parenchyma highlighting histiocytes packed in the sinusoids, many with erythrophagocytosis (arrows) (Hematoxylin-Eosin stain, magnification x 400).

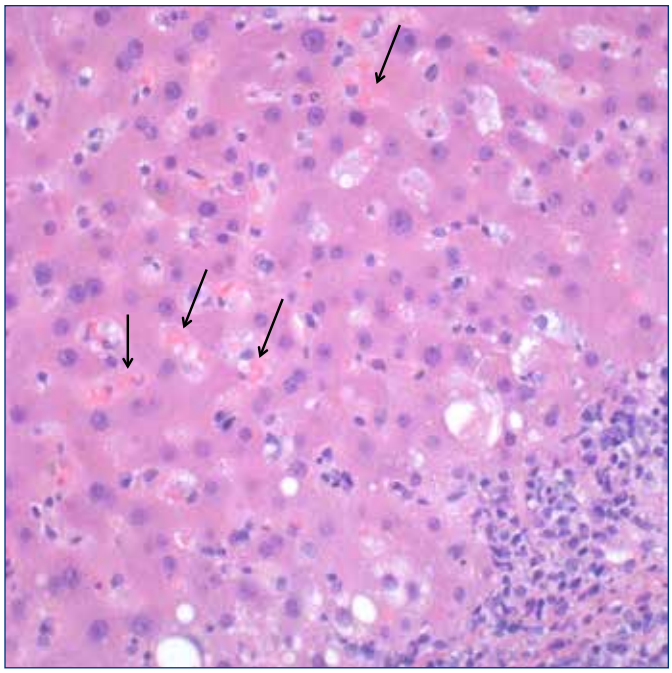
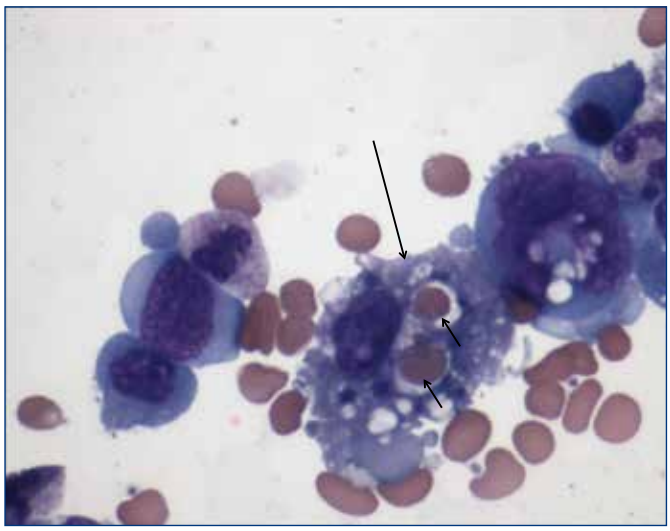


Figure 2. Characteristic bone marrow aspirate demonstrating phagocytosis of non-nucleated erythrocytes (short arrows) by macrophages (long arrow) (Wright-Giemsa stain, magnification x 600).



<100/µL requiring atovaquone and acyclovir prophylaxis. He was also treated with vancomycin and cefepime for hospital-acquired pneumonia and voriconazole for thrush. The patient began to demonstrate improvement in his liver enzymes, renal function, inflammatory parameters, and mental status. However, despite continued treatment, he suffered from ongoing pancytopenia and subsequently developed daptomycin-resistant VRE bacteremia. He ultimately succumbed to sepsis and respiratory failure.

DISCUSSION

RA is a systemic autoimmune condition characterized by polyarticular synovial inflammation that leads to chronic, irreversible joint damage and disability. The joint damage and deformity result from excess inflammatory cytokines, including IL-1, IL-6, and TNF-α, produced by activated T-lymphocytes. Treatment of RA typically consists of corticosteroids and disease-modifying agents such as methotrexate. In some cases, RA may persist despite these treatments, and biologic therapies targeting pro-inflammatory cytokines,[15,16] IL-1 receptor,[17] T-cell activation,[18] or B-cells are necessary.

Prior to the introduction of biologic agents, the incidence of infection in RA was twice that of healthy matched controls.[20] This is believed to be secondary to the immunologic alterations caused by the disease itself in addition to the disability, skin damage, and immunosuppressive drugs associated with the illness. Since the start of the biotherapy era, studies have identified even greater risks of infection associated with biologic agents.[21] A meta-analysis of seven randomized controlled trials comparing abatacept to placebo or other disease modifying agents in RA found that at 12 months, serious infections were more common in the abatacept group compared to controls (Peto odds ratio 1.91, 95% CI 1.07-3.42).[22] Furthermore, the risk of serious adverse events increased further when abatacept was combined with other disease-modifying agents (RR 2.3, 95% CI 1.2–4.6). Thus, our patient receiving abatacept therapy concurrently with methotrexate and prednisone may have been extraordinarily susceptible to an EBV infection capable of triggering HLH.

In addition to predisposition to infection, it is important to consider immunosuppressive therapy as an independent trigger or cofactor for HLH. A recent systematic review of hemophagocytic syndrome in rheumatic patients reports that 20 HLH cases may have been triggered by immunosuppressive treatments including adalimumab, azathioprine, etanercept, infliximab, leflunomide, methotrexate, and sulfasalazine.[23] Abatacept, which has not yet been associated with HLH, is a fully humanized fusion protein consisting of the Fc portion of IgG1 and the extracellular domain of CTLA-4, modified to prevent complement activation.[24] The drug binds to CD80 and CD86 on antigen presenting cells, blocking the CD28 interaction with T cells. Abatacept was the first drug to selectively target the co-stimulatory signal necessary for T-cell activation, a function that may exacerbate the underlying T-cell dysfunction found in most patients with HLH.

While the mechanism of HLH induction remains unclear and further experience will be necessary to elucidate the potential association of this syndrome with this relatively new drug, HLH should be considered in rheumatic patients receiving abatacept therapy who develop a sepsis-like presentation with acute multi-organ injury. Prompt recognition and treatment of this rare condition is crucial to maximize opportunity for a favorable outcome.

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Psoas Abscess in an Immunocompetent Host

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ABSTRACT

We present a case of iliopsoas abscess in an immunocompetent patient. She experienced three weeks of worsening right hip pain, which was initially misdiagnosed as degenerative joint disease. This led to admission to the Intensive Care Unit for severe sepsis. The patient improved with intravenous antibiotics and percutaneous abscess drainage.

KEYWORDS: Psoas abscess, iliopsoas abscess, percutaneous drainage and intravenous antibiotics.

ABBREVIATIONS: Intensive Care Unit (ICU), Computed Tomography (CT), Intravenous (IV), Emergency Department (ED), Complete Blood Count (CBC), White Blood Cell Count (WBC), and Human Immunodeficiency Virus (HIV).

INTRODUCTION

Many patients with iliopsoas abscess initially present with non-specific symptoms, such as back or hip pain, which causes difficulty in early diagnosis. Fever, abdominal or flank pain, and pain with ambulation are other common presenting features.

A major risk factor for psoas abscess is immunosuppression, including diabetes, IV drug use, HIV infection and renal failure. Trauma, hematoma formation and surgery on adjacent structures can also predispose to development of psoas abscesses.

CT is the optimal radiographic modality to evaluate a psoas abscess. Percutaneous abscess drainage with antibiotics or surgical intervention remains the mainstay of treatment.[1-3]

Case Presentation

A 48-year-old morbidly obese woman with a medical history of chronic back pain and multiple back and shoulder surgeries presented to our ED with three weeks of worsening right hip and flank pain. The pain was sharp, radiated to the buttock and lower back, and was exacerbated by movement.

One month prior, she visited another ED with a large abdominal skin abscess, which was treated with incision and drainage. She then completed a two-week course of Sulfamethoxazole/Trimethoprim.

One week prior to presentation at our ED, she had been evaluated in an urgent care center, where hip X-rays ruled out fractures. The patient was diagnosed with suspected arthritis and sent home with Oxycodone/Acetaminophen and a five-day Prednisone taper. The pain worsened and caused difficulty with ambulation. She consulted her orthopedist the day prior to admission, who referred her for admission after noting a marked leukocytosis on a CBC.

In the ED, she was afebrile, tachycardic and hypotensive. She had lower abdominal tenderness when extending the right hip (positive psoas sign), decreased range of motion at the right hip and weakness upon extension and flexion of the right hip, likely secondary to pain. There was also tenderness to palpation over the right flank and upper buttocks. WBC was 56,100 with 92.7% neutrophils and 23% bands; sedimentation rate was 92; C-Reactive Protein (CRP) was greater than 200 mg/L; BUN was 26 and creatinine was 1.62 mg/dl. Hip X-rays were negative for arthritis and any acute pathologies. An abdominal and pelvis CT without contrast revealed enlargement of the right psoas muscle with

Image 1. CT abdomen and pelvis revealing right psoas abscess.

surrounding inflammation, though no definitive abscess was visualized. She was admitted to the ICU and started on broad-spectrum antibiotics.

On day two of hospitalization an abdominal and pelvis CT with contrast revealed inflammation around the right psoas muscle and retroperitoneal fat, with high suspicion for a focal abscess. On day three, 60 milliliters of pus were drained from the collection. The cultures grew methicillin-sensitive *staphylococcus aureus* (MSSA). Cefazolin was begun, and on day five, the patient's sepsis resolved.

On day seven, the patient became febrile and the pain in her right hip and flank increased. Her WBC was 24,000. CT scan revealed a larger abscess around the right psoas muscle (**see image 1**). Two hundred milliliters of pus were drained. The fluid grew MSSA with the same antibiogram as the previous specimen. A trans-esophageal echocardiogram was normal as was the remainder of the infectious disease workup, including, blood cultures and a HIV test. The patient improved steadily after the second catheter was placed.

The patient was hospitalized for a total of 12 days. On the day of discharge, the WBC was 12,800. She was sent home with IV Cefazolin.

At her outpatient follow-up five weeks after admission, she was afebrile and ambulating normally without pain or analgesics. Her leukocytosis had resolved, but the CRP remained modestly elevated at 32 mg/L (normal <5 mg/L). A CT scan showed only a small residual psoas fluid collection. The IV antibiotics were continued for another three weeks. A follow up CT at eight weeks revealed complete resolution of the abscess and normalization of the inflammatory markers.

DISCUSSION

Iliopsoas abscess is a relatively rare entity, typically more common in immunocompromised patients.[4,5] This patient presented without fever, which may have been suppressed in this case by the non-steroidal anti-inflammatory medications she was taking for pain control. She did not have any recent surgery, or obvious involvement of adjacent structures such as the spine, hip, gastrointestinal or genitourinary tracts. We suspected that the abdominal wall abscess that had been incised and drained just a month prior to admission may have caused transient bacteremia with seeding of the psoas muscle. Although no blood cultures were collected at that time to confirm bacteremia, the wound cultures obtained did grow MSSA with the same antibiogram pattern as the psoas isolate from our facility.

This diagnosis can be easily missed in the outpatient setting in the absence of typical co-morbid conditions predisposing to primary psoas abscess, such as diabetes mellitus, IV drug abuse, immunosuppression or prior abdominal or pelvic surgeries. It is also important to remember that primary psoas abscesses do tend to occur in young adults or children.[6]

CT scan with contrast remains the diagnostic modality of choice. *Staphylococcus aureus* is the most common etiologic organism. Successful management depends on adequate drainage and effective antibiotics.[3-5]

We conclude that it is imperative for clinicians to maintain an index of suspicion for a psoas abscess in patients with worsening hip or back pain, even if the patient is young, immunocompetent and without a history of trauma to the area. Low back pain that radiates to the flank and hip, impedes ambulation, and is associated with a positive psoas sign on exam should raise suspicion for a psoas abscess. Additional findings of impressive leukocytosis (>10,000) and elevated inflammatory markers suggest systemic disease secondary to iliopsoas abscess. The rarity of the condition and non-specific symptoms, in the setting of high morbidity, make the diagnosis essential.

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Refractory Diabetes Insipidus Leading to Diagnosis of Type 2 Diabetes Mellitus and Non-Ketotic Hyperglycemia in an Adolescent Male

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CASE REPORT

An obese 16-year-old male presented with chronic headaches and bitemporal visual field loss. Physical exam showed acanthosis nigricans and BMI of 39.8 kg/m.^{2} MRI of the brain revealed craniopharyngioma (**Figure 1**). He developed hypopituitarism after surgery, requiring Hydrocortisone, Levothyroxine, Testosterone enanthate, and desmopressin (DDAVP).

Two months later, he presented with uncontrolled polyuria despite increasing DDAVP doses up to 1.7 mg daily. A two-hour post prandial blood glucose was 400 mg/dL and hemoglobin A1C was 10.2%, consistent with diabetes mellitus (DM). Diabetes autoimmune panel was negative. He was started on insulin Glargine and Lispro. Two days after starting insulin, he had a seizure consisting of staring episodes, right upper extremity shaking, right-eye deviation and urinary incontinence. Laboratory exam showed venous pH 7.36, sodium 139 meq/L, bicarbonate 19.3 meq/L, glucose 569 mg/dL, serum osmolality 305 mOSM/kg and negative urinary ketones, consistent with nonketotic hyperglycemia. MRI of the brain showed nonenhancing T1-hyperintensity within the left basal ganglia (**Figure 2**). He returned to baseline neurologic status shortly after admission. EEG obtained prior to discharge was negative for epileptiform activity. One month later, his hemoglobin A1C was 8.3% on Glargine and Metformin. He had no further seizure episodes and repeat brain MRI was normal.

DISCUSSION

"Recalcitrant diabetes insipidus" in this obese adolescent was due to undiagnosed Type 2 DM. Nonketotic hyperglycemia with acute neurological changes is rare in adolescents with Type 2 DM. Acute neurological presentations associated with nonketotic hyperglycemia include focal

Figure 1. Coronal T1-weighted image demonstrates a complex cystic and solid suprasellar mass with rim enhancement, which is characteristic of craniopharyngioma.

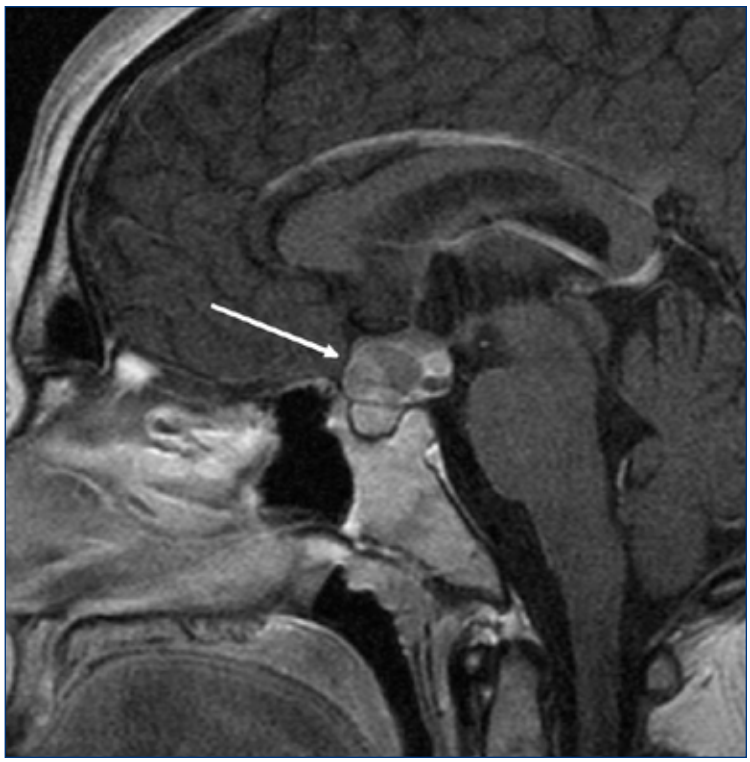
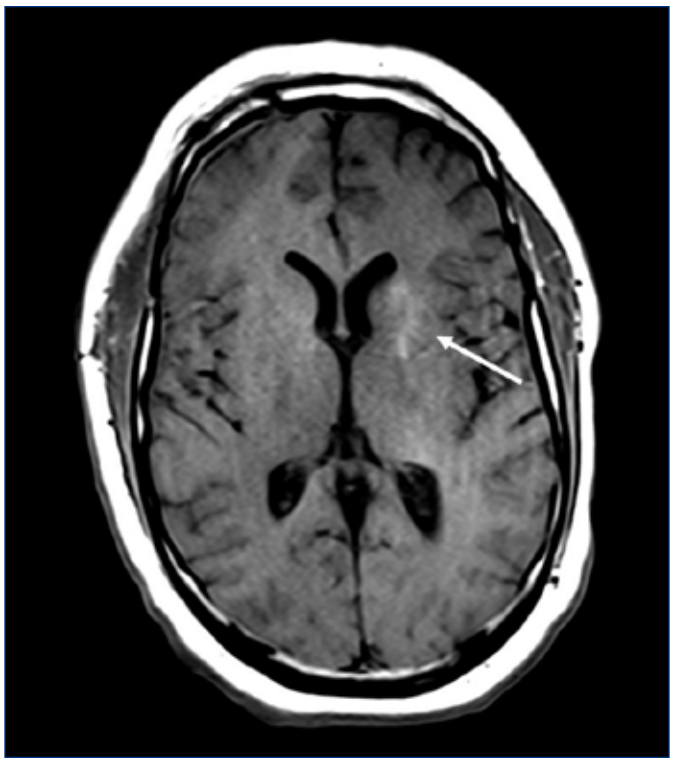


Figure 2. New non-enhancing T1-weighted hyperintensity within the left basal ganglia, consistent with non-ketotic hyperglycemia.



partial seizures, epilepsia partialis continua, chorea, and ballismus.[1-3] The etiology of these findings in nonketotic hyperglycemia is not compeltely understood. The proposed mechanism is increased neuronal excitability due to a relative increase in the metabolism of GABA, an inhibitory neurotransmitter, and the presence of neuronal K_{ATP} channels.[4] As in our patient, these neurological manifestations are reversible with the correction of hyperglycemia.

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The Economic Burden of Preventable Chronic Diseases in Rhode Island

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The Centers for Disease Control and Prevention (CDC) have identified seven chronic conditions where a comprehensive approach to prevention could save tremendous health care costs and reduce premature disability and death in the US. These potentially "preventable" chronic diseases include heart disease, stroke, some cancers, diabetes, arthritis,[1] and asthma.[2]

In 2014, the Milken Institute study estimated the impact on the US economy of seven chronic diseases – cancer, diabetes, hypertension, stroke, heart disease, pulmonary conditions, and mental illness – at $1.3 trillion annually.[3] Projected costs were $28 billion more than that forecast in 2007.[4] The leading drivers of health care costs were increases in treatment intensity,[5] and the dramatic rise in the obesity rate among US adults age ≥ 20 years, now at 34.9%.[6] Obesity has long been recognized as a modifiable risk factor for osteoarthritis,[7] and more recently rheumatoid arthritis in women.[8] It costs an estimated $185 billion to treat osteoarthritis (in 2007 US dollars),[9] and $8.4 billion to treat rheumatoid arthritis (2005 US dollars).[10] If trends in adult obesity persist, the economic burden to the US health care system for treating arthritis will significantly surpass previous estimates. Depression is a frequent concomitant of most medical problems, and it makes treatment of both disorders more challenging and costly.

This report examines the prevalence of arthritis, current asthma, diabetes, and cardiovascular disease, with and without current obesity and current depression, to estimate the public health burden of preventable chronic diseases. We also explore the economic impact of these chronic conditions on Rhode Island's health care system.

METHODS

Study sample. We analyzed data from the 2011 and 2012 Rhode Island Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a cross-sectional survey that uses a multistage-cluster design based on random-digit dialing of landline and cell phones to select a representative sample from each state's noninstitutionalized civilian population aged 18 and older. The 2011–2012 sample used in this analysis included adults 20 years and older (N= 11,726).

Variables. Respondents were asked whether a doctor, nurse, or other health professional had ever diagnosed the following health conditions: (1) a heart attack, also called a myocardial infarction; (2) coronary artery disease; (3) a stroke; (4) asthma; (5) arthritis (defined in this questionnaire as rheumatoid arthritis, gout, lupus, or fibromyalgia); (6) diabetes; and 7) high blood pressure. Adults ever diagnosed with asthma were asked if they still had asthma (current asthma). The presence or absence of each condition was determined by a "yes" or "no" response, respectively. Women reporting diabetes or high blood pressure only when pregnant were excluded from these respective variables.

Cardiovascular disease was based on a "yes" response to having one or more of the following diagnosed conditions: high blood pressure, myocardial infarction, coronary artery disease, or a stroke. This variable was computed from the 2011 BRFSS as the question regarding hypertension is asked every other year in the BRFSS questionnaire, on the odd years.

Current depression (yes/no) was defined as having a score of three or higher on the Patient Health Questionnaire-2 (PHQ-2),[11] which requires further evaluation for major depression,[12] or reporting feelings of stress, depression, and problems with emotions for ≥ 14 days in the past month.[13] Body mass index (BMI=weight [kg]/height [m]^2; < 25, underweight to normal weight; 25 to < 30, overweight; ≥ 30, obese) was based on respondents' self-reported weight and height at the time of the survey.

Statistical analysis. Statistical significance tests were performed to compare the differences in the prevalence of four categories of chronic disease health status: 1) self-reported diagnosed chronic condition without current obesity or current depression; 2) self-reported diagnosed chronic condition with current obesity, but not current depression; 3) self-reported diagnosed chronic condition with current depression, but not current obesity; 4) self-reported diagnosed chronic condition with current obesity and current depression (**Table 1**). Analyses conducted in SAS v.9.3 (SAS Institute, Cary NC) accounted for the complex survey design.

The CDC Chronic Disease Cost Calculator version 2 was used to generate estimates of direct medical expenditures (of all payers, including the uninsured) and absenteeism costs for arthritis, asthma, depression, diabetes, and cardiovascular disease (congestive heart failure, coronary heart disease, hypertension, stroke, and other cerebrovascular disease).[14] Data for the analysis of obesity-related health care costs in Rhode Island came from **Bending the Obesity Cost Curve in Rhode Island**,[15] which drew on micro health simulation models published in a peer-reviewed study.[16]

RESULTS

The prevalence of a chronic disease with co-occurring obesity, but not current depression, was highest for adults with diabetes (36.6%; **Table 1**). Adults with current asthma had the highest prevalence of a chronic disease with co-occurring depression, but not obesity (21.7%). The 95% confidence intervals (CIs) for adults with asthma, however, slightly overlapped those for adults with arthritis and co-occurring depression but not obesity. Having a chronic condition with co-occurring obesity and depression was more common among adults with diabetes than arthritis (16.7% and 11.3%, respectively). Additional analyses found that among adults who reported that they had not been diagnosed with cardiovascular disease, arthritis, asthma, or diabetes, 2.5% were currently depressed and obese (n = 7,803); 15.2% were obese but not currently depressed (n = 46,944); 11.3% were currently depressed but not obese (n = 34,901); and 70.9% were not obese or depressed (n= 218,606; data not shown).

The four potentially preventable chronic conditions shown in **Table 1** cost Rhode Island $2.15 billion in direct medical expenditures in 2010 (all payers), which increased to more than $2.35 billion when treatment for depression was included (**Table 2**). Loss in economic productivity, as measured by costs associated with absenteeism, totaled $164 million (including for depression), and was highest for people with arthritis ($57 million). In 2020, costs for treating preventable chronic diseases in Rhode Island are projected to increase dramatically over costs in 2014. The estimated cost increases range from 28.3% for depression to 33.4% for cardiovascular disease (**Table 3**). Annual obesity-related health care spending in Rhode Island could increase from $2.0 billion in 2010 to as high as $2.4 billion in 2030, based on the predicted rise in the state's adult obesity rates from 26.0% in 2010 to 53.8% in 2030 (**Table 4**).

DISCUSSION

Our study showed that in a statewide population-based sample of Rhode Island adults ages ≥ 20 years with arthritis,

Table 1. Percentage of Rhode Island adults age ≥ 20 years with a self-reported diagnosed chronic disease, obesity,[1] and depression,[2] 2011 and 2012[3]

	Weighted % (95% CI)[4]			
	Chronic conditions with and without obesity and depression			
Characteristic	**Arthritis**	**Current Asthma**	**Diabetes**	**CVD**
Has a chronic condition without current obesity or current depression	48.4 (46.3 – 50.5)	43.9 (40.0 – 47.8.)	34.5 (30.8 – 38.1)	51.5 (48.8 – 54.2)
Has a chronic condition with current obesity but not current depression	23.6 (21.8 – 25.3)	21.5 (18.5 – 24.6)	36.6 (32.8 – 40.4)	24.6 (22.4 – 26.8)
Has a chronic condition with current depression but not current obesity	16.7 (15.0 – 18.5)	21.7 (18.4 – 25.1)	12.2 (9.5 – 14.9)	11.9 (10.3 – 13.6)
Has a chronic condition with both current depression and current obesity	11.3 (9.9 – 12.7)	12.8 (10.2 – 15.5)	16.7 (13.5 – 19.8)	11.9 (9.8 – 14.1)

1. BMI = (weight [kg]/height [m^2]); Obesity = BMI > 30.
2. Current depression, anxiety, stress for 14 or more days in the past month and/or depression for two or more weeks defined by a score of 3 or higher on the Patient Health Questionnaire-2.
3. Data are from the 2011-2012 Rhode Island Behavioral Risk Factor Surveillance System (BRFSS), except for cardiovascular disease (CVD), which is calculated from the 2011 BRFSS to include respondents with diagnosed hypertension.
4. CI = confidence interval.

Table 2. Medical cost estimate for chronic diseases in Rhode Island, 2010

	Medical Expenditures (Direct Cost)				Indirect Cost	Total
	All Payers	Medicaid	Medicare	Private Insurers	Absenteeism	All Payers + Absenteeism
Arthritis	$427	$29	$128	$155	$57	$484
Asthma	$123	$40	$25	$40	$15	$138
Depression	$205	$22	$44	$76	$24	$229
Diabetes	$446	$57	$137	$119	$16	$462
CVD	$1,153	$126	$375	$321	$52	$1,205

1. Costs reported in millions of dollars for the entire state population.
2. Annual expenditures inflated to 2010 $ following recommendations from the Agency for Healthcare Research and Quality. Costs include expenditures for office-based visits, hospital outpatient visits, emergency room visits, inpatient hospital stays, dental visits, home health care, vision aids, other medical supplies and equipment, prescription medicines, and nursing homes.
3. All results generated from the tool are estimates. Actual costs may be larger or smaller than those reported.
4. The costs for cardiovascular disease (CVD) include diseases of the heart, stroke, and an estimate of hypertension costs that avoids double-counting of costs with other diseases.
5. Data source: CDC's Chronic Disease Cost Calculator (CDCC) version 2 (www.cdc.gov/nccdphp/resources/calculator.htm).

Table 3. Projected medical costs for chronic diseases in Rhode Island, 2014-2020[1-5]

Year	Arthritis	Asthma	Depression	Diabetes	CVD
2014	$587	$168	$279	$617	$1,599
2015	$615	$175	$291	$647	$1,677
2016	$643	$183	$304	$678	$1,757
2017	$672	$191	$317	$711	$1,842
2018	$703	$200	$330	$744	$1,932
2019	$735	$208	$344	$780	$2,028
2020	$770	$218	$358	$819	$2,133
Percent increase[6] 2014-2020	31.1%	29.8%	28.3%	32.7%	33.4%

1. Costs reported in millions of dollars for the entire state population.
2. The projections: 1) are medical costs only, including nursing home costs but excluding absenteeism costs; 2) are based on default inputs; 3) are reported in 2010 $ and do not project inflation; and 4) assume no changes in policy or technology and exclude changes due to the Affordable Care Act.
3. All results generated from the tool are estimates. Actual costs may be larger or smaller than those reported.
4. The costs for cardiovascular disease (CVD) include diseases of the heart, stroke, and an estimate of hypertension costs that avoids double-counting of costs with other diseases.
5. Data source: CDC's Chronic Disease Cost Calculator (CDCC) version 2 (www.cdc.gov/nccdphp/resources/calculator.htm).
6. Percent increase is calculated at Time 2 – Time 1 / Time 1.

Table 4. Adult obesity rates in Rhode Island and obesity-related health care spending in Rhode Island if current obesity trends continue, 2010 to 2030

Projected annual costs (adult population)			
	2010	2020	2030
Adult obesity rates[1]	26.0%	36.0%	53.8%
Health care costs[2,3]	$2000	$2200	$2400
Percent increase in costs[4]			
2010 to 2020		10.0%	
2020 to 2030			9.1%
2010 to 2030			20.0%

1. Data are from F as in Fat: How Obesity Threatens America's Future 2012. Issue Report. Trust for America's Health and Robert Wood Johnson Foundation.
2. Data are from Bending the Obesity Cost Curve in Rhode Island. September 2012. Trust for America's Health and Robert Wood Johnson Foundation.
3. Costs are in millions of dollars.
4. Percent increase is calculated at Time 2 – Time 1/Time 1.

asthma, diabetes or cardiovascular disease, 11% to 17% live with a triple health burden. They have a diagnosed but potentially preventable chronic disease, are obese according to self-reported height and weight data, and are currently depressed based on responses to the Patient Health Questionnaire (PHQ-2) and a health indicator measuring frequent mental distress. In less than 10 years (2014 to 2020), medical expenditures for treating these preventable chronic conditions will increase by about 30% for arthritis and asthma, and 33% for diabetes and cardiovascular disease. We could not, however, estimate how much of these increases resulted from the projected increases in medical costs for treating adults with co-occurring obesity or depression.

Researchers at the National Heart Forum (NHF) estimate that obesity-related health care costs for Rhode Island could increase by 20% from 2010 to 2030, the 11th highest projected increase in the country.[17] If Rhode Island's projected adult obesity rate exceeds 50% by 2030, the effects would be sobering. This would translate into 28,655 new cases of coronary heart disease and stroke, 26,754 new cases of hypertension, 17,497 new cases of arthritis, 13,215 new cases of type 2 diabetes, and 4,149 new cases of obesity-related cancer in Rhode Island per 100,000 population.[17] The economic models presented in this brief could not account for whether the chronic conditions noted above developed in the absence of obesity, in the presence of obesity, or with obesity as a contributing risk factor. Our purpose was to show the potential impact of the projected rise in adult obesity rates on health care costs in Rhode Island.

Estimating the costs of potentially preventable chronic diseases with co-occurring depression is challenging. Cross-sectional[18] and longitudinal[19] studies have documented that depression is an independent risk factor for developing chronic physical conditions. Other research has demonstrated a bi-directional relationship between depression and chronic conditions.[20] CDC researchers have found that the prevalence of current depression among US adults is highest in states where a greater prevalence of chronic conditions, such as obesity, had been observed.[21] These findings raise a provocative issue. We suggest that even if Rhode Island was able to reduce the prevalence of certain preventable chronic diseases through prevention and early intervention, future health care costs associated with obesity and depression could have a staggering impact on the economy. As our study showed, among Rhode Island adults ages ≥ 20 years who reported never being diagnosed with the chronic diseases highlighted in this report, more than 7,000 had current depression and were obese (2.5%), nearly 47,000 were currently obese but not depressed (15.2%), and more than 34,000 were currently depressed but not obese (11.3%). Owing to the cross-sectional design used in the study, we could not test bidirectional associations between 1) depression and the risk of chronic conditions, 2) obesity and the risk of chronic conditions, or 3) obesity and depression. Some evidence exists for a bidirectional association between obesity and depression,[22] especially among middle- and older-age women.[23] A better understanding of the mechanisms for this bidirectional risk is needed, with and without co-occurring, preventable chronic diseases.[24] This topic is largely unexplored, especially in relation to health care costs.

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Disclosures

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Progress Towards Controlling Lung Cancer in Rhode Island

JOHN P. FULTON, PHD

Background

Lung cancer (cancer of the lung and bronchus) is the leading cause of cancer death in Rhode Island and the U.S. overall.[1] Currently, it is the most common cancer to be diagnosed in Rhode Island (*second* most common among males, after prostate cancer, and *second* most common among females, after breast cancer), and second most common to be diagnosed in the U.S.[2] Annual *counts* of new lung cancers and deaths have increased over the past 25 years in Rhode Island (19% and 2%, respectively), despite great strides in prevention, although annual *age-adjusted rates* of new lung cancers and deaths tell a slightly different story.

In the United States, tobacco use is the leading cause of lung cancer, followed in importance by exposure to radon gas indoors.[3] Ongoing work to decrease human exposure to these carcinogens will diminish morbidity and mortality from this disease, as may new recommendations for lung cancer screening issued by the United States Preventive Services Task Force.[4]

Lung cancer trends are tracked nationally by the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute, the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC), the North American Association of Central Cancer Registries (NAACCR), the National Center of Health Statistics (NCHS) of the CDC, and the American Cancer Society (ACS) and other private organizations. Locally, lung cancer trends are tracked by the Rhode Island Cancer Registry (RICR). RICR is an organizational unit of the Rhode Island Department of Health (HEALTH), operated by the Hospital Association of Rhode Island (HARI) under contract with HEALTH. RICR contributes to the national cancer statistics published annually by NPCR and NAACCR.

New Cases and Deaths in Context (Table 1)

In the period 1987–1991 (the first full five years of RICR's operation), cancers of the lung accounted for 15% of all invasive cancers[5] newly diagnosed among Rhode Island residents, and 26% of all cancer deaths among Rhode Island residents (6.5% of *all* resident deaths). In 2006–2010, cancers of the lung accounted for 14% of all invasive cancers newly diagnosed among Rhode Island residents, and 28% of all cancer deaths among Rhode Island residents (6.6% of *all* resident deaths).

From 1987–1991 to 2006–2010, average annual counts of lung cancer cases rose 19% (from 736 to 878), while average annual counts of lung cancer deaths rose 2% (from 619 to 637).

Currently, lung cancer ranks 1st among all cancers newly diagnosed in Rhode Island, and 1st among all cancer deaths.

Table 1.

RHODE ISLAND	1987–91	←Δ→	2006–10
Cases*			
All cancers	24,584	+24 %	30,586
Colon-rectum	3,884	-27 %	2,818
Lung-bronchus	**3,679**	+19 %	**4,391**
Female Breast	3,726	+15 %	4,267
Prostate	2,487	+63 %	4,045
Urinary Bladder	1,289	+34 %	1,732
Deaths			
All causes of death	47,947	<+1 %	48,125
All cancers	11,932	-6 %	11,176
Colon-rectum	1,560	-37 %	987
Lung-bronchus	**3,097**	+2 %	**3,183**
Female Breast	1,103	-33 %	743
Prostate	671	-24 %	512
Urinary Bladder	274	+21 %	332

* Includes all invasive cases and *in situ* cases of the urinary bladder.
Sources: RICR; NCHS

Table 2.

LUNG CANCER	1987–91	←Δ→	2006–10
Age-adjusted Incidence Rates* §			
Rhode Island	**68.5**	+5 %	**72.2**
United States	68.2	-12 %	60.0
Age-adjusted Mortality Rates* §			
Rhode Island	**57.2**	-10 %	**51.4**
United States	57.8	-14 %	49.5

* Age-adjustment permits meaningful comparison of rates across populations with very different age structures.
§ Rates are expressed as average annual counts of newly diagnosed cases or of deaths, per 100,000 persons at risk. Rates are age-adjusted using the year 2000 population of the U.S. as the "standard population."
Sources: RICR; SEER; NCHS

Age-adjusted Rates and Trends (Table 2)

In Rhode Island from 1987–1991 to 2006–2010, the average annual age-adjusted incidence rate rose 5% (from 68.5 to 72.2 new cases per 100,000 persons). In contrast, the analogous statistic for the nation as a whole fell 12%.

In Rhode Island from 1987–1991 to 2006–2010, the average annual age-adjusted mortality rate fell 10% (from 57.2 to 51.4 deaths per 100,000 persons). In contrast, the analogous

statistic for the United States fell further (14%).

As a result, the position of Rhode Island vs. the United States has worsened with regard to lung cancer incidence and mortality.

A closer look at age-adjusted lung cancer incidence trends in Rhode Island (**Figure 1**) – by gender – reveals two countervailing trends: for males, a sustained decrease after 1994; for females, a substantial increase after 1987 that seems to have peaked in 2007 or 2008.

It is believed, but poorly documented, that the difference observed between gender-specific lung cancer incidence trends in Rhode Island reflects an earlier difference in gender-specific tobacco-use trends, i.e., that men experienced an earlier "epidemic" of tobacco use than women – an earlier increase and decrease – reflective of gender-specific cigarette marketing trends.

Control Strategy 1: Prevention (Table 3)

Eliminating tobacco use would prevent about 90% of all new lung cancers in the United States.[6] Locally, great progress has been made on this front, primarily because of Rhode Island's strong tobacco-control policies. (For example, Rhode Island's tobacco excise tax is the third highest in the nation: $3.50 in 2014.[7]) In fact, the deep decline in tobacco use among Rhode Island women since 1995 (44%) may, in future, improve the state's lung cancer profile compared to the nation as a whole.

Control Strategy 2: Screening

In 2004, the United States Preventive Services Task Force (USPSTF) "concluded that the evidence was insufficient to recommend for or against screening for lung cancer in asymptomatic persons with LDCT [Low-Dose Computed Tomography], chest radiography, sputum cytologic evaluation, or a combination of these tests." Then, after accumulating additional evidence,[8] the USPSTF revised its position, recommending *for* selective screening in an article published in the December 31, 2013 edition of *Annals of Internal Medicine*:

"The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery."[9]

The USPSTF grades its recommendations on the basis of available evidence. Its new recommendation for lung cancer screening is graded "B," meaning, "The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial."[10] Associated with a "B" grade is the suggestion to medical practitioners, "Offer or provide this service." Thus, a recommendation from the USPSTF graded "B" is a very strong one.

Unfortunately, at least *some* people ages 55–64 in Rhode Island "who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years" *may not have health insurance*, despite recent advances in the accessibility of health insurance. This is because people who continue to smoke, despite great declines in smoking over the past two decades, are disproportionately persons of low socio-economic status. Consider the following statistics from the CDC's Behavioral Risk Factor Surveillance System:

In 1995, (**Table 4**) about half as many college graduates as adults who did not graduate from high school smoked

Figure 1.

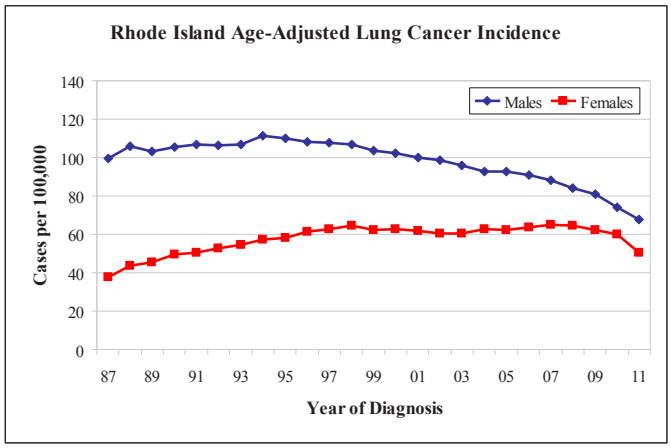

Table 3.

TOBACCO USE	1995	←Δ→	2010
	Percentage of Adults Who Are Current Smokers		
Males			
Rhode Island	**24 %**	-25 %	**18 %**
United States	25 %	-24 %	19 %
Females			
Rhode Island	**25 %**	-44 %	**14 %**
United States	21 %	-24 %	16 %

Sources: CDC: Behavioral Risk Factor Surveillance System

Table 4.

TOBACCO USE IN RI	1995	←Δ→	2012
	Percentage of Adults Who Are Current Smokers		
Educational Level			
Less than High School	**29 %**	**-3 %**	**28 %**
High School Diploma or G.E.D.	31 %	-35 %	20 %
Some post-High School	26 %	-27 %	19 %
College Graduate	**15 %**	**-53 %**	**7 %**
Income Level			
Less than $15,000	**30 %**	**+7 %**	**32 %**
$15,000- 24,999	34 %	-26 %	25 %
$25,000- 34,999	26 %	-15 %	22 %
$35,000- 49,999	23 %	-30 %	16 %
$50,000+	**16 %**	**-25 %**	**12 %**

Sources: CDC: Behavioral Risk Factor Surveillance System

in Rhode Island. In 2012, about one-forth as many college graduates smoked as adults who did not graduate from high school. Over the course of the intervening 17 years, college graduates in Rhode Island experienced a 53% decline in smoking, compared to a 3% decline in smoking among Rhode Island adults who did not finish high school.

A similar comparison may be made using income as a metric of socio-economic status, although the correlation between educational achievement and smoking behavior is stronger than the correlation between income level and smoking behavior.

The Future of Lung Cancer Control in Rhode Island

Clearly, the future of lung cancer control in Rhode Island depends on two things, namely, our resolve to resist tobacco industry marketing, and our effectiveness in getting *all eligibles* screened for lung cancer, despite the inequalities in health insurance status that may persist for some time. With regard to the latter, cancer control advocates would be well advised to begin by estimating the number of eligibles *with* access to health insurance and a good primary care home, and those *without* these essentials, and then designing specific strategies to achieve high rates of screening in *both* groups. If we do not do this systematically, we will inevitably contribute to *new* disparities in lung cancer survivorship attributable to differences (of various sorts) in access to lung cancer screening, as adherence to the new USPTF screening guidelines increases.

Acknowledgment

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Author

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VITAL STATISTICS
MICHAEL FINE, MD
DIRECTOR, RHODE ISLAND DEPARTMENT OF HEALTH
COMPILED BY COLLEEN A. FONTANA, STATE REGISTRAR

Rhode Island Monthly Vital Statistics Report
Provisional Occurrence Data from the Division of Vital Records

VITAL EVENTS	REPORTING PERIOD		
	FEBRUARY 2014	12 MONTHS ENDING WITH FEBRUARY 2014	
	Number	Number	Rates
Live Births	866	11,439	10.9*
Deaths	811	9,828	9.3*
Infant Deaths	7	76	6.6#
Neonatal Deaths	7	56	4.9#
Marriages	269	6,625	6.3*
Divorces	248	3,237	3.1*
Induced Terminations	293	3,278	286.6#
Spontaneous Fetal Deaths	41	674	58.9#
Under 20 weeks gestation	36	547	55.7#
20+ weeks gestation	5	76	6.6#

* Rates per 1,000 estimated poulation
# Rates per 1,000 live births

Underlying Cause of Death Category	REPORTING PERIOD			
	AUGUST 2013	12 MONTHS ENDING WITH AUGUST 2013		
	Number (a)	Number (a)	Rates (b)	YPLL (c)
Diseases of the Heart	167	2,416	229.4	3,244.5
Malignant Neoplasms	186	2,262	214.8	5,897.5
Cerebrovascular Disease	32	430	40.8	560.0
Injuries (Accident/Suicide/Homicide)	63	675	64.1	9,762.0
COPD	33	497	47.2	482.5

(a) Cause of death statistics were derived from the underlying cause of death reported by physicians on death certificates.
(b) Rates per 100,000 estimated population of 1,051,511 (www.census.gov)
(c) Years of Potential Life Lost (YPLL).

NOTE: Totals represent vital events, which occurred in Rhode Island for the reporting periods listed above.
Monthly provisional totals should be analyzed with caution because the numbers may be small and subject to seasonal variation.

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For more information about group rates, please contact Megan Turcotte, RIMS Director of Member Services

RIMS Fetes Executive Director Warde for 30 Years of Service

Newell received two commemorative plaques for his service, both inscribed in Latin: *Mens Qui Agitat Medicos* (The mind that drives doctors), and the humorous *Medicos Administrare est Collere Feles* (Managing doctors is like herding cats).

RIMS' Executive Director Newell E. Warde, PhD, was honored at a reception on July 15, 2014 for his 30 years of dedicated service to the Medical Society.

Ten of RIMS past presidents were joined by current members of RIMS leadership, Council members, members of the RIMS-IBC Board of Directors, current and former staff members, dignitaries, colleagues, family and friends.

RIMS President Elaine Jones, MD presided over the informal affair and presented Dr. Warde with a plaque commemorating his tenure with RIMS. The Executive Directors of Maine and New Hampshire medical societies spoke briefly, as did former president Herbert Rakatansky, MD, who related the hiring process in 1984 that brought Newell to Rhode Island. The AMA was represented by Teresa Marchiori, head of Federation Relations, and frequent visitor to RI.

Michael Migliori, MD, RIMS longest serving president, presented Newell with a bottle of his home brew. Perhaps the highlight of the evening for Newell was the surprise attendance of his friends of 50 years from Belgium, who flew to RI to attend. ❖

Stephen, Newell, and Robin Warde

Johan and Leo Cannaerts traveled from Belgium.

President Elaine C. Jones, MD

Herbert Rakatansky, MD

(L–R) Scott Colby, New Hampshire Medical Society Executive Vice President, and Gordon H. Smith, JD, Maine Medical Association Executive Vice President, presenting gifts.

Terri Marchiori, AMA Director of Federation Relations; Peter Hollmann, MD, Rhode Island AMA Delegate

Past President David Carter, MD, one of ten past presidents in attendance that evening, with gifts for Newell.

Past President Michael Migliori, MD, delivering a homemade gift.

Steven R. DeToy, RIMS Director of Government and Public Affairs; Robin Torbron Warde

Working for You: RIMS advocacy activities

July 1, Tuesday

RIMS Physician Health Committee (Herbert Rakatansky, MD, Chair)

Meeting with Medicaid Director, Deidre Gifford, MD, and James Berson, CEO Greater Providence YMCA, regarding childhood obesity prevention programs

Fellows Orientation, Lifespan; Dr. Herbert Rakatansky and Kathi Boyd presenting; staff at RIMS membership table

July 2, Wednesday

Meeting with Al Charbonneau, Executive Director, RI Business Group on Health, to discuss areas of mutual interest

July 7, Monday

Executive Committee

July 8, Tuesday

Attended meeting of the Physician Assistants licensing board at the Department of Health

July 9, Wednesday

Attended meeting at the Board of Medical Licensure and Discipline, Department of Health

Met with Governor's staff to discuss legislation

July 10, Thursday

Attended meeting of the National Conference of Insurance Legislators with AMA Trustee and AMA-ARC staff member, Boston

Attended Health Services Council Project Review Committee meeting

July 11, Friday

Conference call with Pfizer regarding legislation

Conference call with Lt. Governors' staff regarding State Innovation Model grant

July 14, Monday

Meeting with Drs. Fine, McDonald, Jones, and Karczmar regarding a wide variety of issues.

July 15, Tuesday

30-Year RIMS Anniversary Reception for Newell Warde

July 16, Wednesday

Primary Care Physicians Advisory Committee meeting

Meeting of the Board of Director, RIMS-IBC, Peter A. Hollmann, MD, President

July 17, Thursday

Meet with Catherine Taylor, candidate for Lt. Governor, to discuss health care issues

July 18, Friday

Coalition of Mental Health Professionals of RI (COMHPRI) meeting

July 21, Monday

Conference call with RI Health Center Association and Hospital Association of RI (HARI) regarding DOH regulations

July 22, Tuesday

Health Source RI Advisory Board, Peter Howland, MD, member

July 23 Wednesday

Meeting with Lt. Governor's staff regarding State Innovation Model (SIMS) grant

Meeting with Blue Cross Blue Shield RI regarding *RI Medical Journal* advertising

Primary Care Physicians Advisory Committee meeting

July 24, Thursday

AMA-ARC conference call regarding National Association of State Alcohol and Drug Abuse Directors (NASADAD) Membership Inquiry Report on Heroin and Prescription Drug Abuse

July 28, Monday

Present testimony regarding proposed DOH regulations regarding amending birth certificates for transgendered individuals

July 29, Tuesday

Conference call regarding FDA Prescriber Education Initiative

Conference call with HARI and Oregon Hospital Association regarding Early Disclosure and Resolution Process

Meeting of Health Services Council

July 30, Wednesday

AMA conference call to discuss Medicare SGR strategy

July 31, Thursday

Meeting with Blue Cross Blue Shield of RI, Drs. Jones, Karczmar and staff

Why You Should Join the Rhode Island Medical Society

The Rhode Island Medical Society delivers valuable member benefits that help physicians, residents, medical students, physican-assistants, and retired practitioners every single day. As a member, you can take an active role in shaping a better health care future.

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Password access to pay dues, access contact information for colleagues and RIMS leadership, RSVP to RIMS events, and share your thoughts with colleagues and RIMS

SPECIAL NOTICE: 2014 AMA DUES PAYMENTS

The American Medical Association (AMA) will direct bill its Rhode Island members for their 2014 dues. Beginning August 2013, AMA members will receive a separate dues statement from the AMA instead of paying AMA membership dues through the Rhode Island Medical Society (RIMS) membership invoice. This is simply an operational change so that both RIMS and AMA can concentrate on their respective member satisfaction. There remains no requirement for RIMS members to join the AMA.

Please let us know if you have questions concerning this change by emailing Megan Turcotte or phoning 401-331-3207.

WATERFIRE PROVIDENCE, JENNIFER BEDFORD

The Statehouse glowed yellow on World Hepatitis Day, Saturday, July 26. Crowds gathered for a WaterFire installation and performances at Waterplace Park.

WaterFire Raises Awareness of Hep C

C is for Cure: A WaterFire Lighting for RI Defeats Hep C was held July 26th on World Hepatitis Day to raise awareness, help diminish stigma, and inspire people to get tested and cured. There was also a Hep C Information and Resource Fair on the College Street Bridge and information tents for the Rhode Island Blood Center, the Rhode Island Organ Donor Awareness Coalition and the Alpert Medical School.

Torchbearers included many members of the Rhode Island medical community, who ringed Waterplace Basin at sunset to begin the lighting of 80 braziers, in an evening sponsored by Gilead in recognition of the millions of Americans suffering from hepatitis C. The C Project by Festival Ballet Providence was performed on the Waterplace Basin Stage and Gendo Taiko of Brown University and RISD played five Taiko drumming pieces as part of the opening ceremony dedicated to the spirit of healing. ❖

Cover photo by John Nickerson,
Statehouse crowd by Jennifer Bedford,
torchbearers by Emily Gauvin,
all for WaterFire Providence

Right: The Torch procession leaders were **Dr. Scott Holmberg**, Chief of the Epidemiology and Surveillance Branch, Division of Viral Hepatitis, U.S. Centers for Disease Control and Prevention and **Dr. Lynn E. Taylor**, Assistant Professor of Medicine, Division of Infectious Diseases at the Alpert Medical School and a Rhode Island Foundation Innovation Fellow. As part of her RI Defeats Hep C initiative, she compiled a series of articles for the July issue of the Rhode Island Medical Journal.
http://www.rimed.org/rimedicaljournal-2014-07.asp

WATERFIRE PROVIDENCE, EMILY GAUVIN

Cardiovascular Institute Expands Services at Newport Hospital

NEWPORT – The Cardiovascular Institute (CVI) at Rhode Island, The Miriam and Newport hospitals is enhancing cardiac care on Aquidneck Island by expanding the cardiovascular services offered at Newport Hospital. That expansion includes opening a new cardiovascular practice and adding two new cardiologists.

Carl Levick, MD

George Charlton, MD

Ned Gutman, MD

PHOTOS: NEWPORT HOSPITAL

The new practice, which will be located in the hospital's Borden Carey Building, will include the addition of cardiologists **CARL LEVICK, MD,** and **GEORGE CHARLTON, MD**. They are joining long-time Newport Hospital cardiologist **NED GUTMAN, MD**.

"This is an exciting time for Newport Hospital as we extend the expertise and capabilities of the Cardiovascular Institute to residents of Newport County," said **SAMUEL DUDLEY, MD, PHD**, chief of cardiology at the CVI. "In bringing together the strengths and talents of Drs. Levick, Charlton and Gutman, we will offer patients direct access to all of the specialized services that the CVI offers. This greatly enhances the cardiovascular services that have been offered at Newport Hospital."

Dr. Levick comes to Newport Hospital after serving for the last three years as the director of cardiology at King Edward VII Memorial Hospital in Bermuda. Prior to that, he was the managing partner for a large cardiovascular group in Concord, New Hampshire, a position he held for more than 25 years. He is a graduate of the University of Massachusetts Medical School and completed a fellowship in cardiology at Vancouver General Hospital in British Columbia. He completed both an internship and a residency in internal medicine at The Miriam Hospital. Dr. Levick is certified by the American College of Cardiology and the American Board of Internal Medicine.

Dr. Charlton is a graduate of the University of Pittsburgh School of Medicine. He completed his internship and residency in internal medicine at the University of Virginia Health System, followed by a year as an attending hospitalist at Virginia Hospital Center in Arlington, Virginia. He completed fellowships in both general cardiology and preventive cardiology at the Warren Alpert Medical School of Brown University with training at Rhode Island Hospital, The Miriam Hospital and the Providence Veterans Affairs Medical Center. Dr. Charlton is board certified in cardiovascular disease and internal medicine by the American Board of Internal Medicine and is a diplomate of the National Board of Echocardiography. He is a member of the American College of Cardiology, the American Heart Association, the American Society of Echocardiography, the American Medical Association and the Rhode Island Medical Society. Charlton has clinical and research interests in valvular heart disease, echocardiography, and the promotion of cardiovascular wellness.

Dr. Gutman moved to Rhode Island 25 years ago after graduating from The University of Maryland Medical School. He specializes in cardiovascular disease and internal medicine at The Miriam and Newport hospitals. He completed a fellowship at the Warren Alpert Medical School of Brown University following his residency at The Miriam Hospital where he was also chief resident. Dr. Gutman is board certified in cardiology with additional board certification in nuclear cardiology. His areas of expertise include consultative cardiology, diagnostic catheterization and noninvasive diagnostic cardiac testing. He is a fellow of the American College of Cardiology and his research interests include atrial fibrillation. ❖

Healthcentric Advisors Develops Guidelines for Urgent Care Settings

Standards may address concerns raised with MinuteClinic approval

PROVIDENCE – With seven MinuteClinics slated to open their doors in late 2014, newly published standards for urgent care centers' communication may help ease primary care providers' concerns. Healthcentric Advisors led a collaborative process with providers and stakeholders to develop Safe Transitions Best Practice Measures for Urgent Care Centers, the first-known standards for urgent care communication during patient care transitions. The newly developed best practices:

- Are the first to define standards for urgent care communication with primary care
- Address primary care providers' concerns about urgent care interfering with team-based care
- Establish consistent expectations for urgent care centers across the state

The team used a multi-stage approach to develop the best practices, including reviewing the medical literature and obtaining provider input on the concepts and definitions.

"Urgent care isn't going away," says **DR. BRIAN MONTAGUE**, an internist at The Miriam Hospital whose clinical practice focuses on patients with HIV/AIDS. "There is an accessibility with urgent care that we can't seem to reproduce in most clinical settings – but at the same time, we don't have good communication between urgent care and primary care. Issues identified in urgent care may not be communicated [to a patient's internist], and that can lead to gaps in quality of care. We really need to organize this communication and partner in the care of these patients."

The urgent care best practices can help urgent care centers partner effectively with their primary care colleagues.

"Setting standards for how urgent care centers communicate is a very positive development," says **GUS MANOCCHIA, MD**, senior vice president and chief medical officer at Blue Cross & Blue Shield of Rhode Island.

Dr. Manocchia chairs the multi-disciplinary committee that helped Healthcentric Advisors to create the best practices. "Over the past few years, the Rhode Island health care community has worked hard to transform our primary care infrastructure, but after-hours care remains an issue. On nights and weekends, patients may go to urgent care centers – and primary care providers need to be aware of these visits to provide continuing care. Making communication consistent from urgent care back to primary care supports team-based care, and enhances patient safety." ❖

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Hasbro Hospital Opens Pediatric Specialty Clinics in East Greenwich

Will be joined by a new Fall River pediatric specialty clinic later this year

PROVIDENCE, R.I. – Hasbro Children's Hospital has opened its new East Greenwich Specialty Clinic to provide high-level specialty care more conveniently to children in the community.

"We recognized that there is a significant need in our community for better access to pediatric subspecialties, such as GI or rehab services, which can require frequent visits," said **PATRICIA FLANAGAN, MD**, interim pediatrician-in-chief and chief of clinical affairs at Hasbro Children's Hospital. "Being able to provide the services of our specialists closer to home will allow more families seamless and convenient access to the care they need."

This new East Greenwich location is the latest offering in Hasbro Children's Hospital's evolution from a provider of acute care for the region's children to a provider of health maintenance and wellness. The East Greenwich Specialty Clinic is part of an ambulatory clinic group that already includes an East Providence outpatient clinic for pediatric specialties, and will be joined by a new Fall River pediatric specialty clinic later this year.

"From the day that Hasbro Children's Hospital opened its doors 20 years ago, we have tried to address the health care needs of children across the state and region," said Dr. Flanagan. "This means that not only do families come to us at the hospital for world-class medical care, but also we as pediatric specialty providers can go out to the families in their communities to meet their needs in partnership with their primary care providers."

Several pediatric divisions and programs at Hasbro Children's Hospital now offer additional clinics at the East Greenwich location, including:

- Gastrointestinal medicine
- Child and adolescent eating disorders
- Endocrinology
- Rehabilitation services
- Nephrology
- Pulmonology

The new East Greenwich Specialty Clinic is located at 1454 South County Trail in East Greenwich. ❖

CNE Pilots Statewide Initiative for On-Call Recovery Coaches in EDs

Program implemented to help with drug overdose

PROVIDENCE – In an ongoing effort to prevent drug overdose and substance abuse in Rhode Island and the region, The Providence Center, in collaboration with the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities and Hospitals (BHDDH), will provide on-call recovery coaches for patients in hospital emergency departments across Rhode Island with high rates of accidental opioid overdose.

The program, AnchorED, was first launched at Kent Hospital in Warwick last month and will expand to Memorial Hospital in Pawtucket. Other hospital emergency departments across the state will also be implementing the program.

The Providence Center, whose services include more than 40 programs and services for mental health and addiction treatment, offers AnchorED, a program intended to reduce the instance of accidental opioid overdose by connecting patients with certified recovery coaches. The program, was developed and funded by BHDDH and will provide coaches on an on-call basis, in select emergency departments, every weekend from 8 p.m. Friday to 8 a.m. Monday.

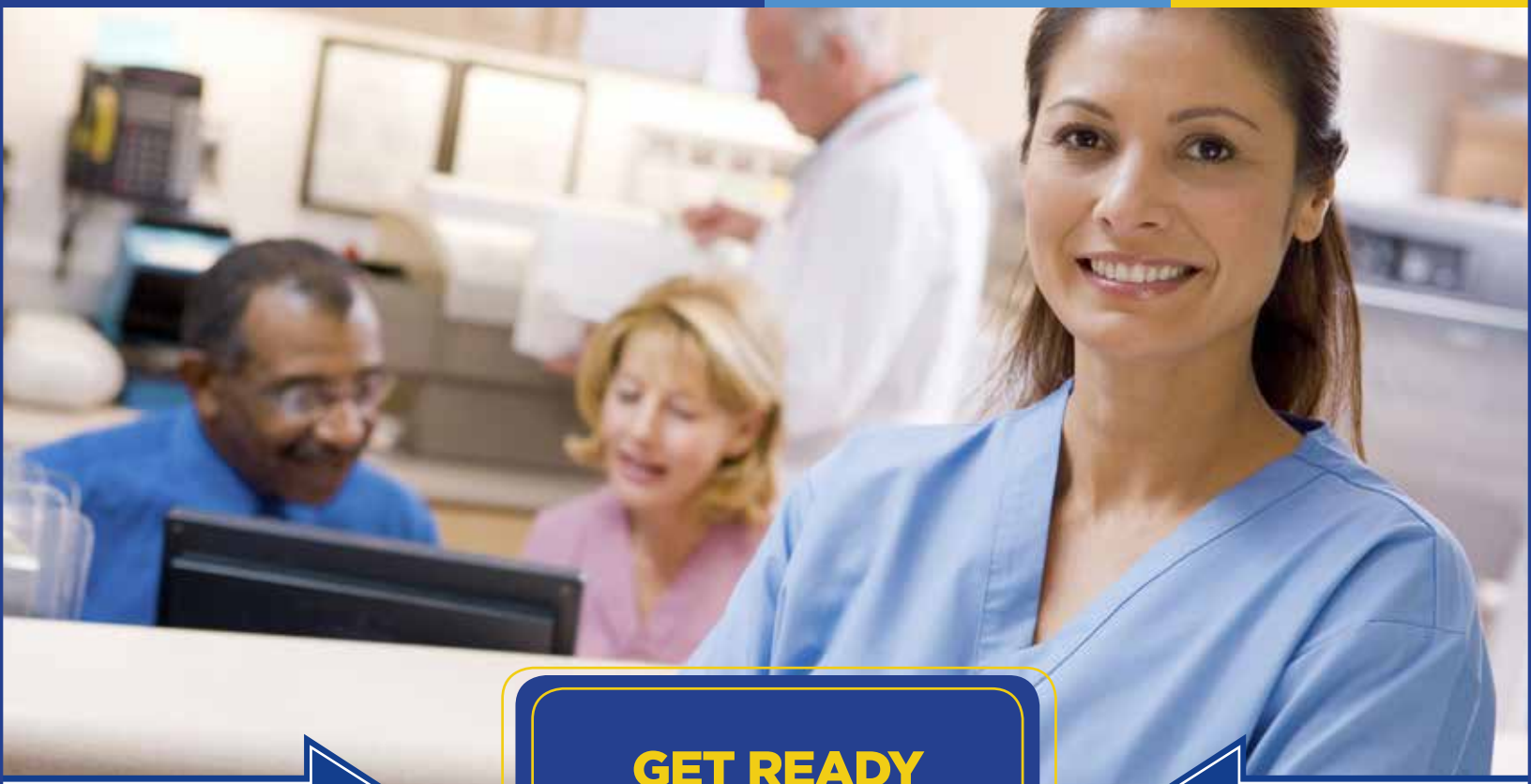
"We are extremely pleased to offer the AnchorED program to our patients in need at Kent Hospital helping to provide a tremendous resource of support, education and eventual recovery," said **PETER GRAVES, MD**, chief of emergency services at Kent Hospital. "Drug overdose is a serious, ongoing occurrence in our emergency department, with a dramatic increase over the past few years in the number of patients we treat."

CNE announced recently it is negotiating the terms of an official affiliation with The Providence Center. The formal agreement seeks to solidify the integration of behavioral health services across community-based and hospital-based systems in order to provide comprehensive treatment and support across the full continuum of care to patients with mental illness and substance use disorders.

"AnchorED offers a unique opportunity for specialized coaches to connect with and help those suffering from addiction, offering places to turn to for help," Jim Gillen, associate director, Anchor Recovery Community Center. "The goal of this program is to ensure patients and their families that addiction is a disease, and recovery is not only possible, it is a reality. The statistics of drug overdose in Rhode Island are alarming, so it is imperative we take the necessary steps to ensure emergency departments have the support they need to provide the best possible outcomes for their patients."

The hours immediately after an overdose are medically risky, but also present a unique opportunity to connect with and help those suffering from addiction. Certified Recovery Coaches will:

- Link individuals to treatment and recovery resources
- Provide education on overdose, prevention, and obtaining Nalaxone
- Provide additional resources to patients and their family members
- -Contact the individual after they are released, with a follow-up call ❖



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DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

CMS Awards Healthcentric Advisors $53M Quality Innovation Contract

To partner with Qualidigm in CT. to serve New England

PROVIDENCE – The Centers for Medicare & Medicaid Services (CMS) recently awarded a $53 million Quality Innovation Network-Quality Improvement Organization (QIN-QIO) contract to Healthcentric Advisors, the incumbent Rhode Island Quality Improvement Organization (QIO).

The new QIN-QIO contracts, awarded to 14 organizations across the United States, represent a revitalization of CMS's long outstanding QIO work. In order to successfully execute the contract initiatives, Healthcentric Advisors, the prime contractor for this work, has formalized a strategic partnership with Qualidigm, the incumbent QIO for Connecticut.

Together, Healthcentric Advisors and Qualidigm will serve as a single QIN-QIO for the six New England states: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. The five-year contract, which is the third-largest award in the country, will begin on August 1, 2014.

The new QIN-QIO contract awards represent the second phase of the restructuring of the QIO program, the largest federal program dedicated to healthcare quality. The previous QIO body of work will be split into two separate contract structures: one for medical case review and appeals, performed by Beneficiary and Family-Centered Care QIOs (BFCC-QIOs), and one for quality improvement and technical assistance, performed by the QIN-QIOs. The medical case review and appeals responsibilities previously performed by Healthcentric Advisors, Qualidigm, Masspro (the incumbent Massachusetts QIO), and the Northeast Health Care Quality Foundation (the incumbent New Hampshire, Maine, and Vermont QIO) will now be performed by Annapolis-based Livanta, LLC. This separation of work is a contract requirement set forth by CMS.

"Healthcentric Advisors and Qualidigm have a long history of working successfully with hospitals, nursing homes, physicians, and other providers and stakeholders in our respective states. We've created solutions to improve patient care and population health while lowering healthcare costs," said John Keimig, president and CEO of Healthcentric Advisors. "We look forward to bringing that same spirit of partnership and collaboration to the entire New England region. We will support and assist providers in all settings, share knowledge and best practices, and accelerate improvements in health care throughout the six-state region."

Through a coordinated regional approach, Healthcentric Advisors and Qualidigm will work with providers and communities on data-driven quality initiatives to improve the quality of care across the New England region. While overseeing work for the entire region, Healthcentric Advisors will focus its efforts in Maine, Massachusetts and Rhode Island and Qualidigm in Connecticut, New Hampshire and Vermont.

Healthcentric Advisors and Qualidigm will work across New England on strategic initiatives such as reducing healthcare associated infections, reducing readmissions and medication errors, working with nursing homes to improve care for residents, supporting clinical practices in using interoperable health information technology to coordinate care, promoting prevention activities, reducing cardiac disease and diabetes, reducing health care disparities and improving patient and family engagement. The partnership will also provide technical assistance for improvement in CMS value-based purchasing programs, including the physician value-based modifier program. ❖

New Law on Expediting COE Process Passed

PROVIDENCE – The governor has signed legislation passed recently by the General Assembly that is designed to help expedite the Department of Health "certificate of need" process and to help open doors for domestic medical tourism companies to locate in Rhode Island.

The legislation was developed to address a specific situation that arose last year involving an out-of-state health care provider in its attempts to obtain a home nursing care provider's license and meet other requirements set by the Department of Health.

Among the law's provisions are:

- In regard to the certificate of need process, it will provide for consideration of an expeditious review request and require that a decision in connection with that review be rendered within 30 days.
- It will, under certain circumstances, provide an exemption from the certificate of need requirements to the domestic medical tourism industry and multi-practice health facilities.
- It will reduce and restructure the composition of the Health Services Council from 24 to 12 members.
- It will set a moratorium on all new healthcare services and equipment until July 1, 2015, during which time the Department of Health in conjunction with the Health Care Planning and Accountability Advisory Council will conduct a statewide healthcare utilization and capacity study and prepare a statewide healthcare plan and inventory of healthcare facilities, equipment and health services. ❖

Appointments

Butler Hospital Announces New Leadership Appointments

PROVIDENCE – Following the induction of Lawrence H. Price, MD, as acting president and COO of Butler on July 1, he has announced key clinical and research leadership appointments. **JAMES K. SULLIVAN, MD, PhD**, has been appointed senior vice president and chief medical officer; **LISA SHEA, MD**, has been appointed medical director; and **AUDREY R. TYRKA, MD, PhD**, has been appointed director of research.

James K. Sullivan, MD

In his role as senior vice president and chief medical officer, Dr. Sullivan will be responsible for overseeing the clinical activities of the hospital, while helping to develop an integrated Care New England (CNE)-wide system for population health. Most recently serving Butler as deputy medical director for clinical services, Dr. Sullivan joined Butler in 2007 as assistant unit chief on the Kent Unit and is also currently a clinical assistant professor of psychiatry at the Alpert Medical School of Brown University.

As medical director, Dr. Shea will be responsible for ensuring that the hospital's services meet the highest levels of quality and regulatory compliance. Appointed Butler's deputy medical director in 2012, Dr. Shea has served as associate medical director, Quality & Regulation, and assistant unit chief of the Partial Hospital. She is a clinical associate professor in the Department of Psychiatry and Human Behavior at the Alpert Medical School of Brown University.

In her role as director of research, Dr. Tyrka will be responsible for the oversight of research activities at the hospital and for helping to advance Butler's scientific mission. Dr. Tyrka joined Butler Hospital as associate director of the Mood Disorders Research Program following completion of her residency in psychiatry at Brown in 2003, and is currently director of the Laboratory for Clinical and Translational Neuroscience at Butler. An associate professor of psychiatry and human behavior at the Alpert Medical School of Brown University, she has published over 85 scientific papers and book chapters and leads a highly successful externally funded research program on the neurobiology of stress exposure and risk for psychopathology and other adverse health outcomes. ❖

Lisa Shea, MD

Audrey R. Tyrka, MD

PHOTOS: CNE

Dr. Unab Khan Named Medical Director of Health Services at Brown

BROWN

Unab Khan, MD

PROVIDENCE – **UNAB KHAN, MD**, has been named medical director of Health Services at Brown. Dr. Khan is currently an assistant professor of pediatrics and family and social medicine at Albert Einstein College of Medicine in Bronx, New York, and the medical director of the B'N Fit program. She begins her duties at Brown on October 1, 2014.

Dr. Khan earned her MD from The Aga Khan University in Karachi, Pakistan and her master's in clinical research at the Albert Einstein College of Medicine. She is currently the principal investigator for an NIH-funded study and has been the co-investigator on two additional NIH-funded studies.

She has published several publications in reviewed journals and authored chapters in *Adolescent Medicine: A Handbook of Primary Care 2005*. She has been a journal article reviewer for several publications and is an early career reviewer for the National Institutes of Health.

She is a member of the American Academy of Family Practice, the American Heart Association, and the Society for Adolescent Health and Medicine. She serves on the editorial board for the American Academy of Pediatrics and is a member of the Research Committee for the North American Society for Pediatric and Adolescent Gynecology. ❖

Appointments

Dr. Robert Insoft Named Sr.-VP for Quality and Clinical Effectiveness at W&I

PROVIDENCE – **ROBERT M. INSOFT, MD**, of Boston, has recently been named senior vice president of quality and clinical effectiveness at Women & Infants Hospital of Rhode Island. A neonatologist and assistant professor of pediatrics at Harvard Medical School, Dr. Insoft most recently served as the medical director of the Neonatal Intensive Care Unit (NICU) and Neonatal Respiratory Services at Brigham and Women's Hospital, Boston, where he was also the quality officer in the NICU.

A graduate of Johns Hopkins University and the Boston University School of Medicine, Dr. Insoft completed an internship and residency in pediatrics at Massachusetts General Hospital, fellowships in neonatal-perinatal medicine and intensive care transport in the Department of Pediatrics and the Cardiovascular Research Institute at the University of California, San Francisco. He is also a scholar from the Brigham Leadership Program at Brigham and Women's Hospital and Harvard Business School. He has led the Section of Transport Medicine (SOTM) of the American Academy of Pediatrics (AAP) and was the senior author on the AAP-sponsored Consensus Statement on Pediatric Transport, published in 2013 in *Pediatrics*. ❖

Dr. Wu Joins W&I Center for Women's Gastrointestinal Health

WOMEN & INFANTS HOSPITAL

D. Ying Wu, MD

PAWTUCKET – Women & Infants Hospital of Rhode Island announces the appointment of **D. YING WU, MD, MSc** – a gastroenterologist interested in liver diseases in women, inflammatory bowel disease, functional gastrointestinal disorders and celiac disease – in its Center for Women's Gastrointestinal Health.

A native of New York City who has studied as a British Marshall Scholar and conducted research on prevention of mother-to-infant transmission of HIV in Botswana, Dr. Wu will see patients at the Center for Women's Gastrointestinal Health in Providence, and at locations in East Greenwich, Wakefield and Woonsocket.

"Dr. Wu is a tremendous addition to the Center for Women's Gastrointestinal Health. With the surge of hepatitis cases and the new treatments on the market now for hepatitis C in particular, we are thrilled to have someone with such expertise in women's liver diseases on our team," says **CHRISTY DIBBLE, DO**, director of the Center.

Dr. Wu was the valedictorian of her graduating class from New York University, did post-graduate training as a British Marshall Scholar and earned a master of science degree in comparative health policy from Oxford University. She then earned a medical degree from Harvard Medical School. She completed a fellowship at Yale Hospital, residency at Stanford University Hospital, and a fellowship in gastroenterology at Massachusetts General Hospital.

In addition to conducting research through the Harvard School of Public Health in Botswana, Dr. Wu was a research consultant with Population Services International's Project Healthy Children in Honduras, where she helped develop and implement a study of folic acid and its use against birth defects. In Guatemala, she helped analyze the barriers to implementation of HIV-prevention strategies among sex workers. She has also helped with modeling the cost-effectiveness of HIV interventions for the Worth Health Organization's World Health Report.

It was in Botswana where she decided to focus on the health of women.

"While living there, I saw first-hand how women have few rights in other parts of the world, and this makes them vulnerable to serious health problems," Dr. Wu says. "In the US, medical research and practice has traditionally focused on men, so although gender inequality is less pronounced socially in the US, there are persistent gender differences in evaluation and management of medical problems. By focusing on women's GI care, I hope to provide the best possible care tailored to women."

Her interest in research began as an undergraduate where she earned one of seven Dean's Undergraduate Research Grants at NYU. More recent research has focused on improving quality of care in digestive diseases and on hepatitis B. She also earned the Bristol Myers Squibb Virology Fellowship for hepatitis B research in 2013.

"I became particularly interested in liver disease because my father has chronic hepatitis B, which is endemic in China where he lived until he was 35 years old. He came to the US to pursue a doctorate in theoretical physics but became progressively sick. By the time I was graduating from college, he needed a liver transplant," Dr. Wu says. "Fortunately, he was lucky enough to get a liver transplant in 2000 and has been doing very well since then. His illness and recovery, which gave him a second chance at life, inspired me to go into medicine and also engendered a strong interest in liver disease."

Dr. Wu was a celebrated student. She earned the Harvard University Presidential Service Initiative Award for public service; the Hubert Fellowship from the Centers for Disease Control, the Albert Schweitzer Fellowship to establish a preventive health program for survivors of domestic violence; and the Harry S. Truman Scholarship based on leadership potential.

"Marshall Scholars are always the most intellectually distinguished Americans who will one day become leaders and decision-makers," Dr. Dibble explains. "We are looking forward to having this sort of powerful force here in Rhode Island, working on behalf of women with liver disease." ❖

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Appointments

Virginia Bass, MD, Joins L+M in Westerly

L+M MEDICAL GROUP

Virginia Bass, MD

WESTERLY – **VIRGINIA BASS, MD**, has joined the L+M Medical Group's Obstetrics and Gynecology practices located in Westerly and New London. A member of both the Westerly Hospital and Lawrence + Memorial Hospital medical staff, Dr. Bass provides women in the greater Westerly/Stonington area with patient-focused obstetric and gynecological care, including pre- and post-natal services. All labor and delivery services are provided at L+M Hospital in New London.

Dr. Bass is board certified in obstetrics and gynecology, and received her medical degree from the Medical University of South Carolina (MUSC), and completed her residency at the Carillon Clinic in Virginia, the Atlanta Medical Center in Georgia, and the Greenville Hospital System in South Carolina. ❖

Prospect CharterCARE, LLC Announces New Management Structure

Belcher to retire at end of month

PROVIDENCE – Prospect CharterCARE, LLC has announced the establishment of a new management structure designed to revitalize and increase efficiency across CharterCARE's core operations.

Prospect CharterCARE, LLC, an innovative joint venture company, was launched on June 20, 2014. The company, which is doing business as CharterCARE Health Partners, is jointly owned by Prospect Medical Holdings, Inc. and CharterCARE Community Board.

The management changes announced are:

KIMBERLY O'CONNELL has been promoted to president of Roger Williams Medical Center. Previously, O'Connell served as senior vice president and general counsel of Roger Williams.

MATTHEW ROY will lead Physician Integration, a newly created executive role at the System. Previously, Roy was a former hospital CFO, multispecialty group practice manager, and strategic consultant at Partners HealthCare and Navigant.

KENNETH BELCHER, the longtime CEO of CharterCARE Health Partners (currently CharterCARE Community Board), who led the organization through the Roger Williams and Fatima affiliation and whose vision has been realized with the launch of the new joint venture, has made the decision to retire effective August 29, 2014.

"Despite our efforts to convince him otherwise, we understand and respect Ken's decision. He will truly be missed," said Thomas Reardon, president of Prospect East Holdings, Inc. A search for Belcher's replacement will begin immediately. Reardon will become interim CEO until a replacement is appointed by the Board. ❖

Dr. Amity Rubeor Named First Sports Medicine Fellow at Care New England

CNE

Amity Rubeor, DO

PROVIDENCE – The Warren Alpert Medical School of Brown University recently accredited the first primary care sports medicine fellowship in Rhode Island. The first fellow to participate in the training program is a family medicine physician from the Care New England (CNE) Health System.

AMITY RUBEOR, DO, who has been part of the Department of Family Medicine at Memorial Hospital of Rhode Island, a Care New England partner, will begin her fellowship work this month at Affinity Sports Medicine and Memorial Hospital of Rhode Island, both of which are affiliated with the Brown fellowship and the CNE health system.

"Sports medicine is an exciting specialty field that uses cutting-edge, evidence-based techniques to diagnose and management a variety of injuries and illnesses," says **JEFFREY D. MANNING, MD**, fellowship director. "Sports medicine specialists specialize in the non-operative treatment of musculoskeletal conditions, which account for a significant portion of all sports-related injuries."

Dr. Rubeor earned a bachelor of science degree in biology from the College of William and Mary, and a doctor of osteopathy degree from the University of New England College of Osteopathic Medicine. She completed a pre-doctoral fellowship in osteopathic manipulative medicine and anatomy, also at the University of New England. She completed a residency in family medicine through Brown at Memorial Hospital and served as chief resident for scheduling and director of the Osteopathic Manipulative Medicine Clinic. She also fulfilled a faculty development fellowship, with a focus in sports medicine and obstetrics, through the Department of Family and Community Medicine at Lancaster General Hospital in Pennsylvania.

Named faculty teacher of the year at Brown several times, Dr. Rubeor is a diplomate with the American Board of Family Medicine. She has worked with the Sports Concussion Management Program at Memorial and is a Medfast director for Special Olympics Rhode Island. Her research, which covers such topics as sports concussions and sideline medical management at sporting events, has been published nationally in peer-reviewed journals and books.

"Dr. Rubeor is a well-rounded and caring family medicine practitioner who happens to have a keen interest in sports medicine, helping athletes with injuries and those interested in being more active do so safely," says **JEFFREY BORKAN, MD**, chief of the Department of Family Medicine at Memorial Hospital. "We are lucky to have her step into this newly created fellowship for advanced training in this field." ❖

Appointments

SOUTHCOAST

Grace A. Medeiros, MD

Grace A. Medeiros, MD, Joins Southcoast Physicians Group

PORTSMOUTH – **GRACE A. MEDEIROS, MD**, a neurologist, has joined Southcoast Physicians Group, and will see patients in Portsmouth, RI, at Southcoast Physician's Group Linden Tree Family Health Center.

Dr. Medeiros is assistant clinical professor at Brown University School of Medicine and an adjunct professor at Roger Williams University.

Prior to joining Southcoast, she was president of the Newport Neurologic and Electrodiagnostic Center in Newport since 2009, and also served as chief of neurology at Newport Hospital since 2000. Dr. Medeiros was attending physician for NHCC Medical Associates from 2000–2009, and previously served as clinical assistant professor, clinical neurophysiology and neuromuscular disease, at Rhode Island Hospital.

She is a member of the American Academy of Neurology, American Medical Association, American Association of Neuromuscular and Electrodiagnostic Medicine, Mount Sinai Alumni Association, and Physician Service Organization. ❖

Dr. Patricia Flanagan to Serve as Interim Pediatrics Chair

HASBRO CHILDREN'S HOSPITAL

Patricia Flanagan, MD

PROVIDENCE – **PATRICIA FLANAGAN, MD,** will serve as interim Pediatrician-in-Chief and Chair of the Department of Pediatrics at The Warren Alpert Medical School of Brown University.

As an active member of the Rhode Island Medical Women's Association (RIMWA), Dr. Flanagan has served as Associate Pediatrician-in-Chief since 2012, and has spent her entire career at Rhode Island and Hasbro Children's hospitals. She also serves as chief of clinical affairs and is a professor and vice chair of pediatrics at The Warren Alpert Medical School. Her research, clinical work and teaching have focused on the unique needs of pregnant women and parenting youth and their children.

Dr. Robert Klein has retired as Pediatrician-in-Chief and Chair of the Department of Pediatrics at The Warren Alpert Medical School of Brown University. ❖

URI Professor named Ernest Mario Distinguished Chair in Pharmaceutics

KINGSTON – A University of Rhode Island researcher who has gained a national reputation for her work on alcoholism, Type 2 diabetes and measuring drug levels in organ transplant patients has been named the Ernest Mario Distinguished Chair in Pharmaceutics.

Wakefield resident **FATEMEH AKHLAGHI, PharmD, PhD**, professor of biomedical and pharmaceutical sciences at URI's College of Pharmacy, was named to the prestigious University post this summer. Endowed faculty chairs and professorships are intended to help URI recruit and retain renowned scholars.

"Dr. Akhlaghi is a well-respected researcher and leader in the pharmaceutical sciences community. She is currently conducting groundbreaking clinical trials with collaborators at the National Institutes of Health that will lead to a better understanding and treatment of alcoholism," said E. Paul Larrat, interim dean and professor at URI's College of Pharmacy.

"Dr. Akhlaghi is particularly gifted at understanding complex scientific problems, creatively exploring possible solutions through her research, and translating that information into strategies that may help individual patients improve their health."

URI PHOTO BY NORA LEWIS

Dr. Fatemeh Akhlaghi, professor of biomedical and pharmaceutical sciences, is named URI's Ernest Mario Distinguished Chair in Pharmaceutics.

Dr. Akhlaghi's lab at URI is helping the NIH to develop a medication that could stop alcohol cravings through a research partnership between URI, NIH and Pfizer. The NIH awarded a $1.65 million grant in 2013 to fund her research partnership with Lorenzo Leggio, a Brown University adjunct professor and chief of section on Clinical Psychoneuroendocrinology and Neuropsychopharmacology at NIH's National Institute on Alcohol Abuse and Alcoholism/National Institute on Drug Abuse.

Dr. Akhlaghi's other research focuses on devising methods for personalized medicine specifically for patients with Type 2 diabetes or organ transplant recipients. "Once we learned more about different factors that influence drug concentration in the body, we can personalize medicine to the individual need of each patient," she said. "In this way, we may be able to improve drug response while reducing adverse effects."

Dr. Akhlaghi is also known for creating a method of measuring drug levels in transplant patients that would eliminate the need for twice-weekly blood draws. Her method of using saliva to monitor anti-rejection drugs is not only more accurate and less costly but is also pain-free and convenient for patients; it is being patented and she is searching for a diagnostic company that would make kits for patients to use at home.

She holds a doctor of pharmacy degree from the University of Mashhad, Iran, and a doctor of philosophy degree from the University of Sydney, Australia. ❖

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Recognition

Dr. Judith Mercer Receives Highest Honor from American College of Nurse-Midwives

PROVIDENCE – **JUDITH S. MERCER, CNM, PhD, FACNM**, a research scientist at Women & Infants Hospital of Rhode Island, was recently honored by the American College of Nurse-Midwives (ACNM) as the recipient of the Hattie Hemschemeyer Award, named in honor of ACNM's first president and a pioneer of the profession. This is ACNM's most prestigious award and is given annually to an ACNM member who has been certified for at least 10 years and has made continuous outstanding and/or historically significant contributions to midwifery, ACNM, and/or maternal child health.

URI

Judith S. Mercer, CNM

An avid learner, Dr. Mercer is a graduate from the Johns Hopkins School of Nursing diploma program in 1962, the University of Maryland School of Nursing in 1973, Columbia University School of Nursing where she obtained a master's of science degree and certificate in midwifery in 1974, and the Catholic University of America where she obtained her PhD in 1989.

She has spent the last 40 years as a midwife – working in the name of midwifery while continuously focusing on the baby's perspective at birth. She began her career at Booth Maternity Center in Philadelphia where she worked as a clinician and educator followed by 15 years of teaching midwifery at Georgetown University, the last 10 of these years as program director. In addition to Georgetown, she has held academic appointments at the University of Alabama at Birmingham, and is currently professor emerita at the University of Rhode Island and adjunct professor of pediatrics at The Warren Alpert Medical School at Brown University. ❖

L. Corey Hanley, MD, Receives Dean's Teaching Award

PAWTUCKET – **L. COREY HANLEY, MD**, assistant professor of pathology and laboratory medicine (clinical) recently received The Warren Alpert Medical School of Brown University 2014 Dean's Excellence in Teaching Award. She received the recognition at the Dean's Excellence in Teaching Award reception held in June at Brown.

The awards are presented to clinical and basic science faculty for their exemplary teaching in preclinical course, core clerkships and clinical electives. These faculty members are recognized for their exceptional teaching and mentoring as lecturers, small group leaders and laboratory, hospital-based and office–based preceptors. ❖

MEMORIAL HOSPITAL

L. Corey Hanley, MD

MEMORIAL HOSPITAL

Shiavax Cowasji, MD

Shiavax Cowasji, MD, Receives Beckwith Teaching Award

PAWTUCKET – Memorial Hospital's **SHIAVAX COWASJI, MD**, clinical assistant professor of medicine, was one of eight who recently received the Alpert Medical School Department of Medicine Beckwith Family Award for Outstanding Teaching.

The award recognizes superb teaching by its faculty. Recipients are nominated and chosen by students, residents, physicians, program and course directors in the Department of Medicine. ❖

W&I Program in Women's Oncology Researchers Earn Awards at NEAGO

PROVIDENCE – Researchers with the Program in Women's Oncology at Women & Infants Hospital of Rhode Island recently earned the two top awards for presentations at the 34th annual meeting of the New England Association of Gynecologic Oncologists (NEAGO).

"The Program in Women's Oncology group presented 16 important scientific abstracts, all of which were superb, and competed against abstracts from some of the world's most prestigious universities, including Harvard, Yale, Dartmouth, Vermont, the University of Connecticut, the University of Massachusetts and Boston University," says **CORNELIUS "SKIP" GRANAI III, MD**, director of the program.

"In light of such competition, the fact that our program stood out and two won the prize papers in clinical medicine and basic science is all that much more impressive."

Winning papers were:

"Increased prevalence of abnormal and cytology and high risk HPV in women with a history of lower genital tract neoplasia compared to women without a history of lower genital tract neoplasia," which won the clinical award. The paper was authored by **DRS. AMY BREGAR, BETH CRONIN, PAUL DISILVESTRO, STEVEN SCHECTER, LATHA PISHARODI, C. RAKER, M. CLARK,** and **KATINA ROBISON** and **CHRISTINE LUIS, MS.**

"HE4 expression is associated with hormonal elements and mediated by importin-dependent nuclear translocation," which won the basic science award. The paper was authored by **DRS. ELIZABETH LOKICH, NAOHIRO YANO, KYUKWANG KIM, RAKESH SINGH, RICHARD MOORE, ALEX HAN, BS,** and **NICOLE ROMANO, BS.** ❖

Recognition

Pharmacy Residents Christine Smelstor and Michael Halse (center) are the first residents to graduate from South County Hospital's one-year Pharmacy Residency Program, which was established in 2012. Both have accepted positions as clinical pharmacists at different hospitals. Here they are pictured with South County Hospital pharmacists Josh Guerin (left) and Jackie Costantino (right).

Michael Fichera, RN, named Nurse of Year at Memorial

PAWTUCKET – **MICHAEL FICHERA, RN**, from Surgical Services, was named Nurse of the Year at Memorial Hospital. A member of Memorial's team for eight years, Michael had numerous nominations. Carolyn Nobrega, RN, provided some of the following comments in her nomination letter:

"He has unequivocally become an accomplished operating room nurse and is an invaluable member of the MHRI OR team. Although he is fully competent in all specialty areas, his knowledge and education of the urology specialty is unsurpassed. Michael is always a positive and optimistic influence in the OR, boundlessly assisting all co-workers as needed at any time. His warm, caring approach with patients is comforting to them and their families." ❖

MEMORIAL HOSPITAL

Michael Fichera, RN, and Shelley MacDonald, RN, senior vice president, Patient Care Services, chief nursing officer at Memorial Hospital.

"Leaves," designed by Thomas Schoos

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Recognition

URI's Christopher Nasin, MD, wins National Honor for Research on Fatigue Among Female Athletes

KINGSTON – A University of Rhode Island Health services physician earned top honors from the American College Health Association for his research presentation on fatigue among female track athletes.

CHRISTOPHER NASIN, MD, a primary care physician at Health Services, who treats URI student-athletes for illness and non-surgical injuries, was awarded a blue ribbon, the health association's top prize, during the organization's recent annual meeting in San Antonio, Texas. The poster, entitled, "Fatigue and Energy Balance in Female College Endurance Athletes," summarized the interdisciplinary research project involving undergraduate kinesiology students Justin Nicoll, Ryan Keith and Valerie Cadbury, as well as Disa Hatfield, associate professor of kinesiology, and Kathleen Melanson, associate professor of food science and nutrition.

According to Dr. Nason's poster, fatigue is a common complaint among college female athletes. While clinicians usually perform routine laboratory studies to rule out organic causes of fatigue, the Saunders town resident's team focused on these factors: energy balance, mood, sleep and serum markers.

The researchers assessed nutrition, vertical jump power and blood markers before the spring track season began, during the season and after its conclusion. Fatigue, sleep and athlete burnout scales were administered weekly. Researchers also assessed race times and the percentage of change during the season.

"What we found at the end of the study was the athletes' nutrition was not adequate to support their level of training and competition," Dr. Nasin said. "They were not eating enough, and they we not getting the right types of nutrition. If this is true for athletes, it's probably true for society in general. The other major factor was poor sleep." ❖

Dr. Surendra Sharma Honored by Professional Association

Receives Distinguished Service Award from the American Society for Reproductive Immunology

WOMEN & INFANTS HOSPITAL

Surendra Sharma, MD

PROVIDENCE – Warwick resident **SURENDRA SHARMA, MD, PhD**, a research scientist and professor in the Department of Pediatrics at Women & Infants Hospital of Rhode Island and The Warren Alpert Medical School of Brown University, was recently presented with the Distinguished Service Award at the 34th annual meeting of the American Society of Reproductive Immunology (ASRI). This award is given to a member of the ASRI who has provided distinguished service to advance the goals and mission of the society.

Dr. Sharma's career has spanned three decades. His laboratory has a multifaceted research program focused on trying to answer the question of why some women have babies that are born too soon as well as why some women have problems with their pregnancy, such as preeclampsia and gestational diabetes.

"We believe that these problems may originate from abnormal immune responses during the pregnancy, but we would like to know how the immune system changes during normal and adverse pregnancy outcomes," said Dr. Sharma. "Some pregnancy-associated complications are diagnosed after 20 weeks of gestation. However, the onset of the related pathology probably occurs much earlier in pregnancy, which may have its origin in unregulated immune responses, protein structures, and vascular activities. These changes, if detected early in pregnancy, may be able to help predict who will develop the disease." ❖

Memorial's Family Care Center Earns PCMH Recognition for Quality

PAWTUCKET – The Family Care Center at Memorial Hospital of Rhode Island recently earned recognition as a Level 3 Patient-Centered Medical Home from the National Committee of Quality Assurance (NCQA).

"We are very pleased to achieve the NCQA's highest level of recognition for patient-centered medical homes. This recognition is the most widely-used way to transform primary care practices into medical homes and is considered to be the current 'gold standard' in the field," says **JEFFREY BORKAN, MD, PHD**, physician-in-chief of family medicine at Memorial Hospital, and chair and professor in the Department of Family Medicine at The Warren Alpert Medical School of Brown University. He is also assistant dean for primary care-population health program planning at the Alpert Medical School.

The recognition is valid through July 9, 2017.

"The Family Care Center at Memorial earned a remarkable 92.25 out of 100 on the NCQA evaluation. This is evidence of the strength of the primary care program here and the dedication of our staff to providing high-quality primary care to the people of our community," adds **EDWARD SCHOTTLAND**, president and chief operating officer at Memorial. ❖

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Obituaries

RICHARD E. FRATES, SR., MD, 85, died July 9, 2014 at home surrounded by his loving family. He was the husband of the late Mary Louise (Burns) Frates. Born in Philadelphia, PA, he was the son of the late Joseph H. and Elsie (Mulvey) Frates. He was a communicant of St. Luke's Church and a graduate of Boston College and Tufts University Medical School.

He was a radiologist for over 50 years, founding the angiography division at Rhode Island Hospital in the early 1960s, and as radiologist-in-chief at Women and Infants Hospital until his retirement in 1998. Dr. Frates had the unique distinction of election to Fellowship in both the American College of Radiology and the American Academy of Pediatrics.

He is survived by his children and their spouses: Anne T. Frates and Richard Michalski, Dr. Mary C. Frates and Dr. John Parziale, Dr. Richard E. Frates, Jr. and Dr. Mary, Patricia G. Noone and Gerald, James M. Frates and Dr. Elizabeth. He is also survived by 11 grandchildren and one great-grandchild. He was the brother of John, Thomas and William Frates and the late Rev. Joseph Frates, Dr. Margaret Geffroy and Barbara Frates.

Donations in his memory may be made to St. Luke's School, 108 Washington Road, Barrington, RI 02806.

GEORGE V. COLEMAN, MD, of Providence, passed away on June 27, 2014. He was the husband of Catherine M. (Bartal) Coleman. They were married for 62 years.

He was born in Providence, on September 26, 1923.

Dr. Coleman attended the college of the Holy Cross and Cornell University Medical College. He completed his residency at Roosevelt Hospital (NYC) in surgery, pathology, and gynecology, and a four-year fellowship at Sloan Kettering.

He served as a naval medical officer in World War II and completed a tour of duty as a surgeon on the hospital ship Repose.

Certified by the American Board of Surgery, he began an oncological surgical practice performing surgeries at all Providence hospitals.

Passionate about the care of others, he strived to provide healthcare to all in need.

In 1965 he was instrumental in establishing Chad Brown Health Center. His love of teaching was evident throughout his career as a mentor and instructor for future doctors at Brown Medical School.

Besides his wife Catherine, he is survived by his three sons, George, Theodore, and Michael; three daughters, Susan, Mary, and Patricia; and 12 grandchildren.

The family would like to thank Edward Gauthier, MD; Fadi Mansourati, MD; and the staffs of Hallworth House and Hopkins Manor. We are forever grateful to Rebecca Brown, MD, and the staff of Home & Hospice Care of Rhode Island.

Donations to: Saint Pius V Church, 55 Elmhurst Avenue, Providence, RI 02908 or Home & Hospice Care of RI, 1085 North Main Street, Providence, RI 02904 in his memory would be appreciated.

The Alphas and Omegas of Medicine

STANLEY M. ARONSON, MD

MEDICINE CLAIMS ACCESS TO TWO TIERS OF EQUIVALENT WORDS: the earthier, more generally monosyllabic terms of Germanic origin; and those derived directly from classical Greek and Latin, these being more polysyllabic, more typically the rhetoric of official documents and more often courteous euphemisms substituting for their equivalent yet blunter terms.

The profession of medicine has also long declared itself to be the guardian and definer of life's beginnings and endings, the births and deaths of humans. And so, in most English-speaking nations, those scraps of paper announcing our arrivals and departures are called birth certificates and death certificates.

These names might have been of a more classical origin; but words such as birth and death are clearly understood by the most poorly schooled. They are words, not inherited from the classical languages of Rome and Greece; rather, these monosyllabic words are derived from Old German – blunt and unambiguous – and their antecedent words were widely known in England long before the vulgar Latin-speaking Normans invaded Britain in the 11th Century.

The word, birth, still proclaims itself on our certificates attesting to our arrival; it stems directly from the Old German giburt meaning a bringing forth; and from a more ancient Indo-European source, *bher* – meaning to carry or bear. The added Old Germanic suffix, *-th*, denotes a process, thus making the word a noun. Note that there are remarkably few collateral derivatives of the word, birth: perhaps stillbirth, birthright, bairn or birthings.

The word, death, also of Old German origin, yields few collateral words such as deadly.

The Latin words for birth and death, on the other hand, have spawned a virtual lexicon of derivative words: From the Latin, *natalis*, for example, came such words as nation, nativity and natural; (but not derivatives of *natatus*, meaning the act of swimming.)

The Latin, *mortalis*, means death; and from which arose English words such as mortality, morbid, morbilli (measles), mortgage, mortician, mortise, mortuary, amortize and mortmain.

The Greek root for death, *thanato-*, has yielded such English terms as thanatology, thanatopsis and euthanasia.

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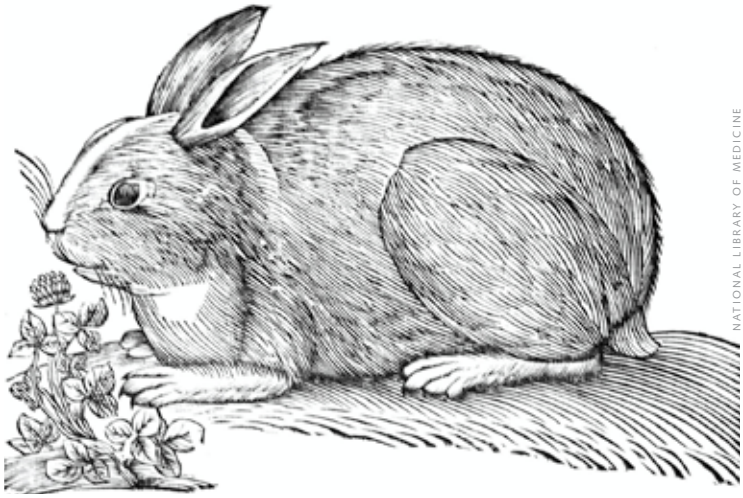
August 1929: Vintage Case Report – Beware the White Rabbit

A Cautionary Tale of Rabbits, a Young Man and the Family Cat

MARY KORR
RIMJ MANAGING EDITOR



NATIONAL LIBRARY OF MEDICINE

In the August 1929 issue of the *Rhode Island Medical Journal* **DR. ARTHUR G. RANDALL** of Providence reported on an unusual case. He was called to see 19-year-old Allen T., who lived with his family in a three-room house nestled in woodland in North Scituate.

The youth had been feeling poorly for several days and upon examination, Dr. Randall discovered a "small open wound at the base of his right forefinger." The boy had a fever of 102, felt chilled, even though the room was "suffocating from the heat of a fire in the family stove."

Dr. Randall's impression was a case of late-season influenza.

Several days later, the boy's parents took him to see Dr. Randall at his home "in an automobile." After visiting back and forth for 10 days, the boy's father reported finding two dead rabbits near the house just prior to the boy's illness.

Indeed, Allen T. said, he had found a dead rabbit near the house and "tore it to pieces and fed it to the cat." Unfortunately, the cat died two days later.

This triggered the doctor's memory of an AMA conference he had attended the previous year in Minneapolis, at which a Dr. Walter Simpson described "the first truly American disease – tularemia."

Dr. Randall took a vial of the youth's blood and hastened forthwith to the state laboratory, which sent it off Washington, DC, and the U.S. Bureau of Hygiene. It tested positive for tularemia.

Dr. Randall wrote up the case report, stating that, "in reporting this, the first case in this section of the country, it would seem well to bear the possibility of running across it in our work." He noted that while a blood-sucking tick or fly may carry the bacterial infection, the great majority of cases come from the jackrabbit in the West and the ordinary cottontail and white rabbit or hare in New England.

Dr. Randall also issued a warning to hunters, farmers, market-men and laboratory workers to be "careful in working on the flesh of hares and rabbits, to explain its non-contagious nature man-to-man, and that thoroughly cooking the meat makes it safe to eat."

If only Allen T. had known that, his cat would have had a tasty, rather than a lethal, meal. ❖

NATIONAL LIBRARY OF MEDICINE

Public Health Service officer stands with three men holding shotguns in front of an automobile during a rabbit drive.

NATIONAL LIBRARY OF MEDICINE

The American Medical Association awarded this medal in 1928 to Dr. Edward Francis for his contributions to the knowledge of tularemia, later called Francis' Disease.