EPIC

The Magazine of the Georgia College of Emergency Physicians

FALL 2011

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Dr. Matthew Keadey, MD, FACEP

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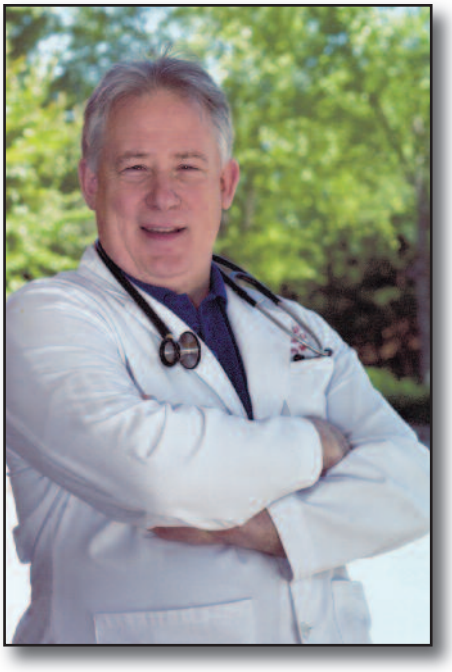

Stat Medical

Read the story on page 13

We welcome your comments or suggestions for future articles. Call or write at:

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From the President

Why Should I?

As I was signing out from my shift at work the other day, my oncoming partner started asking me about organized medicine, and the many facets it takes. And along with the questions about these subsections came a corollary, "why do we have to support all of these things?" And more specifically to the point, "why should we continue to support these things when so few others seems to do so?"

What he was referring to were the many organizations and political action committees (PACs) that our physician group contributes to every year. We have been supporters of the state PACs, both the GCEP PAC, GEMPAC, and the Medical Association of Georgia's GAMPAC. We have been contributors to the National ACEP NEMPAC. And now we are strongly supporting the Emergency Medicine Action Fund (EMAF). There does seem to be many overlapping organizations asking for money, and not just one "cover all" organization to represent our needs, or express our opinions.

I thought about the answers I was giving him, off the cuff, late at night, when I was caught off guard. "We have to support our own interests…" But how do we justify the need to raise monies to help the PAC? How does it affect me (the contributor) directly? I initially said, "if we don't do it, who will?" But maybe the questions were more "what is it exactly that we are doing?"

So let's take a look at that the places that we can send our hard earned dollars, and why we should care whether or not these organizations have funds to carry out their goals.

The PACs: Political Action Committees distribute contributions to candidates (legislators), to be used for their reelection campaigns. These funds are given in order to show support for the decisions that they make in regards to the polities that affect our specialty, or they are used to gain an audience with a legislator that may have a different view than ours, so that we can better educate them as to our point of view, and try to convince them to support our way of thinking.

• **NEMPAC** – This is the national PAC that represents Emergency Medicine Physicians, and the population that they serve. They are involved in lobbying for legislation at the national level, in Washington, DC. They are also monitoring the events and bills that are moving around the capitol. We need to know what is occurring in Washington, as the healthcare reform is occurring, so that when our ability to provide efficient, effective care is impeded, we can try to change the laws before they become permanent. And we also have a built in desire to be compensated for this care. SGR reform, Medicare, CHIP… all are federally regulated and funded sources of our income. We need to have ears, and a voice, when these items come up for discussion and changes are being made.

• **GEMPAC** – This is the same idea, but on the state level. This is where we have opportunities to impact the Medicaid discussions. Also, this is where tort reform occurred for our state in 2005. Insurance regulations, helmet laws, trauma care funding – when these agenda items are up for discussion and voting, GEMPAC has access to the legislators to make our voices heard, and our opinions known. These items affect the way we practice medicine on a day-to-day basis.

• **EMAF** – This is the new kid on the block. The PACs are geared at taking contributions from a pool of similarly interested individuals to the legislators as individuals, and convey their interests. The Emergency Medicine Action Fund, however, is an advocacy board that is comprised of organizations that interact with other organizations. It is run by a board of governors comprised of a mix of Emergency Medicine focused organizations, including ACEP, AACEM, AOCEP, EMRA, SAEM, CORD, and AAEM, in combination with

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the ten largest contributing groups of physicians (chapters, organizations or other alliances) to the fund for the fiscal year. The organizations that the EMAF will be working with include the Department of Health and Human Services, Department of Justice, American Hospital Association, National Quality Forum, and more.

So to simplify, the PACs distribute your individual contributions directly to the legislators, and the EMAF will use the funds that are contributed by physician coalitions to fund studies, retain consulting firms, and pay staffs that are needed to carry out the research and interactions to protect is in the midst of health care reform, and whatever else may present itself at a national level.

But why should each member feel compelled to support these programs? It really comes down to ownership in the specialty. As emergency providers, we all practice in a wide variety of settings, but yet are remarkably similar in the underlying forces that affect our practice environment. It is easy for us to become detached, and feel as though we practice in a bubble, and need to work in "survival mode," protecting our own backs, and possibly some "tribal allegiance," where we work together as a group to protect the local contract.

However, there are bigger forces out there, changing the shape of the landscape in which we practice. If we don't look beyond the walls of our own ED, we will not know why the rules are changing, and will only have the option of rolling over and complying with whatever the law-makers mandate. Or maybe some do have the sense that there is a larger environment that has some control over the reimbursement, malpractice, and other issues that affect the daily practice. But, "I am only one person, right?"

We need to understand that we do not practice in a vacuum, and that there are other people and organizations that have interests in the practice of medicine whose goals might not be aligned with ours. This includes insurance companies, trial lawyers, and government payers, among others. They all understand the importance of making sure the legislators "hear them," and the easiest way to get someone attention who is in public office, is to contribute to their campaign. We do not need to like this fact, but by ignoring it, or thinking that "someone else can worry about it," we do not help ourselves.

We, as emergency physicians, need to band together. We need to concentrate our efforts, and be sure that we are heard over the others out there with competing interests. Trial lawyers, for example, give exponentially more than the average physician to their PAC, and a quote from the TrialLawyersInc.com website states, "In the last political cycle, lawyers and law firms again led all industries in federal political giving, spending a staggering $182 million on federal campaigns alone—outspending the corporate health-care sector by more than 50 percent." These lawyers pool their PAC money, "and the litigation industry gives lavishly to buy the support of legislatures and judges."

As a specific, direct example of why, and how we should all consider donating to the PACs, let's look back at what tort reform has done in Georgia. I would hope that all of us practicing in Georgia more than seven years have seen and personally felt the impact that legislation has had on our malpractice premiums. We have had a leveling for some time, and finally a decrease in premiums from the carriers. We have also seen an increase in the number of carriers in Georgia. If we all take only 25% of the premium reductions we have felt, and reinvest it in the PAC to move forward, we will have not problem providing enough funds to make our voices heard locally, statewide, and nationally.

I know it has been said before, and the slogan still fits: "Give-A-Shift." Take one day, and dedicate your efforts to the PACs of our specialty. Donate, and help yourself!

From the President-Elect

State Legislature and Advocacy Initiatives

John J. Rogers, MD FACEP, President-Elect

As your new president-elect one of my duties is to take the lead on legislative and advocacy efforts. Fortunately Matt Watson and Rob Cox before him, each did an excellent job in paving the way. Matt Watson, Pascal Crosley, Rob Higgins and I recently met with our lobbyist and advisor, Tripp Martin and his assistant, Lindsey Thompson. We met at the offices of Georgia Link, a block away from the Capitol.

For the next session of the Legislature our priority issues are these:

1. Fight the proposed cuts in Medicaid reimbursement
2. Defend tort reform
3. Address the problem with psychiatric holds
4. Support MAG's efforts to
   - Establish a trauma system
   - Fully fund the 911 system
   - Fund a prescription monitoring system

Our Legislative Day is planned for January 31, 2012. Details on the program and speakers are forthcoming. Please make every effort to attend this important day of legislative advocacy.

We also encourage your participation in the Doctor of the Day program at the Capitol. GCEP usually takes an entire week during the legislative session, but that does not preclude you from being the Doctor of the Day at other times. MAG coordinates this program and registration for particular days usually begins later in the fall.

Additional information on our Legislative Day and the Doctor of the Day program will be distributed to members by email and in our next issue.

Did you know that our PAC, GEMPAC, is a leading medical PAC in the state? And legislators often seek our advice and input? Want to know how we compare? The amounts raised by different PACs during the 2010 election year cycle were:

- Georgia Society of Dermatologists - $8,250
- Georgia Orthopedic Society - $21,000
- Georgia Medical Eye PAC - $24,350
- ASC-GA PAC (Surgeons) - $30,400
- Georgia Emergency Medicine PAC – $40,000
- GAMPAC (MAG) - $127,700
- and the Trial Lawyers PAC...$244,800

We all benefit from our legislative activities and GEMPAC makes that possible. Although sometimes painful, it is important to contribute and support GEMPAC. Our goal this year is $100,000. With your help we can get there. Give to GEMPAC so GEMPAC can continue to help you!

Don't forget our GCEP Medical Forum on December 6th and 7th at the Ritz Carlton Lodge, Reynold's Plantation, Lake Oconee. It promises to be a great program again this year. Check with Tara Morrison for details, ed@gcep.org or 770-613-0932.

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Dr. Rogers is president-elect of GCEP.

Get to Know Your Board of Directors: Matthew Keadey, MD, FACEP

EPIC: Just to break the ice, tell me where you grew up?
MK: I consider Durham, North Carolina my hometown.

EPIC: Did you follow your parent's footsteps into medicine?
MK: No my parents were both accountants. Dad worked for Deloitte and Touche and then ran the tax office in Durham. Mom was a business manager for a company that imported Italian pottery and eventually became their VP and COO.

EPIC: So you get a break on Italian pottery I take it. Can't say I would have expected that to be a huge industry, but then again I shop at WalMart for the most fashionable pieces as recommended by experts such as Martha Stewart and Jacklyn Smith. Did any of your siblings take up the accounting and pottery career?
MK: Well my brother became a computer programmer for Allscripts. He ended up marrying the girlfriend he had since 8th grade.

EPIC: Yeah I had a girlfriend in 8th grade too. Saw her at our 40th high school reunion a couple of years ago. In a way she hasn't changed a bit…yep still hates me.

EPIC: So I guess you were on the accounting and pottery teams in high school?
MK: I guess what they say about you is true. You aren't all that funny and border on the psychotic. Actually I was quite athletic and was involved in football, wrestling and baseball my freshman year and then focused on wrestling. Was the captain of the wrestling team during my junior and senior year.

EPIC: Wrestling? You mean like Rick Flair and Hulk Hogan?
MK: No you idiot! I mean like real wrestling, the Olympic kind. I also did a lot of swimming and bike riding. Coached the AAU swimming team in the summer while in high school. I have kind of let the exercise thing lag for several years, but now have started biking and playing tennis again.

EPIC: Yeah I often get the urge to exercise. I've found if I wait a few minutes, the urge goes away. When I was younger I did a fair amount of competitive swimming and coached my college team my last year there. Of course anything involving running, manual dexterity or hand-eye coordination was not something I excelled in.
MK: Yeah you are kind of a clod.

EPIC: So how about college? Where did you go?
MK: Well after looking all over the country I decided to stay in Durham and went to Duke majoring in Biology.

EPIC: Reminds me of the day I spent with wifeypoo moving the furniture all over the place. After six hours of this torture she finally decided it looked best the way it was before we started. So did you wrestle at Duke too?
MK: That was my intention but a bad shoulder injury in high school made that impossible. I did get involved rowing crew though. It really was good exercise.

EPIC: Sounds like too much work to me. My preferred form of exercise now is thumb calisthenics on the remote. So in this family of accounting and business types, how in the world did you end up in medicine?
MK: Well my uncle was a family physician in Oregon and eventually took an academic position at University of Virginia. Not sure if he inspired me or not but he was an interesting guy. I guess medicine always just seemed like the right thing to do.

EPIC: Yeah I was convinced when I had to go to the hospital my first year of college with a broken nose. I decided I'd do anything to spend the day with cute nurses.
MK: So not only are you an idiot but a sexist bastard as well.

EPIC: Why thank you. No need to butter me up. So after Duke what happen?
MK: You are so un-cool it is ridiculous. Well, what hap-

pened was I went to Eastern Virginia Medical School in Norfolk. It focused on primary care and I initially thought I'd be a pediatrician.

EPIC: Can't stand the little rug rats personally but hey, that's just me. So how did you go from pediatrics to emergency medicine?
MK: My God, you say stuff like that and you are still alive? After realizing that my forte was not children, I considered surgery, internal medicine and emergency medicine. Eventually realized EM was the place to be and was part of the third residency class at the new program at the University of North Carolina at Chapel Hill.

EPIC: Chapel Hill is very pretty. Went there once to bail out a buddy of mine who was hitchhiking to Charleston so he could party properly with a bunch of sailors at a port bar. He got arrested for drunk driving in Chapel Hill. Never did understand how a hitchhiker gets arrested for DUI. So what happened after residency?
MK: Initially went to work in rural and smaller EDs in North Carolina. That was not exactly what I had in mind for my career, as I was always interested in research. I did pig and rat studies during residency on blood substitutes and traumatic injuries.

EPIC: Oh so you get off on torturing poor little animals, do you?
MK: I think I'd like to give you a traumatic injury.

EPIC: Oh like I haven't heard that before. You sound just like my old girlfriends. Including that one from 8th grade. So really why research?
MK: I just thought research was extremely interesting and was a way to contribute to the advancement of emergency care. Saw that Emory was looking for new faculty so on a whim I sent them my CV. They decided to take a chance on me and I've been there ever since.

EPIC: Kind of like the path your uncle followed, isn't it. So what kind of stuff you been doing at Emory?
MK: Well I started out doing similar research on traumatic brain injury and resuscitation. The when the Chief of the Emory Hospital ED decided to move on to another position, I became the Chief. Administration was never one of my goals but I have found it quite interesting and it is now the focus of my academic pursuits.

EPIC: I think your parent's experience in management and accounting is rubbing off on you. How has this changed you?
MK: I now understand why it is important to be involved in GCEP and organized medicine. I'm starting my third term on the board this year. Have been active with Medicare issues and EMTALA reviews within the state. Recently was selected for a prestigious training program in leadership called the Woodruff Leadership Academy.

EPIC: Woodruff? I think I've heard that name before. Tell me more.
MK: Well it is mainly for people at Emory and to help them understand business issues and techniques. It has gotten me interested in obtaining an MBA to further my knowledge of business and management.

EPIC: MBA? I'd rather have my head set on fire.
MK: Happy to help you with that. I've got matches.

EPIC: You never did tell me about your wife and family.
MK: Well you are kind of loose cannon so I was hoping to protect them. My wife is a nurse at Egleston and it is funny that she seems to spend more time taking care of other kids than ours. We have three wonderful children. Oldest is a junior at Lakeside High in Dekalb and she is active in running cross country. Our two younger boys are devoted to fighting with each other.

EPIC: Brotherly love. Brings tears to your eyes doesn't it? Favorite movie? You know psychologists have shown that your choice in movies reveals deep dark secrets about your personality.
MK: I'm guessing that since you suffer from a severe personality disorder you prefer such cinema classics such as Creature from the Black Lagoon and Godzilla.

EPIC: You psychic or something? No really what are your favorites.
MK: Without question the entire series of Star Wars. Even have posters of all six episodes in my office.

EPIC: Worst day in the ED?
MK: Had to tell a 16 year-old girl that her mother died. She was in the hospital at Egleston and getting ready to go home. She had ALL and had completed a month long

stay in the hospital. Her mother had been at her bedside the entire time. On the day of discharge her mother began to feel bad. When she came to the ED she looked at me and said, I think I'm going to die. She promptly arrested and we were unable to revive her. Later learned she had a large saddle embolus. Telling this girl who had no other family that her mother had just died was one of the most difficult things I have ever had to do.

EPIC: Hate it when they say stuff like that. Invariably they are always right. If you had not become a doctor you what would you have done? I'm still hoping for professional wrestler in the WWF.

MK: Nope. I would have gone to Alaska to work on a crab boat. Hard work but looks really cool on TV.

EPIC: Who sounds like an idiot now? Wifeypoo loves watching all that kind of stuff. You know programs like Ice Road Truckers, Ax Men, Swamp People and those fishing dudes. I just don't get it. I guess you'd want to be on the crab boat cause chicks really dig that kind of thing?

MK: I can't believe someone hasn't taken you out and made a greasy spot out of you by now.

EPIC: Well it has been a pleasure talking with you today. Hope you enjoyed yourself.

MK: Certainly was interesting. Has anyone ever shown you a sleeper hold?

House Bill 303: What it Means for You EM PAs

Natalie Schmitz, MMSc, PA-C and Jeff Chambers, PA-C, ATC

It is usually very difficult to pass a bill through legislation during a single General Assembly Session. However, this is exactly what happened with House Bill 303 which was passed into law and amends the Physician Assistant (PA) Act. The GAPA bill, sponsored by Representative Sharon Cooper, passed in April 2011. The changes instituted by this bill became effective July 1, 2011. With the passage of HB 303, come some important changes for PAs. More specifically there are two key points that will positively affect emergency medicine PAs and further increase PA utilization.

First, HB 303 changes the subsequent visit rule which stated that a patient seen more than twice a year by a PA must see the physician at least once in that period. Not only would this limit PA utilization but you can imagine the difficulties in trying to enforce this in a busy ED. With the new changes, policy states that when a patient receives medical treatment from a physician assistant, the supervising physician's involvement should be appropriate for the type of medical practice and the acuity of the patient's condition as deemed necessary by the supervising physician. The above changes delegate the degree of physician involvement based on what is best for the patient and the practice to the supervising physician.

The second important change made by the passage of HB 303, is the ability of the physician assistant to authenticate a variety of health-care related forms including 1013 forms. Other forms that physician assistants can now sign are pediatric immunization forms, workers comp forms, and school physicals to name a few. Additionally, where physician assistants were limited in being able to sign for and distribute pharmaceutical samples, this new bill gives more flexibility in this process. The ability or lack there of for signing for samples, likely does not affect emergency room providers comparatively to other practices but it is important to mention. To summarize, PAs can now sign all forms, except death certificates and assigning a percentage of disability rating, as long as it is within their authorized scope of practice.

Passing HB 303 was a substantial accomplishment for PAs and their supervising physicians in 2011 and we do thank GCEP for their support with this very important legislation. What is the next step in Georgia legislation for the coming year? Upcoming legislative agenda for Georgia PAs is a topic that has proven to be a controversial issue for many years; increasing physician assistant's ability to prescribe Schedule II medications. Currently, Georgia physician assistants are able to prescribe Schedule III medications without a physician signature but are unable to prescribe Schedule II meds.

As of now, 36 other states allow delegation of Schedule II prescribing by physician assistants. Once these privileges were enacted, no state has ever rescinded them. Furthermore, there has been no record of significantly increased liability or malpractice claims due to physician assistant prescribing of scheduled drugs. Many PAs have experienced impedance in caring for their patients when valuable time is taken away from patient care to find a physician to sign a Schedule II prescription. As Georgia's population both grows and ages, it is imperative that unnecessary barriers to care be eliminated to improve patient care.

You can download a copy of House Bill 303 at this web address:

http://www1.legis.ga.gov/legis/2011_12/pdf/hb303.pdf

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Natalie Schmitz is the president-elect of the Society of Emergency Medicine Physician Assistants

Jeff Chambers, PA-C, ATC

Jeff Chambers is the Legislative and Governmental Affairs chair, Georgia Association of Physician Assistants.

Research Update from Emory Emergency Medicine

Deb Houry, MD, MPH, Associate Professor

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Dr. Deb Houry is associate professor; vice chair for Research, Emergency Medicine; and director, Emory Center for Injury Control at Emory University. Dr. Houry is also president of SAEM.

EMORY UNIVERSITY SCHOOL OF MEDICINE

Our department of Emergency Medicine has had a tremendous year in research and we are currently the #1 National Institute of Health-funded emergency department in the nation. We also received SAEM approval for our research fellowship, making us one of 14 nationally recognized EM research fellowships. Our faculty research interests cover a wide spectrum including traumatic brain injury (TBI), public health issues, and ultrasound.

The Brain Lab led by Don Stein, PhD laid the groundwork for our multicenter clinical trial studying progesterone as a treatment for TBI. The lab is now moving in several exciting new directions including studying progesterone in the treatment of stroke. In addition, in collaboration with the Emory Institute for Drug Discovery they have identified a progesterone derivative compound that is far more soluble and more stable than progesterone. This new pro-drug will allow us to develop a progesterone field treatment that can be used by any EMT or combat corpsman to deliver treatment to injured patients as soon as possible. They have been invited by the Army Research and Development Command at Ft. Detrick to develop this as a far-forward field treatment and have just completed that proposal, which is now under review. Finally, the group is working with the Pediatric Emergency Care Network (PECARN) to develop progesterone as a treatment for severe TBI in kids. This work is now moving forward to develop the pre-clinical safety, dosing and duration of treatment data needed to obtain FDA approval for the 22-center clinical trial spearheaded by the Universities of Michigan and California, Davis.

Our Emergency Neurosciences research group led by David Wright continues to conduct exciting NIH-funded research at Emory/Grady and other participating partners. The EN is actively enrolling in three clinical trials; the ALIAS acute stroke trial, the POINT transient ischemic attack trial, and the ProTECT III, acute traumatic brain injury trial and has completed enrollment in the RAMPART trial. The EN remains the only Hub located in the southeastern U.S. for the NIH-funded Neurological Emergencies Treatment Trials (NETT) network, which has several exciting studies in the pipeline. Dave Wright is the PI of the ProTECT Phase III multicenter clinical trial, a study testing a very promising treatment for acute traumatic brain injury. ProTECT has been active since March 2010 and enrolled 267 subjects (goal is 1140/4 years) nationally as of June 2011. The EN is also exploring novel approaches to diagnosing hydrocephalus and mild traumatic brain injury.

The emergency ultrasound faculty have also been very productive in scholarship over the past year. Mikaela Chilstrom, the emergency ultrasound fellowship director, has published five articles covering an array of topics including a novel application to diagnose a pneumothorax. William Manson, the director of emergency ultrasound, published articles on sonographic B-Lines and metallic foreign body removal with ultrasound guidance. He is completing data collection for a grant-funded study entitled FLUID: Fast Lung Ultrasound in Dyspnea. Most recently, Emory was awarded a $564,237 subcontract of an AHRQ grant entitled STONE and Dr. Manson will be the site PI in this randomized controlled trial investigating outcomes in patients with renal colic.

Bijal Shah and Brittney Copeland have been successfully running our THRIVE program- an opt-out HIV screening program at Grady Memorial Hospital. To date they have tested over 10,000 patients for HIV and they found a 1.4% prevalence rate of undiagnosed HIV in this population. The majority of these patients were linked with care and two publications are forthcoming on this work. Jeremy Hess serves as the Senior Medical Advisor for the Climate and

Health Program at the CDC's National Center for Environmental Health. His work there has recently explored the public health effects of extreme events, including the possibility of cascading system failures (e.g. the likelihood of blackouts during an extreme heat event and failures of sewage treatment after extreme precipitation events), and strategies for reducing disaster exposure and susceptibility both domestically and abroad. His work on petroleum supply issues has explored the myriad ways in which petroleum is used to support both public health and health care delivery (petroleum is central to transport in the health care sector as well as to the manufacture of most medical plastics and many medications) and he recently published a paper on petroleum use by EMS systems.

Finally, we've had another extremely productive year for the Emory Center for Injury Control, one of 11 CDC funded Injury Control Research Centers. We've continued to have 50+ people at our quarterly meetings and great attendance at all of our brown bag lectures and other events. This spring we kicked off the season with a fantastic lecture from Dr. Jackson Katz, a leader in the field of gender violence prevention. Katz spoke about the bystander approach and his strategies to reach out to young men to help prevent men's violence against women. With media clips and discussion around the language used in our culture, Katz brought home the message of men taking responsibility for violence. In addition, Linda Degutis, the new director of the National Center for Injury Prevention and Control at the Centers for Disease Control and Prevention, spoke at our spring quarterly meeting about the NCIPC agenda and plans for the upcoming year. We also funded 5 pilot projects on a range of topics including drowning prevention in children, developing a city wide gang intervention, and screening athletes for concussions. We also funded 3 summer student scholarships to work on a variety of unintentional and intentional injury research projects. We published many of our center's research projects in the July 2011 special Emory Center for Injury Control issue of *Western Journal of Emergency Medicine*.

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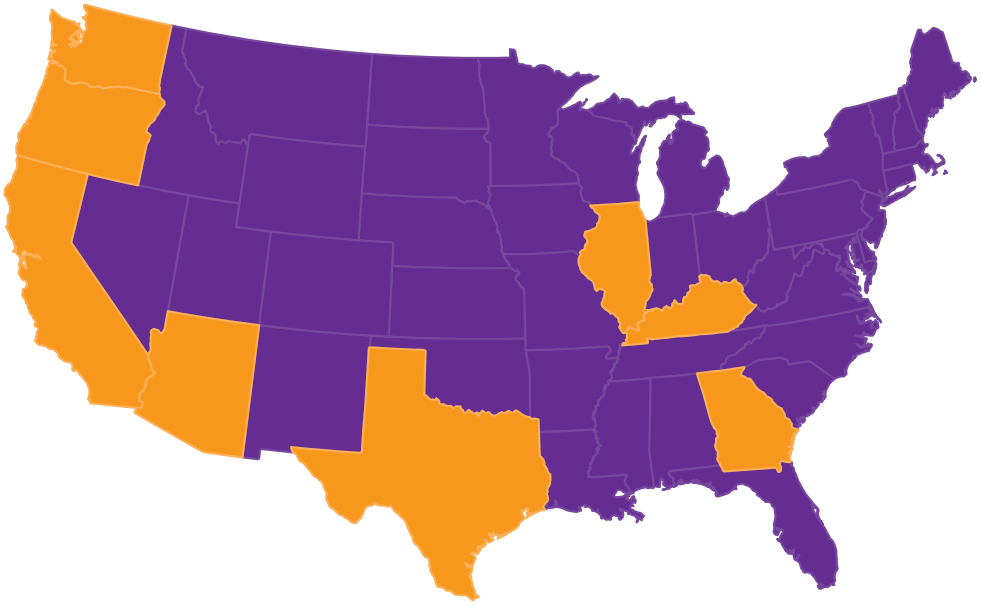

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Georgia Health Sciences University Emergency Medicine Residency Update

Stephen A. Shiver, MD, FACEP

July is always a busy time in graduate medical education. 2011 is no exception. We just graduated 10 seniors and welcomed 12 interns eager to begin their training. We are in the process of digesting and implementing a new set of ACGME Common Program Requirements, instituted July 1, 2011, which mandated significant changes to duty hour standards. And, last but certainly not least, we just had a regularly scheduled ACGME/RRC site visit.

Our last site visit was in 2004. Since that time, we have been part of a pilot project in which the frequency of visits is reduced. Despite the reduced site visits, the actual communication with the RRC has increased. As part of the pilot project, we have been providing the RRC with electronic reports on an annual basis. The recent site visit required a large amount of preparation. In the end, we produced a 108-page Program Information Form, a document outlining every perceivable residency detail and describing ACGME/RRC compliance measures. The site visit went well and we look forward to further communication with the RRC this Fall.

Change continues to be a major residency theme and this year we are focusing on didactics. All emergency medicine residencies are required to provide five hours of didactic time per week. The format, however, is left up to individual programs and up to one-hour of didactic time per week may be "asynchronous" in nature. Our lectures will now be held 8am-12noon on Wednesdays; the residents will make up the additional hour by participating in a number of other learning opportunities involving ultrasound, pediatric emergency medicine, etc. The addition of the asynchronous hour will empower residents and allow them to create a more individualized curriculum. Our residents are excited about the change and we believe that the program will continue to improve as the asynchronous 'menu' expands.

Our ED continues to become a busier place, which of course is advantageous for residency training. Over the last fiscal year, our volume eclipsed 80,000 for the first time. To deal with increased volume, our delivery system has changed significantly over recent years. We are now working in pods – two separate adult ED pods along with a pediatric ED pod. Additionally, we continue to manage and staff a nine-bed ED Observation Unit. Within the next several months, we will fully transition to an electronic medical record and initiate further remodeling efforts in the main ED.

We welcome any questions or comments you may have concerning our residency program. Our Program Coordinator, Courtney Sahm (formerly Courtney Buckner), may be reached at (706) 721-2613.

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Dr. Shiver is Associate Professor of Emergency Medicine and Residency Program Director at the Medical College of Georgia. Clinical and research interests include resident education, emergency ultrasound, airway, and trauma. In addition to his emergency medicine training, he completed a general surgery residency at Wake Forest University Baptist Medical Center and is board certified by the American Board of Surgery.

Georgia Health Sciences University
1828

Administration Fellowship Starts at Emory University School of Medicine!

Joel Moll, MD

Dr. Joel Moll is the director of Academic and Clnical Integration, chair of Emory Emergency Medicine Operations Group and assistant residency director.

Nicole Franks, MD

Dr. Nicole Franks is associate fellowship director and associate medical director at Emory University Hospital Midtown.

On July 1, 2011 the Department of Emergency Medicine at Emory University School of Medicine started a fellowship in Emergency Medicine Administration. This fellowship, which is one or two years in length, will provide education and experience in all aspects of emergency medicine administration. Fellows will be able to draw on the experience and knowledge of a broad depth of talent and perspectives of the Emergency Medicine Faculty. Fellows will also pursue an area of interest and develop expertise in a selected administrative topic in addition to the general curriculum. For those who elect a two-year fellowship, they will have the opportunity to pursue an advanced degree in administrative study from Emory or other graduate programs. Emory Emergency Medicine manages a variety of practice environments that include an urban safety net hospital (Grady Memorial), a tertiary care academic practice (Emory University Hospital), a hybrid academic and community practice (Emory University Hospital Midtown), a community hospital (Emory Johns Creek) and a VA hospital (Atlanta VA). This diverse practice environment will allow fellows critically important experience in EM administration with a goal of building a legacy of leadership in emergency medicine in Georgia and beyond.

The fellowship director is Joel Moll, MD who also serves as Director of Academic and Clinical Integration, Chair of Emory Emergency Medicine Operations Group, and Assistant Residency Director. Nicole Franks, MD serves as Associate Fellowship Director and Associate Medical Director at EUH Midtown.

The inaugural fellows are two outstanding and dedicated physicians who have strong ties to Georgia. Both were chief residents at Emory in Emergency Medicine. Introducing our fellows Stephanie Marshall and Constantine (Deno) Zaharis.

Stephanie graduated from University of Illinois in 2002. She then spent at year at the NIH doing biomedical research and participating in a health care disparities curriculum. Afterwards, she attended medical school at Emory where she also received her MPH in Epidemiology from the Rollins School of Public Health. She completed her residency at Emory serving as Chief Resident. She now practices at Emory University Hospital Midtown and Grady Memorial Hospital. She has an appointment as Clinical Instructor in Emergency Medicine at the Emory University School of Medicine. Considering her public health background and administrative duties as chief resident, she hopes to cultivate her interest in the external factors that affect the patient-physician interaction and the emergency department environment. She will spend this year studying quality and emergency department flow with a focus on how the standardization of patient care process affect care delivery and efficiency.

Stat Medical Care: A Freestanding Emergency Department

Some wait for the future to arrive and react to it. Whereas others like Dr. Jim Dugal, MD, FACEP see the future and use that vision to pro-actively plan and develop. Twenty years ago he anticipated the growth and need for free standing emergency departments and opened Stat Medical Care in Alpharetta. Make no mistake, it is not a "Doc in the Box" but capable of emergency care including cardiac arrest and trauma.

It has the same capability as many emergency departments in smaller and rural facilities and functions in the same capacity. Dr. Dugal and four other physicians at Stat Medical currently see over 12,000 patients a year, more than many emergency departments. It provides the initial emergent stabilization and then to transfer to a higher level of care. Stat Medical exists not to replace traditional emergency departments, but to augment and supplement them. And in that niche, it excels.

But there is more to Stat Medical Care. It provides services typical of an urgent care and private office as well. On site you will find services such as physical therapy, massage therapy, an esthetician, occupational medicine, workman's comp services as well as a minor surgery suite.

On the walls of the waiting room you will find many autographed photos of professional athletes including some from the Atlanta Braves and Falcons as well as a few famous entertainers who have made Georgia their home. They have found their medical home at Stat Medical because of the quality of care, easy access and broad range of services.

And like its academic counterparts, education is also a mission for Stat Medical. It is affiliated with Gwinnett Technical College and provides much of the paramedic training for them. This includes both practical, clinical experience but the didactic lectures as well. Dr. Dugal also serves as a Board Examiner for Paramedics.

Stat Medical Care is located at 9690 Vantana Way in Alpharetta.

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Dr. Dugal is medical director of Stat Medical Care in Alpharetta, GA.

Blogosphere

Each month we plan to bring you information about a website or blog that you may find of interest. This month we shall feature, the NUMBER NEEDED TO TREAT that can be found at www.theNNT.com. This is the brainchild of Dr. David Newman who serves as its senior editor. The other members of his team in New York are Dr. Jarone Lee, Dr. Joshua Quaas and Dr. Graham Walker all from St. Luke's Roosevelt, and Dr. Koustave Mukherjee from Bronx-Lebanon Hospital, and Dr. Ashley Shreves from Mt Sinai Hospital.

Dr. David Newman, MD, FACEP is an Emergency Physician and Director of Clinical Research at Mt. Sinai School of Medicine. He is a Major in the US Army Reserve and served a tour of duty with the 344th combat support hospital in Baghdad, where he received an Army Commendation medal. Dr. Newman teaches at Columbia University and at Mt. Sinai Hospital.

In simplest terms, the NNT is a tool to communicate benefit and harm that both patients and doctors can understand. In order to compare treatments to each other fairly, the NNT summarizes the treatment's effect. The basic question is, how many patients need to be treated to help just one of them? The NNT is an attempt to objectively figure out what definitely helps patients and what definitely hurts them and what we are still not sure about.

They have looked at treatments such as: Heparin for ACS, packing after I&D of abscesses, activated protein C for sepsis, octreotide for variceal bleeding, antivirals or steroids for Bell's palsy, antibiotics for hand lacerations, thrombolytics for stroke, and a myriad of others.

We think you will find this website quite helpful and encourage you to visit it. Please give www.thennt.com a try.

FEATURE

Nikolsky's Sign: A Clinical Finding in Review

Ellana Stinson, MD and Larry Mellick, MD, MS, FAAP, FACEP

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The Nikolsky sign was first described in 1896 by Dr. Pyotr Vasilyewich Nikolsky, a Russian dermatologist at the University of Kiev. In that first report he described skin lesions in patients with pemphigus. Dr. Nikolsky's article described a weakening of the corneal and granular layers seen with various skin disorders. Subsequently, the Nikolsky's sign has become a clinical finding used to differentiate bullous skin lesions and to determine prognosis. A positive sign is elicited by applying pressure to the affected skin (e.g. where a blister is located), perilesional skin, or normal skin in patients with suspected pemphigus. With the application of pressure extension of the blister and/or removal of epidermis in the area immediately surrounding the blister occurs.[1]

Nikolsky's sign was first described with skin surfaces, but has also been reported on mucous membranes of various tissues (i.e. oral, genital, ocular). Nikolsky's sign is most commonly seen in a group of diseases that are classified as pemphigoid disorders and often in autoimmune conditions that result in dermatologic changes. Four of the most common skin disorders most likely to occur in an emergency department setting include staphylococcal scalded skin syndrome, Stevens Johnson Syndrome, toxic epidermal necrolysis and pemphigoid vulgaris. (Table 1) We present cases of each of these conditions and discuss the associated unique features.

CASE 1: A 5-year-old male presented to the emergency department with rash for 1-2 days. His mother denied oral lesions, fever, recent illness, nausea, vomiting or diarrhea. Despite a decreased appetite the patient was tolerating oral intake. The lesions began on the right ear and left lateral neck and two blister-like lesions were noted on the nose one day prior. His past medical history was significant for a premature birth at 27 weeks gestation and a brief stay in the neonatal intensive care unit. The patient was otherwise healthy. Immunizations were up to date and there were no known drug allergies. The patient had been seen by his pediatrician the day before his visit to the emergency department. His private physician prescribed cephalexin, started a work up for Kawasaki's disease and advised follow up if the rash worsened. On presentation the patient was afebrile and his other vital signs were within normal limits. Fluid filled bullae with surrounding erythema were noted on the right ear, left lateral neck, chest with apparent extension to the trunk and abdomen. (Figure 1) The lesions were tender to palpation. His remaining physical exam was significant for facial edema, purulent conjunctivitis, lymphadenopathy and evidence that the rash was spreading to his upper extremities. No mucosal membrane involvement was noted. The patient was diagnosed with staphylococcal scalded skin syndrome and started on clindamycin 150 mg every six hours. He was admitted to the Children's Medical Center for continued intravenous antibiotics and intravenous hydration.

Table 1: Conditions with a Positive Nikolsky Sign[1]

- Toxic Epidermal necrolysis
- Staphylococcal scalded skin syndrome
- Bullous impetigo
- Epidermolysis bullosa
- Mycosis fungoides
- Bullous lichen planus
- Benign mucous membrane pemphigoid

DISCUSSION: Staphylococcal Scalded Skin Syndrome (SSSS), also known as Ritter disease, is usually seen in infants and children under the age of five with the clinical presentation of fever, sore throat, malaise, conjunctivitis and painful bullae. Bullae are typically found on flexor surfaces and appear within 48 hours of onset of symptoms. SSSS is caused by epidermolytic toxins produced by staphylococcus aureus that result in dissolution of keratinocyte attachments. This dissolution results in a positive Nikolsky's sign, leaving a moist erythematous base giving a scalded skin

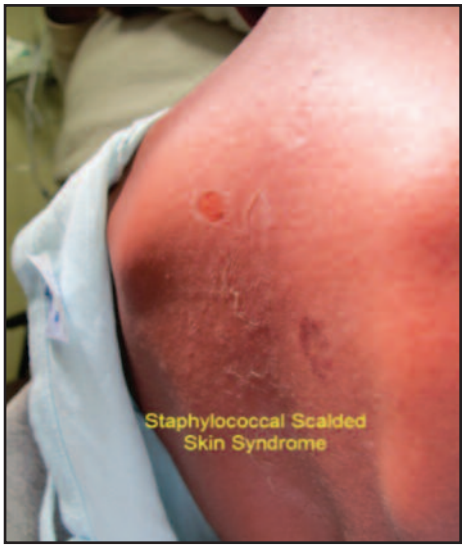

Figure 1: Staphyloccoccal Scalded Skin Syndrome

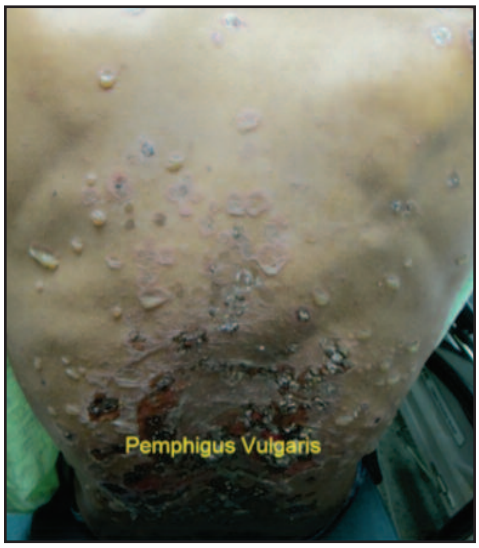

Figure 2: Pemphigus Vulgaris

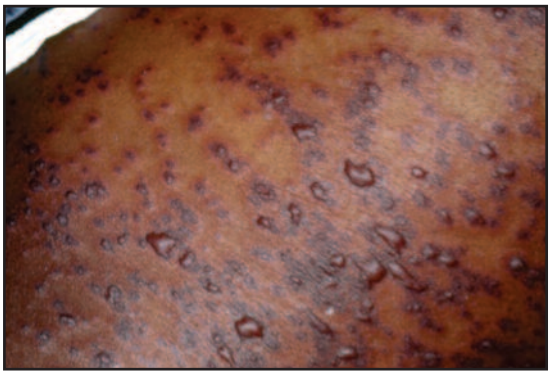

Figure 3: Toxic Epidermal Necrolysis (TEN)[14]

appearance. The lesions are typically tender, erythematous, and characterized by desquamation or bullae formation.[2] Mucus membranes are spared, but exudates and crusting are found periorally along with large radial fissures. Treatment primarily entails intravenous anti-staphylococcal antibiotics. It is recommended that any formed blisters remain unroofed. All eroded lesions should be covered with petroleum impregnated gauze to prevent trauma and co-infection. Corticosteroids are contraindicated as they may worsen the condition. Temperature and fluid status should be regulated due to insensible fluid losses and special care should be given to skin care, pain control, and nutrition. The mortality rate is approximately 4% in children and greater than 60% in adults.[2] Prompt diagnosis and early treatment are essential to a good outcome. Prevention has been targeted towards improved hygiene.

CASE 2: A 55-year-old male initially presented to the emergency department with bullous lesions on his left upper extremity, chest and back two days after sustaining a left upper extremity gunshot wound. He was evaluated in the emergency department and discharged with the diagnosis of bullous dermatitis. The patient was treated for 14 days with ciprofloxacin and trimethoprim-sulfamethoxazole. At that visit, his only complaint was mild pruritis. He denied fever, nausea, vomiting, sore throat or pain. Eleven days later he returned to the emergency department with worsening of his rash. The rash had spread to his back and lower extremities bilaterally. The pruritis complaint continued and patient received no relief from prior treatment. On his second presentation, the patient was noted to be mildly tachycardic and a positive Nikolsky's sign was noted. (Figure 2) No lesions were noted on his genitals or oral mucosa. The patient was discharged home with prednisone, mycophenolate mofetil (CellCept®), doxepin and given a follow up appointment with dermatology.

DISCUSSION: Pemphigoid Vulgaris (PV) is one of the four variants of the pemphigus skin diseases. PV is a chronic autoimmune bullous forming condition that is potentially fatal and is characterized by intraepidermal split above the basal keratinocytes.[3] Autoantibodies (anti-Dsg3 and anti-Dsg1) form, usually IgG, and interfere with the cell adhesion property called desmoglein (DsG). It occurs more commonly in middle-aged and older persons. Besides the elderly, it has a higher predilection for women and those of Ashkenazi Jews and Mediterranean decent. Sixty percent of patients initially present with oral lesions characterized as painful flaccid bullae that easily denude.[5-7] Bullous lesions are superficial and range in size from 1 to 10 cm in diameter. The lesions usually appear initially on the mucus membranes; and it is not uncommon for patients to go undiagnosed on average for seven months until skin lesions appear. The diagnosis of pemphigus vulgaris requires a skin biopsy. Since the introduction of topical corticosteroids mortality rate has decreased significantly from 100 percent to essentially a rare occurrence. With the combination of steroids and immunosuppressive medications, the mortality rate is now approximately five percent.[8] Ten percent of patients achieve complete remission after initial treatment and do not need continued drug therapy. The majority of patients, however, require maintenance therapy.[8] The mortality rate does increase, however, when corticosteroids are used chronically. Secondary

infection, most commonly due to staphylococcus aureus, is the most common cause of death in pemphigus vulgaris patients.

Case 3: A 55-year-old African American male with chronic kidney disease, stage V, gout, hyperlipidemia, anemia and hypertension presented to the emergency department with "tiny bumps" scattered diffusely over his body. He had started allopurinol three months prior. He was initially seen by a family practice physician and then referred to the emergency department for steroid therapy for a suspected hypersensitivity reaction. Because of worsening renal failure he was admitted to the hospital. An extensive hepatic and renal work up were performed as well as a skin biopsy that was considered non diagnostic. On the second day of hospitalization the patient was sent to interventional radiology for the placement of a dialysis catheter. When the nurse in interventional radiology removed his chest electrodes to prepare the skin for a right internal jugular catheter, a 4-5 cm section of the patient's skin peeled off. During the procedure his skin was noted to slough with light contact and any attempts to place adhesive dressing at the catheter insertion site resulted in additional skin sloughing. The following day the patient was transferred to a burn center.

DISCUSSION: Toxic Epidermal Necrolysis (TEN)/ Steven-Johnson Syndrome (SJS) are reactions triggered primarily by drug exposure. (Figure 3) The two skin disorders are differentiated solely by severity and percentage of body surface affected. SJS is triggered by infections as well as drug administration. SJS symptoms include fever, malaise and painful skin lesions described as well demarcated purpuric macules and plaques. Skin bullae develop within 48 hours of symptoms and typically cover less than 10% of total body surface; mucus membranes are affected in 92-100% of patients.[3] SJS has been reported to be less severe than TEN. Toxic epidermal necrolysis, often referred to as Lyell's syndrome, is characterized by full thickness epidermal cell necrosis and basal layer vacuolar degeneration which leads to a dermo-epidermal split.[1] The presentation is similar to staphylococcal scalded skin syndrome and the associated malaise and fevers are typically higher than what is seen in SJS. Skin involvement initially appears as erythematous lesions that are not very well demarcated and are painful out of proportion with physical exam prior to eruption of bullae. Lesions are almost always drug induced and involve more than 30% of total body surface. Mucosal membrane involvement has been identified in more than 90% of cases.[12] Risk factors include HIV infection, genetic factors, concomitant viral infections, and underlying immunologic diseases. Diagnosis of either TEN or SJS is solely clinical, as there are currently no set diagnostic criteria. Because of the overlap of the two disease entities, there has been described an SJS/TEN overlap syndrome and clinicians must maintain a high suspicion based on presentation and clinical findings. Cultures and skin biopsies are recommended to rule out other differential diagnosis considerations. Symptoms usually occur within 2-4 weeks after drug exposure. Anticonvulsants, especially carbamazepine, were the most frequently cited drug, followed by antibiotics and NSAIDs.[13] Anemia, neutropenia, and mild elevation in serum aminotransferase levels are common lab abnormalities. The severity of neutropenia can be used as a prognostic factor. Treatment is mostly supportive in addition to removal of the offending agent. Patients are often placed in burn units to provide appropriate wound care, fluid replacement, and nutritional support. Antibiotics should be used if an infectious source is present. Controversy remains over the use of corticosteroids and immunosuppressants. Some studies, however, suggest that high-dose corticosteroids may be effective in SJS. Other studies suggest that intravenous immunoglobulin is useful in TEN and SJS/TEN overlap syndrome.[13] Recovery of affected skin may take 2-3 weeks.

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Treatment of Headaches in the ED With Lower Cervical Intramuscular Bupivacaine Injections: A 1-Year Retrospective Review of 417 Patients

Larry B. Mellick, MD; S. Timothy McIlrath, MD; Gary A. Mellick, DO

Objective

The primary objective of this retrospective chart review is to describe one year's experience of an academic emergency department (ED) in treating a wide spectrum of headache classifications with intramuscular injections of 0.5% bupivacaine bilateral to the spinous process of the lower cervical vertebrae.

Background

Headache is a common reason that patients present to an ED. While there are a number of effective therapeutic interventions available for the management of headache pain, there clearly remains a need for other treatment options. The intramuscular injection of 1.5 mL of 0.5% bupivacaine bilateral to the sixth or seventh cervical vertebrae has been used to treat headache pain in our facility since July 2002. The clinical setting for the study was an academic ED with an annual volume of over 75,000 patients.

Methods

We performed a retrospective review of over 2,805 ED patients with the discharge diagnosis of headache and over 771 patients who were coded as having had an anesthetic injection between June 30, 2003 and July 1, 2004. All adult patients who had undergone paraspinous intramuscular injection with bupivacaine for the treatment of their headache were gleaned from these two larger databases and were included in this retrospective chart review. A systematic review of the medical records was accomplished for these patients.

Results

Lower cervical paraspinous intramuscular injections with bupivacainewere performed in 417 patients.

Complete headache relief occurred in 271 (65.1%) and partial headache relief in 85 patients (20.4%). No significant relief was reported in 57 patients (13.7%) and headache worsening was described in 4 patients (1%). Overall a therapeutic response was reported in 356 of 417 patients (85.4%). Headache relief was typically rapid with many patients reporting complete headache relief in 5 to 10 minutes. Associated signs and symptoms such as nausea, vomiting, photophobia, phonophobia, and allodynia were also commonly relieved.

Conclusion

Our observations suggest that the intramuscular injection of small amounts of 0.5% bupivacaine bilateral to the sixth or seventh cervical spinous process appears to be an effective therapeutic intervention for the treatment of headache pain in the outpatient setting.

Key words: allodynia, bupivacaine, cervical, headache, injection, intramuscular, migraine, pain, paraspinous, trigeminocervical (Headache 2006;46:1441-1449)

Headache is a common chief complaint of patients who present to an emergency department (ED).[1] Many patients access theEDas a last resort after other therapeutic resources and interventions have failed to provide headache relief. The therapeutic interventions currently used in the ED setting often involve medications that require the placement of intravenous lines, have side effects such as cognitive impairment, extrapyramidal reactions, or may enable opiate dependency.[2-4]

It was first recognized in 1996 and initially reported in 2003 that bilateral lower cervical paraspinous intramuscular injections with bupivacaine appear to

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For CME, visit http://www.headachejournal.org

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consistently relieve a spectrum of International Headache Society (IHS) classification headaches as well as orofacial pain.[5,6] In July 2002 the procedure was introduced into our ED practice as a therapeutic option for headache pain. Subsequent clinical experience with this procedure suggested that a majority of ED patients with headache pain experienced a therapeutic response and typically reported relief of associated signs and symptoms including allodynia.[7]

In this paper, we describe a large retrospective case series of all headache patients treated during a 1-year period in an academic ED with bilateral lower cervical paraspinous injections with bupivacaine. This retrospective review was approved by the Medical College of Georgia human assurance committee.

METHODS

All patients 18 years of age or older who presented to the ED between June 30, 2003 and July 1, 2004, had a diagnosis of headache and underwent treatment with intramuscular injections of bupivacaine to the lower cervical paraspinous muscles were included in this study. The patients were obtained by meticulous review of two databases. A database of 2,805 patients who had a discharge diagnosis of headache were reviewed for patients who had been treated with bupivacaine injections as was a second database of 771 patients who were coded as having had an anesthetic injection. Two research assistants reviewed every chart to determine whether or not the procedure had been performed during treatment for headache pain.

A total of three chart reviewers participated in data extraction. Data extraction rules were developed and served as the foundation for data extraction training. Definitions of headache relief, partial headache relief, and no significant relief were also established. (See Table 1.) A data extraction form was developed using Microsoft Office Excel. An initial testing of inter-rater reliability (IRR) was performed using approximately 20 patient charts. A second testing of IRR was performed following completion of data extraction.

Compliance with Health InsurancePortability and Accountability Act (HIPAA) regulations included password protected databases, obscuring of patient identifying information and locked storage with eventual destruction of chart copies used in the review.

The lower cervical injection procedure is accomplished using the following technique. After preparation of a sterile field by swabbing with an antiseptic solution over the lower cervical and upper thoracic dorsal spine, 1.5 mL of 0.5% bupivacaine HCl is injected into each location using a 1.5-inch 25-gauge needle. The needle is inserted 1 to 1.5 inches into the paraspinous musculature 2 to 3 cm bilateral to the spinous process of the sixth or seventh cervical vertebrae.

(See Figs. 1 and 2.) The bupivacaine is injected slowly to minimize patient discomfort. The selected volume of

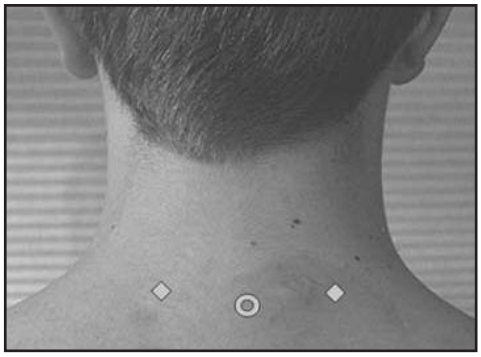

Fig 1.—The lower cervical injections are performed in the paraspinous muscles bilateral to the C6 or C7 spinous process. The injections are performed at a distance of approximately 2 to 3 cm from the spinous process.

Table 1.—Therapeutic Response Definitions

I. Headache relief
- A. Complete headache resolution documented (0/10 numerical descriptor scale, "Headache Resolved," "Headache Relieved," and "Headache Gone")
- B. Headache relief documented (1-2/10 numerical descriptor scale) and no rescue medications required prior to discharge
- C. Headache relief reported by patient ("feeling better," "improvement," and "good relief") and no rescue medications required prior to discharge

II. Partial headache relief
- A. Reduction in pain documented by numerical descriptor scale and headache pain not reduced below 3/10 following treatment (with or without rescue medications administration prior to discharge)
- B. Reduction in headache topography documented, but an area of residual headache reported and residual pain not below 3/10 on numerical descriptor scale documented (with or without rescue medications administration prior to discharge)
- C. Reduction in headache topography and/or clinical improvement documented, but rescue medications required prior to discharge

III. No headache relief
- A. Patient relates no significant headache relief with bupivacaine injection
- B. No improvement documented in record and rescue medications required

IV. Headache pain worsened
- A. Headache pain reported as intensified or worsened following injection

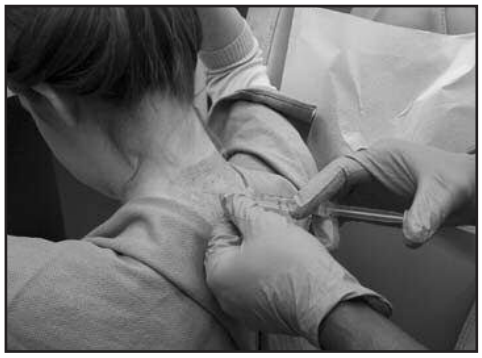

Fig 2.—A 1.5-inch, 25-gauge needle attached to 3 mL syringe filled with 0.5% bupivacaine is placed into paraspinous muscle at an angle parallel to the examination table.

1.5 mL of bupivacaine is based on physician preference and the entire amount is completely deposited in a single injection location. As with any injection procedure careful identification of anatomical landmarks, aspiration before injection and appropriate precautions are taken to manage potential vasodepressor syncope. Since the therapeutic response to the injection is typically unambiguous, alternative headache therapies are generally initiated within 20 to 30 minutes if the patient's pain relief is reported as inadequate or incomplete.

RESULTS

IRR testing of the three physicians who performed data extraction was completed twice during the study period. IRRtesting was performed before formal chart review began and again at the completion of the study.

The software used was STATA version 9.0 and the Kappa routine for multiple raters was used for the calculations. For each dimension, Cohen's Kappa was calculated for the three raters for each outcome and overall outcomes combined. Eight dimensions were tested during the initialIRRtesting and seven were evaluated during the second session. The initial IRR testing demonstrated an averaged Kappa of .7215 with the lowest Kappa being .4450 and the highest 1.0000. The averaged Kappa of the final IRR testing was .8267. The lowest Kappa score of the final IRR testing was .6227 and the highest was .9371.

Four hundred, twenty-five patients 18 years of age or older underwent bilateral lower cervical paraspinous intramuscular injections with 0.5% bupivacaine as part of their headache pain management. Eight patients were excluded because of incomplete documentation of essential information. The charts of 417 patient visits were available for review. A total of 27 different attending physicians or physician assistants were documented as either performing or supervising the procedure. Headache relief following the injection was reported in 271 patients (65.1%) while 85 patients (20.4%) experienced partial relief. Fifty-seven patients (13.7%) experienced no relief and 4 patients (1%) reported worsening of their headache. Overall, a therapeutic response to the bupivacaine injections was reported in 356 patients (85.4%). (See Table 2.)

The first author was the attending physician of record for 197 or 47.2% of the injections. Headache relief was documented in 142 or 72.1% of this cohort of patients.When the relief and partial relief categories (40 patients) are combined, 92.4% of the first author's patients demonstrated headache improvement. Other attending physicians and a physician assistant who performed the procedure independently and relatively frequently demonstrated similar results. The physician assistant treated 28 patients during the study period and had 24 patients (85.7%) who experienced headache relief and when combined with those who had a partial response (as defined in Table 1), 89.3% of the physician assistant's patients reported a therapeutic response. The three physicians who treated 26, 22, and 18 patients during the study period had headache relief in 61.5%, 59.1% and 83.3% of their patients, respectively. A therapeutic response (relief or partial relief) was documented in 80.7%, 90.9%, and 94.4% of their patients.

Supplemental bupivacaine injections were performed on 37 patients. These injections were typically performed on patients with an incomplete and often unilateral therapeutic response to the first set of injections. Twenty-two patients or 59.5% of the 37 patients who received a supplemental injection (usually unilateral) experienced headache relief. The first author was the attending of record for 27 of the 37 patients receiving a supplemental injection.

The reported side effects of the injection were few and included muscle soreness at the injection site, transient weakness of posterior neck muscles, relief of associated neck pain, and brightening of vision.

Table 2.—Total Number of Patients and Percentages for Each Headache Relief Category

Definition	Patient Numbers	Percent
Headache relief	271	65.1
Partial headache relief	85	20.4
No headache relief	57	13.7
Headache worsened	4	1.0
Total treated	417	100
Total therapeutic response	356	85.4

COMMENTS

The severity and therapeutic complexity of headache complaints presenting to an ED may be potentially greater than other clinical settings.[8] Many patients presenting to theEDwith headaches have failed to respond to other standard therapies or the headache severity and duration has become intolerable.[8] Central sensitization and allodynia develop over time;[9-11] and at least for the migraine-specific class of drugs, the triptans, it has been shown that treatment failures are more likely when treatment is started in the late headache phase.[12-14]

The headache relief observed with the lower cervical bilateral paraspinous bupivacaine injection appears similar to other treatment modalities studied in the ED setting. In one ED study comparing intravenous prochlorperazine against intravenous metoclopramide and placebo clinical success occurred more commonly after treatment with prochlorperazine (82%) than after metoclopramide (46%) or placebo (29%).15 The metoclopramide and placebo scores reportedly did not differ statistically. Clinically important successful treatment was defined in this report as achievement of patient satisfaction and either a decrease of 50% or more in the 30-minute pain score (compared with the initial score) or an absolute pain score of 2.5 cm or less using a 10-cm nonhatched visual analog scale. A study by Jones et al reported that 60 minutes after intravenous injection 74% (31/42) of those who received prochlorperazine had complete relief and 14% (6/42) of the patients had partial relief. Overall, there was complete or partial relief of pain in 88% (37/42) of the drug group and in 45% (18/40) of the placebo group.[16] Ginder et al studied intravenous magnesium and intravenous prochlorperazine.[17] This study enrolled 36 similar patients. Complete or partial pain relief was reported in 90% of the prochlorperazine group and 56% of theMgSO4 group. None of the prochlorperazine patients required additional medication during the study period. A study by Tek et al attempted to determine the effectiveness of IV metoclopramide against placebo. Analysis of the data showed that 67% of the metoclopramide group obtained sufficient relief to allow discharge from the ED without further treatment compared with 19% for the placebo group.[18] An ED headache study by Friedman et al compared 20 mg of IV metoclopramide (given up to 4 times over 2 hours as needed for persistent headache) with 6 mg of subcutaneous (SC) sumatriptan. On an 11-point pain scale the change in pain intensity by two hours for the metoclopramide group was 7.2 compared with 6.3 for the sumatriptan group. At two hours, painfree rates were 59% in the metoclopramide arm and 35% in the sumatriptan arm.[19] A meta-analysis of randomized controlled trials summarized that even though metoclopramide was better than placebo, three studies suggested that it may provide less relief from pain and nausea than other phenothiazine antiemetics(prochlorperazine and chlorpromazine).[20] In another study comparing the efficacy of SC sumatriptan injection versus placebo for acute migraine headaches, ED patients were randomized to receive 6mg sumatriptan SC or placebo. One hundred thirty-six patients were enrolled in this study. Seventy percent of patients in the sumatriptan group versus 35% in the placebo group reported mild or no pain at discharge.[21] A systematic review of the literature for dihydroergotamine (DHE) in the management of acute migraine headache concluded that in three studies results failed to demonstrate a significant benefit of DHE over sumatriptan and phenothiazines. In eight combination treatment studies, DHE administered with an antiemetic was reported to be as effective as or more effective than meperidine (MEP), valproate, or ketorolac across all pain, nausea, and relapse outcomes.[22] DHE was compared with 1.5 mg/kg of MEP in a prospective, double-blind randomized study by Carleton et al in 1998. Reduction of headache pain as measured on a 100-mm visual analog scale was 41 ± 33 mm (53.5% reduction) for the DHE group, and 45 ± 30 mm (55.7% reduction) for the MEP group at 60 minutes after treatment. DHE and MEP were considered comparable therapies for acute migraine.[23] In general, there is consensus that MEP is less effective and opioids less desirable than other available agents.[2,24]

It is unclear to the authors if the deep intramuscular injection used in this series should be considered a nerve block of the lower cervical dorsal roots or if its effect is mediated through the sensory dermatome of that level. It is also not clear if it shares a similar mechanism of action to other reported blocks. Nevertheless, headaches have been treated with peripheral nerve blocks for decades and[25] greater occipital nerve blocks, facet blocks, third occipital nerve blocks, sympathetic nerve blockade for cluster headaches and the lower cervical injection described in this paper all place anesthetic deep into tissues on the back of the neck. And, in multiple small case series evidence of headache relief greater than what can be attributed to a placebo effect alone have been reported.[26-31] There may even be shared antinociceptive mechanisms with botulinum toxin, type A. Investigation of the antinociceptive effects of botulinum toxin, type A (BoNT/A) indicates that BoNT/A inhibits peripheral sensitization thereby resulting in a reduction of central sensitization.[32] While the technique and evidence of anatomical specificity for other blocks is convincing, perhaps it is possible that all blocks and this lower cervical intramuscular injection share a common mechanism of headache relief.

The mechanism of headache relief following lower cervical paraspinous bupivacaine injections is unknown.

Relief of headache pain and associated signs and symptoms including allodynia suggest that the sensitized trigeminocervical complex has been calmed. Many other medications that effectively relieve headaches appear to work through an effect on the trigeminocervical complex and cell activity of second order neurons is reduced.[33-36] Convergence of cervical and trigeminal afferents to the brainstem has been well established with different lines of evidence.[37-41] In addition, descending inhibitory projections from brainstem structures such as the periaqueductal gray (PAG), nucleus raphe magnus, and the rostroventral medulla synapse the trigeminocervical complex and have a profound antinociceptive effect.[41,42] Central antinociception pathways may also play a role in the observed pain control.

There are other reports of anesthetic blocks to the neck and head that have similarities to this retrospective review. Brofeldt and Panacek reported a case series of patients responsive to pericranial injection therapy for the treatment of headaches resistant to standard pharmacologic therapy.[43] Their injections focused on the suboccipital and anterior temporal areas. Focal areas where palpation augmented the headache symptoms were selected as injection locations. Their anesthetic was injected in a fanning motion through the areas of maximal tenderness. Brofeldt and Panacek's local anesthetic injections also resolved headache pain, photophobia, blurred vision, nausea, and vomiting. The authors hypothesized that the resolution of symptoms was due to interrupting nociceptive signals originating in the temporal and suboccipital areas. Hecht et al used occipital nerve blocks to relieve postconcussive headaches in a small series of patients.[44] Caputi et al reported positive results with greater occipital nerve and supraorbital nerve blocks in patients with migraine headaches.[45] These authors postulated that presumed foci of nociceptor discharges were blocked and normal central neuron sensitivity was reestablished. Another study by Ashkenazi and Young reported 17 of 19 patients (89.5%) whose headaches responded within 20 minutes to greater occipital nerve blocks (GONB) and trigger point injections. Allodynia reduction was also measured and documented.The authors attributed the headache relief to theGONBeffect on sensitized neurons in the trigeminocervical complex.[46]

LIMITATIONS

This study has a number of potential limitations. The nonvalidated criteria for documented pain relief were developed because a unique tool was needed to define pain relief in this retrospective review (Table 1). We attempted to accurately define pain relief consistent with clinical experience and match as closely as possible pain relief definitions found in prospective studies. The numerical descriptor scale was a predominant component of our pain relief documentation and has been previously validated in the ED setting.[47]

In contrast to many prospective pharmaceutical studies that documented pain relief at two hours, the clinical practice in our ED was to initiate rescue therapies if the injection had not sufficiently relieved the patient's headache within 20 to 30 minutes. By two hours following therapy, the patients in this study were either discharged or had been treated with one or more rescue medications. Consequently, the actual number of patients experiencing relief following the procedure may have been underestimated.

A percentage of the reported headache relief responses were undoubtedly related to a placebo effect. As a retrospective review, the placebo effect was not measured in this study. While the recognized placebo effect of headache pain management is significant, the observed response is much greater than placebo effects reported in a headache placebo study. A metaanalysis of 22 trials was performed to determine the comparative placebo effect of SC versus oral administration in the treatment of migraine.[48] For the oral regimen, 25.7% of the participants reported no or mild headache severity after two hours compared to 32.4% of those receiving SC placebo.[48] Similar placebo effects are reported in multiple pharmaceutical trials. In this review, 65.1% of our patients experienced headache relief and another 20.4% experienced partial relief.

Because the setting of the study was a teaching hospital ED, many of the lower cervical injections were performed by rotating physicians recently trained in the procedure. It is probable that procedural skill varied even though individual training was provided to all healthcare providers who performed the injection. Consequently, treatment failures or partial therapeutic responses may have occurred secondary to the faulty technique of novice operators.

It is also possible that one physician, the first author, being responsible for 47.2% of the procedures, might have introduced bias into the study. The potential for influencing outcomes through patient selection, suggestion, and documentation does exist. Nevertheless, when compared with others who relatively more frequently and independently performed the procedure, outcomes appear similar.

In this retrospective review of ED charts, the quality of data collected was dependent on completeness of chart documentation. Inadequate or missing documentation potentially influenced our assessments of therapeutic outcome.

Finally, a spectrum of primary and secondary headaches (migraine, tension-type, chronic, viral meningitis, postdural puncture, head trauma, influenza, and nitroglycerin associated) was treated. No attempt was made in this study to differentiate the type of headache or correlate an International Headache Society (IHS) classification with the documented therapeutic response. In that IHS classification is possibly more difficult in the ED setting,[49,50] and chart documentation consistently lacked necessary data elements, IHS classification was not accomplished. It is possible, however, that the results might vary if this intervention was studied for a single type of headache. In their 1998 review article, Newman and Lipton[8] reported that migraine and tension headaches accounted for 25% and 55% of ED patient headaches, systemic illness accounted for another 33% to 39% and 1% to 16% of ED headaches were secondary to serious neurologic conditions.

CONCLUSION

In conclusion, this is the first report of a large number of patients whose headaches were relieved with bilateral lower cervical paraspinous injections with bupivacaine. The headache relief is typically accompanied by interruption of associated signs and symptoms including allodynia.While the therapeutic mechanism is unknown, it is possible that a sensitized trigeminocervical complex is somehow quieted and/or descending inhibitory antinociception by the PAG and related structures contributes to the relief. Our observations suggest that the intramuscular injection of small amounts of 0.5% bupivacaine bilateral to the sixth or seventh cervical spinous process appears to be a safe and effective therapeutic intervention for the treatment of headache pain caused by a spectrum of etiologies presenting in the ED setting.

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Conflict of Interest: None

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Bat Attack

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Am I the only one who enjoys starting her call to the Medicine admission service with, "You're not going to believe this but....," and then presenting a case that makes everyone rush to consult Dr. Google because no one can quite remember the details of symptoms or how to treat it? I had occasion to do just that recently when I had a patient who may have had the early signs of rabies. Really. He was HIV positive, though well controlled on medications, and was complaining of a flu-like illness including fever, nausea, vomiting, tingling in the hands, intermittent headache, and sore throat. Oh, by the way, ten days before, he had been attacked by a bat.

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I thought this would be an excellent opportunity for quick review. We all know about post-exposure prophylaxis, but what do you do when the patient has non-specific symptoms and the exposure, for which the patient did not seek care, was more than a week ago? And involved the scalp? We all know how dangerous rabies is, but who remembers the prodrome? It is essentially the same as every other non-specific viral syndrome: malaise, anorexia, irritability, fever (usually low-grade), sore throat, headache, nausea, and vomiting. There may be some paresthesias, pain, or pruritis at the site of viral entry. There may be muscle swelling at the site as well (percussion myoedema). This assumes that the patient knows about exposure, though some do not have a recognized exposure. Bats are famous and infamous for this sort of transmission. The prodrome usually lasts less than a week, then progresses to more classic symptoms of "furious" rabies encephalitis which last up to a week. Fever, fluctuating consciousness, hypersalivation, seizures, hyperactivity, and pharyngeal spasms are all common findings. Non-neurologic findings may occur such as myocarditis or arrhythmias, which may be related to either hyperadrenergic state or direct viral infection. Paralytic rabies resembles Guillain-Barre except for persistent fever, bladder dysfunction, retained sensation (except at bite site), and percussion myodema (which would be an excellent name for a rock band). Symptoms may begin years ofter initial exposure.

Rabies travels along peripheral nerves to the central nervous system at approximately 50-100mm/day until it reaches the spinal cord, after which it moves more rapidly. So if Yao Ming (currently the tallest NBA player) at 2.29m (7ft, 6in) is bitten by a rabid squirrel on his great toe, it would take 12.5-25 days for the virus to travel to the spinal cord after replicating sufficiently in the periphery. Once in the CNS, immunization may no longer be effective and the virus spreads centrifugally for dissemination. Virions replicate in the salivary glands to be shed, so when Yao bites the referee for calling a foul, the referee will require prophylaxis. And before I start getting emails from those squirrel-lovers who claim that squirrels don't get rabies, though rare, it does happen. And before I get emails from basketball fans who claim that basketball players don't bite each other, though rare, that happens too. Tree Rollins of the Atlanta Hawks once bit Danny Ainge of the Boston Celtics (Boston Herald Headline: "Tree Bites Man").[1] But I digress.

Once all of these rabid basketball players start biting each other, there is a limited window for vaccination for prevention of advancement. Pre- and post-exposure prophylaxis are the mainstays of management. Once symptoms occur, treatment is mainly supportive, since the infection is fatal. There has been one case report of a 15-year-old Wisconsin female who survived with neurologic sequela after infection from bat attack. It is not clear if she survived due to, or in spite of, an experimental regimen which failed at least four other patients.[2] She was placed in a drug-induced coma, given respiratory support, and placed on ribavirin and amantadine. Cheese does not appear to have been involved.

My patient defevervesced and improved rapidly while in the hospital and returned for all of his vaccinations. He experienced no further problems from his encounter, though the urge to fight crime may yet develop. One can only hope.

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Acute Bronchitis

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Acute bronchitis is a respiratory tract infection and one of the most common diagnoses in the fall and winter months. Most cases are caused by viruses and are self-limiting, but patients with bronchitis are uncomfortable and seek symptomatic relief from their physician.

In this article, I'll discuss the pathophysiology of bronchitis, the hallmark cough and other signs and symptoms, and the appropriate use of antibiotics.

Infection of the Airways

Acute bronchitis is an infection of the airways. The entire tracheobronchial tree becomes inflamed, including the bronchi and bronchioles. The condition is sometimes referred to as tracheobronchitis; in children, it's called bronchiolitis. It is usually associated with a generalized respiratory infection, upper respiratory infection (such as rhinosinusitis or pharyngitis), or the common cold. As a result of the infection, exudates form and bronchospasm often develops in the entire respiratory tree.

Both viruses and bacteria can cause acute bronchitis. Common viruses are influenza A and B, adenovirus, parainfluenza virus, rhinovirus, respiratory syncytial virus and Coxsackie virus A21. Other less common viruses include measles, rubella, herpes viruses, corona viruses, and echovirus. Bacteria linked to acute bronchitis are Bordatella pertussis, *Mycoplasma pneumoniae*, *Chlamydophila* (formerly called *Chlamydia pneumoniae*), and *Streptococcus pneumonia* (also called pneumococcus).

These pathogens invade at different times of the year. In the summer, for example, bronchitis may be caused by Coxsackie virus and echovirus. In the wintertime, the influenza virus can be involved. Rhinovirus and *M. pneumoniae*, on the other hand, can cause acute bronchitis anytime during the year. From fall to spring, all other viruses can come into play.

Severe cases of bronchitis are caused by herpes simplex and measles. Respiratory syncytial bronchitis in children can cause acute bronchitis in adults as well as acute pneumonia in adults.

Almost all causes of acute bronchitis are infectious Viruses are far more common as causes of secondary

Among the Top Five Diagnoses

Bronchitis is a very common disease and has remained in the top five diagnoses in the United States for the last 20 years. Upper respiratory tract infection was the most frequent reason for seeking ambulatory medical care in 2003; it is estimated that there are about 37 million visits to physician offices and emergency departments for this complaint. Acute bronchitis consistently ranks among the top 10 conditions accounting for most ambulatory visits to U.S. physicians.

About 5% of adults in the U.S. report an episode of bronchitis each year and seek medical care. Work absences from bronchitis costs businesses millions of dollars per year.

Bronchitis falls along a spectrum of disease ranging from the common cold to respiratory failure. There is a very strong association between asthma and bronchitis, and "asthmatic bronchitis" represents the mid-range of this disease spectrum. Patients who are diagnosed with acute bronchitis are likely to have a previous history of asthma or atopic disease and are likely to have subsequent visits for asthma.

Anatomy and Pathogenesis

The trachea runs from the larynx to the fourth thoracic vertebra, with C-shaped cartilage plates throughout its length. Many mucous glands populate the entire respiratory tree in the pseudostratified respiratory epithelium. It is important to differentiate between bronchi and bronchioles. Bronchi are proximal to the last plate of cartilage in the airway, and there are approximately 15 generations of divisions. Bronchioles, which do not have cartilage, are distal to the last plate of cartilage in the airway; they are proximal to the alveolae and are the final three to five generations of

divisions of the bronchi. Thus, the smallest airways collapse under pressure just like the alveolae.

During an episode of acute bronchitis, the mucous membranes of the tracheobronchial tree become edematous and hyperemic. Bronchial secretions increase markedly; the role of these secretions is controversial Some researchers feel that bronchial secretions are helpful in moving pathogens up and out of the respiratory tree; others do not agree. Their purulence and color are not important. Purulent secretions in bronchitis are as likely to be viral as bacterial in origin, so you can't base a diagnosis on this finding. The same is true of color.

Pathogens invade the respiratory epithelium to varying degrees. Influenza is the worst invader; it destroys the entire epithelium, which takes weeks to fully regenerate. This is thought to be one of the reasons influenza is so deadly. At the other end of the spectrum, rhinovirus causes little damage to the epithelium.

The result of this invasion of the respiratory epithelium, in most cases, is impaired mucous ciliary function. With *M. pneumoniae*, however, there is a different result. Because *Mycoplasma* is an organism that attaches to the respiratory epithelium, the mucosal cells will eventually slough off, denuding the lining of the airway. Patients with mycoplasma will cough for weeks because of this denuded airway.

Air pollutants play a role in the severity of bronchitis. The severity and frequency of bronchitis attacks will increase with exposure to pollutants and cigarette smoke. The combination of exposures may lead to prolonged abnormalities in airway resistance and reactivity.

Clinical Features

Cough is the hallmark of acute bronchitis, occurring in approximately 50% of all cases of common respiratory illness in people of all ages. Cough is one of the true respiratory tract symptoms as opposed to fever, chest pain, shortness of breath, dyspnea on exertion, which can be symptoms of many other diseases. Infection with any of the major respiratory viruses and bacteria will cause a cough.

Bronchitis is also frequently associated with fever and strongly associated with hoarseness. Other symptoms typically seen in bronchitis are rhinitis, myalgias, dyspnea or wheezing as a result of bronchospasm, and mucus production in the airways.

The influenza A and B viruses produce the most severe symptoms, with an abrupt onset of fever, chills, headache, and myalgias. These symptoms will subside over three or four days but are followed by a nonproductive cough lasting one to two weeks. One-quarter of patients may have rales or wheezes. Outbreaks of bronchitis caused by influenza A and B are common from October to April.

Rhinovirus is a much more common cause of acute bronchitis than the influenza viruses, but it causes less severe symptoms. Adenovirus causes acute bronchitis among patients in close contact, such as military recruits and college students living in dormitories. The measles virus causes a very severe cough and severe bronchitis. Respiratory syncytial virus is the usual cause of bronchiolitis in children.

Bordatella pertussis warrants special mention because its incidence has been increasing since 1981. Adults with a chronic cough of many weeks' duration may have B. pertussis infection. Childhood immunizations provide protection for 4 to 12 years, and then lose immunogenicity. Adults may be reservoirs of the disease and may then transmit the infection to children. Patients will have low-grade fever, rhinorrhea, and conjunctivitis; adults do not have the "whoop" heard in children's cough.

Mycoplasma pneumoniae is found in older children and young adults. There seem to be epidemics of bronchitis caused by this virus every four to seven years. An incubation period of 16 to 30 days is typical with this infection. Symptoms tend to resolve quickly.

Chlamydophila and closely associated organisms are also known as TWAR organisms ("TW" for Taiwan and "AR" for acute respiratory disease). This form of bronchitis is found mainly in the elderly and may cause wheezing. It has a 30-day incubation period; patients may be afebrile and have minimum sputum production. Laryngitis is common, and symptoms may persist after antibiotic therapy. Chlamydophila is very difficult to detect and notoriously difficult to culture. Its incidence may actually be much higher than currently thought.

The causative organism in acute bronchitis is difficult to determine because of sampling techniques. It is impossible to collect samples of the tracheobronchial secretions without contamination by the nasopharyngeal flora. The only way to do this without contamination is with transtracheal aspiration, which is extremely painful and has proved fatal in some cases. Some answers to determining the causative organism may lie in DNA markers for *M. pneumoniae* and *Chlamydophila*.

Why Patients Seek Medical Attention

Patients seek medical attention because of acute discomfort or because their symptoms are getting worse or are persisting. The cough is usually the most troublesome symptom. Initially, it is dry but later becomes productive of sputum, which starts out as mucoid in appearance and then becomes purulent.

The duration and frequency of the cough are

increased in smokers. All patients with bronchitis who are smokers should be advised of smoking cessation programs.

Another possible cause of patient discomfort is tracheal involvement, which may result in substernal chest pain, with burning on deep inspiration. This symptom of acute bronchitis is sometimes difficult to distinguish from cardiac disease.

Diagnostic Criteria

Clinical diagnostic criteria for acute bronchitis include a cough of less than one week's duration with no prior history of lung disease. The patient should have normal arterial oxygenation and no abnormalities on auscultation. Wheezing is also diagnostic, but it should be wheezing without a history of asthma or bronchospasm. Patients should not have significant dyspnea, cyanosis, or signs of consolidation on auscultation; a patient with any of these signs should have a chest x-ray performed to evaluate for pneumonia, which requires different treatment than acute bronchitis.

Fever may or may not be present. The organisms that cause fever are adenovirus, the influenza viruses, *M. pneumoniae*, and bacteria. Agents that typically do not cause fever are rhinovirus and corona viruses.

The differential diagnosis should include foreign body aspiration, pulmonary embolus, heart failure, endobronchial tumor, and pulmonary fibrosis.

Key History Considerations

Obviously, it is mandatory to ask patients if they smoke cigarettes. (It is amazing how many patients will continue to smoke cigarettes even during a bout of acute bronchitis.)

But also ask about exposure to toxic substances, particularly if patients live in industrial areas, and immunizations, especially for influenza, *S. pneumoniae*, and *Haemophilus influenzae*.

Immunity to pertussis vaccination in early childhood wanes in adolescents and adults. Pertussis infection in adolescents and adults causes a severe prolonged cough and may have associated symptoms such as rhinorrhea, conjunctival injection, lacrimation and low grade fever, up to 100.5°F P.O. The most serious problem with pertussis in older age groups is the potential for the disease to spread to children, particularly infants who have not developed immunity to pertussis. The Centers for Disease Control and Prevention (CDC) now recommend that the tetanus-diptheria-acellular pertussis (Tdap) booster be given routinely to adolescents, adults, and health care workers.

Chest x-rays are not required for straightforward cases of acute bronchitis. The likelihood of infiltrates being present on an x-ray is less than 1% if there is no fever, no tachycardia, no tachypnea, and no ausculatory abnormalities. Chest x-rays would be appropriate if the patient appears sick or toxic, has a fever above 102.5°F, is a cigarette smoker, has chest pain or shortness of breath, or a young black person with a possible history of sarcoidosis.

Pulse oximetry is indicated if the patient has dyspnea or cyanosis. A peak flow meter may be helpful if the patient has dyspnea or wheezing. Blood tests are not necessary, and neither are sputum cultures except in immunocompromised patients.

Treatment Options

Since most cases of acute bronchitis are viral in origin, treatment is usually intended to alleviate the patient's bothersome symptoms. Particular attention should be paid to controlling the cough and treating myalgia and fever. It should also be noted that antibiotics are markedly over utilized in treatment of acute bronchitis.

Guaifenesin is not effective in controlling cough. Dextromethorphan, which is a distant cousin of morphine, is effective with most coughs. Codeine compounds remain controversial. Other opiate analogs that are most effective in controlling cough include hydrocodone or oxycodone containing liquids. Analgesics can help with the myalgias and hydration will prevent drying of bronchial secretions.

Concerns with Antibiotics

Antibiotics for acute bronchitis: do they help or hurt? Certainly microbial resistance is a major concern; there is undoubtedly emerging resistance throughout the United States. Before the mid-1980s, all strains of *Pneumococcus* were sensitive to penicillin, but in the past 15 years the CDC reports a 60-fold rise in high-level resistance to the drug. Some areas of the United States showed 30% of strains with intermediate or high-level resistance to penicillin. Penicillin-resistant strains are often resistant to other antibiotics, such as macrolides, trimethoprim-sulfamethoxazole, and second- and third-generation cephalosporins. *Pneumococcus* is a virulent organism and is responsible for common lethal infections, such as meningitis, pneumonia, bacteremia, and cellulitis.

Antibiotic resistance is growing with other pathogens, such as *Streptococcus pyogenes, H.influenza, Enterococcus faecalis* (formerly known as *Streptococcus faecalis*), *Neisseria gonorrhoeae, Salmonella, Escherichia coli*, and other urinary pathogens as well as staphylococci.

How often do physicians prescribe antibiotics for upper respiratory illness? For patients with colds, 51% of the time; for patients with upper respiratory infection,

52%; for patients with bronchitis, 66%.

Do antibiotics help the patient with acute bronchitis? In the Cochran library, there are eight studies of 750 patients with acute bronchitis, and those who received an antibiotic versus placebo had slightly better outcomes and returned to work 0.7 days earlier. However, another study in 1998 also compared patients who received an antibiotic versus placebo and found that the antibiotic did not affect resolution of the cough and did not alter the course of the illness.

Antibiotic Use in Acute Bronchitis

ANTIBIOTIC USE IN ACUTE BRONCHITIS

Recommendations in 2002 taken from the CDC's "Principles of Judicious Antibiotic Use" and an *Annals of Emergency Medicine* article ("Principles of appropriate antibiotic use for treatment of uncomplicated bronchitis: background," June 2001, Gonzales et al) make three key points:

1. Evaluation of adults with an acute cough illness or bronchitis should focus on ruling out serious illness, particularly pneumonia. It is important to remember that pneumonia is unusual in healthy, nonelderly adults with no vital sign abnormalities and symmetrical lung sounds. Also, patients with a cough of more than three weeks' duration may need a chest x-ray.

2. Routine antibiotic treatment of uncomplicated acute bronchitis is not recommended regardless of the duration of the patient's cough. If pertussis is suspected, the patient should be tested and treated. There is no single clinical feature that confirms the diagnosis of pertussis, and patients should be treated only when there is a high probability of exposure to pertussis during documented outbreaks.

3. Patient satisfaction with care for acute bronchitis depends more on physician-patient communication rather than on antibiotics. Patients should be given realistic expectations regarding the duration of the cough, which will typically last 10 to 14 days. The physician should refer to the cough illness as a "chest cold" rather than bronchitis; patients think that a chest cold does not require antibiotics but bronchitis does. Physicians should try to educate the patient on unnecessary antibiotic use, describing the carrier state, infection with antibiotic-resistant bacteria, side effects of antibiotics, and possible anaphylactic reactions to antibiotics. They should explain why they need to be more selective in treating only those conditions for which a major clinical benefit of antibiotics has been proven.

Other Medications for Acute Bronchitis

Bronchodilators such as albuterol have been shown to decrease cough by 50%. Anticholinergic bronchodilators have not been studied, and neither has inhaled corticosteroids. The combination of inhaled corticosteroids/bronchodilators, such as fluticasone/salmeterol may be of some benefit.

Another reason for limiting antibiotic use is their cost. A seven-day course of levofloxacin costs approximately $75; a five-day course of azithromycin is about $40. Side effects, such as Stevens-Johnson syndrome and gastrointestinal disturbances with macrolides, are a constant concern.

Which Patients Should be Treated?

Patients with a history of severe asthma that required intubations or multiple hospitalizations and those with a very low initial peak-expiratory flow rate may benefit from treatment with antibiotics, depending on duration of their illness. Certainly patients with HIV/AIDS should be treated, as should dialysis patients, transplant patients, and other immunocompromised patients. Patients with sarcoidosis, cancer, or diabetes should be viewed with caution since these patients are likely to develop bacterial infection, progressing to pneumonia.

When the criteria for antibiotic treatment are met, consider coverage for *M. pneumonia*, which is provided by erythromycin, tetracycline, or doxycycline. During an outbreak of B. pertussis, erythromycin is the drug of choice. A very effective treatment is oral erythromycin 250 mg four times daily for 10 days, with a codeine-containing cough suppressant. If the patient is wheezing, an albuterol metered-dose inhaler with spacer (two puffs every two hours while awake for three days) is effective. It is not unreasonable to excuse the patient from work for two days, with strict orders for bed rest and plenty of fluids.

Acute Exacerbation of Chronic Bronchitis

Acute bronchitis is different from acute exacerbation of chronic bronchitis (AECB). Approximately two-thirds of cases of AECB are bacterial in origin. The bacteria involved are *H. influenzae, S. pneumoniae*, and *Moraxella catarrhalis*. High-risk patients include the elderly, patients with poor lung function, structural lung disease, or comorbid diseases, and patients with a history of chronic obstructive pulmonary disease. Also, patients with any two of the following should be treated with antibiotics: increased dyspnea, increased sputum volume, or increased sputum purulence.

Antibiotic treatment choices on an outpatient basis for AECB are doxycycline 100 mg twice daily or an extended-spectrum cephalosporin, such as cefaclor 500 mg every eight hours, cefixime 400 mg daily, cefpodoxime 200 mg twice daily, or cefprozil 500 mg twice daily. Other options include an advanced macrolide such as

azithromycin (500 mg in the office and then 250 mg daily for four days) or amoxicillin-clavulanate (175/125 mg twice daily or 500/125 mg three times daily). Fluorquinolones such as levofloxacin 500 mg daily or moxifloxacin 400 mg daily are effective. Duration of treatment is controversial, but 7 to 14 days is reasonable with all antibiotics except azithromycin which is prescribed for 5 days.

Treatment of AECB leads to modest improvement in clinical outcome, fewer therapeutic failures, and more rapid recovery of lung function.

Influenza Immunization

Encourage influenza immunization for high-risk patients and their household contacts, health care workers, and children less than nine years of age who would be immunized for the first time. Four antiviral agents are approved for the treatment of influenza: amantadine, oseltamivir, rimantadine, and zanamivir. Influenza A can rapidly develop resistance to amantadine and rimantadine; the CDC recommends against prescribing these two agents for outbreaks of influenza A.

Oseltamivir is available as a capsule or oral suspension, while zanamivir is a dry powder that is inhaled through a plastic device. The recommended duration of treatment with either drug is five days.

Initiation of antiviral treatment is most likely to be helpful if symptoms are present for less than 48 hours.

Suggested Reading

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Irregularly Irregular Narrow Complex Rhythms

Ben Holton, MD, FACEP and Stephen A. Shiver, MD, FACEP

Mr. Brown is a 65-year-old male who presents to the ED complaining of palpitations. He denies any chest pain or shortness of breath. His past medical history is significant for hypertension and COPD.

Vital Signs T37.4 P110 BP150/90 RR20

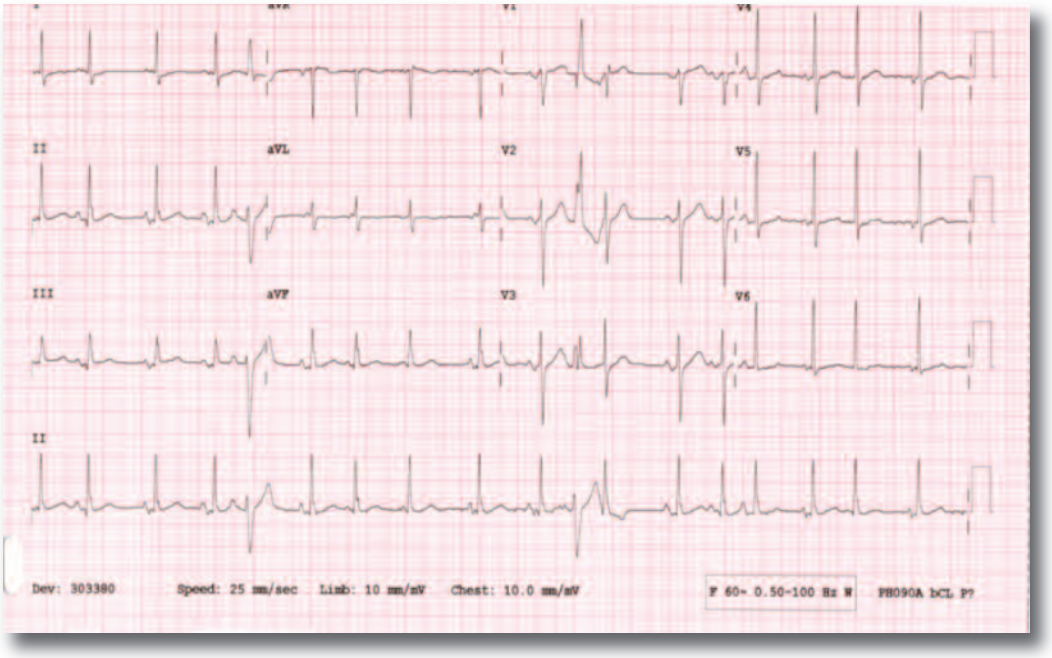
He appears comfortable and is in no apparent distress. Cardiovascular examination reveals a regular rhythm without any murmurs or gallops. Pulmonary examination reveals clear lungs bilaterally.

EKG is shown below.

Diagnosis: Multifocal Atrial Tachycardia

When presented with a narrow complex irregularly irregular rhythm, three primary diagnoses should come to mind: atrial fibrillation, atrial flutter with variable conduction, and multifocal atrial tachycardia (MAT). Of note, atrial fibrillation is far and away the most common.

The presented patient's history and EKG are consistent with MAT. To diagnose MAT, there must be a minimum of three different p wave morphologies. The different morphologies correspond to a different origin of the atrial impulse. MAT most often occurs in elderly patients with multiple medical problems, particularly chronic pulmonary conditions such as COPD. MAT generally does not result in hemodynamic instability and is not life threatening in and of itself. Treatment focuses on addressing the underlying condition; MAT is often transient and resolves when the patient's underlying condition improves. Numerous treatment modalities have been employed, including drugs that slow conduction in the AV node. In particular, magnesium has been found to be efficacious in some cases. Specific treatment is usually not indicated, however.



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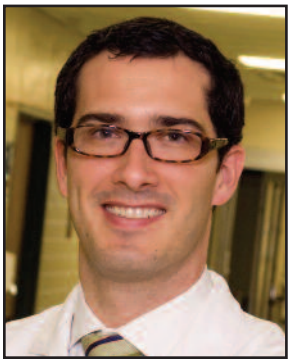
Evaluation of Intracranial Pressure Using Ultrasound

William Manson, MD, RDMS, RDCS and Matt Lyon, MD, FACEP



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Dr. Lyon is Associate Professor of Emergency Medicine at the Medical College of Georgia. He serves as the director of the Section of Emergency and Clinical Ultrasound as well as the director of the Emergency Department Observation Unit. He has significant educational experience, lecturing both nationally and internationally, and has published over 30 peer-reviewed articles on the use of ultrasound in clinical practice.

Bedside use of ultrasound is increasing in the practice of emergency medicine. It is an important addition to the clinical assessment of a wide variety of emergency conditions. One, which may not be obvious, is the use of ultrasound for the evaluation the eye. The eye is an ideal candidate for evaluation by ultrasound. With ultrasound, the globe, the orbit, and retro-orbital structures can be evaluated at the patient's bedside in an accurate, safe manner. Using a closed eyelid, the acoustically empty anterior chamber and vitreous cavity form an ideal window for viewing the normal structures both in the anterior and in the posterior parts of the eye. Additionally, since the eye can be moved as well as the transducer, all aspects of the eye can be evaluated. Using an ultrasound probe commonly found on most emergency department ultrasound systems many ocular conditions can be evaluated: intraocular foreign body, lens dislocation, ocular penetration or rupture, retinal and vitreous detachment, and elevated intracranial pressure and papilledema. While ultrasound is beneficial in the diagnosis of all these conditions that can be a challenge to diagnose in the ED, this article will focus on detection of elevated intracranial pressure.

Headache and alteration in mental status are common presenting complaints to the ED. Often these complaints are associated with elevated intracranial pressure, which could be due to intracranial bleeding from trauma or stroke. Many modalities are available to evaluate elevated intracranial pressure, however, in some circumstances these methods are not always the best approach. Ultrasound is a solution which has the advantages of being a bedside test, does not use ionizing radiation, can be performed serially with changes in mental status or patient condition and can be done in the comatose patient.

Principle

Due to a direct communication between the subarachnoid space and the optic nerve sheath, pressure variations in the subarachnoid space are transmitted to the optic nerve sheath. Originally described using animal models, subsequent clinical trials have demonstrated that variations in the nerve sheath diameter correlate with variations of the subarachnoid or intracranial pressure. These trials have showed clinical sensitivity and specificity optic nerve sheath diameters versus computed tomography for measurement of elevated intracranial pressure were 100 and 95% respectively. Further, the changes in the optic nerve sheath have been shown to be clinically relevant in all age

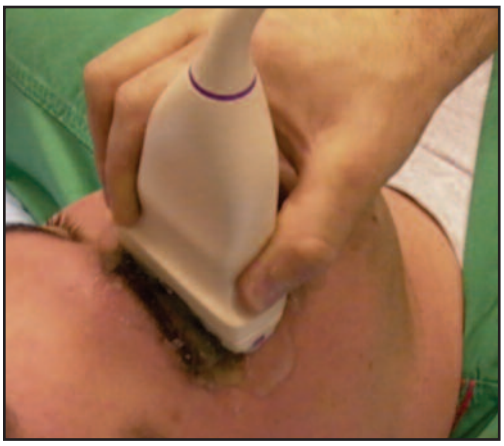

Figure 1. Transverse position of probe on the eye

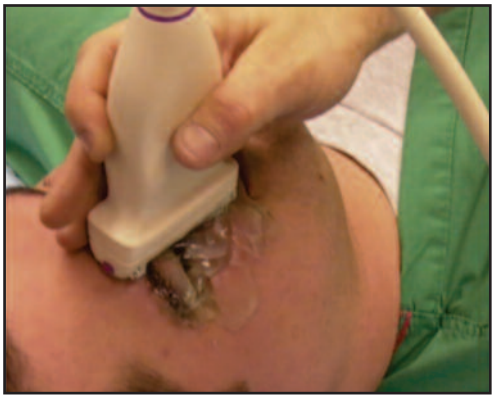

Figure 2. Longitudinal position of the probe on the eye. Note that the orbital rim is preventing contact of the probe on the eyelid.

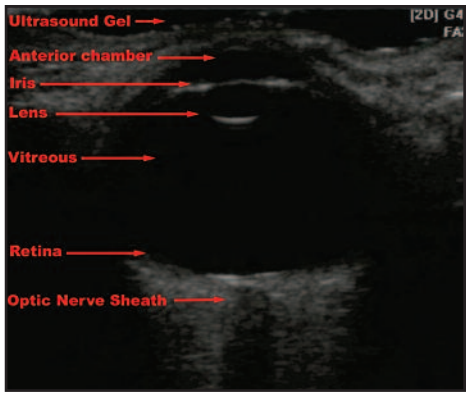

Figure 3. Ocular ultrasound anatomy

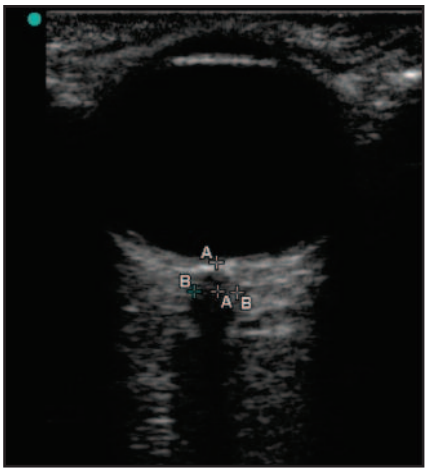

Figure 4. Optic nerve sheath measurement. The ONS measurement is made 3 mm posterior to the retina perpendicularly across the optic nerve sheath. The optic nerve sheath diameter is 4.3 mm in this case.

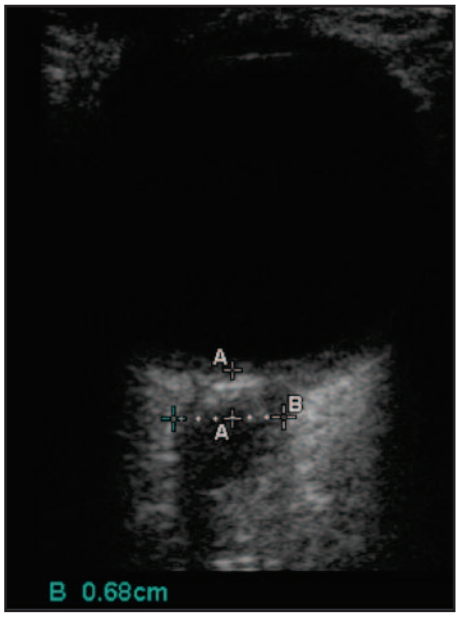

Figure 5. Optic nerve sheath in this case is 6.8 mm indicating elevated intracranial pressure.

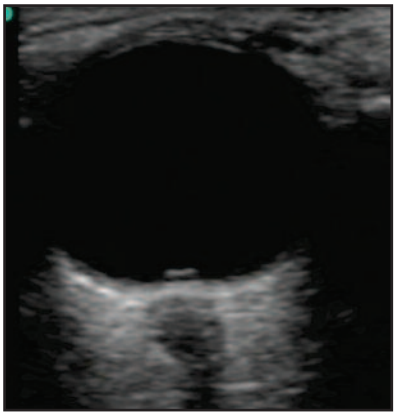

Figure 6. Optic nerve head elevation into the vitreous indicating long standing elevation in intracranial pressure.

ranges, including pediatrics. We can use the ultrasound measurement of the optic nerve sheath to estimate the intracranial pressure in a non-invasive manner at bedside. This is a particularly useful technique in patients presenting with normal mental status but with a history or physical exam concerning for elevated intracranial pressure, i.e. pseudo tumor cerebri, head trauma, stroke patients, etc.

Technique

For this exam, use a linear probe, the same probe used for superficial applications as well as for vascular access. With the patient in a recumbent position with the eyelid closed, place a small amount of ultrasound gel on top of the eyelid. As long as a globe injury such as perforation or laceration is not suspected, a small amount of gel is all that is required. Brace you're had on the patient's face to be able to better control the pressure that the probe places onto the globe. Minimal pressure is all that is needed. The probe may be placed in either a transverse (figure 1) or longitudinal position (figure 2). However, the orbital rim may prevent adequate contact with the eyelid (depending on the size of the probe available) with the longitudinal position. Once the probe is placed on the eyelid, the entire globe is easily visualized with ultrasound (see figure 3). Pan or fan the probe to identify the optic nerve sheath, which is visualized as a hypoechoic structure posterior to the retina. Adjust the probe so that the optic nerve sheath edge is crisp and sharp. Measurements of the optic nerve sheath are taken 3 mm posterior to the retina. Normally in adults, the sheath is less than 5 mm in width (< 4.5 mm for children and < 4 mm for infants). Measurement should be made perpendicular to the optic nerve sheath longitudinal axis 3 mm posterior to the retina (see figure 4). A measurement greater than 5 mm in an adult is consistent with elevated intracranial pressure. (see figure 5)

Pressure changes in the intracranial space are transmitted near simultaneously to the optic nerve sheath. However, with prolonged elevation of the intracranial pressure, the optic nerve head may be come elevated, protruding into the vitreous. The posterior portion of the globe is typically very smooth, and any protrusion of the optic nerve head is easily seen with ultrasound (figure 6). This is the equivalent of detecting papilledema by fundoscopic exam and can be very useful in clinical practice.

In conclusion, detection of elevated intracranial pressure is easily performed using ultrasound at the beside. It is an easy technique to both learn and perform. Please contact me if you have any questions or would like more explanation into this technique.

Did You Catch the Wave...or Miss the Boat?

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Dr. Setu Mazumdar helps physicians like you make smart decisions about your money so you can take control of your financial life. He is President and Wealth Manager at Lotus Wealth Solutions, an independent fee-only wealth management firm in Atlanta, GA exclusively for physicians. Setu received his MD from Johns Hopkins School of Medicine and he is board certified in emergency medicine.

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For the past few years all you've been hearing is pessimism. Just read the headlines from major newspapers and magazines in Summer 2010 and Summer 2011:

Summer 2010

"Fear Returns—How to Avoid a Double-Dip Recession," *Economist*, May 29, 2010

"Housing Prices Remain Weak," *Wall Street Journal*, May 26, 2010

"Discouraging Job Growth Batters Stocks," *Los Angeles Times*, June 5, 2010

Summer 2011

"The World Economy—Sticky Patch or Meltdown?" *Economist*, June 18, 2011

"Home Market Takes a Tumble," *Wall Street Journal*, May 9, 2011

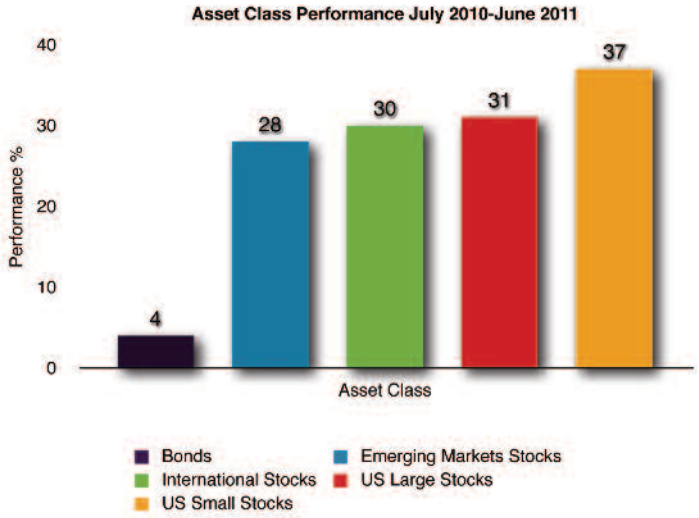
"Jobs Data Stoke US Recovery Fears," *Financial Times*, June 4, 2011

If you were paying attention to all of this a year ago, it would have been tough to invest your hard earned, highly taxed money in the market. Trends in employment, housing, and economic growth have remained negative over the past year. May as well just stuff the money under the mattress and work more shifts, right?

But amidst the barrage of gloomy news, let's take a look at what your investment returns should have been over the past year, from July 2010 to June 2011.

A Very Good Year

Here s a summary of how different investments performed over the past year:



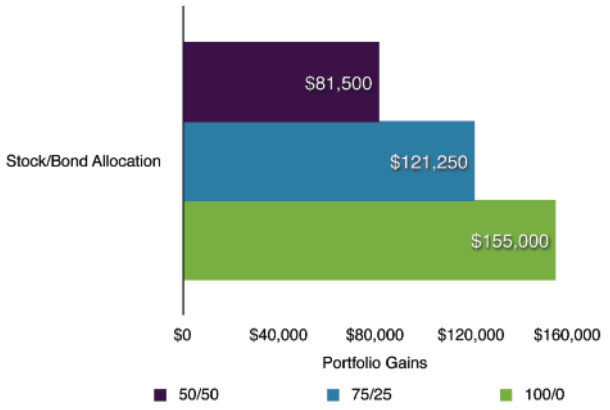
As you can see, stock markets around the world had spectacular returns during this time period. If someone had told us a year ago that global markets would stage such a strong rally, you would think that the economic outlook would have improved. Instead who would have thought that markets could thrive with US unemployment at 9%, the Japan tsumani, the US and European debt crises, and other end-of-the-world news?

No Summertime Blues

But let's say you ignored the summertime headlines. Here are the gains you should have

had with various stock/bond allocations over this past year assuming you started with $500,000 in July 2010:

Nothing to complain about here.

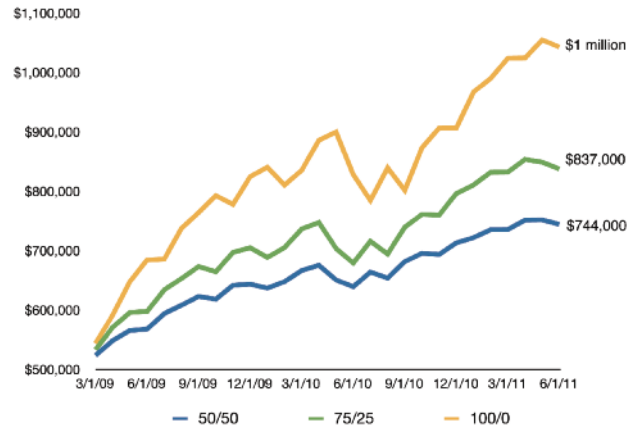


The incredibly Expanding Portfolio

It gets even better if you go back to March 2009–the bottom of the stock market–and you hung on for a very rewarding ride.

Just take a look at the ending values of various stock/bond allocations starting with $500,000 in March 2009 and ending in June 2011:

Over this time frame the stock portion of your portfolio should have at least doubled.



More conservative portfolios should be up 50% or more. Diversified portfolios were up even more.

Your Returns

So how did you do over the past year or two? Did you capture these returns, or did you stay on the sidelines? Do you even know what returns you got?

If you ve been practicing medicine for more than 10 years and have have been steadily investing, you should be far wealthier now than you were 24 months ago even accounting for the market decline in 2008.

If you re managing your portfolio by yourself and you don't have a far higher portfolio value now than you did two years ago, you lack investment discipline and need a sound investment plan.

If you've got a financial advisor managing your portfolio and didn't achieve these results, your advisor did one of the following:

1. Timed the market and missed big time
2. Did not diversify your portfolio
3. Lacks an investment philosophy

So take a look back at your investment statements, figure out your returns, and if you missed the boat this time, create a sound investment plan so you can ride the wave next time.

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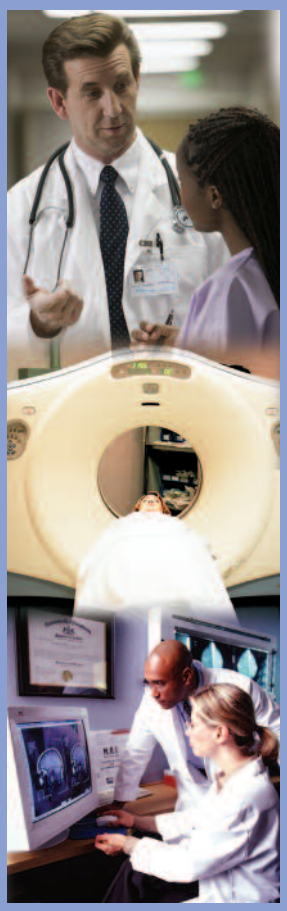

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