

EPIC



The Magazine of the
Georgia College of
Emergency Physicians

FALL 2015

May You Live in Interesting Times

IN THIS ISSUE:

- The Influence of Emergency Medicine ♦
- Open Airway - Neutral Cervical Spine: 1 Intervention for 2 Problems ♦
- A Mere Technicality? ♦

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From the President

May You Live in Interesting Times

Matt Lyon, MD, FACEP

We do live in interesting times. Whether a curse or a blessing (the ED attracts a different breed so maybe not a curse for some), we are facing a large number of challenges in our practice of Emergency Medicine. To list a few:

- Implementation of the Affordable Care Act
- Lack of expansion of Medicaid
- Decreased reimbursement
- Implementation of ICD-10
- Health system mergers
- Hospital acquisition of private specialty groups
- Overcrowding and boarding
- Psychiatric patients lining the halls
- Prescription drug abuse
- PQRS
- MOC
- “Dogs and cats, living together! Mass hysteria!” (Ghostbusters)

Ok, so we will always have challenges. What’s new? What’s the point?

Even though there will always be challenges to our medical practice, GCEP is there for you and your patients. There are members of GCEP on state and national committees, in governmental organizations, in medical director positions, and in the pits as doctors on the frontline. As a group, we have a tremendous amount of influence. Our influence, however, is greatest when we are all united and speak with one voice on an issue. This is particularly true when we speak to legislators. For our state legislative priorities the GCEP 2015-17 legislative priorities are:

Decrease Psychiatric Boarding in the Emergency Department

Acute psychiatric and substance abuse care is in crisis. GCEP believe all patients deserve the right care in the right setting. The ED is a chaotic environment. After evaluation of the emergency condition, patients with a psychiatric complaint should be cared for by a psychiatrist. This evaluation should be done in an expedited fashion in an environment outside of the ED.

Emergency Access for All of Georgia’s Citizens

Quality emergency care should be available to all of Georgia’s citizens, rural and urban. GCEP believes local access to emergency care is essential as increased distances and increased time to care is directly related to morbidity and mortality.

Quality End of Life Care in the ED

Patients have the right to direct their own care. Their wishes should be honored regardless of location of care. The ED is a common location for end of life care and a patient’s end of life plan should be readily available to the ED physician. GCEP believes that advanced directives should be discussed prior to emergency care. These decisions regarding planned patient care should be readily available to the ED physician.

Protect Tort Law

Frivolous lawsuits not only lead to increased cost of care through defensive medicine but also discourage doctors from working in Georgia. GCEP believes that fair tort reform



Matt Lyon, MD, FACEP
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Dr. Lyon is a Professor of Emergency Medicine at Georgia Regents University. He serves a Vice Chairman for Academic Programs, the Director of the Section of Emergency and Clinical Ultrasound and Director of the Emergency Ultrasound Fellowship. He is currently President-Elect for GCEP and Chairman of the Georgia Emergency Medicine Political Action Committee.

improves patient care by increasing specialist's availability during an emergency and decreasing the cost of care.

So what can you do?

Get involved. GCEP is nothing without our members. Attend board meetings. Come to GCEP conferences. Join a committee. Make your voice heard.

Contribute to your PAC. Money talks. Your donations to GEMPAC allow us to make our issues known to the

lawmakers and governor, influence legislation, and create positive change. Please contribute!

Talk to your patients. Our best advocates are our patients. Ask them to contact their legislators. Patients (constituents) have a large amount of influence on the legislative process.

GCEP is your organization. Emergency Medicine is your profession. Get involved. Stay active. Thank you for your support.

Introducing our EPIC Co-Editors



Eric R. Zevallos, MD

• **Ultrasound** - Dr. Zevallos is fellowship trained and graduated in 2014. He is assistant director of emergency ultrasound at GRU. He has worked on developing a multimedia ultrasound course and have taught courses around the US and outside of the country.

- **Medical Student Education** - Dr. Zevallos is assistant director emergency medicine clerkship and teaches physical diagnosis and is working on developing a new curriculum for medical students involving multimedia.
- **International Medicine** - He loves traveling and experiencing different cultures and travels to Peru and Panama yearly teaching ultrasound courses.
- **Personal** - Dr. Zevallos is married with a 5-month-old son and lives in Augusta. He is very active spending time

with his two huskies and bike riding, running, basketball and soccer or playing on the water (jet ski, paddle board, water sports).



Todd Taylor, MD

Todd Taylor is an Assistant Professor at Emory University. He went to Medical College of Georgia Georgia Regents Augusta and then completed his residency at Louisiana State University.

Todd's educational interests include social media, ultrasound, EKG's and airway management.

In his spare time, of which there is not much, he enjoys cooking and seeing live music.



GCEP Councillors and Alternates at the 2015 ACEP Council Meeting. Pictured from left to right: (Front Row) John Sy, DO, FACEP; Matt Lyon, MD, FACEP; Earl Grubbs, MD, FACEP; Matthew Watson, MD, FACEP (Back Row) Ralph Griffin, MD, FACEP; Jeff Linzer, MD, FACEP; Steve Shiver, MD, FACEP; Jim Dugal, MD, FACEP; Matt Astin, MD, FACEP; Chip Pettigrew, MD, FACEP; J. Smith, MD, FACEP

The Influence of Emergency Medicine

John Sy, DO, FACEP, Secretary Treasurer, GCEP and Steering Committee, GPLA

The bond and relationship between Georgia College of Emergency Physicians (GCEP) and Medical Association of Georgia (MAG) has never been stronger. The specialty of Emergency Medicine has a strong voice and influence within the House of Medicine, which is plainly evident with the election of Dr. Steve Stack, MD, FACEP, as president of the American Medical Association (AMA). Dr. Stack is the first board certified Emergency Physician elected to lead the AMA in addition to being their youngest president in over 160 years.

The Georgia Physicians Leadership Academy (GPLA), which is program of the Medical Association of Georgia Foundation, brings together physician leaders in all specialties across the state of Georgia for an intense one-year training program on leadership skills, legislative advocacy, and conflict resolution. Many of the Emergency Physicians that have graduated from the Georgia Physicians Leadership Academy have gone on to leadership positions within the Georgia College of Emergency Physicians, including the following:

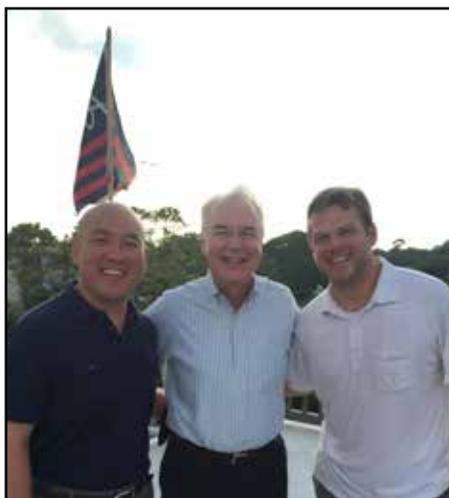
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- Matt Lyon, MD, FACEP – President, GCEP
- Jay Smith, MD – Board of Directors, GCEP
- Mark Griffiths, MD – Board of Directors, GCEP

US Congressman Tom Price, MD, is part-time faculty for GPLA



John Sy, DO, MS, FACEP
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Dr. Sy is GLAF program director, chair of membership committee and a member of GCEP Board of Directors. Dr. Sy is attending physician, Emergency Medicine; assistant professor, Mercer University; Memorial University Medical Center in Savannah.



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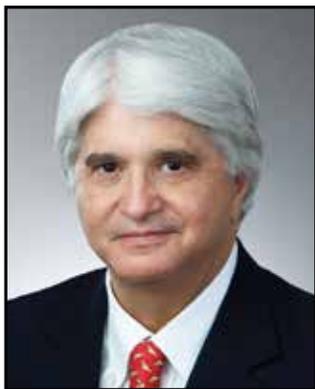
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From the Immediate Past President

GEMPAC — Working For You

John J. Rogers, MD, CPE, FACS, FACEP

Chair, GEMPAC and Immediate Past President, Georgia College of Emergency Physicians



John J. Rogers, MD, FACEP
jrogers@acep.org

Dr. Rogers is Chair of the GEMPAC and Immediate Past President of GCEP.

GCEP's political influence has grown exponentially over the past ten years. Today we are known as one of the most active and important medical specialty societies in Georgia. GCEP is involved with MAGs legislative activities, GCEP continues to participate in the Doctor of the Day program at the State Capitol, and individual GCEP members have developed personal relationships with their State Senators and Representatives.

During the past decade, we have also grown our Political Action Committee, GEMPAC. It is now highly respected by those who work under the Gold Dome. Your contributions to GEMPAC have been essential to this growth. Your time, talent and treasure enable GEMPAC to influence and educate legislators and advocate on your behalf.

Many of you have taken the time to attend campaign fundraisers and have personally delivered our GEMPAC contributions to your elected officials. These personal relationships prove invaluable and must be forged before they are needed. We need more of you to be our primary contact for particular legislators. Our newly developed Legislative Advocacy Network will allow us to share information, send alerts, and forward invitations to members in a particular legislators district.

Your participation in GEMPAC is critical:

- Your financial participation in the political process is almost as important as voting.
- We need to support candidates that understand and support the issues critical to emergency physicians and our patients.
- Elections are expensive and Georgia legislators are part time legislators. Our contributions make a real difference in the outcome of local and statewide elections.
- Healthcare, as we all know, is undergoing constant change in the laws and rules that regulate our profession. Our active involvement in government and the shaping of public policy on healthcare is critical to the preservation of the specialty of emergency medicine and those we serve.

Please make a contribution so we can maintain our relationships, our effectiveness, and advocate on your behalf. Contributions can be made online at <http://www.gcep.org/gempac.php>. Or they can be mailed to GEMPAC, 6134 Poplar Bluff Circle, Suite 101, Norcross GA 30092.

Please consider serving as a Doctor of the Day at the Capital, attending fundraisers, delivering checks to legislators, and participating in GCEP's Legislative Week's activities. To volunteer as a Doctor of the Day or be our primary contact for your legislator, please send an email with your name and phone number to Tara Morrison at taramorrison@theassociationcompany.com. Information on the details of our Legislative Week activities will be published as we get closer to the start of the 2016 Legislative Session.

CLICK HERE to Contribute to GEMPAC:
<http://www.gcep.org/gempac.php>



What can you do to improve emergency care in the state of Georgia? Give to GEMPAC

Your voice in the state legislature. GEMPAC uses your donations to educate, inform and lobby legislators on Emergency Medicine issues. These are the issues you face every day:

- protecting tort reform
- caring for the patients with psychiatric problems in our ED's
- protecting and improving Medicaid reimbursement
- decreasing prescription drug abuse

Your money allows for face-to-face discussions on these issues as well as key legislative bills.

Without this money we have no voice. Please consider both individual and group donations to GEMPAC.

17 PRACTICE OPPORTUNITIES IN GEORGIA AND GROWING!



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What's New at GRU and the PEM Fellowship?

Natalie E. Lane, MD, Fellowship Director, Medical College of Georgia



Natalie E. Lane, MD, FAAP
nlane@gru.edu

Dr. Lane is the Pediatric Emergency Medicine Fellowship Director at the Medical College of Georgia, Georgia Regents University Augustus in Augusta, GA.



What's in a name? Well apparently not enough to stay the same. For those unaware, our institution is undergoing an additional name change, the fourth in a five-year span. Forgive us if we appear confused but Medical College of Georgia, Georgia Health Sciences University, Georgia Regents University and now Augusta University are one in the same.

Thankfully, underneath the turmoil of the name change remains a commitment to great educational venues and excellent clinical care. This remains true here in the Department of Emergency Medicine as we enter the 10th year of our fellowship in pediatric emergency medicine. We accepted our first two pediatric trained residents Drs. George Hsu and Kevin Allen. Both completed their pediatric residency at Georgia Regents University in the Children's Hospital of Georgia.

Newly incorporated into the curriculum is pediatric ultrasound. We are fortunate to gain from a well-established emergency-medicine ultrasound program within the department and the additional access to excellent technology. Fellows incorporate ultrasound into their daily clinical practice. Additionally, we have developed a research-educator course incorporating all pediatric subspecialty fellows for a monthly conference focused on clinical research design and teaching instruction. Adding to their clinical experience, fellows spend a month during their second year caring for some of the sickest pediatric patients at the Joseph M.

Still Burn Center in Augusta. This provides additional opportunities for critical care procedures. An established introductory month for new fellows includes completion of ATLS, ACLS, an emergency medicine procedures course and a two-day disaster life support course.

We are fortunate to have a supportive research program within the department. Research focus for the fellowship includes sickle cell disease, asthma ultrasound, ketamine, influenza and pediatric disaster preparedness. Quality initiatives involving fellows recently include development of a pediatric massive transfusion protocol, throughput improvement and development of a new clinical pathway in bronchiolitis. There are ample opportunities for our fellows to teach including traditional bedside, presentation at emergency medicine grand rounds, pre-hospital personnel including our Annual Emergency Medical Services for Children Conference, and within the paramedic program at our Center of Operational Medicine.

Our program will be growing over the next few years. We will move to acceptance of two from one fellow per year accepting either emergency medicine or pediatric trained residents. Our new pediatric-trained fellows have been great additions to the department and we look forward to a great interview season with candidates coming from all over the country to look at what we have to offer.

Emergency Medicine Residency Update: Georgia Regents University

Rich Gordon, MD, Assistant Residency Program Director

Fall is here and we look forward to another civilian interview season. Interviews are currently slated to start early November and end mid-January. Welcoming the EM candidates is a busy and exciting time of the year, not just for residency leadership, but faculty and resident alike. This year we plan to take seven civilian candidates, whom make up approximately 50% of our 14 ACGME-approved positions. The Army interview season, on the other hand, is currently in full swing and we are very excited at the prospect of matching another six outstanding EM candidates from the Army. Army match day will be mid-December.

Recently, the Ultrasound and International Medicine teams have been working in partnership to bring ultrasound and medical education to providers of the developing world. The experience has been rich in rewards of new friendship, patient care, and even new training partnerships. This past summer the International Medicine and Ultrasound teams traveled to Panama, Central America with a mission to continue training Emergency, Intensive Care, Pediatric, General Surgery, and General Practitioners in bedside ultrasound. Our Panamanian colleagues were such gracious host and the trip overall was a great success. A resident exchange program between MCG and the Panama Ministry of Health has been in the planning phase for the last year. The exchange program would allow MCG Emergency Medicine residents the opportunity of traveling to Panama City and experiencing their unique Emergency Medicine training environment. Of course, the same opportunity would be afforded for Panamanian residents interested in travel to MCG to experience EM as practiced here in the United States. On behalf of MCG Department of Emergency Medicine and the Panamanian Ministry of Health, I'm happy to report the exchange program is approved. We currently anticipate residents will begin to participate in the exchange next summer.

The ACEP annual meeting is almost upon us; keeping with tradition many of our senior residents and any junior resident presenting research will be heading to Boston. Historically, this experience has been a wonderful networking and educational opportunity; we anticipate this year will be no different. Several of our faculty will be present as well. We look forward to seeing familiar faces and catching up!

The GCEP annual gathering will be held Monday 10/26 from 5:30-7:30pm at Fenway Park, Bleacher Bar. As always we anticipate there will be a healthy showing of Emergency Providers from across the state of Georgia. We hope to see you there. Stay connected with your alma mater via the department website and social media including Facebook. We welcome any questions or comments you may have concerning our program. Jessica Burkhalter, our Program Coordinator, may be reached at (706) 721-2613 or via email at Jburkhalter@gru.edu.



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Dr. Gordon is an emergency medicine physician at Medical College of Georgia, Georgia Regents University Augusts in Augusta, GA.



Bronchiolitis: Safely Doing Less and the New AAP Guidelines



Kevin Allen, Jr., MD
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Dr. Allen is a pediatric emergency medicine fellow at Children's Hospital of Georgia, Medical College of Georgia Georgia Regents University Augusta in Augusta, GA

Kevin Allen, Jr., MD, Pediatric Emergency Medicine Fellow, Children's Hospital of Georgia, Medical College of Georgia

“Since acute viral bronchiolitis is thus a self-limited disease of relatively good prognosis, the principle of primum non nocere should temper frustrated anxiety to do something - anything - to relieve severe dyspnea. Simple physical exhaustion may determine the fate of an infant laboring to meet his metabolic requirements for oxygen. His energies should not be frittered away by the annoyance of unnecessary or futile medications and procedures. Rest should be treasured.”

- Drs. F. Howell Wright and Marc O. Beem 1965

Bronchiolitis is an acute respiratory disorder commonly caused by viral lower respiratory tract infections in infants, affecting infants between the ages of 1 to 23 months. It is the most common cause of hospitalization among infants during the first 12 months of life, accounting for approximately 100,000 admissions per year in the US. Drs. F. Howell Wright and Marc O. Beem first described the disease process in 1965. Despite the interim 50 years, little has changed in the epidemiology, diagnosis or treatment of bronchiolitis. In June 2013, the AAP convened a new subcommittee to review and revise the previous 2006 guidelines. The subcommittee consisted of primary care physicians, hospitalists, pulmonologists, emergency physicians, neonatologists, infectious disease specialist along with an epidemiologist, guideline methodologist and parent representative. They performed an evidence search using electronic databases (Cochrane, Medline/Ovid, CINAHL, and PubMed) including articles up through May 2014. Their goal was to provide a quick synopsis of the new guidelines that focused on making the diagnosis and recommendations for the treatment of bronchiolitis.

Diagnosis

The diagnosis of bronchiolitis should be made based on the patient's history and physical examination. Imaging studies and laboratory data are not needed to make the diagnosis. Bronchiolitis is characterized by

acute inflammation of the airway, leading to airway edema (primarily lower airway); necrosis of epithelial cells lining small airways and increased mucous production. Signs and symptoms typically begin with rhinitis and cough progressing to tachypnea, wheezing and/or rales, use of accessory muscles and nasal flaring. Review of the literature argued against the use of scoring systems, RSV/viral PCR testing and radiologic imaging. None of these diagnostic modalities add to the clinical decision or management of the patient. They may additionally prolong hospitalizations and or encourage admission.

Concern for the risk of apnea may be unfounded in infants with bronchiolitis who are term and otherwise healthy. Large multicenter studies have shown no risk for apnea in healthy infants greater than 1 month of age, preterm infants greater than 48 weeks post conceptual age and in those who have no history of apnea prior to presentation to a health care setting. Additionally infection with RSV-proven bronchiolitis does not put an infant at increased risk for apnea. Hospitalization for risk of apnea alone should be reviewed carefully.

Treatment

Contrary to the previous guidelines, the AAP does not recommend the use of albuterol or racemic epinephrine treatments to infants diagnosed with bronchiolitis.

Evidence showed that neither treatment improved length of stay, lowered hospitalization rates or lessened severity of disease course. Even the infants with positive family history of atopic disorders (asthma, allergies and eczema) do not require a trial of albuterol. However, racemic epinephrine is still accepted as a rescue treatment for the rapidly deteriorating infant in an acute care setting. The use of nebulized hypertonic saline was restricted to hospitalized infants as it was shown to decrease LOS in hospitals where LOS was greater than three days as a norm. There are no noted benefits to its use in the emergency department. There was a strong recommendation against the use of corticosteroids in the outpatient or inpatient setting with strong supportive evidence. Supplemental oxygen was reserved for inpatient use on infants with oxygen saturation levels <90%. Continuous pulse oximetry contributes to unneeded admissions and increased length of stay. Suctioning of the nasopharynx with saline is the “mainstay” of treatment and the guidelines recommend against deep suctioning or chest physiotherapy. Lastly, there was a strong recommendation against the use of antibiotics unless there was clinical evidence of a concomitant bacterial infection, reiterating the recommendation against obtaining a chest x-ray or blood work.

Other Important Recommendations

Nutrition and hydration are important in managing bronchiolitis as the infant has an increased metabolic demand related to respiratory distress and potential fever. Recommendations are for shared decision making (along with family) to supply the nutrition via nasogastric or intra-

venous route, with a cutoff of 60-70 breaths per minute for oral feeding.

Synagis (palivizumab) prophylaxis for preterm infants and/or infants with chronic lung disease was supported by the guidelines during the RSV season (usually between the months of October through March).

Parental education on good hand hygiene, tobacco smoke exposure and breastfeeding were strongly recommended as ways to decrease the risk of bronchiolitis in infants and limit the spread of the disease.

Summary

The new AAP guidelines seem to support the ideals of the original describers of the bronchiolitis disease process, advocating for the least amount of supplemental care necessary to keep the infant comfortable and well-hydrated. These guidelines only apply to infants’ age 1 to 23 months with no risk factors for underlying cardiopulmonary disease prematurity or history of apnea with disease presentation. And lastly, these guidelines serve as recommendations for clinicians managing patients with bronchiolitis and each patient should be evaluated and treated on an individual basis.

References

Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis

Shawn L. Ralston, Allan S. Lieberthal, H. Cody Meissner, et al. Pediatrics 2014; 134:e1474

Pediatrics 2014;134:e1474; originally published online October 27, 2014



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Choosing Wisely

Lekha Shah, MD



Lekha Shah, MD

Lekha Shah, MD is a practicing attending in Emergency Medicine and Pediatric Emergency Medicine at Emory University. She completed her residency training at SUNY Downstate/King's County in Brooklyn, NY. She completed Emergency Ultrasound fellowship at St. Luke's-Roosevelt Hospital in NY and her Pediatric Emergency Medicine at Emory University in Atlanta.

Jenna Wade, a feisty 17-month-old toddler, presented to the ER because mom found a swollen, red, tender area on her right buttock today after she spiked a fever. On clinical exam, she had a soft tissue abscess. She required an incision and drainage (I&D) under procedural sedation.

Her distraught mother asked, “How did this happen?” and “What can I do to prevent this next time?”

We are partly, or even largely, to blame for the current epidemic increase in MRSA. Abscesses and cellulitis from CA-MRSA (community acquired MRSA) are routine, rather than rare.

Many pediatric providers have memorized the dose and concentration of Bactrim and Clindamycin suspensions. CA-MRSA is so widely prevalent in the U.S. that the CDC's *Choosing Wisely* campaign now recommends against the routine use of wound culture; instead, soft tissue infection should be presumed be due to MRSA or *S.pyogenes*. Many Children's Healthcare of Atlanta pediatric emergency medicine physicians sedate for I &D approximately once (or more) per shift per provider and treat MRSA-associated cellulitis on a daily basis.

What is the scope of the antibiotic overuse problem? The antibiotic prescribing rate for children under age two years exceeds that of elderly adults over 65 years. Acute viral respiratory infections (e.g., sinusitis, acute bronchitis, viral pharyngitis, and otitis media) account for 75% of antibiotic prescriptions written for children, mostly under two years of age. According to a large United Kingdom

database analysis of 3.4 million respiratory infections (excluding pneumonia) treated with antibiotics, the number need to treat (NNT) to prevent one complication was > 4000 (*Peterson*).

Regarding more serious adverse events, a recent CDC analysis found 944 pediatric *Clostridium difficile* infections in the U.S. in 2010-11. Of the community acquired *C. difficile* isolates, 71% occurred in infants. Horton, et al's study in the May issue of *Pediatrics*, found a dose-dependent association between antibiotic exposure and onset of Juvenile Idiopathic Arthritis compared to age-matched controls.

From the ER perspective, adverse events attributable to antibiotics account for >142,000 ER visits/per year in the U.S. Allergic reactions account for 4/5's of these ER visits; the most common culprit drugs—penicillins and cephalosporins, bread-and-butter drugs in pediatrics.

Many of our patients, and perhaps some of us, believe that antibiotics are benign, but consider this statement in an opinion piece by Linder regarding antibiotics in acute URI treatment:

“For your infection, there is ~1 in 4,000 chance that an antibiotic will prevent a serious complications, a 5-25% chance that it will cause diarrhea, and an ~1 in 1,000 chance that you will require a visit to the emergency department because of a bad reaction to the antibiotic.”

For further information, please visit the “CDC Get Smart: Know When Antibiotics Work” website at <http://www.cdc.gov/getsmart/week/partners/partners.html>.



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GCEP LEADERSHIP & MEDICAL DIRECTORS FORUM

TUESDAY, DECEMBER 8 - WEDNESDAY, DECEMBER 9, 2015
THE RITZ CARLTON LODGE • GREENSBORO, GA

AGENDA:

Tuesday, December 8, 2015

11:00AM - 1:00PM Janssen Product Showcase Luncheon (non-CME event. Free for all attendees)
2:00PM - 6:30PM GCEP Medical Directors & Leadership Forum
6:30PM - 7:15PM Reception in the Exhibit Hall
7:15PM Dinner

Wednesday, December 9, 2015

7:00AM - 7:30AM Breakfast & Exhibit Visitation
7:30AM - 11:30PM GCEP Medical Directors & Leadership Forum
11:30 - 2:15PM Special Resident and Young Physician Focused Program (all attendees are invited to stay)



CLICK HERE for a full agenda

To book your reservation at The Ritz Carlton Lodge, Reynolds Plantation Hotel, please call 1-800-241-3333 or visit <https://resweb.passkey.com/go/GCEP>. Reference the "Georgia College of Emergency Physicians Leadership & Medical Directors Forum" to receive the group rate. Group Room Rates Run of the House: \$159/night
*Reservations must be made by Friday, November 6, 2015 in order to receive the discounted rate.



For Meeting & Hotel Information and Registration, visit www.gcep.org

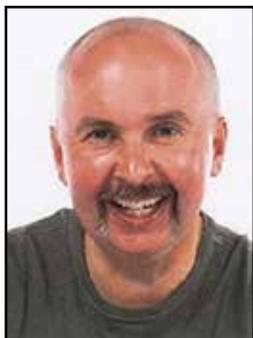
Open Airway-Neutral Cervical Spine: 1 Intervention for 2 Problems

George Hsu, MD, MS, Fellow, Pediatric Emergency Medicine and Larry B. Mellick, MD, MS, FAAP, FACEP



George Hsu, MD, MS,
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Dr. Hsu is currently in fellowship for pediatric emergency medicine.



Larry B. Mellick, MD, MS,
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Dr. Larry B. Mellick is professor of Emergency Medicine and Pediatrics, Department of Emergency Medicine, Georgia Regents University, Augusta, Augusta, GA.

You are working a typical night shift when you hear an overhead page of a high speed motor vehicle collision with an ejected pediatric passenger on the scene. As the local EMS team is arriving in your emergency department you note them to be bagging a young child who has obvious significant blunt trauma to the face and neck. As they roll into the trauma bay, the lead EMS provider tells you they have had problems ventilating for the past few minutes since immobilizing the patient with a c-collar and spine board. As you prepare for the resuscitation, you wonder what could be the cause of the sudden respiratory decline of the patient.

Introduction

The care of the pediatric trauma patient continues to be an evolving field. Most standards of practice are adapted from adult trauma literature with adaptation to address the unique anatomy and physiology of the pediatric patient. Examples of this adaptation process include pediatric cervical spine and pediatric airway management. Pediatric cervical spine immobilization guidelines are extrapolated from adult trauma guidelines.^{1,2} Additionally, unique anatomical and physiologic differences of the pediatric airway also exist and can make its management additionally challenging for the unexperienced provider. Sometimes, however, beneficial anatomic associations occur serendipitously and can simplify both airway and neutral cervical spine immobilization. In this article we review how one intervention can simultaneously address both open airway maintenance and neutral cervical spine management in the pediatric trauma patient.

Discussion

C-Spine Immobilization

Severe spinal injury in pediatric patients is rare, however when present, key differences exist when compared with adult patients. Pediatric patients with spinal trauma are more likely to have cervical spine injuries (60-80%) when compared with adult patients (30-40%).^{3,4} When present, these injuries are associated with high rates of morbidity and mortality.⁵ The reason for increased morbidity and mortality is

unknown, however some observational studies have found a higher incidence of high cervical spine injury (C1-C4) resulting in poorer outcomes.⁵

Full spinal immobilization during transport is standard of care in pediatric patients with suspected spinal injury.⁶ Immobilization typically consists of cervical collar placement and immobilization on a spine board. The goal of effective pre-hospital cervical spine immobilization is to eliminate excessive flexion of the cervical spine during transport that may lead to further injury. In the adult patient, appropriately sized cervical collars have been shown to neutralize unwanted flexion of the cervical spine. However, multiple studies have shown that even with utilization of appropriately sized cervical collars, pediatric patients less than eight years of age will have a degree of flexion and in some cases this degree of flexion is increased after application of a cervical collar.^{7,8,9} The impact of this phenomenon is not completely clear, but the article by Herzenberg et al clearly demonstrated anterior translation of fractured cervical spines when a neutral position was not present.⁹ Guidelines recommended for visual determination of neutral position include alignment of the external auditory meatus with the shoulder or positioning the long axis of the cervical spine to be perpendicular to the transverse axis of the head (gaze is directly perpendicular to the horizontal plane of backboard).^{8,9} The intent is to mimic the position of the head

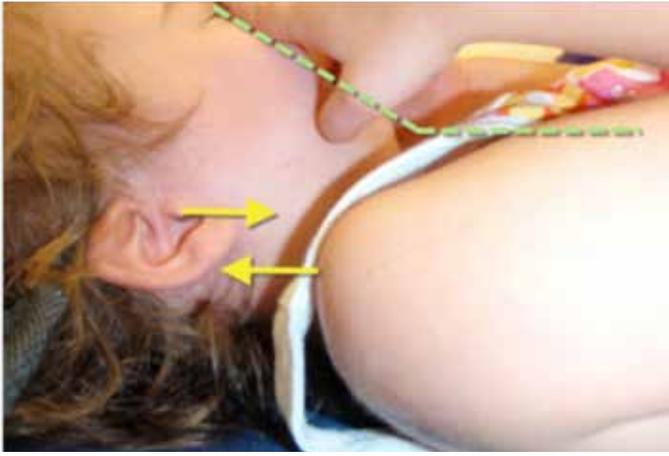


Figure 1.

and torso obtained while standing looking straight forward. Radiographically this optimum positioning of the pediatric cervical spine occurs with a slight degree of extension.^{7,8,9} This slight extension also has a favorable effect on the pediatric airway while maintaining a safe neutral position in the pediatric trauma patient.

Open Airway

Cervical spine neutrality appears to bring with it a more patent and open pediatric airway.¹⁰ Neck flexion, especially in the neonate, undeniably worsens the patency of the airway.^{11,12} The anesthesia literature using MRI studies confirms that 5 to 10 cm of padding under the shoulders can improve the size of the pediatric airway.¹³ Intuitively, the image of the infant or toddler on a backboard without padding under the shoulders who presents with the head flexed and the little chin crunched against the chest or cervical collar should immediately cause concern for a compromised airway. (Figure 1) While the ideal sniffing position isn't going to be acceptable to the pediatric trauma patient, the evidence suggests that a neutral cervical spine will provide an adequate open airway. That neutral position will be obtained with 5-10 cm of padding under the shoulder. (Figure 2) This degree of extension removes the amount of natural flexion that occurs when a pediatric patient is supine and immobilized on a backboard while simultaneously opening the airway to some degree. If the patient is altered or sedated (as the pharyngeal soft-tissues may relax under those conditions) a jaw thrust while maintaining cervical spine neutrality will resolve any stridor or other signs of airway compromise.¹⁴

Conclusion

Care of the pediatric trauma patient with suspected spinal injury can be a challenging to providers not experienced with caring for pediatric patients. While most guidelines are extrapolated from adult literature, care must be taken to adjust for unique aspects of pediatric anatomy and physiology. The "Open Airway, Neutral Cervical Spine" positioning technique provides optimal neutral cervical spine positioning while insuring the most patent pediatric airway. We effectively address two issues with one simple maneuver.

As you quickly access the patient in the trauma patient, you quickly place a shoulder roll under the patient and repo-

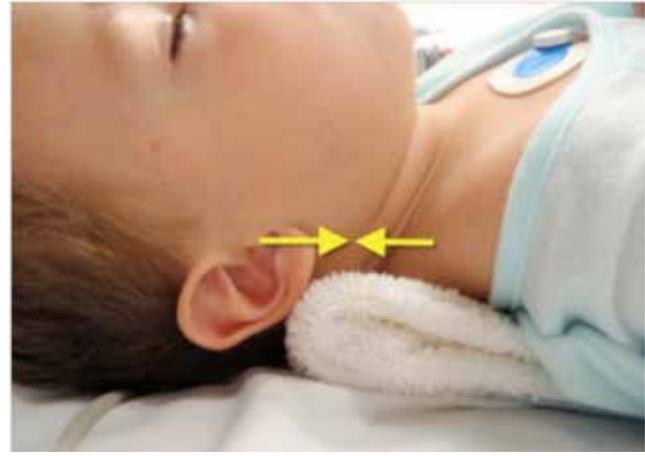


Figure 2:

sition until the external auditory canal of the ear and the apex shoulder align. Immediately you notice a difference in ease of ventilation and the patient's vital signs which eases the rest of your resuscitation.

https://www.youtube.com/watch?v=0Q_JTY2V-R4

References:

- Hoffman JR, Mower WR, Wolfson AB, et al. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. National Emergency X-Radiography Utilization Study Group. *N Engl J Med.* 2000 Jul 13;343(2):94-9.
- Viccellio P, Simon H, Pressman BD, et al. A prospective multicenter study of cervical spine injury in children. *Pediatrics.* 2001 Aug;108(2):E20.
- Dietrich AM, Ginn-Pease ME, Bartkowski HM, et al: Pediatric cervical spine fractures: Predominately subtle presentation. *J Pediatr Surg.* 1991 Aug;26(8):995-9; discussion 999-1000.
- Dickman CA, Rekatte HL, Sonntag VKH, et al: Pediatric spinal trauma: Vertebral column and spinal cord injuries in children. *Pediatric Neurosci* 15:237-256, 1989
- Brown RL, Brunn MA, Garcia VF. Cervical Spine Injuries in Children: A Review of 103 Patients Treated Consecutively at a Level 1 Pediatric Trauma Center. *J Pediatr Surg.* 2001 Aug;36(8):1107-14.
- American College of Surgeons Committee on Trauma. Spine and spinal cord trauma. In: *Advanced Trauma Life Support for Doctors, Student Course Manual.* 7th ed. Chicago, IL: American College of Surgeons;2004:177-203.
- Treloar DJ, Nypaver M. Angulation of the pediatric cervical spine with and without cervical collar. *Pediatr Emerg Care.* 1997 Feb;13(1):5-8.
- Nypaver M, Treloar D. Neutral cervical spine positioning in children. *Ann Emerg Med.* 1994 Feb;23(2):208-11. 3.
- Herzenberg JE, Hensinger RN, Dedrick OK, et al. Emergency transport and positioning of young children who have an injury of the cervical spine. *J Bone Joint Surg* 1989;71-A(1): 15-22.
- Mellick LB, van Stralen D, Perkin R. Letter. Emergency transport and positioning of young children who have an injury of the cervical spine. *Pediatr Emerg Care* 1993;9:128.
- Wilson SL, Thach BT, Brouillette RT, Abu-Osba YK. Upper airway patency in the human infant: influence of airway pressure and posture. *J Appl Physiol Respir Environ Exerc Physiol.* 1980 Mar;48(3):500-4.
- Chua C, Schmölder GM, Davis PG. Airway manoeuvres to achieve upper airway patency during mask ventilation in newborn infants - An historical perspective. *Resuscitation.* 2012 Apr;83(4):411-6.
- Shorten GD, Armstrong DC, Roy WI, Brown L. Assessment of the effect of head and neck position on upper airway anatomy in sedated paediatric patients using magnetic resonance imaging. *Paediatr Anaesth.* 1995;5(4):243-8.
- Reber A, Paganoni R, Frei FJ. Effect of common airway manoeuvres on upper airway dimensions and clinical signs in anaesthetized, spontaneously breathing children. *Br J Anaesth.* 2001 Feb;86(2):217-22.

Bedside Evaluation of Sudden Vision Loss Using Ultrasound

Claire Abramoff, MD



Claire Abramoff, MD

Claire Abramoff is a 3rd year emergency medicine resident at Emory University. She completed her medical school training at The Ohio State University College of Medicine. She is currently applying for the ultrasound fellowship for next year.

Ocular complaints comprise approximately 2% of emergency department visits(1). Ultrasound can play a key role in the evaluation of sudden vision loss, and is an important adjunct to our traditional eye exam. The eye is a particularly easy organ to ultrasound due to its superficial location and fluid filled structure. Ocular ultrasound can reveal a variety of pathologies, including intraocular foreign bodies, lens dislocation, retinal detachment or hemorrhage, vitreous detachment or hemorrhage.

Examination

Ocular ultrasound can be done sitting up or lying supine. Place a small tegaderm over the closed eyelid to protect it from the gel. Apply a liberal amount of sterile gel. A copious amount of gel allows you to use less pressure over the shut eyelid. It should be noted that this exam is contraindicated if there is concern for globe rupture as any pressure applied to the eye runs the risk of extruding ocular contents. Use the high-frequency linear probe and, bracing your hand on the patient’s face, apply minimal pressure. Examine the eye in at least two planes. If the condition is unilateral, the unaffected eye can serve as an example of normal anatomy. Asking the patient to move their eye in the cardinal positions ensures complete visualization of the ocular structures.

Retinal Detachment

Quickly diagnosing a retinal detachment (Figure 1) using bedside ultrasound and alerting ophthalmology can help to prevent

permanent loss of vision for the patient. To assess for retinal detachment, focus on the posterior chamber and increase the gain. The retina is attached at the optic nerve and ora serrata. A retinal detachment will appear as a hyperechoic membrane floating in the vitreous fluid, attached at these two sites. A retinal hemorrhage will appear as a hyperechoic collection under the retina or under a retinal detachment.

Vitreous Hemorrhage

A posterior vitreous hemorrhage (Figure 2) will appear as hyperechoic particles floating in the posterior chamber. These particles will freely move with eye movements. When the patient rapidly adducts and abducts their gaze the particles will swirl. This swirling motion is described as the “washing machine sign”. This can help differentiate between a retinal detachment and a vitreous hemorrhage.

Retinal detachment and vitreous hemorrhage are vision threatening diagnoses that are not uncommonly seen in the emergency department. Performing a thorough dilated fundoscopic exam or slit lamp exam may be difficult to do in a busy chaotic emergency department. Ultrasound, in comparison, is a quick bedside modality that can provide immediate diagnostic information.

Reference

Marx, John, Ron Walls, and Robert Hockberger. Rosen’s Emergency Medicine-Concepts and Clinical Practice. Elsevier Health Sciences, 2013. APA



Figure 1.

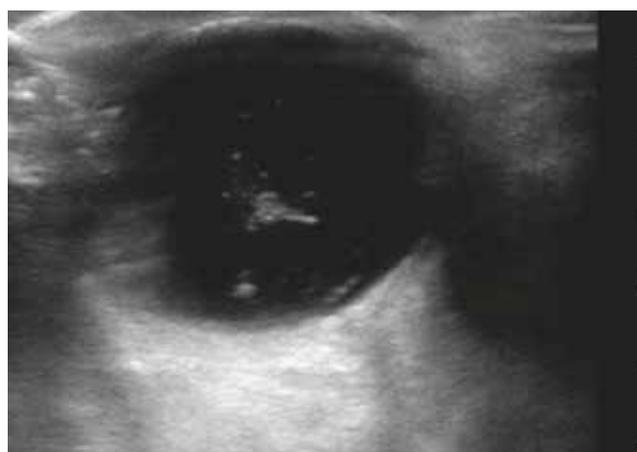


Figure 2

What is the Best Course of Action?

Stephen Shiver, MD, FACEP

A 63-year-old male complaining of substernal chest pain presents to triage and is brought back immediately to a resuscitation room. He denies any prior history of CAD and states the pain began several hours ago while watching a college football game on television. There has been some associated shortness of breath as well as mild nausea. The pain is described as “pressure” and does not radiate. He does have several risk factors for CAD including hypertension and hypercholesterolemia.

Vital Signs

Temperature: 37.0; Pulse: 70; Blood Pressure: 150/80; Respiratory Rate: 20

As you enter the room, you see an elderly male in no acute distress but appearing a bit uncomfortable. The physical exam is essentially unremarkable. A 12 lead EKG is obtained.

The EKG shows a rhythm that is somewhat irregular but appears to be sinus in origin. The intervals are essentially normal. What about the ST/T changes? The machine read is “Acute Ischemia”. You just sent laboratory studies and nothing has returned. What is the best course of action?

There are several interesting things to note about the EKG. There is ST depression in multiple leads and in multiple different anatomic distributions. There is no obvious ST elevation with one notable exception: Lead aVR. Lead aVR is the Rodney Dangerfield of the EKG – it never gets any respect! In general, we tend to overlook it or at most give it a casual glance. But, in certain circumstances including pericarditis, overdose, and ischemia, Lead aVR can be quite important. What does this finding mean in our patient?

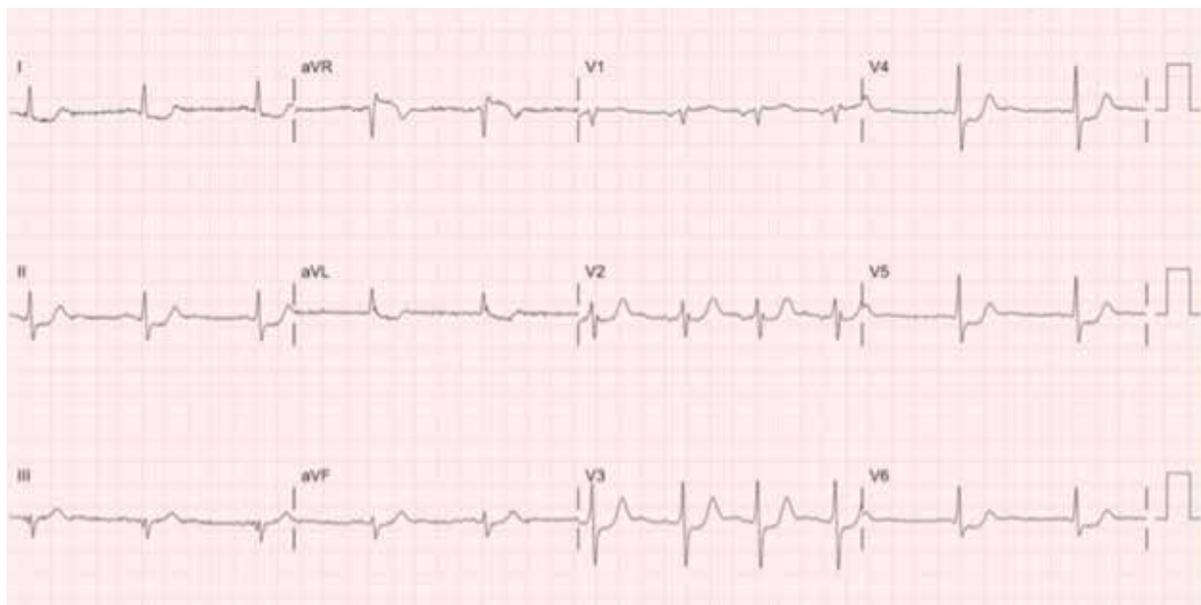
As it turns out, ST elevation in aVR can be associated with left main and/or proximal LAD obstruction. ST Elevation of 1.5 mm or more in aVR correlates with a poor outcome and higher mortality than otherwise would be expected. A useful pearl here is that you should be most concerned about ST elevation in aVR when there is diffuse ST depression elsewhere on the EKG.

ST elevation in aVR is increasingly being viewed as a “STEMI Equivalent” by many authorities. Thus, we as EM practitioners should be aware of the finding and should discuss such patients emergently with our Cardiology colleagues. Many such patients will be taken for emergent catheterization and undergo potentially life saving interventions.



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How to Know You are Financially Independent



**Setu Mazumdar, MD, CFP, President and Wealth Manager
Financial Planner For Doctors**

Practicing medicine isn't a whole lot of fun these days. Ask yourself how many physicians jump up and down with joy when they enter the ED at the beginning of their shift. I've yet to see a single one, but I see plenty who rejoice when the shift is over—does that sound familiar?

Many physicians are looking for an escape plan or thinking about cutting down and retiring if they have the financial means to do so. How do you know when you've achieved financial independence so you can walk away from the grind? While there's never a 100% guarantee, here's how you can begin thinking about the answer to that question.

Suppose you are a 60-year-old emergency physician, want to retire at age 65, live to age 90, have a \$2.5 million investment portfolio in a tax deferred retirement account, achieve an average 6% annual rate of return, and have no debt. You make \$300,000 annual income, save \$50,000 into your retirement account, and want to spend \$100,000 annually in today's dollars when you retire at age 65.

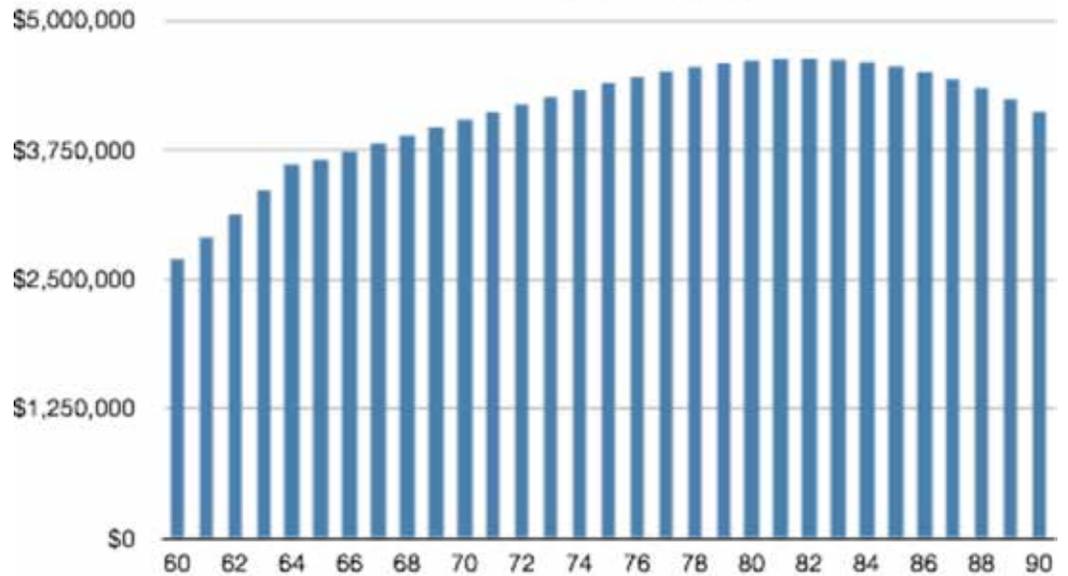
After factoring inflation and taxes here's what your projected portfolio value looks like for the rest of your life:

Setu Mazumdar, MD, CFP® is a financial planner and President of Physician Wealth Solutions where he helps make work optional for doctors. He is also a board certified emergency medicine physician.

www.FinancialPlannerForDoctors.com



Portfolio Value By Age



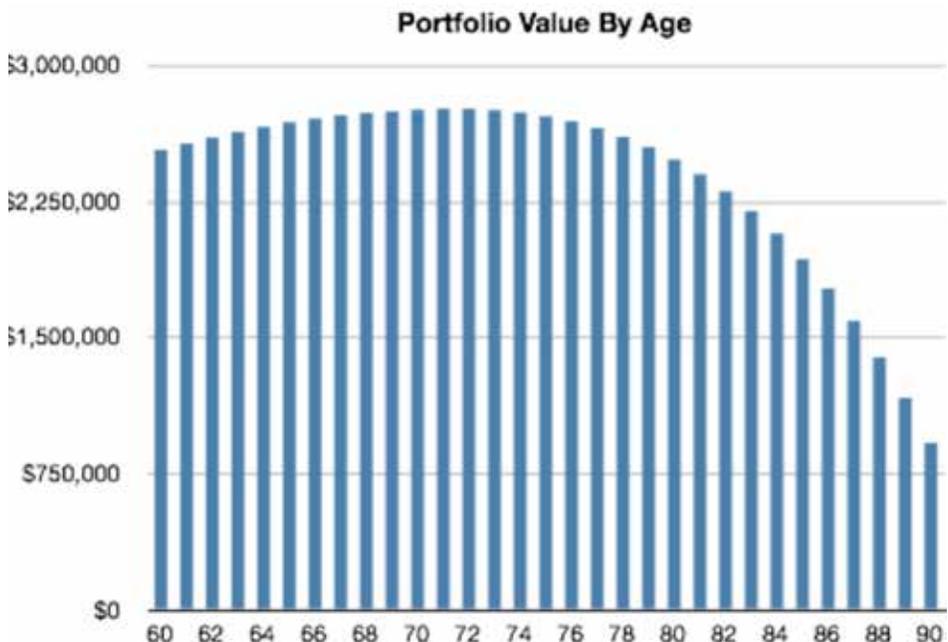
That result might excite you. “I can stop working now!” you might exclaim.

Not so fast.

If you stop working now -- which means you will no longer have any income and will not contribute any money to your portfolio -- the results don't look so good and you might run out of money:



But if you make an adjustment such as spending \$20,000 less annually – probably not too uncomfortable of a change – then voila, you may just have achieved what almost every physician desires. Take a look:



This is a simplistic analysis and it doesn't factor in everything, but at least it's a start.

No matter what age you are now, if you're itching to know when you can hang up the stethoscope, you or your financial advisor need to do this analysis regularly. To make it more robust and meaningful, create other scenarios (for example a stock market crash, a disability, or lower future returns) and do this analysis in a more dynamic way so you can see the possible outcomes.

If the analysis looks good, I bet you'll be the first one to jump up and down for joy at the beginning of your next shift -- because it might be the last one you ever work.

Here's to your financial independence

Georgia Certificate of Need Law Facing Multiple Challenges

Lee Little, Partner, Hamil Little



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Lee Little is a partner in the Georgia law firm Hamil Little. Lee, a former federal prosecutor, is a business and healthcare lawyer with extensive experience. Her law practice is focused on representation of physicians, other healthcare providers and businesses with regard to business set up, contracts, transactions and regulatory compliance. You can read more about Lee at www.hamillittle.com, or contact her directly with questions at: lee@hamillittle.com.

Georgia legislators and courts are contending with challenges to Certificate of Need laws impacting the establishment and modification of hospitals and other healthcare facilities in the state.

Background: Certificate of Need

A Certificate of Need (CON) is a legal document required to be issued by a federal or state regulatory agency before certain types of facilities can be built, expanded or modified. In the healthcare context, CONs are required by 36 states, including Georgia, to pave the way for hospitals and other medical facilities to be established or modified. Healthcare CONs were created in an effort to contain costs by requiring government agencies to regulate the number of hospitals and other providers in their markets in order to avoid flooding the markets with excess hospitals so that competitors would not unnecessarily expand services and inflate costs, nor influence patients to accept unnecessary hospitalizations.

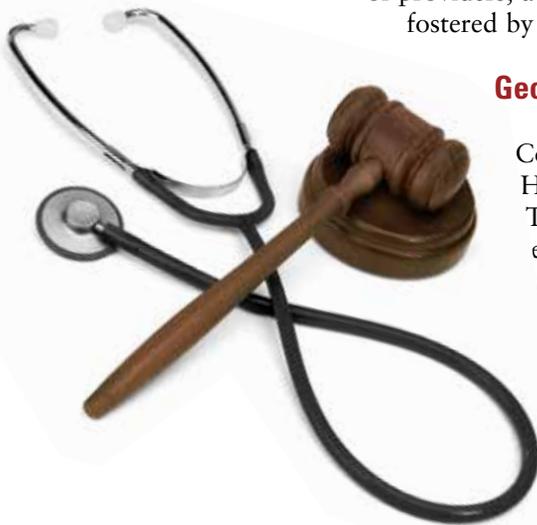
Certificate of Need programs began by Congressional mandate in the 1970's, but were abandoned at a federal level in 1987. Nevertheless, many states, including Georgia, opted to continue their CON programs. Opponents have argued that state CON programs are outdated and ineffective to contain costs, create monopolies, and effectively hinder patient access to care. Various legislative efforts in Georgia for more than two decades have been advanced to change or eliminate its CON law. See <http://www.wsj.com/articles/SB84903233450231500>

State methods vary widely as to requirements to obtain CONs. Georgia's Department of Community Health administers the CON program for this state, with the following goals: (1) to measure and define need, (2) to control costs, and (3) to guarantee access to healthcare services.

In practice, CON requirements have been useful to existing hospitals to eliminate competition by blocking the entry or expansion of new hospitals and medical services into local markets. Such outcomes support the criticism that the CON system gives monopoly privileges to existing hospitals, at the expense of patients -- who may benefit from choice of providers, additional community medical facilities, and enhanced quality of services fostered by a competitive market.

Georgia CON Controversies

In June 2015, Arizona's Goldwater Institute filed a lawsuit in Fulton County Superior Court against the Georgia Department of Community Health challenging the constitutionality of Georgia's medical CON law. The case was brought on behalf of two Cartersville physicians seeking to expand the operating room in the ambulatory surgery center they own across the street from Cartersville Medical Center, which objected along with other area hospitals to the physicians obtaining a CON. DCH's denial of the CON on the basis that the expansion would cause "unnecessary duplication of services" prompted the lawsuit. Should the court strike down the CON law as unconstitutional, the impact of its decision would affect the statewide expansion of medical services, and contribute to the national debate as to the viability of other state CON laws. For instance, in Georgia, several Augusta area hospitals seeking to expand into Columbia County have been awaiting the outcome of



an appeal challenging DCH's grant of a CON to Georgia Regents Medical Center. South Carolina and other states face ongoing challenges to their own CON laws.

In 2016, Georgia legislators also are expected to consider modifying state law as to CONs, relevant to a controversy involving Rome area hospitals and the Cancer Treatment Centers of America. In 2008, the Cancer Treatment Centers of America (CTCA), a multi-state corporation offering conventional and alternative cancer treatments, negotiated with the Georgia General Assembly to allow CTCA to build a facility by exception to the typical state CON requirements. Characterized as a "destination hospital," CTCA agreed at that time to obtain at least 65% of its patients from outside Georgia, cap its number of beds at 50, and provide a certain level of care to indigent, Medicare and Medicaid patients. In 2009, CTCA built a \$150 million cancer treatment center in Newnan, Georgia. Last year, CTCA advanced Georgia House Bill 482, which would have eliminated the limitations to which CTCA agreed in 2008. Leaders of numerous area hospitals strenuously objected, asserting that CTCA is failing to abide by the 65% out-of-state and indigent patient care pledges, according to coverage in the *Rome News-Tribune*. In addition, the Georgia Hospital Association (GHA) strongly opposed HB 482. See http://www.northwestgeorgianews.com/rome/news/local/cancer-treatment-centers-of-america-executives-fire-back-at-opposition/article_5483f482-d04f-11e4-8023-2b1768819443.html

As reported last week in the *Atlanta Journal & Constitution*, CTCA convinced the Georgia Department of Community Health (DCH) board to approve tentatively a rule change that could allow CTCA to eliminate its in-state patient cap. The DCH rule change, pending final vote in November, would allow CTCA to become a general hospital that is not required to have an emergency room. With that change in its designation, the in-state patient cap and limit on number of beds would be eliminated. The Georgia Hospital Association and Georgia Alliance of Community Hospitals have vowed to fight the proposed rule change, characterizing the rule change efforts by CTCA as an end-run around the legislature. See <http://www.ajc.com/news/news/state-regional-govt-politics/lawmakers-not-happy-about-cancer-center-rule-change/nf4Z/>. This issue is certain to be considered by legislators in the next session.

Notably, first on GHA's list of legislative priorities for 2016 is preservation of the CON process. GHA advocates that the CON program preserves access to health care for all Georgians, helps control costs by requiring all applicants to demonstrate the need for services in their locale: preventing overutilization and unnecessary duplication of services, and discourages unfair competition by facilities that serve few if any Medicaid and uninsured patients. <https://advocacy.gha.org/Home/GovernmentRelations/LegislativePriorities.aspx>

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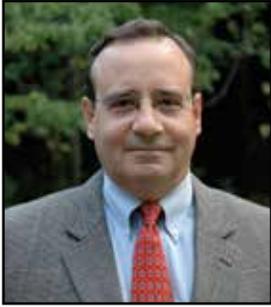
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So you can focus on Medicine...

CYANOSIS: “Doctor, This Patient is Blue!”

Michael J. Bono, MD, FACEP



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Dr. Michael Bono is professor of emergency medicine and associate residency director for the Department of Emergency Medicine at Eastern Virginia Medical School in Norfolk.

With the advent of pulse oximetry and arterial blood gas analysis, diagnosis of hypoxemia is no longer based on the clinician’s identification of cyanosis. However, evaluation of the cyanotic patient provides a framework for discussion of an important group of diseases which may be encountered in adults in the acute care setting.

Cyanosis is derived from the Greek “kyanos” which means dark blue and is used to describe a blue, gray, or purple discoloration of the skin and mucous membranes. Cyanosis can be present without hypoxia, and hypoxia can be present without cyanosis. It is neither a sensitive nor specific indicator of the patient’s oxygenation state.

The clinical identification of cyanosis is limited by lighting, thickness of the patient’s skin and cutaneous pigmentation, and the examiner’s skill, thus making its detection subjective and unreliable. Counter intuitively, patients with a higher total hemoglobin content may exhibit cyanosis at higher oxygen saturation values than patients with lower hemoglobins; patients with hypovolemia or severe anemia may develop cyanosis only after death. Cyanosis can represent possible tissue hypoxia.

The presence of cyanosis indicates an increased amount of either deoxygenated hemoglobin or abnormal hemoglobin derivatives in the blood. The examiner must determine if the patient is exhibiting true cyanosis as opposed to pseudo cyanosis, and then determine if the cyanosis is central versus peripheral in order to rapidly identify the underlying problem causing the cyanosis. This article will provide a systematic approach for evaluating the cyanotic patient and will highlight specific treatment for the lesser known modalities.

Basic Science

Oxygen is found in the body as a gas in the respiratory tract, dissolved in plasma, or bound to hemoglobin in the red blood cell. More than 200 million hemoglobin molecules are in an individual red blood cell. Each hemoglobin molecule is a globular protein with four pigmented iron-containing subunits. The individual subunit, or heme group, can bind one oxygen molecule. When hemoglobin is chemically attached to oxygen it turns the erythrocyte bright red. Deoxygenated, or unbound, hemoglobin causes blood to have a bluish-purple hue. The total amount of deoxygenated hemoglobin present at any time depends on a multitude of factors including arterial oxygen saturation, oxygen extraction, and tissue perfusion.



The appearance of cyanosis is NOT based on a percentage or relative amount of this form of hemoglobin in the blood. It is the ABSOLUTE amount of deoxygenated hemoglobin that is important. Cyanosis can be seen when 5g/dL of deoxygenated hemoglobin is present in the capillaries. That is, if all the hemoglobin were extracted from the red blood cells found in 100 mL of capillary blood, the deoxygenated hemoglobin would weigh 5 grams. The 5 g/dL value of deoxygenated hemoglobin in capillaries is an ABSOLUTE amount—a critical

mass—and once this level is reached, cyanosis is evident, regardless of the total amount of oxygenated hemoglobin present. This value translates to 3.4 g/dL of deoxygenated hemoglobin in arterial blood. Abnormal hemoglobin in the form of methemoglobin and sulfhemoglobin may cause cyanosis at levels of 1.5 g/dL and 0.5 g/dL, respectively. This is discussed later.

History & Physical

First evaluate the patient's airway, breathing, and circulation. Provide stabilization prior to proceeding with a secondary survey. Intubate when necessary, establish IV access as clinically indicated. All cyanotic patients should receive supplemental high flow oxygen; hypoxia should be assumed as it represents a medical emergency. Do not wait to rule out other less serious causes of cyanosis.

Pertinent history includes determining the acuity of symptoms as well as the patient's baseline cardiopulmonary status, medications, allergies, and possible toxin exposures. Circumstances surrounding any known exposure should be investigated. Was this an accidental ingestion, recreational drug use, a suicide attempt, or routine use of a medication? If the patient is transported from an industrial site, obtaining a MSDS (Material Safety Data Sheet) will be necessary.

All cyanotic patients need a complete set of vital signs, heart and lung auscultation, assessment of mental status, and a thorough exam of the skin, extremities, and vascular system.

Cyanosis is most easily seen where the skin is thin and transparent: lips, oral mucous membranes, earlobes, nail beds, and conjunctiva. The tongue is the most sensitive and reliable place to look for cyanosis and its presence here indicates a central process. Pseudo cyanosis can be differentiated from true cyanosis by the absence of cardiopulmonary symptoms or signs of hypoxia. In addition,

the patient's tongue will be pink and the "cyanosis" will not blanch when pressure is applied to the skin.

Clubbing is soft tissue hypertrophy of the distal digits with curvature of the fingernails and may be acquired or hereditary. Clubbing can be associated with many medical conditions including infective endocarditis, ulcerative colitis, and metastatic lung cancer but is often indicative of chronic hypoxemia from underlying pulmonary arteriovenous shunts or congenital heart disease.

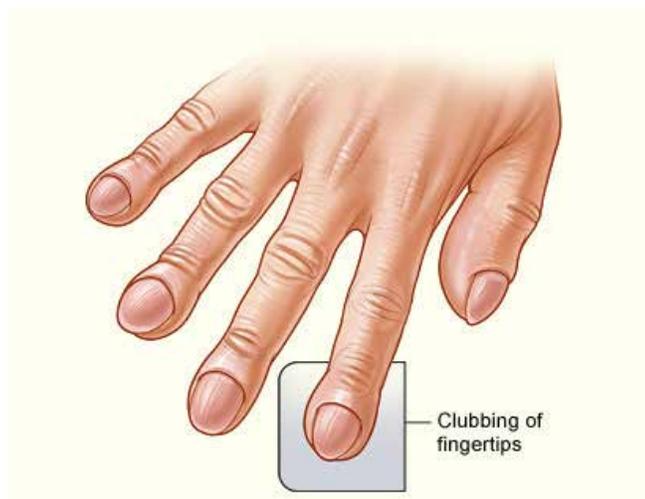
Ancillary Studies

An arterial blood gas and complete blood count should be obtained in all cyanotic patients. Chest x-ray, EKG, peripheral blood smear, and co-oximetry as well as other ancillary testing will depend on the specific patient and the clinical situation.

Central Cyanosis may result from decreased arterial oxygen saturation as a result of cardiopulmonary causes or from a significant amount of abnormal hemoglobin, both of which cause hypoxia. Skin and mucous membranes appear discolored. An essential amount of hemoglobin is deoxygenated and the clinician must search for causes of decreased arterial oxygen saturation such as V/Q mismatch, pulmonary arteriovenous shunting, or exposure to decreased atmospheric pressure (i.e., high altitudes).

In many situations where central cyanosis is present, other signs and symptoms are clues to the diagnosis. For example, in one study cyanosis was documented in 10% of cases of airway foreign bodies. These patients also had stridor, coughing, wheezing, or respiratory distress. Other instances in which cyanosis has been listed as a physical sign include myocardial rupture, pulmonary contusions, pneumococcal sepsis, pulmonary embolism, superior vena cava syndrome, and high altitude pulmonary edema. In these cases, cyanosis will most likely not be an isolated sign, and other information from the history or physical may lead to the diagnosis. Patients with central cyanosis and an abnormal oxygen saturation without an obvious etiology have anatomic shunts or impaired pulmonary function.

Hemoglobinopathies can cause central cyanosis, not directly from the presence of typically deoxygenated blood, but from the presence of altered forms of hemoglobin. Consider this diagnosis in the setting of a cyanotic patient with a normal arterial blood gas and complete blood count who does not improve with oxygen. Pulse oximetry, a measure of the amount of dissolved oxygen in plasma, may be normal or slightly abnormal but in fact, in this case, overestimates a patient's oxygen saturation. Methemoglobin, sulfhemoglobin, and carboxyhemoglobin are abnormal forms of hemoglobin and are unable to bind oxygen. (Carboxyhemoglobin is the result



of carbon monoxide poisoning and like methemoglobin and sulfhemoglobin falsely elevates the calculated oxygen saturation but does not cause cyanosis and will not be discussed here.) A patient's symptoms, which may range from anxiety and light-headedness to confusion and arrhythmias, are secondary to hypoxia.

Methemoglobinemia results from the ferrous form of iron in hemoglobin being converted into the ferric form, which cannot bind oxygen (oxygenation should not be confused with oxidization). Iron loses an electron and is changed from the 2+ ferrous state to the 3+ ferric state. The amount of arterial oxygen saturation is decreased by this "unavailable" hemoglobin. Normally, this occurs in a small percentage of hemoglobin molecules and the body has enough enzyme to convert the transformed iron back into its oxygen-binding able state. When there is an excess of this altered hemoglobin or a deficiency in the enzyme system, the body is unable to revert the changed hemoglobin back to its functional state.

Methemoglobinemia can be hereditary but is more commonly acquired from exposure to certain medications or chemicals. Inherited forms result from endogenous enzymatic deficiencies (cytochrome b5) or an abnormal form of hemoglobin HgbM and patients may be asymptomatic despite profound discoloration.

Any compound that causes oxidization (removal of an electron) can cause methemoglobinemia. Documented causes include benzocaine, lidocaine, prilocaine; sulfonamides; metoclopramide; nitrates and nitrites; aniline dyes and aromatic amino and nitro compounds; dapsone, naphthalene; and hydrocarbon exposure such as "huffing" or "bagging."

An absolute amount of 1.5g/dL of methemoglobin will cause cyanosis. It is the intense color of the abnormal hemoglobin (not the deoxygenated hemoglobin) that is causing the bluish tinge seen in the skin. Measured SaO_2 is reduced in this case, but PaO_2 is not affected as long as the patient does not have coexisting pulmonary problems



involving gas transfer from the atmosphere to the lungs. Co-oximetry measures methemoglobin as a percentage of the total hemoglobin; a concentration of 1.5 to 3.0 g/dL (assuming a hemoglobin level of 15 g/dL)—at which level cyanosis can be seen—corresponds to a measurement of 10-20 percent.

Historically, blood samples from patients with methemoglobinemia have been described as "chocolate brown." In a 1988 study at University of Pennsylvania, resident physicians were asked to describe blood samples with varying levels of methemoglobin. "Chocolate brown" was only used to describe blood containing more than 68% methemoglobin. Other blood samples were only described as "darker than normal." While the bedside test of blood discoloration may raise the suspicion of a methemoglobinemia, it is not reliable and confirmatory testing is necessary for diagnosis and to also monitor treatment response.

Some patients who have levels less than 20% may do well with just supportive treatment. Patients who are symptomatic, have severe underlying disease or significant concurrent problems, or who have a methemoglobin level greater than 30% should be given 1% methylene blue intravenously in a dose of 1 to 2 mg per kg, over five minutes. This dose may be repeated up to a maximum dose of 7 mg per kg. Patients with G6PD deficiency or those who do not improve after administration of methylene blue may need an exchange transfusion, hyperbaric oxygen therapy, or an administration of an alternative reduction agent (such as ascorbic acid). Consultation with the Poison Control Center or a toxicologist is advisable under these circumstances.

Sulfhemoglobinemia is a rarer form of altered hemoglobin and results from exposure to phenactin, acetanilid, or sulfonamides in which sulfur binds with hemoglobin. Sulfhemoglobin is inert as a oxygen carrier and cannot be reversed. An amount as low as 0.5 g per dL of blood can cause cyanosis. Symptoms are milder than with methemoglobinemia and treatment is supportive care, as well as removal of the causal agent. Diagnosis can be made with spectroscopy.

Peripheral Cyanosis can result from alterations in local capillary blood flow (exposure to cold, passive congestion from polycythemia) or an abnormally increased uptake of oxygen from normally saturated arterial blood. Cyanosis is evident in the extremities. Congestive heart failure, peripheral vascular disease, shock, hypothermia, or any cause of vasoconstriction can lead to peripheral

cyanosis. Both central and peripheral cyanosis can be present in the same disease states (such as cardiogenic shock with pulmonary edema) and an absolute distinction between the two can be difficult. In most cases, isolated peripheral cyanosis is not indicative of significant hypoxia or deoxygenation in the arterial blood.

Raynaud's phenomenon is intermittent vasospasm of arterioles in the digits and is usually an exaggerated physiologic response to cold temperatures but can also be triggered by stress. Attacks of pallor and cyanosis are usually followed by a reactive hyperemia as blood flow returns to the affected digits. Passive rewarming usually improves the symptoms in less than 60 minutes. Patients rarely require more than cold avoidance as treatment, but in patients with disabling or recurring attacks, vasodilator therapy may be necessary. Additionally, patients with concomitant symptoms should be screened for underlying connective tissue disease as outpatients.

Phlegmasia cerulea dolens results from thrombosis of veins in the lower extremity. In almost half the cases there is an underlying malignancy. As the name implies, the leg is painful and blue and may be cool, swollen or even have bullae. The natural history of the disease involves compartment syndrome and gangrene. Doppler ultrasound, impedance plethysmography, and venography are important in making the diagnosis; treatment is systemic anticoagulation with vascular surgery consultation. Likewise, patients with peripheral cyanosis and evidence of vascular compromise (pain, pulselessness, paralysis, etc.) should be evaluated for acute arterial occlusion and treated in a similar manner.

Pseudo cyanosis is skin discoloration not related to deoxygenated or altered hemoglobin. Changes in skin coloring can be caused by heavy metals and certain types of drugs. Some ethnic groups may have darker pigmented lips or gums which may appear blue in certain lighting and should not be confused with cyanosis.

Chrysiasis is a discoloration of the skin caused by gold in sodium aurothiomalate used for treating rheumatoid arthritis. Patients with ingestions or applications of silver compounds (such as silver nitrate, silver iodine, silver protein) used to treat burns can develop discoloration known as argyria. Argyria can also be caused by prolonged exposure to silver compounds in the silver mining and processing industry. Some alternative medicine enthusiasts intentionally ingest silver salts, silver proteins, and silver colloids to theoretically bolster their immune systems, and develop argyria. Amiodarone, minocycline, chloroquine hydrochloride, and the phenothiazines have caused blue tinting of the skin in a few patients, and symptoms usually lessen or resolve with discontinuation of the drug.

Cutis marmorata is a patchy cyanosis or marbling of the skin uncommonly seen in scuba divers. It does not follow any dermatomal or anatomic distribution. Cutis marmorata is thought to be caused by venous stasis and is appropriately also called "skin bends" or cutaneous decompression sickness. Patients may experience pruritus, formication, or swelling. In isolation, skin manifestations of decompression sickness are usually self-limited. The presence of cutis marmorata, however, often indicates more serious pathology and requires management by a specialist. Contact Divers Alert Network (919) 684-8111 for the closest hyperbaric treatment facility.

Other documented causes of pseudo cyanosis include hemochromatosis and Addison's disease, and there is one case report of Munchausen's syndrome in which a patient in a psychiatric ward applied blue dye to her skin and was found unresponsive and "cyanotic." The majority of cases of pseudo cyanosis involve cosmesis only but these patients should have follow up arranged as needed for any underlying disease process.

SUGGESTED READING

Fernandez-Frackelton M, Bocock J. Cyanosis. In: Marx J, Hockberger R, Walls R, ed. Rosen's Emergency Medicine. 7th ed. Philadelphia, PA. Mosby Elsevier; 2010: 211-216.

Sarko J, Stapczynski J. Respiratory Distress. In: Tintinalli J, ed. Tintinalli's Emergency Medicine: A Comprehensive Study Guide. 7th ed. New York, NY. McGraw Hill. 2011; 470-471.

Carpenter KD: A comprehensive review of cyanosis. Crit Care Nurse. 1993 Aug;13(4):66-72.

Wright RO, Lewander WJ, Woolf AD: Methemoglobinemia: etiology, pharmacology, and clinical management. Ann Em Med 34(5):646, 1999

Trost C. The blue people of Troublesome Creek. Science 1982;82:35-39. <http://www.indiana.edu/~oso/lessons/Blues/TheBlues.htm>

Henretig FM. Interpretation of color change in blood with varying degree of methemoglobinemia. J Toxicol Clin Toxicol 1988;26:293-301

George T, Shaikh AI, Thomas L, Kundavaram AP. Severe methemoglobinemia due to insecticide poisoning. Indian J Crit Care Med [serial online] 2014 [cited 2015 Oct 9];18:113-4. Available from: <http://www.ijccm.org/text.asp?2014/18/2/113/126087>

A Mere Technicality?

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One of us (JH) was on a fourth year elective at a hospital in another state when EMS brought to the EC an unresponsive patient who was hemodynamically unstable, and the crash cart was brought into the room. It was soon discovered that the patient had DNR orders. The paperwork was signed by the patient, but was missing the physician's signature. Exasperation was evident on the ER attending's face. The patient's condition deteriorated, and he subsequently required intubation, CPR, and a central line. The patient remained on the ventilator until his family arrived and immediately withdrew care.

It was a frustrating experience for the entire team who had worked to resuscitate the patient. The team believed they knew the wishes of the patient and/or his family according to the document received, but the team believed they were obligated to act against those wishes because the form was incomplete. A number of questions arose from this event. For example, what if the patient had been had resuscitated to the point that he was able to breathe without the ventilator but had suffered an irreversible anoxic brain injury during the process? Was the involvement of multiple team members in this scenario justified, given that care was delayed to other patients in the EC? Were other costs justified, including intubation equipment, crash cart, ventilator, and central line kit?

If the case had been in Georgia, EMS might have discovered a POLST (Physician Orders for Life-Sustaining Treatment) form that indicated no CPR, was signed by the patient but not the physician, and a call would have been made to the EC physician for further directions. What would you have done? Would you have asked EMS to transport the patient to the EC, and to initiate CPR and other procedures as needed?

When the case was first presented to me (RE), my initial reaction was also one of frustration, as it seemed clear that the presence of the patient's signature on the DNR form should have been enough to convey the patient's wishes that CPR not be pursued. After all, shouldn't that have been enough to have satisfied a surrogate decisionmaker (in this case the EC physician taking the call from EMS) making the decision the patient would have chosen had he been able? Didn't the decision to begin CPR violate the ethical principle of *primum non nocere*, first of all, do no harm (also known as the principle of nonmaleficence)? Didn't the decision to begin CPR expose the patient to the risks mentioned by Mr. Hornsby in the face of presumptive evidence that the patient would have chosen otherwise?

But I also knew that the team in the EC undoubtedly had faced similar situations in the past where information about the patient's wishes for CPR were partially known, perhaps from verbal statements, but were not sufficient to have forestalled the decision to begin CPR. So there must have been more to this decision to begin CPR than I realized.

On this basis I consulted Dr. Parish, who helped to create our primary teaching hospital's first bioethics committee almost 30 years ago, and who has conducted research on resuscitation for almost as long. His input was invaluable in helping us to understand better the dilemma facing the EC team.

Under Georgia law, "Every adult is presumed to have the capacity to make a decision regarding CPR and every patient shall be presumed to consent to the administration of CPR unless there is consent or authorization for the issuance of an order not to resuscitate."¹ On this basis, it would seem a request for DNR status signed by a patient, in the absence of a physician's signature, could be a sufficient basis to withhold CPR. But for a decision as weighty and irreversible as withholding CPR, we would like to know that the patient actually had the capacity to consent to a DNR. Thus the standard is higher, requiring a physician to attest to several conditions for a DNR order to be valid:

"This form should be completed by a health care professional based on the patient's medical condition, and on the patient's wishes, as expressed to the physician by the patient while in a competent condition, or in the patient's advance directive, or by a representative of the patient acting with legal authority."²

Should an advance directive alone, without a POLST, specifying that a patient does not want CPR be sufficient for EMS personnel to withhold CPR? No. The decision by EMS to withhold CPR requires a valid medical order, and an advance directive is not a medical order. This is the key difference between an advance directive, and a POLST.³ A POLST is a

valid medical order, which may, among other things, place the patient on DNR status. It is then incumbent on the patient and caregivers to have the POLST form available to EMS so that they may have a valid order to withhold CPR.

Crucial to a valid POLST is that a physician determine whether the patient has the capacity to make the decision to forgo CPR. The physician must determine whether the patient can understand his or her medical condition and prognosis, the meaning of CPR, and the consequences of receiving or refusing CPR. This can be a difficult conversation, but is necessary for end-of-life care planning. If the patient lacks that decisionmaking capacity, a physician can still order DNR status, based on information contained in an advance directive, or from information obtained the patient's legally authorized representative (health care agent).

It seems clear, then, that a physician's signature is not a mere technicality, but offers some assurance that when the patient signed the POLST asking the CPR not be performed, he or she understood what was being asked and the consequences of the decision. A physician's signature also indicates support for the belief that the patient's medical condition warrants withholding CPR. And, although not specified in the law, a physician's signature might also offer some assurance that the patient's decision to forgo CPR was not the result of undue influence from a third party who might benefit from the patient's death.

Thus we can answer the question "What if the patient, in Georgia, came to the EC with a POLST having the DNR box checked, but containing no physician's signature?" Then, like any other unsigned "order" it would not be a valid medical order, and EMS would be obligated to initiate CPR and to transport the patient to the EC unless otherwise instructed by the medical director.

The ethical "bottom line" seems to be that we must act so that patients' lives come first, and that a decision to withhold life-saving interventions requires overcoming high barriers. The need to have a valid medical signature is not a "mere technicality" but is a reasonable safeguard to protect patient autonomy in making this decision, and to prevent a casual or cavalier approach to such critical decisions.

References

1. O.C.G.A. 31-39-3 (b)
2. Georgia POLST form downloaded at <http://dph.georgia.gov/POLST>
3. O.C.G.A. 31-1-14