The Pediatric Early Warning Score can potentially provide a forewarning time >11 hours, alerting the team to adapt the care plan and possibly averting a Rapid Response Team or code.

**Background:** The Pediatric Early Warning Score (PEWS) has been promulgated as an early indicator of a patient's clinical deterioration. The score is assigned in 3 domains: behavior, respiratory, and cardiovascular (CV). Scores in each domain can range from 0 to 3; eg, Behavior: playing (0), sleeping (1), irritable (2), reduced response (3); CV: pink (0), pale (1), cyanotic (2), mottled (3); Respiratory: WNL (0), accessory muscles (1), retractions (2), grunting (3). Additional scores for nebulization (2 points) and postoperative vomiting (2 points) complete the process. Total score can range from 0 to 13.

**Objective:** To evaluate the sensitivity of PEWS for patients with a documented Rapid Response Team (RRT) interaction or a code blue event; to evaluate the lead time for the earliest and latest critical PEWS before the event; and to evaluate staff awareness of the clinical deterioration before the event.

**Design:** Retrospective analysis.

**Participants:** 170 non-ICU RRT plus 16 code blue events (2006 to 2008).

**Methods:** Researchers evaluated the in-hospital course of subjects and applied retrospectively PEWS at intervals during the preceding 24 hours of the event. Interrater reliability was achieved among the examiners. A total score ≥4 or a score of 3 in any PEWS domain was deemed critical. Data on frequency of nursing assessments, addition of monitoring equipment, and consulting other health care professionals were also examined as indicators of staff awareness of deterioration of clinical status.

**Results:** With PEWS, the earliest indicator of clinical deterioration was 11 hours, 36 minutes (median) for 85.5% of patients (the latest critical score was 30 minutes for 85.5% of patients). Interestingly, the earliest median time for a consultation was 80 minutes for 97.1% of patients.

**Conclusions:** PEWS is sensitive enough to alert the staff as early as 11 hours, which may be sufficient enough to avert an RRT event or a code blue.

**Reviewer's Comments:** This study showed that the staff had the clinical acumen to do something when there was evidence that the child was going in the wrong direction. However, a definitive interaction was delayed maybe because there wasn't an objective, validated tool that would compel staff to take action early. Retrospectively, this study proves that PEWS is that missing link. Prospective validation is needed, but I suggest you obtain a copy of the PEWS and hang it in your triage area and nursing station. (Reviewer-Paul P. Rega, MD).

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Keywords: Pediatric Early Warning Score, Rapid Response Team Interaction, Code Blue Event

Print Tag: Refer to original journal article
Emergency Physicians Rarely Over-Call Cardiac Cath for STEMI

An Evaluation of the Accuracy of Emergency Physician Activation of the Cardiac Catheterization Laboratory for Patients With Suspected ST-Segment Elevation Myocardial Infarction.

Kontos MC, Kurz MC, et al:


Emergency physicians (EPs) unnecessarily activate the catheterization lab only a small percentage of the time. These results support the recommendation that EPs activate the catheterization lab for potential STEMIs.

**Background:** According to the current recommendation, catheterization lab personnel are to be activated by a single page by an emergency physician (EP) after identifying a ST-segment elevation myocardial infarction (STEMI).

**Objective:** To assess treatment times, outcomes, and the accuracy of these activations by the EP based on angiographic results.

**Design:** Retrospective single-center study of consecutive STEMI pages made by an EP over 27 months.

**Methods:** The EPs initial ECG evaluation was compared to cardiology interpretation and presence of coronary disease. ECGs were reviewed independently by 2 cardiologists who were blinded to the outcome. Each STEMI was confirmed by cardiac enzymes. In total, >50% stenosis of a main artery or bypass graft was defined as significant disease.

**Results:** The catheterization lab was activated 249 times during the study period. Overall, 76% of patients (188) had a true STEMI; 15% (37) of ECGs were false positive for STEMI -- in these patients, cardiac enzymes were normal. However, all false positives went to the cath lab and 30% of them did have significant disease. Eleven patients had concerning but not STEMI criteria ECGs -- the cardiologists took 9 of them to the cath lab and about half had significant stenosis. There were no STEMIs missed by the EP. Thirteen activations (5.2%) were considered unnecessary, MI was excluded, and angiography was not performed.

**Conclusions:** Emergency physicians made a significant number of catheterization lab activations for patients who did not have STEMI criteria. However, most patients did require emergency angiography, were diagnosed as non-STEMI, or had significant disease. EPs unnecessarily activate the catheterization lab only a small percentage of the time. These results support the recommendation that EPs activate the catheterization lab for potential STEMIs.

**Reviewer’s Comments:** These authors were sympathetic to emergency physicians. From where they draw their lines, the total number for "unnecessary caths" did not include the false positive STEMIs in which even the cardiologist was duped. This is an important distinction that explains why other literature suggests higher rates of erroneous activation on our part. With the time limits in place, and ST elevation on an ECG, these false positives are unavoidable and the cost of doing business. The fact that no STEMIs were missed means we are doing business pretty well. (Reviewer-Gretchen S. Lent, MD).

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Keywords: STEMI, Cardiac Catheterization, Angioplasty, Angiography

Print Tag: Refer to original journal article
**Background:** Beta-blockers have been clearly established to reduce adverse events and mortality after myocardial infarction (MI), but they are contraindicated in settings where chest pain is associated with recent cocaine use.

**Objective:** To test the hypothesis that beta-blockers are safe in the setting of acute chest pain and recent cocaine use.

**Design/Methods:** This was a retrospective cohort study of consecutive patients admitted to a single center over a 5-year period with a complaint of chest pain and urine toxicologic test results positive for cocaine. Mortality data were collected from the United States National Death Index.

**Results:** The search identified 328 emergency department (ED) patients with chest pain in the setting of recent cocaine use, of whom 151 (46%) received a beta-blocker in the ED versus 177 who did not. The mean self-reported duration since cocaine use was 22 to 29 hours (only 99 patients provided such information). Ten patients in each group had a documented MI. One patient in each group experienced a ventricular arrhythmia. Overall mortality during hospitalization was approximately 1.3% and did not vary between groups. There were no statistically meaningful differences in ECG manifestations, troponin levels, hospital length of stay, requirement for vasopressor agents or intubation, incidence of ventricular tachycardia or ventricular fibrillation, or death between those who did and did not receive a beta-blocker. After adjusting for potential confounders, systolic blood pressure significantly decreased by a mean value of 8.6 mm Hg among patients administered a beta-blocker in the ED compared with those who received their first beta-blocker in the hospital ward ($P=0.006$). Over a median follow-up of 972 days (interquartile range, 555 to 1490 days), overall mortality in both groups was high, but patients discharged on a beta-blocker regimen demonstrated a significant, nearly 70% reduction in cardiovascular death (hazard ratio, 0.29; 95% confidence interval, 0.09 to 0.98; $P=0.047$).

**Conclusions:** Beta-blockers do not appear to be associated with adverse events in patients with chest pain with recent cocaine use.

**Reviewer’s Comments:** Can you make retrospective hamburger from sacred cow? It's amazing how pernicious this contraindication is because it seems so reasonable mechanistically. Recommendations against the use of beta-blockers were based on animal studies, small human experiments, and anecdote. But if you think about all the millions of cocaine users, add in the millions of chest pain presentations, and correct for withheld information during the clinical interview, it's statistically very likely that we've been giving beta-blockers to cocaine-associated chest pain all along. Interestingly, approximately 37% and 28% ($p=NS$) of those who did or did not receive a beta-blocker, respectively, were supposed to be on a beta-blocker as part of a preexisting outpatient regimen, so don't even ask about patients who are on beta-blockers anyway as part of a daily regimen and dabble in cocaine on the weekends! (Reviewer-Steven B. Abrams, MD).
Among children with food-related anaphylaxis who received epinephrine, 12% received a second dose. Results of this study support the recommendation that children at risk for food-related anaphylaxis carry 2 doses of epinephrine.

**Background:** One of the mainstays of therapy for food-related anaphylaxis is epinephrine. Should vulnerable children have one EpiPen or should more be immediately available?

**Objective:** To determine the frequency of epinephrine dosing in children presenting to the emergency department (ED) with food-related anaphylaxis.

**Design:** Retrospective analysis.

**Participants:** 605 anaphylaxis cases from an allergic cohort of 1255 patients (62% male) with a median age of 5.8 years.

**Methods:** The medical records of all children presenting to Boston EDs with food-related allergic reactions were reviewed. In the chart review, the researchers concentrated upon causative foods, presentations, and emergency therapy. The study period was between 2001 and 2006.

**Results:** In the study population, the foods that caused the majority of the reactions were peanuts (23%), tree nuts (18%), and milk (15%). In total, 52% of the study population met the criteria for food-related anaphylaxis (ie, an acute allergic reaction involving ≥2 organ systems or hypotension alone). Of the anaphylactic subset, 31% received 1 dose of epinephrine and 3% received >1 dose before arriving at the ED. For the anaphylactic subset in the ED, therapy included antihistamines (59%), steroids (57%), and epinephrine (20%). Throughout the whole course of the reaction, of those patients who received epinephrine, 12% received >1 dose. Those who were older or who were transferred from another hospital were more likely to receive repeat epinephrine doses. Overall, 88% were able to be discharged from the ED (43% of whom received prescriptions for self-injectable epinephrine and 22% received referrals to an allergist).

**Conclusions:** A significant percentage of children who develop food-related anaphylaxis require at least 2 doses of epinephrine.

**Reviewer's Comments:** Why a prescription for an Epi-Pen is not more universally administered is a mystery to me especially when you consider that about 150 to 200 deaths occur annually from food-related anaphylaxis. (Reviewer-Paul P. Rega, MD).

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Keywords: Epinephrine, Pediatrics, Food-Related Anaphylaxis

Print Tag: Refer to original journal article
Does Spin Exist in Findings in Randomized Controlled Trial Reports?

Reporting and Interpretation of Randomized Controlled Trials With Statistically Nonsignificant Results for Primary Outcomes.

Boutron I, Dutton S, et al:

JAMA 2010; 303 (May 26): 2058-2064

Many parallel group randomized controlled trials with identifiable primary outcomes with nonsignificant results have a conclusion that is inconsistent with results.

**Background:** Authors have an obligation to make the results of their investigation available to the public and should be accountable for the completeness and accuracy of their reports, so says the Declaration of Helsinki. Despite this moral obligation, by their nature, scientific reports have plenty of opportunity to influence their readers on many levels. Spin, defined as specific reporting that distorts the interpretation of results and misleads readers, is fairly prevalent. Spin can result from bias, conscious or unconscious, from ignorance, or from a willingness to deceive.

**Objective:** To identify spin in reports of parallel group randomized controlled trials (RCTs) that have nonsignificant results of the primary outcome. They also sought to categorize spin strategies.

**Methods:** Parallel group RCTs with clearly identified primary outcomes were screened from a cohort of articles indexed in PubMed. Only trials with nonsignificant results ($P > 0.5$) were included. Articles were reviewed by 3 reviewers and were assessed for extent of spin and were graded as high spin, moderate spin, or low spin.

**Results:** Of 616 articles, 72 were selected. In total, 33% had funding from for-profit sources. In only 22% did the main text address effect size and its precision for primary outcomes, 18% had spin in the title, 37% had spin in the abstract results, and 58% had spin in the abstract conclusions. Similar findings were noted in the main text. In abstracts, spin consisted mainly of within-group comparisons and subgroup analysis. Overall, 25% of abstract conclusions claimed equivalence or comparable effectiveness. Another spin strategy concerned safety interpretations and statistically nonsignificant results were used as a demonstration of a lack of adverse events. Spin was identified in more than half of the main text conclusions. Spin was more evident in abstracts. According to the authors, "the most familiar and common approach was to focus on statistically significant results for other analyses, such as within-group comparisons, secondary outcomes, or subgroup analyses. Another common strategy was to interpret $P > 0.05$ as demonstrating a similar effect when the study was not designed to assess equivalence or noninferiority (such trials require specific design and conduct, as well as a larger sample size, than superiority trials)."

**Conclusions:** The authors found many parallel group RCTs with identifiable primary outcomes with nonsignificant results that had a conclusion that was inconsistent with results. They admit that much more research needs to be conducted.

**Reviewer's Comments:** We readers need to be much more vigilant about the quality of studies. There are some take home-points. We need to pay attention to primary outcome definition, sample size calculation, and importantly $P$ values. A $P \geq 0.5$ means nonsignificant. Many abstracts can be misleading. Watch out for subgroup analysis and noninferiority statements. (Reviewer-Arjun Chanmugam, MD).

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Keywords: Randomized Controlled Trials, Evaluation, Nonsignificant Results, Spin

Print Tag: Refer to original journal article
Thoracic conduction of an electrical current applied to the chest wall offers rapid estimation of cardiac output.

**Background:** Dyspnea is a frequent complaint in emergency department (ED) patients, and a primary dilemma is differentiating between cardiac and non-cardiac causes. Thoracic fluid conducts electricity. Electrical current applied to the chest wall follows the path of least resistance, namely fluid within the thoracic aorta. Changes in impedance are related to changes in aortic blood flow, changes in cardiac output, and systemic vascular resistance. Fick catheter thermodilution has been the gold standard for assessing cardiac output, a clearly inappropriate and essentially impossible intervention for ED physicians.

**Objective:** To determine whether non-invasive thoracic electrical bioimpedance (TEB) can measure hemodynamic parameters sufficiently to differentiate between cardiac and non-cardiac causes of acute dyspnea in adult ED patients.

**Design:** Prospective cohort study of adults presenting to the ED with acute dyspnea.

**Methods:** Study patients had hemodynamic parameters known to be evaluable by TEB (cardiac output [CO], cardiac index [CI], systemic vascular resistance) measured using a commercially available TEB device consisting of 6 chest leads and a hardware processor. The hospital discharge diagnosis was used as the comparator to determine the ability of TEB to identify whether the underlying cause of acute dyspnea was cardiac or non-cardiac.

**Results:** 52 patients were recruited into the study; 51 had complete TEB data and were included in the analysis. There were statistically significant differences in CO (6.2 vs 7.9; \( P < 0.001 \)), CI (3.1 vs 4.4; \( P < 0.001 \)), systemic vascular resistance (1227 vs 933; \( P = 0.002 \)), and systemic vascular resistance index (2403 vs 1681; \( P < 0.001 \)) between the cardiac and non-cardiac cohort. CI was found to be an excellent discriminator. The optimal diagnostic criterion for CI to distinguish between cardiac and non-cardiac dyspnea was 3.2 L/minute per square meter or less (positive likelihood ratio, 7.9; negative likelihood ratio, 0.14).

**Conclusions:** Hemodynamic parameters determined by non-invasive TEB can differentiate between cardiac and non-cardiac-related causes of dyspnea in emergency patients; cardiac index appears to be the most promising discriminator.

**Reviewer’s Comments:** Thoracic electrical bioimpedance has been kicking around in the literature for about 15 years and is slowly coming into practice. In fact, several insurance companies have published reimbursement schedules for it. TEB has a minimal learning curve, similar to placing an ECG. It is faster than waiting for a plain film or a pro-BNP. Ideally, one would like to measure intrathoracic water directly with it and get an indication of what is going on in the lungs exactly -- in fact, this is the primary sticking point preventing widespread adoption. On the other hand, it is becoming increasingly clear from articles such as this that bioimpedance evaluation of cardiac index can be a reasonable marker of a failing heart and consequently wet lungs. I like quick bedside data. A large-scale study is needed. (Reviewer-Steven B. Abrams, MD).

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Keywords: Dyspnea, Thoracic Electrical Bioimpedance, Heart Failure, Cardiac Output

Print Tag: Refer to original journal article
Background: Chagas disease is caused by *Trypanosoma cruzi*, a parasite that infects animals and humans via an insect vector (blood-sucking insects of the family Reduviidae [Triatominae, aka kissing bugs]). Acutely, Chagas disease may be mild with fever and swelling at the inoculation site. Rarely, it may result in cardiomyopathy and meningoencephalitis. Should there be recovery from the acute phase, there may be a prolonged asymptomatic phase that could be life-long. However, there is a chronic disease variety that may include dysrhythmias, debilitating cardiomyopathy, and esophageal/colonic dysfunction. This disease is endemic throughout Mexico and Central and South America and is responsible for infecting nearly 8 million people, creating up to 3.3 million symptomatic cases, an annual incidence of 42,000 cases, and 21,000 deaths each year. The vast majority occur through the blood-sucking vectors, but the disease can also be transmitted through blood transfusions, congenitally, and organ transplantation. However, epidemiologists in the U.S. are concerned that this disease may become a serious health concern here since kissing bugs exist in the U.S. Apart from those residing in the U.S. who have been infected from exposure while in Latin America, there has been a significant number of blood donors here who are seropositive for *T. cruzi*. Despite this, there have only been 7 autochthonous cases in the U.S. However, cases of Chagas disease may be missed because either the symptoms are mild, the disease is unrecognized by naïve health professionals, or both.

Objective: To determine whether triatomines in and around Tucson, Arizona are infected with *T. cruzi*.

Design: Prospective analysis.

Methods: 164 triatomine bugs were collected by volunteers inside and around houses in metropolitan Tucson. Then the bugs were analyzed for the presence of *T. cruzi* using standard molecular techniques.

Results: 41.5% of bugs were infected with *T. cruzi* and 63.0% of the collection sites yielded ≥1 infected specimens.

Conclusions: While there have been no human cases of Chagas disease in the Tucson area, the risk for that possibility may be higher than previously thought.

Reviewer's Comments: It's speculative why cases of Chagas disease are rare in this country. Nevertheless, this paper does serve to acquaint the emergency physician with its presence and therefore is the motive behind its inclusion in this session. During the acute phase, benznidazole and nifurtimox, 2 anti-parasitic agents may be beneficial, but their use may require approval by the Centers for Disease Control and Prevention. For the chronic phase, therapy is directed at managing the complications. (Reviewer-Paul P. Rega, MD).

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Keywords: Chagas Disease

Print Tag: Refer to original journal article
Aortic Rupture Following Low-Speed Car Crashes Might Be Higher Than You Think

*Low-Impact Scenarios May Account for Two-Thirds of Blunt Traumatic Aortic Rupture.*

Sastry P, Field M, et al:


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**Background:** Blunt traumatic aortic rupture (BTAR) is classically thought to be a deceleration-type injury following high-velocity impact. The literature periodically suggests an unquantified association with low-velocity mechanisms.

**Objective:** To characterize the incidence of BTAR in low-speed accidents and to determine whether such BTAR is associated with unique kinematic and demographic risk factors.

**Design/Methods:** This is a review of motor vehicle accidents associated with BTAR reported to the U.K. Cooperative Crash Injury Study (UK CCIS) databank. Impact profiling using the European standard Equivalence Test Speed (ETS) was performed for these accidents. Victim seat position and principal direction of impact were calculated. ETS does not reflect vehicle speed at the moment of the reported accident; it is a controlled measurement of the speed necessary to create a similar amount of vehicle deformation following contact with a standardized barrier. ETS is thus a surrogate marker reflecting the net impact forces acting on a vehicle. An ETS of ≤40 mph was used to identify low-impact blunt traumatic aortic rupture (LIBTAR) cases, which were subsequently analyzed for unique risk factors.

**Results:** 16,444 vehicular crashes were reported to the UK CCIS between 1998 and 2007, representing 4793 casualties. Of these, 119 fully evaluable postmortem cases of aortic injury were identified. All were front seat passengers or drivers, sustaining either lateral or frontal impacts. Eighty-eight were men and 31 were women, none of whom were pregnant. The age range of cases was 18 to 99 years. As a group, BTAR cases were evenly distributed between frontal impacts (n=62) and lateral impacts (n=57). Applying the ETS 40 mph threshold yielded 79 cases (66.4%) that qualified as LIBTAR; the lowest reported ETS associated with aortic rupture was about 13 mph. Risk factors for LIBTAR were age >60 years ($P<0.0001$), lateral impact direction (OR, 2.041; RR, 1.99; $P=0.003$), and struck side seat position (OR, 1.934; RR 1.885; $P=0.101$). Overall, low-impact crash scenarios were found to represent >95% of U.K. road traffic accidents.

**Conclusions:** Low-impact collisions account for two thirds of fatal aortic injuries, with important, possibly predictive patient risk factors including age >60 years, lateral impacts, and struck side seat position.

**Reviewer's Comments:** Urban driving is increasingly controlled and constrained, and low is going to be the new high. Obviously, a high index of suspicion of aortic injury is needed to find a victim among a low-impact cohort. In addition to being retrospective, this was a postmortem study, so the true incidence of LIBTAR may never be known. On autopsy exam a number of low-impact cases were associated with intimal/media injuries that conceivably could be overlooked in an otherwise stable patient unless specifically sought with advanced imaging. My favorite sinister finding that gets me to worry about an aortic injury? T-spine fractures. (Reviewer- Steven B. Abrams, MD).

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**Keywords:** Trauma, Aortic Rupture, Blunt Trauma, Motor Vehicle Accidents

**Print Tag:** Refer to original journal article
Although methodological reporting has improved since the 1996 Consolidated Standards of Reporting Trials statement, many trials continue to omit critical information, making it difficult to properly assess the validity of the study.

**Background:** The Consolidated Standards of Reporting Trials (CONSORT) Statement was first published in 1996, revised in 2001, and was designed to provide some clarity to the murky world of clinical trial reporting. The statement has been endorsed by many of the key associations of medical editors worldwide. The CONSORT statement has a 22-item checklist that helps both authors and readers to better interpret and appraise clinical trial information.

**Objective:** Now that nearly 12 years have passed, and since its revision, the authors of this paper decided to see if there had been any improvement in the world of clinical trial reporting. They wanted to do this in 2 parts -- first to examine randomized clinical trials (RCTs) published in 2006 to see if there was adequate incorporation of CONSORT recommendations, and then to compare the 2006 RCTs to 2000 RCTs. In December 2000, before the CONSORT revision was published, >50% of the randomized clinical trials were inadequately described, including such fundamentals as sample size calculations, primary outcomes, random sequence generation, allocation concealment, and handling of attrition.

**Methods:** The authors searched PubMed in March 2007 and used the Cochrane highly sensitive search strategy to identify randomized trials published in December 2006 on human prospective studies that use randomly allocated study groups. Three reviewers carried out the data extraction.

**Results:** 616 RCTs were included; the majority of randomized trials were 2-arm parallel group trials published in specialty journals as well as *New Engl J Med*. Overall, 58% were drug trials, 21% were procedural interventions, and 18% were counseling or lifestyle interventions. The median number of participants was 62. In total, 32% did not state whether it was a single site or multisite study; 33% reported that the study was randomized in the title, only 53% defined the primary outcome, only 45% stated that a sample size calculation was completed, 33% defined the method of random sequence generation, and only 59% reported details of blinding.

**Conclusions:** There was improvement in reporting of clinical trials from 2000 to 2006, but the authors conclude that the quality is well below acceptable.

**Reviewer's Comments:** No wonder so many of us remain confused after reading some journals. With the dizzy array of statistical methodologies and the impressive use of wordsmithing, it is very clear that the authors can make all sorts of conclusions, and now it is clear that many of the articles do not adhere to the recommendations of RCT reporting. Frankly I believe articles like this need more play in the mainstream literature and that all medical journals should give more rigorous editorial reviews. In the future, I for one will look to see if there are some statements in each RCT about adhering to CONSORT. Remember that the CONSORT revision is due to occur in 2011. Let's hope for more fair, clear, and concise reporting. (Reviewer-Arjun Chanmugam, MD).

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Keywords: Randomized Clinical Trials, Quality of Reports

Print Tag: Refer to original journal article
Spontaneous, Nontraumatic Hemothorax -- Why?

Hemothorax Due to Rupture of Pulmonary Arteriovenous Malformation: An Interventional Emergency.


Etiologies of a nontraumatic hemothorax include spontaneous pneumothorax, coagulopathies, neoplasms, pleural endometriosis, and pulmonary arteriovenous malformation (PAVM).

**Background:** Spontaneous, nontraumatic hemothorax is a life-threatening event. Fortunately, it is a rare event. Etiologies of a nontraumatic hemothorax include spontaneous pneumothorax, coagulopathies, neoplasms, pleural endometriosis, and pulmonary arteriovenous malformation (PAVM).

**Objective:** To present 2 cases of hereditary hemorrhagic telangiectasia (HHT). **Case Discussion:** The authors' presentation and emergency management are discussed. A 57-year-old female presented to the emergency department (ED) with a massive hemothorax. Her medical history included a known PAVM and HHT. She developed a sentinel leak 10 days prior to the major hemothorax (mild pleurisy). When the major hemothorax occurred, her chest x-ray demonstrated a large right pleural effusion with a mediastinal shift. The subsequent multidetector CT angiography (MDCTA) showed the PAVM that resulted in her transfer to the authors' hospital where on initial presentation, her blood pressure (BP) was 90/50, her SaO₂ was 94% on 60% FiO₂, and she was in moderate respiratory distress. She was taken emergently for a pulmonary angiogram, which located the PAVM in the right lower lobe. Then the right lower lobe artery to the PAVM was treated by transcatheter embolization (TCE). It was only after that procedure that a chest tube was inserted evacuating 1000 cc of blood. Other more definitive therapies followed and she was discharged by day 8. Case number 2 involved a 64-year-old man who presented to the ED with progressive pleuritic chest pain and shortness of breath over a 3-day time span. He arrived with a stable B/P, but was tachycardic and his SaO₂ was 88% on 5 L of oxygen. Besides decreased breath sounds, his physical exam revealed telangiectases of the buccal mucosa and hands. A family history was positive for nosebleeds. He received an emergent MDCTA and then was transported to interventional radiology where the artery supplying the PAVM was occluded. Then the patient underwent drainage of the hemothorax. Recovery was complete in due course and he and the family were to undergo a work-up for HHT.

**Conclusions:** Hemothorax secondary to PAVM has an incidence of between 1% and 8%. It may also be complicated by massive hemoptysis. As a sidebar, women in their last trimester of pregnancy are predisposed to a PAVM rupture.

**Reviewer's Comments:** Seeking the cause of a spontaneous hemothorax may be more important than performing an emergent thoracostomy. If the situation permits, the authors suggest that a MDCTA, pulmonary angiogram, and a TCE should be accomplished first so as to occlude the source of bleeding. Draining the chest first may lead to uncontrolled bleeding. (Reviewer-Paul P. Rega, MD).

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Keywords: Spontaneous, Nontraumatic Hemothorax, Hereditary Hemorrhagic Telangiectasia

Print Tag: Refer to original journal article
Elapsed times from triage and qualification for early goal-directed therapy to administration of appropriate antibiotics are primary determinants of mortality in patients with severe sepsis and septic shock.

**Background:** Early goal-directed therapy (EGDT) of severe sepsis and septic shock is geared to key hemodynamic parameters; antibiotic administration, an established mainstay of sepsis treatment, is not mandated in the EGDT protocol although it is clearly advocated in all EGDT literature. At present, the priority early antibiotic administration should be given in an algorithmic EGDT strategy is unknown.

**Objective:** To evaluate the association between time to antibiotic administration and survival in emergency department (ED) patients with severe sepsis or septic shock who receive EGDT.

**Design:** Single-center cohort study over a 1-year period.

**Methods:** The authors retrospectively reviewed the effects of different time intervals on in-hospital mortality. These intervals were (1) time from triage to first antibiotic administration; (2) time from patient qualification for EGDT to first antibiotic administration; (3) time from triage to "appropriate" antibiotic administration, with appropriate denoting an antibiotic or multiple antibiotic regimen appropriate to the sensitivities of the pathogen and/or the presumed site of primary infection; and (4) time from qualification for EGDT to appropriate antibiotic administration.

**Results:** The authors identified 261 patients undergoing EGDT for sepsis; the mean age was 59 ± 16 years and 41% were female. In-hospital mortality was 31%. Median time from triage to first antibiotic was 119 minutes (interquartile range, 76 to 192 minutes) and from qualification for EGDT to antibiotics was 42 minutes (interquartile range, 0 to 93 minutes). No significant association was demonstrated between time from triage or qualification to first antibiotic and mortality when assessed at different hourly cut-offs. In contrast, when evaluating time from triage to appropriate antibiotics, a significant association was demonstrated at the 1-hour or sooner breakpoint (mortality 19.5 vs 33.2%; OR, 0.30 [95% CI 0.11 to 0.83; P =0.02]). Similar results were noted for time from EGDT qualification to appropriate antibiotics, with a significant improvement in mortality seen at the 1-hour or sooner breakpoint (mortality 25.0 vs 38.5%; OR, 0.50 [95% CI, 0.27 to 0.92; P =0.03]).

**Conclusions:** Elapsed times from triage and qualification for EGDT to administration of appropriate antibiotics are primary determinants of mortality in patients with severe sepsis and septic shock.

**Reviewer's Comments:** In other words, get an appropriate antibiotic up early, even if you can't start timely EGDT in a typically chaotic ED environment. It has been said that if enough people tell you that you look tired, you should lie down. And so if enough people around you are talking early-goal directed therapy in the ED, better get out the central line. This is coming, you may be sure. How on earth we'll get it done is anyone's guess. They keep trying to streamline it, so let's hope we reach some sort of accommodation with the intensivists. (Reviewer-Steve Abrams, MD).

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**Keywords:** Sepsis, Septicemia, Early Goal-Directed Therapy, Infectious Disease, Mortality

**Print Tag:** Refer to original journal article