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INSIDE

Hand Hygiene Exemplars: Lead the Followers

ABSTRACT & COMMENTARY

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Leslie A. Hoffman reports no financial relationships relevant to this field of study.

This article originally appeared in the July 2012 issue of Critical Care Alert. *It was edited by David J. Pierson, MD, and peer reviewed by William Thompson, MD. Dr. Pierson is Professor Emeritus, Pulmonary and Critical Care Medicine, University of Washington, Seattle, and Dr. Thompson is Associate Professor of Medicine, University of Washington, Seattle. Drs. Pierson and Thompson report no financial relationships relevant to this field of study.*

Synopsis: *Hand hygiene was more likely to be performed when the first person entering the room or the attending physician (regardless of order) performed hand hygiene.*

Source: Haessler S, et al. Getting doctors to clean their hands: Lead the followers. *BMJ Qual Saf* 2012;21:499-502.

In this study, a research assistant who was already embedded in patient care teams to observe the process of care during bedside rounds was recruited to document hand hygiene compliance by nine internal medicine teams over a 3-month period. The teams consisted of one attending, one post-graduate year 3 (PGY-3) resident, two PGY-1 residents, one medical student, and one pharmacy student. The research assistant recorded order of entry and exit from the room, training level, and adherence to hand hygiene using a data collection tool encrypted to maintain secrecy.

During the study, there were 718 observed hand hygiene opportunities when the team entered patient rooms and 744 opportunities when leaving the room. Overall, hand hygiene compli-

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ance was 52% before entering and 70% before leaving the room. Compliance by training level ranged from 47%-67% before entering and 64%-87% on leaving ($P < 0.001$). Simply being first, second, or last did not impact the likelihood of performing hand hygiene. However, if the first person entering or leaving the room performed hand hygiene, compliance of the other team members increased significantly ($P = 0.002$). If the attending physician performed hand hygiene on entering the room, overall team member compliance also increased significantly ($P < 0.001$). This observation held regardless of who entered or left the room first. Mean compliance was 74% if the attending physician performed hand hygiene compared to 51% if not done ($P = 0.016$).

■ **Commentary**

Adherence to good hand hygiene is considered essential for infection protection. With the emergence of highly resistant organisms, rigid adherence to this simple practice becomes even more important. However, it is well known that compliance remains poor, despite multiple attempts to change this outcome. Findings of this study are especially intriguing because they suggest that a simple, no-cost intervention can improve hand hygiene compliance, i.e., role modeling and peer pressure. In this study, hand hygiene compliance was significantly improved when the attending physician performed this routine on entering and exiting the patient's room and, as well, when the first person to enter or exit the room performed this step.

Interestingly, hand hygiene compliance was greater on exiting the patient's room than when entering. The authors attributed this finding to "self protection" and questioned whether this finding implied that "self protection" may be a stronger driver of behavior than patient protection. In more than half of the patient encounters in this study, the attending physician was the first person to enter the room, suggesting that if senior clinicians made hand hygiene an integral part of bedside teaching, they need to do little more than perform the task themselves to motivate others to follow their example. This study was conducted on general medical wards, rather than in an ICU; however, there would appear to be no reason why the same findings would be expected in critical care settings. ■

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High-Flow Nasal Cannula Oxygen Therapy in Acute Respiratory Failure: What Do We Know?

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Dr. Walter reports no financial relationships relevant to this field of study. This article originally appeared in the July 2012 issue of Critical Care Alert. *It was edited by David J. Pierson, MD, and peer reviewed by William Thompson, MD. Dr. Pierson is Professor Emeritus, Pulmonary and Critical Care Medicine, University of Washington, Seattle, and Dr. Thompson is Associate Professor of Medicine, University of Washington, Seattle. Drs. Pierson and Thompson report no financial relationships relevant to this field of study.*

Synopsis: *Limited data on the use of high-flow nasal cannula oxygen therapy suggests it is associated with improvement in physiologic parameters.*

Source: Sztrymf B, et al. Impact of high-flow nasal cannula oxygen therapy on intensive care unit patients with acute respiratory failure: A prospective observational study. *J Crit Care* 2012;27:324.e9-324.e13.

High-flow nasal cannula oxygen therapy (HFNC) is a generic name for oxygen delivery devices that provide oxygen nasally at higher flow rates than conventional nasal cannulae. Conventional ventilation usually can only provide flow rates up to 15 L/min, while HFNC can deliver flow rates up to 60 L/min. Both flow rate and fraction of inspired oxygen (FiO_2) are titratable. HFNC

has been successfully used in the neonatal intensive care unit (ICU) for neonates with acute respiratory failure (ARF). Although there are substantially fewer published studies outside the neonatal ICU, it is now being used with increasing frequency in adults with ARF.

This small, prospective study reported outcomes from 20 patients with ARF admitted to the ICU and placed on HFNC. ARF was diagnosed as pulse oximetry < 96% and/or a respiratory rate ≥ 25 while receiving oxygen through a facemask at an estimated FiO_2 > 50%. The median age of enrolled patients was 59 years and the median SAPS2 score was 33 (estimating a 16% risk of hospital mortality). Pneumonia was the most common diagnosis (11/20). Following initiation of HFNC, median respiratory rate decreased from 28 to 24.5, with a significant increase in oxygen saturation (93.5% vs 98.5%). Both results were statistically significant. PaO_2 increased from 65.5 to 114.5 mmHg with no significant change in pH. Six patients were ultimately intubated and two patients died.

■ Commentary

This small study is one of a handful of studies beginning to critically evaluate HFNC. HFNC may represent another case of the adoption of technology in advance of the data. Small studies similar to that of Sztrymf et al have been published showing similar improvements in physiologic parameters and/or patient comfort. While many changes are statistically significant, one can argue the clinical significance of a respiratory rate improving from 28 to 24.5. Many of these studies lack a control arm so we do not know how patients would have done had HFNC not been started. However, taken together, the direction of clinical changes in this study, and others, does seem to suggest that HFNC can provide improvements in oxygenation and respiratory effort for patients.

There are a variety of mechanisms proposed to explain how HFNC may help to improve ARF. Patients with ARF often have very high inspiratory flow rates. Conventional oxygen delivery devices often only provide oxygen at flow rates up to 15 L/min, and thus a significant amount of room air may be entrained. HFNC is hypothesized to better match oxygen delivery with inspiratory flows. HFNC has been shown to provide low-level positive airway pressure, theoretically providing some alveolar recruitment as well. Furthermore, HFNC may wash out carbon dioxide from the nasopharynx, decreasing the rebreathing of carbon dioxide and increasing the amount of oxygen that reaches the lungs.

HFNC is relatively easy to use but there are some important considerations. Both FiO_2 and flow rate are titratable. It is important that everyone on the medical team is aware of what changes are being made. For example, a patient who has gone from 70% to 50% oxygen may seem to be improving until it is discovered this occurred in the setting of increasing flow rates from 30 to 60 L/min. Arguments are being made that HFNC may prevent or delay intubation in patients with hypoxic ARF. It remains to be seen if this is a good or bad thing. Few would argue that preventing intubations is a bad thing but delaying a necessary intubation too long may actually be harmful.

In summary, HFNC appears to be here for good. It is relatively easy to use and early data suggest it improves physiologic parameters in patients with ARF. Data related to more clinically significant outcomes, such as length of stay, intubation rates, and mortality, are currently lacking. We should not let our excitement for new technology cause us to forget that only after critical evaluations can we be sure we are helping, and not hurting, our patients. ■

Medical Emergency Team Calls in the Radiology Department

By David J. Pierson, MD

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This article originally appeared in the July 2012 issue of Critical Care Alert. *It was peer reviewed by William Thompson, MD. Dr. Thompson is Associate Professor of Medicine, University of Washington, Seattle. Drs. Pierson and Thompson report no financial relationships relevant to this field of study.*

Synopsis: *This study of potentially life-threatening changes in patient condition during trips to the radiology department of a large academic medical center found that such events occurred about once a week, involved both ward and ICU patients who had comorbidities and high overall mortality, and were often unanticipated by vital sign changes or other recognized warnings.*

Source: Ott LK, et al. Medical emergency team calls in the radiology department: Patient characteristics and outcomes. *BMJ Qual Saf* 2012; 21:509-518.

Ott and colleagues at the University of Pittsburgh reviewed all medical-emergency team (MET) calls to the radiology department involving adult inpatients during a 2-year period. They sought to identify the characteristics of the patients involved, and to find any relationships between these characteristics and patient outcomes. Activation of the hospital's well-established MET system oc-

curs when patients experience deterioration in respiratory, cardiovascular, or neurological status, or develop other predefined alterations in symptoms, signs, or interventions, using standardized criteria. MET calls originating during transport to or from the radiology department were not considered in the study. The authors recorded the timing and circumstances of each MET call, the patient's origin (e.g., ward or ICU), demographic and diagnostic data, the Charlson Comorbidity Index, plus vital signs and level of care needs in the 12 hours prior to the call. In addition, the level of care given in the radiology department was sought from the electronic medical record, as was information on the level of care required following the call and whether the patient died in the hospital after the event.

During the 2-year study period, there were 111 MET calls to the radiology department. Patients were sent for CT (44%), MRI (22%), interventional radiology (15%), and other imaging. Calls happened more frequently on days near the middle of the week and during the hours from 8 a.m. to noon, although they also occurred at other times. Almost half (43%) of the MET calls occurred on the patients' first day in the hospital. Forty percent of the patients came to the radiology department from an ICU, and 60% from the wards. Fifteen percent were mechanically ventilated, 12% were on an oxygen facemask, and 38% had nasal oxygen, while only 35% of the patients arrived in radiology on no respiratory support. After the MET call, most patients (78/111, 70%) required a higher level of care than before, including 38 of the 67 non-ICU patients; 26% of those not on mechanical ventilation before the call required it afterwards.

Patients generating MET calls in the radiology department tended to be middle-aged, and there was no gender difference. They were evenly distributed across diagnostic categories, and tended to have comorbidities (renal 61%, cerebrovascular 28%, diabetes 22%, myocardial infarction 21%, cardiopulmonary disease 20%), with a mean Charlson Comorbidity Index of 4. During the 12 hours preceding the MET call, 16% had reached or exceeded the institution's MET vital sign threshold. More than half of the patients received continuous monitoring while in the radiology department.

Twenty-five percent of patients who experienced a MET call in the radiology department died. Mortality was higher among ICU-originating patients than in those coming from the ward (57% vs 43%; $P = 0.03$). Aside from this, the only association with a fatal outcome following the MET call was for having received inotropic medications and/or fluid resuscitation in the 12 hours prior to the call (39% vs 17% of the patients who died; $P = 0.02$).

■ Commentary

This study is helpful in that it provides a systematic look at a large consecutive series of patients in a tertiary referral center for whom the MET system was activated while they were in the radiology department for imaging or procedures. Intensivists and other hospital clinicians dread the "stat" page to the radiology department, and they know that the acute patient deterioration that triggers such calls occurs not infrequently. A hope in conducting a study like this is that patterns and predispositions can be identified that will permit effective preventive measures to be implemented. However, Ott et al had no such good fortune. In documenting the wide variety of patient characteristics and clinical factors present in this series, the authors are careful to point out that nothing can be concluded about causation or specific measures to take in the future. Nonetheless, they have better described a clinical scenario that is both frequent and associated with high patient mortality. One may hope that future studies can identify ways in which the incidence of radiology department MET calls can be reduced and their outcomes improved.

As pointed out in the accompanying editorial by Staples and Redelmeier,[1] there are a number of possible explanations for acute patient deterioration in the radiology department. Of these, the two most likely are, first, that seriously ill patients are likely to need complex studies requiring imaging, and are also predisposed to complications associated with both intrahospital transport and the performance of the procedures. Imaging procedures may be ordered because of patient deterioration or suspicion of a new medical process, settings in which adverse events may be particularly likely. And, second, caring for a complicated, potentially unstable patient during transport and imaging-related interventions presents major challenges, including the following:

- The procedure and associated waiting can take considerable time.
- The patient must be moved, positioned, and otherwise physically manipulated.
- The administration of various contrast agents and sedatives may be required.
- Lines may come out, infusions may be interrupted, and scheduled medication doses may be missed.
- Physicians and other caregivers may be distracted by aspects of the procedure.
- Patients may experience anxiety, agitation, claustrophobia, or other distress.

Although the present study does not tell us how to prevent MET calls to the radiology department or how to improve outcomes when they occur, it casts light on an important problem affecting all who work in the ICU. ■

reference

1. Staples JA, Redelmeier DA. Medical emergencies in medical imaging. *BMJ Qual Saf* 2012;21:446-447.

Nighttime Intensivist Coverage May Not Benefit All ICUs

By Betty Tran, MD, MS

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Dr. Tran reports no financial relationships relevant to this field of study.

This article originally appeared in the July 2012 issue of Critical Care Alert. *It was edited by David J. Pierson, MD, and peer reviewed by William Thompson, MD. Dr. Pierson is Professor Emeritus, Pulmonary and Critical Care Medicine, University of Washington, Seattle, and Dr. Thompson is Associate Professor of Medicine, University of Washington, Seattle. Drs. Pierson and Thompson report no financial relationships relevant to this field of study.*

Synopsis: *This retrospective, multicenter study found that nighttime intensivist staffing is associated with lower patient mortality only in ICUs that lack mandatory daytime intensivist staffing.*

Source: Wallace DJ, et al. Nighttime intensivist staffing and mortality among critically ill patients. *N Engl J Med* 2012;366:2093-3101.

Supporters of 24-hour intensivist staffing in the ICU cite potential benefits to the patient as a result of more timely and accurate diagnostic evaluation, consistent provision of complex treatment, and overall higher quality, safer care. Previous studies, however, have reported conflicting results with regard to patient outcomes in ICUs with nighttime intensivist staffing. This study by Wallace and colleagues sought to examine the relationship between nighttime intensivist staffing and mortality in patients admitted to the ICU.

The authors conducted a retrospective study using data obtained for 65,752 patients admitted to 49 ICUs in 25 hospitals (74% of all surveyed sites) participating in the Acute Physiology and Chronic Health Evaluation (APACHE) clinical outcomes database from 2009 through 2010. The hospitals were diverse with regard to academic status, geographic location, and number of ICU beds, and there were no significant differences between hospitals participating in the study and those that did not. Of the 49 ICUs that participated, 12 had nighttime intensivist staffing, contributing data for 14,424 admits (22%), and 37 had no nighttime intensivist for 51,328 admits (78%). There were no significant differences between patients admitted to ICUs with or without nighttime intensivists.

Nighttime intensivist staffing was associated with a reduction in risk-adjusted in-hospital mortality only in ICUs with low intensity (i.e., optional consultation) daytime intensivist coverage (odds ratio [OR] 0.62, $P = 0.04$). In ICUs with high intensity (i.e., mandatory consultation or primary care by an intensivist) daytime intensivist staffing, there was no additional mortality benefit associated with an in-hospital nighttime intensivist (OR 1.08, $P = 0.78$). These results were supported by sensitivity analyses in subgroup populations most likely to benefit from in-house nighttime intensivist staffing: patients receiving active treatment on admit, undergoing mechanical ventilation, admitted at night, with the highest acute physiology scores, and admitted with sepsis. Similar results were also found in a separate verification cohort using data from the Pennsylvania Health Care Cost Containment Council (PHC4). An additional finding was that when the definition of nighttime intensivist staffing was modified to include a resident physician, nighttime staffing was associated with lower mortality in all ICUs, although the addition of a nighttime intensivist to an ICU already staffed by residents offered no extra benefit in outcomes.

■ Commentary

As more hospitals contemplate moving toward 24-hour intensivist staffing, the potential benefits of such efforts will need to be weighed against the inherent costs and requisite expansion of the intensivist workforce necessary to build such programs. Crucial to this decision is the need for solid data supporting better outcomes in patients admitted to ICUs with nighttime intensivist staffing compared to other ICU models.

This study has important implications for addressing this dilemma. The findings suggest that ICUs already staffed by an intensivist either as a consultant or as the primary person responsible for the patient's care or that have resident physician nighttime coverage do not benefit from the addition of a nighttime intensivist in the hospital in terms of reducing patient mortality. On the other hand, ICUs in which daytime intensivist input is merely optional may benefit from nighttime intensivist staffing. This latter observation is not surprising, as mandatory intensivist staffing in the ICU is associated with lower ICU and hospital mortality.[1]

Overall, the findings of this study argue against widespread implementation of 24-hour intensivist staffing as standard of care. Specific to academic teaching hospitals, there is added concern for loss of resident and fellow physician autonomy when a 24-hour intensivist is present. There are, however, other potential benefits to nighttime intensivist staffing. These include reduced intensivist burnout, increased allied health staff satisfaction, reduced patient ICU length of stay, and fewer procedural complications. Further studies on all these outcomes are warranted. In the meantime, individual ICUs will need to define carefully the anticipated benefits they hope to derive from 24-hour intensivist coverage and at what costs prior to expanding their staffing. ■

r eference.

1. Pronovost PJ, et al. Physician staffing patterns and clinical outcomes in critically ill patients: A systematic review. *JAMA* 2002;288:2151-2162.

Risk of Sudden Cardiac Death with Azithromycin

By John P. DiMarco, MD, PhD

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This article originally appeared in the July 2012 issue of Clinical Cardiology Alert. *It was edited by Michael H. Crawford, MD, and peer reviewed by Ethan Weiss, MD. Dr. Crawford is Professor of Medicine, Chief of Clinical Cardiology, University of California, San Francisco, and Dr. Weiss is Assistant Professor of Medicine, Division of Cardiology and CVRI, University of California, San Francisco. Dr. Crawford reports no financial relationships relevant to this field of study, and Dr. Weiss is a scientific advisory board member for Bionovo.*

Source: Ray WA, et al. Azithromycin and the risk of cardiovascular death. *N Engl J Med* 2012;366:1881-1890.

In this paper, the authors performed a pharmacoepidemiologic study on the relationship between azithromycin, a frequently used broad-spectrum macrolide antibiotic, and cardiovascular death. The authors analyzed data from the Tennessee Medicaid program. This database provides information on medical care encounters and dates and causes of death and is linked to death certificates and hospital discharge data. Data on antibiotic use were taken from Medicaid pharmacy files. The cohort included patients who had been prescribed azithromycin between 1992 and 2006. Patients who had a concomitant life-threatening non-cardiovascular illness, had a diagnosis of drug abuse, resided in a nursing home, or had been hospitalized within the prior 30 days were excluded. Several control groups were analyzed. These included patients who had received no antibiotics and patients who had received courses of therapy with three other commonly used antibiotics: amoxicillin, ciprofloxacin, and levofloxacin. The study outcomes were cardiovascular death, death from any cause, and sudden cardiac death. Deaths during the typical 5-day course of azithromycin therapy and the succeeding 5 days were compared to deaths during the usual 10-day course of the other study antibiotics. Each study comparison was adjusted for an extensive set of covariates using a propensity score that also included a risk for cardiovascular disease.

The study cohort included 348,000 patients with prescriptions for azithromycin who were compared to 1.4 million patients with no antibiotic prescriptions, and to 1.35 million, 265,000, and 194,000 patients with prescriptions for amoxicillin, ciprofloxacin, and levofloxacin, respectively. The mean ages for the groups were between 48 and 51 years of age. Approximately 75% in each group were female. The prevalence of heart failure, chronic obstructive pulmonary disease, diabetes, and measures of disability were roughly similar between groups. The most common indications for use of azithromycin and amoxicillin were respiratory tract infections. The most common indication for ciprofloxacin was genitourinary tract infection. Levofloxacin was used for a variety of infections, including both respiratory and genitourinary tract infections.

The cardiovascular death rate during a 5-day course of treatment for azithromycin was 85.2 per 1 million courses with an estimated 64.6 sudden cardiac deaths per 1 million courses. For patients who did not take antibiotics, there were 29.8 cardiovascular and 24.0 sudden cardiac deaths per 1 million matched 5-day intervals. For amoxicillin, the cardiovascular death rate was 31.5 and 29 sudden deaths per 1 million courses of therapy. The hazard ratio for death during a 5-day course of azithromycin therapy compared to no antibiotic treatment was 2.88. Amoxicillin use was not associated with an increased risk of death. Patients who took ciprofloxacin did not have an increased risk of either cardiovascular death or death from any cause, but there was a nonsignificant trend toward increased risk of cardiovascular death with the use of levofloxacin (hazard ratio 1.50). The absolute excess risk of cardiovascular death among patients who took azithromycin was related to the baseline risk for cardiovascular disease. In patients with the highest risk score, there were an estimated 245 additional cardiovascular deaths per 1 million 5-day courses of azithromycin therapy.

The authors conclude that azithromycin results in a small absolute increase in cardiovascular deaths that is particularly noted in patients with the highest cardiovascular risk.

■ Commentary

Azithromycin is a macrolide antibiotic. Two other agents in the same class, erythromycin and clarithromycin, have been shown to block IKr and prolong the QT interval, and have been associated with reports of drug-induced polymorphic ventricular tachycardia (torsades de pointes). Limited animal data have suggested that azithromycin has a much lower proarrhythmic potential.[1] The current report, however, suggests that the risk for proarrhythmia with azithromycin, although low, can be quantitated.

Azithromycin was developed and released before the current rigorous protocols for testing new drugs for QT prolongation were standardized. Recently, the FDA revised the azithromycin product label to include a warning about a low risk for proarrhythmia. They did not add a black-box warning since the risk is felt to be low.

Most proarrhythmia associated with antibiotics involve the combination of more than one factor that favor development of the problem. These might possibly include genetic factors, electrolyte imbalance, cardiac status, bradycardia, and other drug therapy. Physicians should be aware of how these factors might interact in a given patient and consider the use of alternative therapy when several risk factors are present. ■

reference

1. Milberg P, et al. Divergent proarrhythmic potential of macrolide antibiotics despite similar QT prolongation: Fast phase 3 repolarization prevents early afterdepolarizations and torsade de pointes. *J Pharmacol Exp Ther* 2002;303:218-225.

Adenosine for a Wide Tachycardia?

eCG review

By Ken Grauer, MD, *Professor Emeritus in Family Medicine, College of Medicine, University of Florida*

Dr. Grauer is the sole proprietor of KG-EKG Press, and publisher of an ECG pocket brain book.

This article originally appeared in the June 15, 2012, issue of Internal Medicine Alert. *It was edited by Stephen Brunton, MD, and peer reviewed by Gerald Roberts, MD. Dr. Brunton is Adjunct Clinical Professor, University of North Carolina, Chapel Hill, and Dr. Roberts is Assistant Clinical Professor of Medicine, Albert Einstein College of Medicine, New York, NY. Dr. Brunton serves on the advisory board for Lilly, Boehringer Ingelheim, Novo Nordisk, Sunovion, and Teva; he serves on the speakers bureau of Boehringer Ingelheim, Lilly, Kowa, Novo Nordisk, and Teva. Dr. Roberts reports no financial relationship to this field of study.*

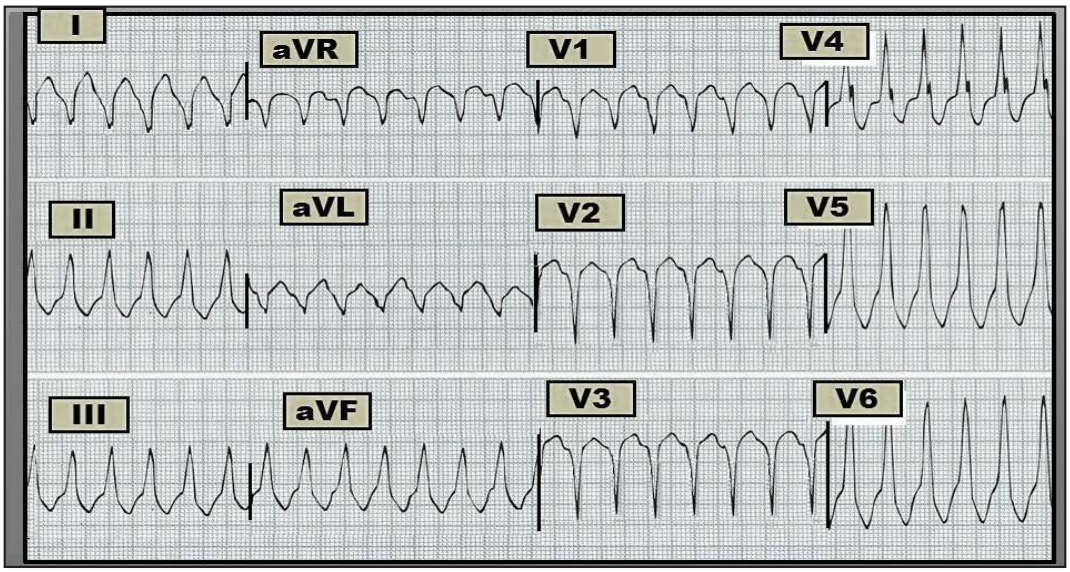

Figure — 12-lead ECG obtained from a 30-year-old man with palpitations.

Scenario: The 12-lead ECG shown above was obtained from a previously healthy 30-year-old man who presented to the emergency department with new-onset palpitations. No prior ECG was available for comparison. The patient was alert and hemodynamically stable at the time this tracing was recorded. What is the rhythm? Is this rhythm likely to respond to adenosine?

Interpretation: The rhythm is rapid and regular at a rate of ~180/minute. The QRS complex is obviously wide. No P waves are seen. Thus, the rhythm is a *regular* wide-complex tachycardia (WCT) without clear sign of atrial activity. Ventricular tachycardia (VT) must be assumed until proven otherwise!

Clinical management of sustained VT depends on the clinical setting in which it occurs. If no pulse is present, the rhythm is treated the same as for ventricular fibrillation — with immediate unsynchronized countershock. If a pulse is present but the patient is unstable (i.e., hypotensive, short of breath, having chest pain), then immediate synchronized cardioversion is in order. On the other hand, if the patient is hemodynamically stable and tolerating the rhythm (as in this case), there is at least a moment of time to contemplate management. A trial of antiarrhythmic therapy (with amiodarone, procainamide, or other antiarrhythmic agent) is in order — keeping in mind that the patient should be cardioverted if decompensation occurs at any time during the process.

Much has been written about the role of adenosine in the management of a stable patient with either VT or a regular WCT of uncertain etiology. If (as may occur on occasion) the WCT is supraventricular with preexisting bundle branch block or aberrant conduction, adenosine may convert the rhythm. Because of the ultra-short half-life of this drug (less than 10 seconds!), any adverse effects that may result from adenosine are usually short-lived. The important clinical point to appreciate is that a small but significant percentage of VT rhythms are adenosine-responsive! The reason for this is uncertain, but thought to relate to adenosine receptor inhibition of adenylate cyclase, as well as modulation in autonomic tone. The most common adenosine-responsive form of VT originates from the right ventricular outflow track (RVOT). Clinically, this most often occurs in otherwise healthy young adults without structural heart disease. Episodes of VT are often related to catecholamine release, and therefore commonly occur with exercise or stress. The ECG picture of RVOT VT is distinctive: The QRS is wide with a left bundle branch block pattern in the precordial leads and a superior axis in the limb leads (as in the Figure). Other forms of adenosine-responsive VT may not be distinguishable from non-responsive forms. The patient with RVOT VT should be referred for electrophysiologic study following conversion of the acute rhythm disturbance. By way of perspective, it is important to emphasize that most VT will not be adenosine-responsive. Nevertheless, it is well to be aware that some VT will respond to this drug, which provides an additional rationale for considering a trial of adenosine when confronted with a stable patient who presents in either VT or a WCT of uncertain etiology. ■

CME / Objectives

Upon completion of this educational activity, participants should be able to:

- discuss pertinent safety, infection control and quality improvement practices;
- explain diagnosis and treatment of acute illness in the hospital setting; and
- discuss current data on diagnostic and therapeutic modalities for common inpatient problems. ■

CME Questions

1. According to the study by Wallace and colleagues, what observations were made about nighttime intensivist staffing in ICUs?

a. Nighttime intensivist staffing was associated with a reduction in mortality in ICUs with low-intensity daytime intensivist coverage.

b. There was no additional mortality benefit associated with nighttime intensivist staffing in ICUs with high-intensity daytime intensivist coverage.

c. The addition of a nighttime intensivist to an ICU already staffed by residents offered no additional benefit in outcomes.

d. All of the above

2. In the observational study by Haessler et al., which of the following factors was most important in improving hand hygiene in patients on a general medical ward?

a. The presence of a nurse or physician coach reminding people to perform hand hygiene

b. The patient being on contact precautions

c. The first person entering the room performing hand hygiene

d. The presence of the patient's family members in the room

3. Based on the cohort trial by Milberg et al., what can be said about the known risk of antibiotic use?

a. Azithromycin is associated with a small increase in the risk of sudden cardiovascular death.

b. Amoxacillin is associated with an increased risk of retinal detachment.

c. Ciprofloxacin was associated with an increased risk of death from any cause.

d. All of the above.

CME Instructions

1. Read and study the activity, using the provided references for further research.

2. Log on to **www.cmecity.com** to take a post-test; tests can be taken after each issue or collectively at the end of the semester. *First-time users will have to register on the site using the 8-digit subscriber number printed on their mailing label, invoice, or renewal notice.*

3. Pass the online tests with a score of 100%; you will be allowed to answer the questions as many times as needed to achieve a score of 100%.

4. After successfully completing the last test of the semester, your browser will be automatically directed to the activity evaluation form, which you will submit online.

5. Once the evaluation is received, a credit letter will be sent to you. ■