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INSIDE

Can Potential Acute MI Patients be Triaged Faster?

ABSTRACT & COMMENTARY

By Michael H. Crawford, MD

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

This article originally appeared in the February 2012 issue of Clinical Cardiology Alert. *It was peer reviewed by Ethan Weiss, MD. Dr. Weiss is Assistant Professor of Medicine, Division of Cardiology and CVRI, University of California, San Francisco. Dr. Weiss is a scientific advisory board member for Bionovo.*

Source: Keller T, et al. Serial changes in highly sensitive troponin I assay and early diagnosis of myocardial infraction. *JAMA* 2011;306:2684-2693.

Newer, more sensitive troponin assays have the potential to identify acute myocardial infarction (AMI) earlier, but some detect troponin in 50% of normal populations, which renders them clinically useless. This study evaluates the use of troponin kinetics clinically to separate AMI patients from those with chronically elevated troponin levels. They enrolled 1818 consecutive patients suspected of having AMI and measured high sensitivity troponin I (hsTnI) and conventional troponin I (cTnI) at admission and 3 and 6 hours after. Patients were followed for 30 days and a final diagnosis of AMI was made based on current guidelines by blinded cardiologists. Critical to the diagnosis was at least a 20% rise and fall in a conventional troponin assay (I or T). The final diagnosis of MI was made in 413 (23%), of whom 56 (14%) had ST elevation MI. AUC values for the ROC curves were highest for hsTnI (0.96) followed by cTnI (0.92) on admission. The hsTnI at admission

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had a sensitivity of 82% and a negative-predictive value (NPV) of 95%, whereas for cTnI the values were 79% and 94%. The positive-predictive value (PPV) on admission for hsTnI was 75% and for cTnI was 81%. Samples at 3 hours improved the sensitivity of hsTnI to 98% with a NPV of 99% and identical values were observed for cTnI. Using the criteria of a hsTnI > 99th percentile at admission and a change > 266% at 3 hours improved PPV for both assays to 96%. The authors concluded that TnI measurements on admission and 3 hours later may facilitate the early triage of suspected AMI patients.

■ **Commentary**

This is a relatively large observational study that compares hsTnI to cTnI and compares admission values to 3 hours post admission values and the change from admission to 3 hours for diagnosing AMI. The data analysis is comprehensive and quite complicated. Also, other biomarkers were evaluated in the study, but none, alone or in combination, were better than troponin. The study focused on suspected AMI patients because of chest pain symptoms. Only 14% of the MIs proved to be STEMIs, so the study mainly was about identifying non-STEMIs. Several conclusions can be made. First, at the time of admission hsTnI and cTnI were similar for ruling out AMI (NPV 95% vs. 94%). For diagnosing AMI at admission cTnI was a little better than hsTnI (PPV 81 vs. 75%). So for initial triage there is no real value of hsTnI over cTnI. Second, most low-risk patients will be held until a second troponin is done to improve diagnostic accuracy. Three hours hsTnI had a NPV of 99%, as did cTnI. So again there was no added benefit of hsTnI. Third, an evaluation of the change in troponin from admission to 3 hours showed that the PPV for both assays was increased to 96%, again demonstrating no advantage to using hsTnI. Fourth, the only subgroups that showed an advantage for hsTnI were patients with initially normal troponin and patients known to have presented very early after symptom onset (< 2 hrs). Fifth, using hsTnI routinely will result in a higher false-positive rate at admission as compared to cTnI. In summary, at this point I do not see any reason to switch to hsTnI.

There are some limitations to this study. Since troponin values were used to adjudicate the AMI diagnosis, there is the risk of incorporation bias, which would tend to increase the accuracy of troponin tests. This population was unique in at least two regards. There was a relatively high rate of AMI (23%) compared to other studies. This would also tend to increase accuracy. Also, almost all of the patients were white Europeans; so the results may not be applicable to other ethnic groups. Overall, this is a robust study which will undoubtedly influence the application of hsTnI assays in clinical settings. ■

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Risk vs. Benefit of Atrial Fibrillation Ablation Procedures

ABSTRACT & COMMENTARY

By John P. DiMarco, MD, PhD

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This article originally appeared in the February 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: Shah RU, et al. Procedural complications, rehospitalizations, and repeat procedures after catheter ablation for atrial fibrillation. *J Am Coll Cardiol* 2012;59:143-149.

Shah et al used an administrative database, the California State Inpatient Database from the Healthcare Utilization Project, to analyze the short and intermediate success

and complication rates associated with catheter ablation for atrial fibrillation (AF). The authors identified patients who underwent an initial AF ablation in California between January 1, 2005, and November 31, 2008. Search methods identified patients who underwent ablation for only AF and excluded patients having other electrophysiologic procedures. Comorbidities were identified through the database. Acute procedural complications were also obtained from the database and included: cardiac perforation and/or tamponade, pneumothorax, hemothorax, procedure-related stroke, transient ischemic attack, vascular access complications, and in-hospital death. Thirty-day and long-term rehospitalization rates were also identified.

During the 4-year study period, the authors identified 4156 patients who received an initial ablation for AF in the state of California. There was a steady increase in the number of initial procedures annually, with 684 cases in 2005 and 1332 in 2008. AF ablations were performed in 98 unique hospitals with a mean annual volume of 15.4 throughout the study. The mean patient age was 61.7 years, with hypertension (50.3%) and coronary artery disease (14.7%) the most common cardiac diagnoses. Only a minority of patients (20.9%) had been hospitalized with a primary diagnosis of AF during the year before ablation. The mean observation time from the initial ablation to the close of the study was 1.5 years.

During the initial hospitalization, complications were noted after 5.1% of AF ablations. The complication rate was constant during the course of the study. More than half of the complications were vascular. There was, however, only one death. In addition to these early complications, 9.4% of patients discharged were rehospitalized within 30 days after discharge. Recurrent atrial arrhythmias and late procedural complications accounted for 47% of these repeat admissions. The risk of an inpatient complication or 30-day rehospitalization was associated with the following: increased age; female gender; primary payer (Medicare vs. private insurance); a history of heart failure, hypertension, renal, or lung disease; the prior number of AF hospitalizations; and hospital AF ablation volume. The latter was a strong predictor of rehospitalization with a 50% increase in the odds of complication or rehospitalization in hospitals in the lowest frequency quartile compared to those in the highest frequency quartile. After 30 days, rehospitalizations continued to be frequent. At 1 year, 39% of the patients had been rehospitalized at least once and 22% of patients had been hospitalized for either recurrent arrhythmia or a repeat ablation. Repeat ablations were performed in 17.4% of the study group with most receiving a single additional procedure.

The authors conclude that during the period of study, AF ablation procedures had only modest efficacy with a significant risk for complications and need for rehospitalization.

■ **Commentary**

AF ablation is now one of the more common procedures performed by electrophysiologists. Evaluating the efficacy of AF ablation has been difficult. If one uses the criterion of no detectable AF off all antiarrhythmic therapy during intensive periodic monitoring, single procedure success rates are less than 65% for patients with paroxysmal AF and less than 50% for patients with persistent AF, even in experienced centers. This paper suggests that the success rates may be even lower in general practice. AF is usually managed on an outpatient basis and this report only captured recurrences if they resulted in hospitalization or a repeat ablation procedure. The observation that success rates were higher and complication rates lower in higher volume centers is also important, although not surprising. AF ablation techniques continue to evolve and only centers and operators who do enough procedures to remain current are likely to have the best outcomes. ■

Absence of Pathogens in Intestinal Tissue of Patients with Necrotizing Enterocolitis

ABSTRACT & COMMENTARY

By Dean L. Winslow, MD, FACP, FIDSA

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This article originally appeared in the February 2012 issue of Infectious Disease Alert. *It was edited by Stan Deresinski, MD, FACP, FIDSA, and peer reviewed by Timothy Jenkins, MD. Dr. Deresinski is Clinical Professor of Medicine, Stanford University, and Dr. Jenkins is Assistant Professor of Medicine, University of Colorado, Denver Health Medical Center. Dr. Deresinski does research for the National Institutes of Health, and is an advisory board member and consultant for Merck, and Dr. Jenkins reports no financial relationships relevant to this field of study.*

Synopsis: *28 surgical specimens from patients with necrotizing enterocolitis (NEC) were examined using multiplex real-time polymerase chain reaction (RT-PCR) to detect gastrointestinal*

pathogens. Infectious enteritis pathogens were not detected in any specimens.

Source: Ullrich T, et al. Absence of gastrointestinal pathogens in ileum tissue resected for necrotizing enterocolitis. *Ped Infect Dis J* 2012; epub ahead of print.

Fresh ileum tissue specimens from infants with NEC or non-NEC diagnoses were provided by the Pathology departments at the children's hospitals at Vanderbilt and at University of Illinois. Standard methods of nucleic acid extraction were employed. Multiplex RT-PCR was used to detect 15 bacterial and viral pathogens (including Salmonella, Shigella, Campylobacter, *C. difficile* toxin A/B, ETEC, *E.coli* O157, STEC E. coli, V.cholerae, Yersinia, Giardia, *Entamoeba histolytica*, Cryptosporidium, Adenovirus 40/41, Rotavirus, and Norovirus). 23 ileum samples from 22 cases of NEC, 14 samples from non-NEC controls, 1 tissue sample from a child with confirmed Giardia enteritis, and one stool specimen from a child with Norovirus infection were examined. Median gestational age of NEC patients was 28.2 weeks and all samples were collected between 2007 and 2011. All of the NEC and non-NEC tissue specimens were negative for gastrointestinal pathogens included in the multiplex assay. The two positive controls were strongly positive for Giardia and Norovirus respectively.

■ **Commentary**

NEC is a severe and poorly understood complication of prematurity characterized by a generally irreversible inflammatory process leading to bowel necrosis. It occurs in 7% of infants less than 1,500 grams at birth and is associated with significant morbidity and mortality with most patients requiring surgical resection of variable amounts of small bowel. Anecdotal reports and small case series have suggested etiological roles for a variety of gastrointestinal pathogens including *C. difficile*, C. perfringens, E. coli, adenovirus and other enteric viruses. Formula feeding has also been implicated by association in many case series.

This study, which utilized a sensitive and specific multiplex RT-PCR technique, is an important advance in our understanding of this disease, and may reduce the use of unnecessary and potential harmful antibiotics in the NICU, which are often given empirically for treatment of NEC. While the multiplex PCR method used in this study ruled out the presence of the specific pathogens examined, it may still be of use to repeat this study using broad-spectrum 16S rDNA PCR primers to look for potentially unidentified potential pathogens. However, the present study along with the lack of histopathological evidence of bacterial pathogens in resected specimens suggests that infectious agents are not generally causal in NEC. ■

Posterior Reversible Encephalopathy Syndrome, Seizures, and the EEG

ABSTRACT & COMMENTARY

By Steven Karceski, MD

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Dr. Karceski reports he is on the speakers bureau for GlaxoSmithKline, Cyberonics, and Pfizer; and receives research support from Novartis and Cyberonics.

This article originally appeared in the February 2012 issue of Neurology Alert. *It was edited by Matthew Fink, MD, and peer reviewed by M. Flint Beal, MD. Dr. Fink is Interim Chair and Neurologist-in-Chief, Department of Neurology and Neuroscience, Weill Cornell Medical College, New York Presbyterian Hospital, and Dr. Beal is Anne Parrish Titzel Professor, Department of Neurology and Neuroscience, Weill Cornell Medical Center. Dr. Fink is a retained consultant for MAQUET, and Dr. Beal reports no financial relationships relevant to this field of study.*

Synopsis: *This clinical study evaluated patients with posterior reversible encephalopathy syndrome to determine the kind of seizures they experienced, abnormalities on EEG, and to correlate this with findings on neuroimaging (MRI).*

Source: Kastrup O, et al. Posterior reversible encephalopathy syndrome (PRES): Electroencephalographic findings and seizure patterns. *J Neurol* 2011 DOI 10.1007/s00415-011-6362-9.

Posterior reversible encephalopathy syndrome (PRES) is a clinical and radiological diagnosis characterized by changes in mental status, headaches, visual obscurations, and seizures. Radiographically, there are characteristic changes on MRI, consisting of both white and gray matter hyperintensities. As the name of the syndrome suggests, MRI changes usually occur in the posterior quadrants of the brain and are usually symmetric. PRES is most often associated with hypertension (usually quite high), eclampsia, neurotoxins (such as chemotherapeutics), and immunosuppressants. The connection between these causes and the radiologic findings is unclear, though one hypothesis is that there is vasogenic leakage through the blood-brain barrier, accounting for the clinical and imaging findings.

In the medical literature, there is scant information

about PRES and associated EEG findings. Kastrup and colleagues carefully reviewed the EEGs in 49 adults (ages 18-66) who were treated for PRES at the University of Duisburg-Essen, between 2004 and 2011. They performed a retrospective chart review of 49 patients who had radiologically confirmed PRES and 38 of these patients also had seizures. Of the 38 who had seizures, 17 had one or more EEGs during the course of their illness. Of the 17, one (5%) had focal visual seizures, and one (5%) had focal motor seizures. Two (12%) had serial grand mal seizures, defined as seizures that recurred within the first hour of the initial seizure. Three (17.6%) had recurrent grand mal seizures, defined as seizures that recurred within the first 3 hours of the initial seizure. None of the patients had status epilepticus nor seizures for more than 1 day after the initial seizure. About one-half (53%) were treated for their seizures.

EEGs were abnormal in all 17 patients. Diffuse slowing to the theta range was the most common finding, occurring in 13 of the 17 patients (76.5%). Diffuse delta was the next most common finding in 23.5%. Epileptiform discharges occurred in one patient, consisting of occipital sharp-slow wave discharges. One patient had periodic lateralized epileptiform discharges in the left hemisphere.

Kastrup et al noted that a single "grand mal" seizure was the most common type of seizure to occur in PRES. Serial or recurrent grand mal seizures occurred less often. Though described in the medical literature, status epilepticus and chronic epilepsy did not occur in this case series. No correlation was found between the occurrence of seizures and the pattern of abnormalities on MRI. The most common finding on EEG was diffuse slowing (theta and delta); infrequently, epileptiform discharges were recorded.

■ Commentary

PRES is known to cause seizures. This makes sense given the cortical involvement in most people who develop this syndrome. In the medical literature, most descriptions of the seizures that occur in PRES come from case series or case reports. Convulsions, focal seizures, and status epilepticus all have been reported. In most people, the seizures are self-limited, acute, and usually do not become chronic epilepsy.

Although very helpful, Kastrup's study is limited. Of the 49 patients, EEG results were available in only one-third (34%). Of the 38 who had seizures, an EEG was performed in fewer than one-half (44%). This is a limitation of a retrospective chart review; not all patients will have undergone the testing that the authors were interested in studying. A prospective study of PRES would eliminate this problem. Although such a study would take many years to complete, it would be helpful to perform an EEG in all patients who are diagnosed with PRES, providing EEG information for all patients with PRES, including the ones in whom seizures did *not* occur. It might be interesting to know if there are differences in the EEG of people who had seizures and those who did not. For instance, if there is a difference, the EEG information might identify people with PRES who are at *greater risk* for having seizures. Further study of this syndrome is needed. ■

High Mortality in Patients with COPD Exacerbations Who Fail Noninvasive Ventilation

ABSTRACT & COMMENTARY

By David J. Pierson, MD

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This article originally appeared in the February 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: *Wider use of noninvasive ventilation in managing severe COPD exacerbations has improved overall outcomes, but this study of a large nationwide database shows that increasing numbers of patients fail NIV and require intubation. This subset of patients has substantially higher mortality and hospital costs.*

Source: Chandra D, et al. Outcomes of non-invasive ventilation for acute exacerbations of COPD in the United States, 1998-2008. *Am J Respir Crit Care Med* 2011;Oct 20. [Epub ahead of print.]

Until now, getting a handle on the utilization and outcomes of noninvasive ventilation (NIV) in the management of acute exacerbations of chronic obstructive pulmonary disease (AECOPD) in the United States has been hampered by the absence of a nationwide database on this important condition.[1] With this study, Chandra and colleagues have gone a long way toward correcting this deficiency. They used a nationwide database to ex-

amine more than 7 million hospitalizations for AECOPD between 1998 and 2008, looking at patient demographics, the use of both NIV and invasive mechanical ventilation (IMV), and patient outcomes. Although the article provides a general overview of their findings, I will focus primarily on what their data reveal about an important subset of AECOPD patients — those in whom NIV is unsuccessful, necessitating intubation and the use of IMV.

The authors used data from the Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project (HCUP-NIS), which collects information from about 20% of all U.S. hospitals and includes all areas of the country, insurance categories, and hospital sizes. For all admissions for AECOPD, Chandra et al determined whether NIV or IMV had been used and identified all patients who were started on NIV and subsequently received IMV; against these data they examined in-hospital mortality (adjusted for patient demographics, hospital characteristics, and comorbidities), length of stay, and total charges for the hospitalization.

Of the 7,511,267 admissions for AECOPD to the participating hospitals from 1998 through 2008, 612,650 (8.1%) received ventilatory support, with NIV progressively increasing (from 1.0% to 4.5% of admissions) and IMV decreasing (from 6.0% to 3.5%) during the study period. The proportion of patients who started on NIV and were switched to IMV remained the same at about 4.6%, but because of the steady increase in patients in whom NIV was used, their absolute numbers climbed steadily. Overall, 9681 patients transitioned from NIV to IMV, of whom 2595 (27%) died. This compares to 17,436 deaths (9%) among 198,375 patients managed initially on NIV who were not switched to IMV. Adjusted odds ratios for mortality in NIV patients who were switched to IMV were substantially increased in comparison with those who remained on NIV, for every year starting in 2000. In 2008, a patient requiring IMV after unsuccessful NIV had 61% greater odds of death than a patient placed directly on IMV at the start, and 677% greater odds of death compared to a patient treated with NIV without transition to IMV. Charges for hospitalization increased steadily from 1998 through 2008, but the increase was steepest for patients who required a transition from NIV to IMV. Hospital length of stay was longest for the latter group and did not fall over time, whereas length of stay gradually decreased among the other groups.

■ Commentary

This study demonstrates that whether ventilatory support was required was strongly correlated with outcomes among patients hospitalized with AECOPD. The mortality rate among those in whom neither NIV nor IMV was used remained in the 2-3% range throughout the 11-year data period. For patients who received NIV only, in-hospital mortality started at 11 or 12% and fell gradually to 7% or 8% (estimates from Figure 3, since precise data are not provided in the paper). Patients who received only IMV (no NIV) had an overall mortality rate of 23%, whereas, as mentioned, 27% of the patients who started out on NIV and had to be intubated for IMV died. Of course, these groups of patients undoubtedly varied a great deal in terms of severity of underlying COPD, the acute illness, comorbidities, and other factors, so that the mortality differences cannot be interpreted as simply reflecting differences in ventilatory support. Still, I think some conclusions can be drawn.

The steady increase in NIV use nationwide during the study period probably reflects increased awareness of the compelling evidence supporting it and the recommendations of practice guidelines, and the progressive decrease in mortality among patients who did not require intubation is consistent with increasing experience and expertise with this therapy over time. That the proportion of patients receiving IMV fell by nearly half during the study period likely also reflects increasing awareness that this complication-laden intervention is not necessary as often as we used to believe; the mortality rate among this decreasing proportion of patients who required IMV stayed about the same.

The group of greatest concern, whose outcomes actually worsened over time in terms of absolute patient numbers, is those patients who were initially managed with NIV and subsequently required intubation. Some of these patients likely developed new complications or experienced a progression of the primary problem. However, it is also likely that others were unsuitable for NIV in the first place, or received NIV in an ineffective or suboptimal manner. Carrying out NIV effectively is both a science and an art, with a substantial learning curve not only for the physician in knowing when to use it but also for the respiratory therapist in tailoring it to the patient's needs and toleration over time. The findings of the present study are very encouraging in their documentation of more widespread use of NIV for AECOPD. Hopefully, the overall improvement in patient outcomes will continue with increasing experience, and the subset of patients who fail initial NIV will be better understood and more successfully managed.

r eference

1. Pierson DJ. History and epidemiology of noninvasive ventilation in the acute-care setting. *Respir Care* 2009;54:40-52. ■

Patients Placed in Contact Isolation Are at Increased Risk for Delirium

ABSTRACT & COMMENTARY

By David J. Pierson, MD

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This article originally appeared in the February 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 retrospective study of all non-psychiatric patients admitted to an academic medical center found that although those placed in contact isolation from the time of admission had no increased risk for delirium, patients moved into isolation after admission were twice as likely to develop delirium during the hospital stay.*

Source: Day HR, et al. Association between contact precautions and delirium at a tertiary care center. *Infect Control Hosp Epidemiol* 2012;33: 34-39.

To examine the association between being placed in contact isolation and delirium, Day and colleagues at the University of Maryland Medical Center reviewed administrative data on all patients admitted during a 2-year period ending in 2009. They excluded patients with underlying schizophrenia or bipolar disorder, those admitted to the psychiatry service, and alcohol-related admissions, as well as patients under age 18. Patients placed into contact isolation during hospitalization were stratified into those assigned this status on admission (because of pre-existing risk or documented infection) and those subsequently moved into isolation (because of positive surveillance or clinical cultures, acquired risk, or other factors). Because delirium is underdiagnosed and incompletely identified by its direct ICD-9 code, the authors also used as proxy measures the otherwise-unexplained use of haloperidol or other antipsychotic drugs and the use of physical restraints during the admission. They performed selected chart reviews to assure that the variables under study were recorded in the administrative database with acceptable accuracy.

Of 70,275 admissions during the study period, 60,151 (in 45,266 unique patients; 9869 ICU admissions) were evaluated after *a priori* exclusions. Contact precautions were used in 9684 admissions (15%), 58% of them from the time of admission and 42% commencing at some point following admission. The authors' criteria for delirium were met in 7721 admissions (13.5%). Overall, patients placed in contact isolation at any time during hospitalization were twice as likely to have delirium compared to non-isolated patients (16.1% vs. 7.6%, respectively; odds ratio [OR], 2.4; 95% confidence interval [CI], 2.2-2.5%). There was no relationship between contact precautions and delirium among patients who were placed in isolation immediately on admission. However, being moved into isolation sometime after admission because of identification of a multiple-drug-resistant bacterium was associated with increased risk for delirium (OR, 1.75; 95% CI, 1.60-1.92; $P < 0.01$). Although ICU patients had significantly more delirium than non-ICU patients, being placed in contact isolation had no independent effect.

■ Commentary

Delirium, which occurs in about 15% of all hospitalized patients and is considerably more common in the ICU, is associated with numerous bad outcomes, including increased mortality, morbidity, and length of stay. Under current recommendations by the Centers for Disease Control and Prevention, contact precautions — including the use of gloves and gowns and isolation in a private room — are now used in a substantial number of hospitalized patients. Several studies have documented that physicians, nurses, and other clinicians interact with patients in isolation less often than non-isolated patients, and that those in isolation have more symptoms of depression and anxiety. Because decreased environmental stimuli predispose to delirium, it is hardly surprising that patients placed in isolation are more likely to develop this important disorder.

This study does not show that isolation causes delirium. Patients placed in isolation had increased mortality and lengths of stay, were more likely to be admitted to the ICU, and had more positive cultures suggesting clinical infections with resistant organisms than patients who were never placed in contact precautions. Thus, delirium was likely influenced by some or all of these and other factors that could not be controlled for in a retrospective study. The fact that patients placed in isolation from the time of admission — because of a past history of colonization with resistant organisms or the presence of specific risk factors — did not have a higher risk for delirium suggests that those who required the institution of contact precautions subsequent to admission were sicker and perhaps more predisposed to delirium in the first place. These points are acknowledged by the authors.

I think the important contribution of this study is the spotlight it shines on contact isolation as a marker for the development of delirium. Regardless of the contribution of isolation per se to this development, knowing that isolated patients are at increased risk can help — at the level of the individual clinician as well as for hospital policy — with respect to efforts at early detection, appropriate treatment, and prevention of this important complication of acute illness. ■

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. In the study by Keller and colleagues comparing a highly sensitive troponin I (hsTnI) assay to a conventional troponin I (cTnI) assay, which of the following was true?

a. The highly sensitive troponin I was significantly more accurate in ruling out acute MI at admission.

b. The highly sensitive troponin I was significantly more accurate in ruling out acute MI at three hours after admission.

c. The hsTnI assay did not provide significantly improved diagnostic accuracy over the cTnI assay either at admission or three hours later.

d. Both A and B

2. According to the study conducted by Ullrich et al, what percentage of patients with necrotizing enterocolitis had identifiable gastrointestinal pathogens in their resected ileal specimens?

a. 0

b. 8 percent

c. 15 percent

d. 41 percent

e. 90 percent

3. Based on the study by Kastrup et al, what was the most common finding on EEG in patients with PRES (posterior reversible encephalopathy syndrome) and at least one seizure?

a. Normal EEG

b. Diffuse slowing

c. Focal epileptiform discharges

d. Status epilepticus

e. Burst-suppression

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.*

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