

Hospital Medicine

Evidence-Based Information for Hospitalists
Intensivists, and Acute Care Physicians [ALERT]

ABSTRACT & COMMENTARY

Not All Patients with Acute, Uncomplicated Diverticulitis Require Hospitalization

By Jennifer A. Best, MD

Assistant Professor, University of Washington School of Medicine, Seattle, WA

Dr. Best reports no financial relationships in this field of study.

SOURCE: Biondo A, Golda T, Kreisler E, Espin E, Vallribera F et al. Outpatient versus hospitalization management for uncomplicated diverticulitis. *Ann Surg* 2014;259:38-44.

Diverticulitis of the colon is a common condition frequently implicated as an admitting diagnosis among hospitalized adults in the United States and elsewhere. Most often, hospitalists initially manage this condition with intravenous antibiotics and transition to oral therapy upon improvement in clinical status, as evidenced by normalization of vital signs, diminished gastrointestinal symptoms and ability to tolerate an oral diet. Current guidelines lack clear recommendations on the ambulatory management of uncomplicated diverticulitis, which can be defined as lacking a complication such as perforation, obstruction, gastrointestinal bleeding or fistula. The majority of diagnosed episodes of diverticulitis can be classified in

this fashion. Given a lack of prospective and randomized studies, it is uncertain whether acute, uncomplicated diverticulitis can safely be managed in the outpatient setting with oral agents alone. It is worth noting that only approximately 15% of patients admitted with acute diverticulitis require urgent surgical intervention during that admission.

In this trial published in the *Annals of Surgery* in January 2014, Biondo and colleagues evaluated the result of two different management strategies for acute, uncomplicated left-sided diverticulitis. Their randomized study was performed at five university hospitals in Spain. Potential subjects were recruited from a population of patients older than 18 years who presented to the emergency department with suspicion of diverticulitis with fever

Financial Disclosure: *Hospital Medicine Alert's* physician editor, Kenneth P. Steinberg, MD, peer reviewer John H. Choe, MD, MPH, executive editor Russ Underwood, and associate managing editor Jill Drachenberg have no relevant financial relationship related to the material presented in this issue.

[INSIDE]

Disparities in hospital trans-
fers: Not what you would
expect
page 3

Inpatient STEMIs: Are they as
complicated as they seem?
page 4

Endocarditis outcomes in the
elderly
page 6

Hospital Medicine

[ALERT]

Hospital Medicine Alert, ISSN 1931-9037, is published monthly by AHC Media LLC, One Atlanta Plaza, 950 East Paces Ferry Road NE, Suite 2850, Atlanta, GA 30326. Website: www.ahcmedia.com.

EXECUTIVE EDITOR:

Russ Underwood.

GST Registration Number: R128870672. Periodicals Postage Paid at Atlanta, GA 30304 and at additional mailing offices.

POSTMASTER: Send address changes to Hospital Medicine Alert, P.O. Box 550669, Atlanta, GA 30355.

Copyright © 2014 by AHC Media. All rights reserved. No part of this newsletter may be reproduced in any form or incorporated into any information-retrieval system without the written permission of the copyright owner.

Back Issues: \$42. Missing issues will be fulfilled by customer service free of charge when contacted within one month of the missing issue's date.

This is an educational publication designed to present scientific information and opinion to health professionals, to stimulate thought, and further investigation. It does not provide advice regarding medical diagnosis or treatment for any individual case. It is not intended for use by the layman.

SUBSCRIBER INFORMATION

1-800-688-2421

customerservice@ahcmedia.com

Editorial E-Mail: russ.underwood@ahcmedia.com

Questions & Comments:

Please call **Russ Underwood**, Executive Editor at (404) 262-5521 or email at russ.underwood@ahcmedia.com

Subscription Prices

United States

1 year with free AMA Category I credits: \$249

Add \$17.95 for shipping & handling. (Student/Resident rate: \$125)

Multiple Copies: Discounts are available for group subscriptions, multiple copies, site-licenses or electronic distribution. For pricing information, call **Tria Kreutzer** at 404-262-5482.

Canada

Add GST and \$30 shipping.

Elsewhere

Add \$30 shipping.

ACCREDITATION

AHC Media is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

AHC Media designates this enduring material for a maximum of **20 AMA PRA Category I Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

This CME activity is intended for hospitalists, intensivists, and acute care clinicians. It is in effect for 24 months from the date of the publication.

AHC Media

and acute abdominal pain and tenderness. These patients were evaluated initially with radiographs of the chest and abdomen to exclude other etiologies for symptoms and an abdominal CT scan with contrast. Patients were excluded from participation if they exhibited signs of complicated diverticular disease (including even small abscesses), failed to respond to initial therapy or tolerate oral intake in the ED, or carried additional comorbidities which rendered them high risk for decompensation (pregnancy, recent antibiotic use, suspicion of malignancy, immunosuppression). On-call surgeons at each site, not investigators, assumed responsibility for recruitment and randomization.

Patients were randomized to two groups. Group 1 was admitted to the hospital. Group 2 was discharged from the emergency department and contacted daily by investigators for 5 days subsequent to that discharge. All patients received an initial dose of intravenous antibiotics in the emergency department (amoxicillin and clavulanic acid; ciprofloxacin and metronidazole substituted for patients with penicillin allergy). Group 1 was then admitted to the hospital and managed with intravenous antibiotics and fluids for 36-48 hours to tolerance of oral intake and adequate pain control, followed by discharge. Group 2 was discharged directly from the emergency department with instructions to continue oral amoxicillin-clavulanic acid (or ciprofloxacin-metronidazole, if allergic). Both groups completed 10 days of total antibiotic therapy and received dietary recommendations. For the outpatient cohort (Group 2), this consisted of liquid diet with electrolyte drinks for 2 days, then escalation to low fiber. Pain was managed with paracetamol (acetaminophen). Phone calls to the outpatient subjects included assessment of temperature, diet, bowel function and pain. All patients were seen in clinic at 14 days and referred for colonoscopy to exclude

neoplasm between days 45 and 60. The study's primary outcome was treatment failure of the outpatient strategy, as compared with initial hospitalization. Treatment failure was documented to have occurred in the setting of persistent pain and fever, progression to bowel obstruction or drainable abscess, surgical indication or mortality in the 60 days post-randomization. Other endpoints included quality of life (as assessed by the SF-12 tool) and a cost analysis completed at the coordinating institution, based on services for diagnosis, treatment, follow up and mean length of stay.

132 patients were ultimately randomized, and no significant differences were noted between the groups at baseline. Of this group, only 7 (5.3%) were readmitted, with no difference in readmission between the groups. No patients died and none required emergency surgery. There were no differences observed between initial inpatient and outpatient therapy related to quality of life at days 14 and 6, though within each group, quality of life improved between these two clinic visits. The cost was three times lower with outpatient therapy than with initial hospitalization (1124.70 euros less per patient — equivalent to \$1532.74 US at the time of this article). The authors conclude that outpatient treatment with oral antibiotics is as safe and effective as initial hospitalization for intravenous therapy, at a lower cost and without decline in quality of life.

Though this is the first RCT to address the risks and benefits of outpatient management of acute uncomplicated diverticulitis directly, there are a number of weaknesses with this study. Subject numbers were small. Many patients were not randomized due to the presence of complicated disease — only those with confined phlegmon were included. Patients with confined small abscess were excluded for simplicity here, but this modestly more complicated population likely warrants additional study. Furthermore, a substantial

number of patients otherwise eligible refused to be randomized, given the possibility of outpatient management. This reader notes the even patients randomized to group 2 received a single dose of intravenous antibiotics prior to discharge, so it remains unclear whether these patients would have recovered with a strictly oral antibiotic regimen — this too should be investigated. In summary,

however, these data suggest that many patients with acute, complicated diverticulitis, as manifest by inflammation/phlegmon without abscess, may be safely treated with early discharge and oral antibiotics. On a related note, interesting data are arising about the utility and necessity of follow-up colonoscopy in these patients, but we'll save that for another review. ■

ABSTRACT & COMMENTARY

Disparities in Hospital Transfers: Not What You Would Expect

By Deborah J. DeWaay, MD, FACP

Assistant Professor, Medical University of South Carolina, Charleston, SC

Dr. DeWaay reports no financial relationships in this field of study.

SYNOPSIS: Administrative data extracted from the Nationwide Inpatient Sample indicates that uninsured patients and women were less likely to be transferred from one acute hospital to another.

SOURCE: Hanmer J, Lu X, Rosenthal G, Cram P. Insurance Status and the Transfer of Hospitalized Patients: An Observational Study. *Annals of Internal Medicine*. 2013; 160: 81-90.

In 1986, the Emergency Medical Treatment and Active Labor Act (EMTALA) was enacted in order to assure that all patients, irrespective of sex, ethnicity, race or ability to pay were given emergent medical care. The act mandates that all patients are examined, treated and stabilized until they are stable for discharge, even if they cannot pay. There have been several studies in the past showing that once a patient is stabilized that hospitals may transfer patients to other hospitals for non-medical reasons. The authors of this article used the 2010 data from the Nationwide Inpatient Sample (NIS) to examine the relationship between inter-hospital transfer and insurance status for patients who have already been admitted. They hypothesized that hospitals would transfer their underinsured patients to other acute care hospitals at a greater rate in order to lessen their financial burden.

The 2010 NIS data set contains discharge data for about 8 million hospitalizations from 1051 hospitals. The authors purchased this data from the Agency for Healthcare Research and Quality (AHRQ). The hospitals included in this study are only acute care hospitals. Patients who were admitted under observation are not included in the data set. The authors analyzed discharges as opposed to individual patients because there are no unique identifiers in the

database which could be used to track patients across different hospital admissions. The authors selected all discharges for patients 18-64, excluding those 65 and older because they presumably had Medicare. The following discharge records were also excluded: those of patients whose primary payer was listed as “other” (as opposed to Medicare, Medicaid, private or uninsured), those of patients who died, and those of patients who left against medical advice. The authors selected 5 common diagnoses — biliary tract disease, septicemia, skin infections, pneumonia, and chest pain — to study further. Then the authors linked this data to the AHRQ’s hospital weights file in order to analyze data such as hospital ownership and financial status.

The authors used the chi-square test for all categorical variables and t-tests for continuous variables to compare the patients transferred to those that were not transferred in the following areas: demographic characteristics, presence of key comorbid conditions, average comorbid conditions, and insurance coverage. They also used weighted analyses to look at the odds of a patient transfer to another acute care hospital. They controlled for patient demographics, comorbid conditions, and hospital characteristics. The authors did multiple sensitivity analyses to make sure their data were robust and held true under a variety of assumptions.

Across all diagnoses, women and the uninsured were less likely to be transferred than men and those with private insurance. For example, the odds ratio for women to be transferred with chest pain was 0.67 (0.58-0.76; $P < 0.001$). The uninsured were significantly less likely to be transferred if they had biliary tract disease, chest pain, septicemia and skin infections. The uninsured with pneumonia were less likely to be transferred, but the odds ratio was not statistically significant. Patient transfer also was different depending upon which type of hospital the patient was originally admitted. Non-teaching hospitals transferred more frequently than teaching hospitals.

The authors were surprised to find their hypothesis was incorrect; the uninsured were less likely to be transferred than those with private insurance. Although these data only reveal associations and do not prove causation, the authors argue that the receiving hospitals may not be accepting patients without insurance. It is not clear why women would be less likely to be transferred. Further research is necessary to explain this difference. The consequence of this difference is also unclear. Patients who are not transferred may receive substandard care because they are not

transferred to facilities with better technology or subspecialty care. Or, patients who are transferred may receive tests and procedures that are not necessary, therefore they are exposed to extra risk with transfer. The major limitation to this study is that it used administrative data, so the exact reason for each transfer is unknown. In addition, the clinical outcomes for patients are unclear.

■ COMMENTARY

The finding that women and the uninsured are less likely to be transferred is an interesting finding because it illustrates that there are differences in treatment in these groups. However, the consequences of this difference are unclear. Importantly, the fact that administrative data was used is a major limitation since the reason for transfer in each case is unknown. Further research is necessary to see if these differences remain when the reason for transfer is known. An interesting follow-up question would be how Medicare patients with different supplemental plans are treated versus patients with private insurance. In addition, this study will need to be redone after the full effects of the Affordable Care Act are in place. ■

ABSTRACT & COMMENTARY

Inpatient STEMIs: Are They as Complicated as They Seem?

Jeffrey Zimmet, MD, PhD

Associate Professor of Medicine, University of California, San Francisco, Director, Cardiac Catheterization Laboratory, San Francisco VA Medical Center

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

This article originally appeared in the February 2014 issue of Clinical Cardiology Alert. It was edited by Michael H. Crawford, MD, Professor of Medicine, Chief of Clinical Cardiology, University of California, San Francisco, and peer reviewed by Ethan Weiss, MD, 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: Garberich RF, et al. ST elevation myocardial infarction diagnosed after hospital admission. *Circulation* Jan 3, 2014. [Epub ahead of print.]

The link between time to reperfusion and mortality in ST-elevation myocardial infarction (STEMI) is well established, and has led to a national initiative to improve prehospital and hospital systems to speed recognition of STEMI and delivery of primary percutaneous coronary intervention (PCI). Much of the emphasis in the door-to-balloon

initiative has focused on earlier identification of these patients by emergency medical services (EMS) in both the ambulance and emergency department (ED) settings. Pathways for STEMI recognition and activation of the cath lab have greatly improved time to treatment for these patients. However, patients who are already in the hospital at the time of STEMI development have

been specifically excluded from most analyses. The reasons for this seem appropriate to those of us involved in the care of these patients. The ED admission who was well until the sudden development of chest pain an hour ago is in most cases more straightforward than the sick inpatient with multiple comorbidities who develops STEMI as a complication of another illness. Does this mean that inpatients have been left behind in the door-to-balloon revolution? Who are these patients anyway?

The authors of the current study, who are leaders in development of systems of acute MI care, have developed a comprehensive, prospective program database of patients treated using the Minneapolis Heart Institute regional STEMI program. Like many other systems, their program initially excluded inpatients from the regional protocol established in 2003. In 2010, the standard protocol was expanded to include inpatients. Of the 3795 consecutive STEMI patients treated under this program from 2003-2013, 990 presented directly to the PCI center. Of these, 640 were taken via EMS, 267 arrived driven by themselves or family, and only 83 were already inpatients at these facilities. Notably, only 26 inpatients with STEMI were identified in the 7 years prior to implementation of the standard protocol in 2010, while 57 were detected after implementation. In total, inpatients represented 8.4% of all patients presenting with STEMI during the 10-year period.

Were inpatients presenting with STEMI more complex than outpatients? Of the recorded variables, patient age, body mass index, and rates of hypertension and coronary disease were all greater in the inpatient group. Patients already admitted to the hospital at the time of STEMI presentation also were more likely to present with cardiac arrest or cardiogenic shock, and had a higher average Killip score than those presenting to the ED. Perhaps more telling is the effect of inpatient status on indices of acute MI care. Time from diagnostic ECG to reperfusion was greater for inpatients when compared with door-to-balloon times for patients presenting via EMS (76 minutes [53, 100] vs 51 minutes [38, 71]; $P < 0.001$), although there was only a nonsignificant trend when compared with those patients arriving by themselves or with family (76 minutes [53, 100] vs 66 minutes [41, 78]; $P = 0.13$). Only 68.3% of inpatients were reperfused within 90 minutes of the diagnostic ECG, compared

with 94% of those arriving by EMS and 85.7% of those arriving by self or family. There was a trend toward greater in-hospital mortality among the inpatient group (8.4% vs 5.5% vs 2.6%; $P = 0.061$), and an increased rate of death for these patients at 1 year.

Who were these patients? Of the 83 patients identified, only 25 had been admitted with acute coronary syndrome prior to developing ST elevation. Eight had been admitted for PCI and subsequently had either stent thrombosis or a post-PCI dissection. The remainder was a heterogeneous group, and included patients who were post-surgery, admitted for respiratory failure, and patients with cancer or gastrointestinal illness. Unsurprisingly, when compared with the non-cardiac patients, those admitted for primary cardiac reasons showed a trend toward shorter ECG-to-balloon times and had lower in-hospital mortality as well as mortality at 30 days and 1 year. Although the numbers for comparison are small, inpatients who developed STEMI after implementation of the standard protocol had decreased mortality at 1 year compared to patients who developed STEMI prior to the protocol being in place (10.5% vs 30.8%; $P = 0.022$).

■ COMMENTARY

Patients already admitted to the hospital who present with STEMI are indeed complex. Recent examples from my own experience have included a patient with disseminated cancer and HIT, as well as another who was just hours post major vascular surgery. This study does the field a significant service by characterizing these patients. As compared to patients presenting to the emergency department, inpatients clearly have more comorbidities and longer times to reperfusion. Patients admitted with cardiac diagnoses generally had better outcomes. As seen here, although tracking of inpatient STEMIs is generally not done in most systems, it can be highly illustrative.

Importantly, this study is limited in that it only tracked patients who were ultimately brought to the cath lab. Prior studies that were not focused on the procedure have shown that a significant proportion of inpatients are ineligible and are never offered reperfusion.

More importantly, however, this study demonstrates that implementation of standardized STEMI protocols for inpatients can have tangible results, despite the greater complexity and illness severity of these patients. ■

ABSTRACT & COMMENTARY

Endocarditis Outcomes in the Elderly

By Michael H. Crawford, MD

Professor of Medicine, Chief of Clinical Cardiology, University of California, San Francisco

This article originally appeared in the February 2014 issue of *Clinical Cardiology Alert*. It was peer reviewed by Ethan Weiss, MD, 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: Bikdeli B, et al. Trends in hospitalization rates and outcomes of endocarditis among medicare beneficiaries. *J Am Coll Cardiol* 2013;62: 2217-2226.

Infective endocarditis hospitalization rates have increased during the 1990s and early 2000s. Whether such trends are continuing may reflect recent guideline changes and potential increases in susceptible patients due to increased use of electrophysiologic devices during this time period. Thus, these investigators studied Medicare data on hospitalizations from 1999-2010. Patients with a primary or secondary diagnosis of endocarditis were examined. The primary endpoints were in-hospital, 30-day, 6-month, and 1-year all-cause mortality. A secondary objective was to compare the hospitalization rates for endocarditis before and after the 2007 change in the prophylactic antibiotic guidelines of the American Heart Association (AHA). There were 262,658 patients age ≥ 65 years hospitalized for valvular endocarditis over these 12 years, and the mean age remained constant at 79 years. The hospitalization rate was 72 per 100,000 person-years in 1999, which increased gradually to a high of 84 in 2005 and then declined to 71 in 2010. The hospitalization rate for those with a principal diagnosis of endocarditis remained stable from 1999 to 2005 (16-17 per 100,000 person-years) and then declined progressively (11 per 100,000 person-years by 2010). There were no consistent changes in adjusted mortality rates: in-hospital (8.8-11.4%), 30-day (14.2-16.5%), 6 months (28.4-31.8%), and 1 year (33.1-36.2%). Mortality rates for the principal diagnosis of endocarditis were somewhat higher but trended downward starting in 2005. No subgroups showed significantly different results and nor did including device-related cases. The authors concluded that there is substantial mortality among older patients hospitalized for endocarditis and there was no increase in hospitalizations or mortality after the 2007 guideline changes.

■ COMMENTARY

In the last decade, two major developments could have changed the incidence and mortality from infective endocarditis: the change in the AHA guidelines and the increased use of intracardiac devices, mainly electrophysiologic devices. Thus, this new analysis of the hospitalization rate and mortality from endocarditis in the Medicare population is of interest. Although there has been a downward trend in mor-

tality, it still is a lethal disease, as this study shows: approximately 10% died in hospital, 15% died by 30 days, 30% by 6 months, and 35% by 1 year. This study also shows that the incidence as measured by hospitalizations increased until 2005 and then began a progressive decline. This has occurred despite an increase in device placements. Perhaps this is due to more attention being paid to preventing catheter-related bloodstream infections, but the cause could not be determined from this study.

The fact that the change in the AHA guidelines did not increase the incidence of endocarditis is interesting and supported by other studies. There are several possible explanations for this finding: The widespread use of prophylactic antibiotics was having no effect on incidence, the new guidelines were largely being ignored, or there were other factors profoundly affecting endocarditis hospitalizations. Whatever the reason, the lack of any evidence of a deleterious effect of markedly reducing the use of prophylactic antibiotics is encouraging. However, it must be realized that this study is not the ideal way of assessing the effect of guideline changes per se.

The major strengths of this study are that it is a national database with a large number of cases, it includes the highest-risk individuals due to advanced age, and the results were consistent across all subgroups. One could argue that by including only those ≥ 65 years of age that the study is not representative of the whole population of endocarditis patients. However, these tend to be the sickest patients with frequent comorbidities, so they would likely reflect the experience in the whole population. Other weaknesses include that this is a study of administrative data and few clinical details that are not translatable in ICD codes are available. Also, the change in guidelines would be expected to mainly affect streptococcal endocarditis due to the decrease in dental prophylaxis and this study included all endocarditis from a variety of organisms. Finally, hospitalizations do not represent the true incidence, but since almost all patients with endocarditis are admitted, this is probably a close approximation of endocarditis incidence.

My conclusion is that the incidence of endocarditis is decreasing and we need to continue to deploy preventive measures against catheter and line

infections and other proven prophylactic practices, not the useless practice of mass antibiotics for minor procedures. Also, death rates, although historically

low, remain relatively high and we must continue to improve early recognition and encourage aggressive treatment of endocarditis. ■

ABSTRACT & COMMENTARY

A Worldwide Assessment of Procedure-Related Pain Intensity and Distress in ICU Patients

By *Linda L. Chlan, RN, PhD, FAAN*

Dean's Distinguished Professor of Symptom Management Research, The Ohio State University, College of Nursing

Dr. Chlan reports that she receives grant/research support from Hospira.

This article originally appeared in the February 2014 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: Results from a large, multinational study indicate that ICU patients worldwide experience moderately intense pain, most commonly from chest tube removal, wound drain removal, and arterial line insertion.

SOURCE: Puntillo KA, et al. Determinants of procedural pain intensity in the Intensive Care Unit: The Europain Study. *Am J Respir Crit Care Med* 2014;189:39-47.

Attention to pain management for intensive care unit (ICU) patients remains a priority for critical care clinicians. The pain intensity and distress associated with common ICU procedures, such as positioning, has not been evaluated since 2001 with the Thunder II project.¹ As pointed out by the authors, pain management has come a long way since the Thunder II report was published, with clinical practice guidelines for managing ICU pain, agitation, and delirium much more prominent.² Further, pain intensity from ICU patients around the world has not been previously reported. Thus, a large group of investigators, led by U.S. pain expert Dr. Kathleen Puntillo, conducted a prospective, cross-sectional, multinational designed study to assess the characteristics and determinants of pain associated with 12 common ICU procedures. Participating investigators and ICUs were recruited through the European Society of Intensive and Critical Care Medicine, and included those who had previously participated in international studies.

A predefined list of common ICU procedures such as positioning, device and line insertion and removal, wound care, mobilization, endotracheal suctioning, and respiratory exercises was used to guide the pain intensity and pain distress ratings, based on a 0 = no pain or no distress to 10 = worst pain or severe distress numeric rating scale. Patients were also observed during the procedures. Patients were enrolled from the participating ICUs for one or two procedures performed on the same day, or over 2 consecutive days. Patients were eligible if they were ≥ 18 years, met the institutional review board requirements, and were to experience at least one of the 12 study procedures during their stay. Patients' pain was assessed prior to

and immediately after the selected procedures.

Overall, 28 countries participated with a total of 192 ICUs worldwide. A majority of the participating hospitals were university or university-affiliated centers (66%) and public facilities (82%). ICUs were classified as medical/surgical (60%), medical (12%), surgical (8%), trauma (7%), other (8%), or cardiac (5%). A total of 4812 procedures experienced by 3851 patients were included in the analysis. Median patient age was 62 years with median Sequential Organ Failure Assessment (SOFA) and Richmond Agitation-Sedation Scale (RASS) scores of 3 and 0, respectively. Across the list of specified ICU procedures, the most common was positioning and the least common was wound drain removal. When considering all of the pre-procedure pain assessments, patients reported mild pain intensity, but they experienced a significant increase in pain intensity during a procedure. The most painful procedures were chest tube removal, wound drain removal, and arterial line insertion. Factors that contributed to higher pain intensity ratings included the specific procedure, high pre-procedure pain intensity and distress ratings, higher intensity of "worst" pain on the evaluation day, whether opioids were administered for the specific procedure, and procedures not being performed by a nurse.

■ COMMENTARY

Pain intensity and distress emanating from common ICU procedures is a worldwide phenomenon, regardless of country or culture. As reported by Puntillo and colleagues, patients evaluated their pain intensity as moderate, and this pain was associated with a variety of common procedures that ICU patients experience daily. While clinicians may aim to

“do no harm,” these necessary procedures do cause pain and distress in ICU patients.

The findings from this paper should be a reminder to all ICU clinicians that patients experience pain very individually, and that a majority of ICU patients can evaluate their pain intensity and distress using a simple numeric rating scale. Pain assessment evaluations should be standard practice in all ICUs, regardless of a patient’s RASS score! Further, while ICU clinicians may think that short-duration procedures such as chest tube removal may not “bother” patients, the findings from this large study remind us that despite a common ICU procedure not being lengthy, it can be extremely painful and distressing for patients.

ICU clinicians should strive to work collaboratively with patients to assess pain and premedicate

patients with the appropriate medication for the specific pain associated with common procedures (e.g., topical anesthetic or intravenous opioid). Remember, ICU patients frequently recall painful experiences while in the ICU that can be psychologically detrimental. ICU clinicians around the world should strive to implement best practices for pain assessment and pain management in their ICUs to ensure this common ICU symptom is not distressful for patients. ■

REFERENCES

1. Puntillo KA, et al. Patients’ perceptions and responses to procedural pain: Results from Thunder Project II. *Am J Crit Care* 2001;10:238-251.
2. Barr J, et al; American College of Critical Care Medicine. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. *Crit Care Med* 2013;41:263-306.

EDITOR

Kenneth Steinberg, MD
Professor of Medicine,
Program Director, Internal
Medicine Residency
Program, University of
Washington

ASSOCIATE EDITOR

Jennifer A. Best, MD
Assistant Professor,
University of Washington
School of Medicine
Seattle, WA

PEER REVIEWER

John H. Choe, MD, MPH
Assistant Professor of
Medicine, University of
Washington, Seattle

EXECUTIVE EDITOR

Russ Underwood

ASSOCIATE

MANAGING EDITOR
Jill Drachenberg

DIRECTOR OF CON-

TINUING EDUCATION
AND EDITORIAL
Lee Landenberger

CME INSTRUCTIONS

To earn credit for this activity, please follow these instructions:

1. Read and study the activity, using the provided references for further research.
2. Scan the QR code to the right or 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 completed evaluation is received, a credit letter will be e-mailed to you instantly.



CME QUESTIONS

1. Biondo and colleagues deemed the following groups ineligible for outpatient management for acute diverticulitis, EXCEPT

- a. Patients with symptomatic improvement in the ED.
- b. Patients who were immunosuppressed.
- c. Patients with recent antibiotic use.
- d. Patients who were pregnant or breastfeeding.

2. The Emergency Medical Treatment and Active Labor Act (EMTALA) was enacted to do what?

- a. To ensure that all patients have access to nursing homes when needed.
- b. To ensure that all patient transfers are performed solely based on what is medically best for the patient.
- c. To ensure that all patients have access to emergency care when needed.
- d. To ensure that health care is less expensive.

3. In the case series by Garberich, et al., patients who were already inpatients when developing an S-T segment elevation myocardial infarction (STEMI) were more likely:

- a. To be older and have greater co-morbidities.
- b. To have a higher average Killip score.
- c. To have a lower rate of revascularization with a longer time from diagnostic ECG to reperfusion than patients presenting to the ED.
- d. All of the above.

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.

Dear *Hospital Medicine Alert* Subscriber:

This issue begins a new continuing education semester.

Here is how you earn credits:

1. Read and study the activity, using the provided references for further research.
2. Log on to cmecity.com to take a post-test. Tests can be taken for each issue or collectively at semester's end. First-time users must register on the site using the 8-digit subscriber number printed on your mailing label, invoice or renewal notice.
3. Pass the post-test with a score of 100%; you will be allowed to answer the questions as many times as needed to pass.
4. After completing the last test of the semester, complete and submit an evaluation form.
5. Once the evaluation is received, a credit letter is emailed to you instantly.

If you have any questions about the process, please call us at (800) 688-2421, or outside the U.S. at (404) 262-5476. Our fax is (800) 284-3291 or outside the U.S. at (404) 262-5560. We are also available at customerservice@ahcmedia.com.

Thank you for your trust.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lee Landenberger', with a long horizontal flourish extending to the right.

Lee Landenberger
Editorial & Continuing Education Director