Emergency Physicians' Rates of Opioid Prescribing Vary Widely, Even Within the Same ED

BY JEFF BAUER

A large retrospective analysis found a wide variation in opioid prescribing among emergency physicians (EPs) working within the same ED. The study also found that Medicare patients treated by EPs who wrote the most prescriptions for opioids were more likely to use opioids for 6 months after their ED visit than were those treated by EPs who wrote fewer opioid prescriptions.

Researchers evaluated initial visits to an ED by approximately 378,000 Medicare beneficiaries (average age: 68 years) from 2008 through 2011. None of these patients had received a prescription for an opioid in the 6 months before the ED visit, and none of the visits resulted in a hospital admission. Prescriptions for opioids (excluding methadone) were identified by the national drug code in the Medicare Part D database. An opioid prescription was attributed to the treating EP if the patient filled the prescription within 3 days after the ED visit.

Investigators categorized the treating EPs in this study as "high-intensity" or "low-intensity" opioid prescribers by calculating the proportion of all ED visits that resulted in an opioid prescription being filled. They then grouped the EPs into quartiles of opioid prescribing within each hospital. High-intensity prescribers were those in the top quartile of opioid prescribing rates, and low-intensity prescribers were those in the bottom quartile.

The primary outcome was long-term opioid use, defined as 6 months or more of opioids supplied in the 12 months after the initial ED visit. This did not include prescriptions filled within 30 days of the initial visit.

Overall, approximately 215,700 patients were treated by low-intensity prescribers and 162,000 by high-intensity prescribers. In general, the patient characteristics and diagnoses were similar in both groups. The rate of opioid prescribing of high-intensity prescribers was approximately triple the rate of low-intensity prescribers. High-intensity prescribers provided an opioid prescription for 21.4% of ED visits, compared to 7.3% among low-intensity prescribers.

Long-term opioid use at 12 months was significantly higher among patients who had been initially treated by high-intensity prescribers compared to those who had been treated by low-intensity prescribers (1.51% vs 1.16%; unadjusted odds ratio [OR], 1.31). There was minimal change in this difference after the results were adjusted for the patients' age, race, sex, disability status, and presence of chronic conditions (OR, 1.30). The number needed to harm was calculated as 49, meaning theoretically, for every 49 patients who received a new opioid prescription in the ED, one would become a long-term user. The authors noted, however, that

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"…prescriptions provided by other physicians in the months after an [ED] visit are necessary for long-term opioid use to take hold."

Researchers pointed out several limitations to their study. Because the study was observational, it could not establish causality. Researchers were not able to directly attribute opioid prescriptions to the treating EPs, but instead used prescriptions filled within 3 days of an ED visits as a surrogate; some opioid prescriptions could have been written by another clinician, such as the patient's primary care physician during a follow-up visit. Because the study focused on Medicare patients, the results may not be applicable to younger patients. Based on their analysis, researchers could not determine whether an opioid prescription was appropriate, and therefore they could not quantify the extent of opioid overprescribing.

For more on EPs and opioid prescribing, see "The New Opioid Epidemic and the Law of Unintended Consequences" by *Emergency Medicine* Editor in Chief Neal Flomenbaum, MD (*Emergency Medicine.* 2017;49[2]:52) and "The New Opioid Epidemic: Prescriptions, Synthetics, and Street Drugs" by Rama B. Rao, MD and *Emergency Medicine* Associate Editor, Toxicology Lewis S. Nelson, MD (*Emergency Medicine.* 2017;49[2]:64-70).

Barnett ML, Olenski AR, Jena AB. Opioid-prescribing patterns of emergency physicians and risk of long-term use. *N Engl J Med.* 2017;376(7):663-673. doi:10.1056/NEJMsa1610524.

Lower Admission Rates, Other Factors Tied to High Rate of Death Soon After ED Discharge Among Older Adults

BY JEFF BAUER

Each year, approximately 10,000 older adult patients die within 7 days of discharge from an ED in the United States, despite having no obvious life-threatening illness, according to a large retrospective study. Emergency departments with lower rates of inpatient admission from the ED, lower patient volumes, and lower charges had significantly higher rates of death after discharge.

Researchers evaluated Medicare claims data related to slightly more than 10 million ED visits from 2007 to 2012. Because the goal was to study generally healthy patients, the following patients were excluded: individuals who were age 90 years and older; were receiving palliative or hospice care; or had received a life-limiting diagnosis, such as a myocardial infarction (MI) or a malignancy, either in the ED or in the year prior to the ED visit. The primary outcome was death within 7 days after discharge from an ED. The cause of death was determined by linking claims to death certificates; this information was available only for a subset of patients who visited an ED in 2007 or 2008.

Overall, during the 6-year study, 0.12% of discharged patients died within 7 days of discharge; this translates to more than 10,000 early deaths per year nationally. The leading causes of death were atherosclerotic heart disease (13.6%), MI (10.3%), and chronic obstructive pulmonary disease (9.6%).

Emergency departments ranked in the lowest fifth for admission rates admitted 15% of patients, compared to 56% of patients at EDs with the highest admission rates. The early death rate of patients treated at EDs with the lowest rates of inpatient admissions from the ED was 3.4 times higher than the death rate seen in EDs with the highest inpatient admission rates (0.27% vs 0.08%, respectively). This was true despite the fact that EDs with low-admission rates treated healthier patients, as evidenced by the overall 7-day mortality rate of all patients treated in the ED, whether they were admitted or discharged. Emergency departments that saw higher volumes of patients and had higher charges for visits had significantly fewer deaths.

Obermeyer Z, Cohn B, Wilson M, Jena AB, Cutler DM. Early death after discharge from emergency departments: analysis of national US insurance claims data. *BMJ.* 2017;356:j239. doi:10.1136/bmj.j239.

Tertiary Center Repeat Computed Tomography Scans Find Additional Injuries

MICHELE G. SULLIVAN

FRONTLINE MEDICAL NEWS

Imaging obtained at nontertiary trauma centers (NTCs) probably does not tell the whole story of a trauma patient's injuries, according to a new retrospective study.

Repeat scans done at a Level 1 trauma center identified new injuries in 76% of patients who were transferred, Morgan Bonds, MD, reported at the annual scientific assembly of the Eastern Association for the Surgery of Trauma. About half of these previously unobserved injuries were considered clinically significant, said Dr Bonds, a surgical resident at the University of Oklahoma, Oklahoma City.

Her study examined imaging and clinical assessment of 203 trauma patients who were initially worked up at an NTC, and then transferred to the Level 1 University of Oklahoma tertiary trauma center (TTC). The facility's primary radiologist reviewed all of the initial computed tomography (CT) scans while blinded to the NTC interpretation. The initial scans and interpretations were then compared with those done at the TTC.

The team split imaging and interpretation disconnects into four categories:

- Type A errors: A missed injury on the NTC scan. "This represents the expertise and experience of our primary radiologist," Dr Bonds said.
- Type B errors: Missed injuries on scans where NTC radiologists saw other injuries that the TTC radiologist did not confirm. "This represents the experience of our radiologist and also the inexperience and overreaction of the NTC radiologists."
- Type C errors: New injuries seen on additional TTC imaging of the same body area. "This represents the quality of the image."

- Type D errors: New injuries found upon any new imaging, whether of a previously scanned or newly scanned body area. "This represents quality of work-up—the decision of the trauma team to more fully investigate the patient's injuries, as well as the quality of the CT tech performing the scan."

During the study period, 203 patients presented at the TTC with prior scans conducted at an NTC.

The mean age of the patients was 43 years; most (67%) were men. The mean Injury Severity Score was 16; 97% had experienced blunt trauma. Shock was present in 3% and a traumatic brain injury in 8%. Repeat scans were most common for neck and cervical spine injuries (54%) and thoracic/lumbar spine injuries (53%), and least common for chest injuries (32%).

An inadequate NTC work-up as judged by the TTC attending was the most common reason for obtaining new images (76%). Poor image quality was the next most common reason (31%).

Among the 203 patients, 99 (49%) had a type A error. Of these injuries missed on the initial scan, 90% were considered to be clinically significant.

Type B errors occurred in 15% of patients. Type C errors (new injuries in different body area) occurred in 54% of patients and, of these, 76% were considered clinically significant. Type D errors (new injuries seen in any imaging of any area) occurred in 73% of patients.

"This study confirms that images are often repeated or completed after having images done at NTCs," Dr Bonds said. "Relying on NTC image interpretation can lead to undertreating our patients. One potential solution to this issue could be image sharing between NTCs and TTCs. This might reduce both the rate of missed injuries and the need for repeat scans."

Cutaneous Eruption Reported in Pregnant Woman With Locally Acquired Zika Virus

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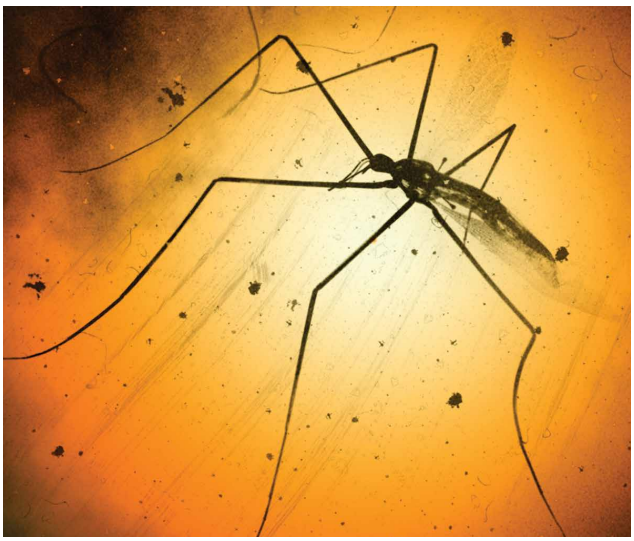
FRONTLINE MEDICAL NEWS

Zika presented in a young, pregnant Florida woman as erythematous follicular macules and papules on the trunk and arms, scattered tender pink papules on the palms, and a few petechiae on the hard palate, according to a report in the *New England Journal of Medicine*.

The report advises how Zika virus may present during pregnancy. "Medical providers on the front line should be aware of the constellation of symptoms in patients reporting travel to endemic areas, including areas



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in Southern Florida, where other non-travel-associated cases have been confirmed," wrote investigators led by Lucy Chen, MD, of the University of Miami.

The 23-year-old woman presented on July 7, 2016 at 23 weeks and 3 days' gestation with a 3-day history of fever, widespread pruritic rash, and sore throat, which were followed by myalgias and joint pain 2 days later. The cutaneous eruption was noted on physical examination; neither conjunctivitis nor lymphadenopathy was present. The patient and her partner said they had not traveled outside the United States for 2 years.

Zika virus RNA was detected in the woman's urine and serum specimens with the use of reverse-transcriptase polymerase chain reaction and persisted for 2 weeks in urine samples and for 6 weeks in serum samples. On histopathology, skin lesions revealed a mild perivascular lymphocytic infiltration in the upper dermis, admixed with some neutrophils. Liver and renal functions were normal.

Fetal ultrasonography performed on the day of presentation showed an estimated fetal weight of 644 g (53rd percentile), an estimated head circumference of 221 mm (63rd percentile), and normal intracranial anatomy. Fevers and rash subsided after 3 days of supportive care. Screening for measles, varicella, rubella, syphilis, Epstein-Barr virus, influenza, hepatitis B, hepatitis C, mumps, and dengue was negative.

An initial immunoglobulin M test on July 7 was negative; seroconversion occurred 1 week after presentation and remained positive through delivery.

A full-term infant weighing 2,990 g was delivered vaginally. Neonatal ultrasonography and magnetic resonance imaging of the head showed a normal head size and intracranial anatomy, with no calcifications. Placental tissue was negative for Zika virus, and neonatal laboratory testing revealed no evidence of infection.

The case was confirmed by the Miami-Dade County Department of Health as the first non-travel-associated Zika infection in the United States.

Chen L, Hafeez F, Curry CL, Elgart G. Cutaneous eruption in a U.S. woman with locally acquired Zika virus infection. *N Engl J Med.* 2017;376(4):400-401. doi:10.1056/NEJMc1610614.

Lab Values Poor Surrogate for Detecting Pediatric Rocky Mountain Spotted Fever in Children

WHITNEY MCKNIGHT

FRONTLINE MEDICAL NEWS

Three fatalities observed in a retrospective analysis of six cases of Rocky Mountain spotted fever (RMSF) in children were associated with either a delayed diagnosis pending laboratory findings or delayed anti-rickettsia treatment, researchers said.

"The fact that all fatal cases died before the convalescent period emphasizes that diagnosis should be based on clinical findings instead of RMSF serologic and histologic testing," wrote the authors of a study published online in *Pediatric Dermatology*.

Rechelle Tull of the department of dermatology, Wake Forest University, Winston-Salem, NC, and her colleagues conducted a retrospective review of 3,912 inpatient dermatology consultations over a period of 10 years at a tertiary care center, and identified six patients aged 22 months to 2 years (mean, 5.1 years) diagnosed with RMSF. The patients were evaluated in the months of April, May, and June, and three of the six patients infected with the vector-borne obligate intracellular bacterium, *Rickettsia rickettsii*, had died within 4 days of hospitalization, according to the authors.

Two of the fatal cases involved delayed anti-rickettsial therapy after the patients were misdiagnosed with group A *Streptococcus*. None of the six children were initially evaluated for *R rickettsii*; they averaged three encounters with their clinician before being admitted for acute inpatient care, where they received intravenous doxycycline after nearly a week of symptoms.

"All fatal cases were complicated by neurologic manifestations, including seizures, obtundation, and uncal herniation," a finding that is consistent with the literature, the authors said.

Although the high-fatality rate might be the result of the small study size, Ms Tull and her coinvestigators concluded that the disease should be considered in all differential diagnoses for children who present with a fever and rash during the summer months in endemic areas, particularly since pediatric cases of the disease are associated with poorer outcomes than adult cases.

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Given that RMSF often remains subclinical in its early stages, and typically presents with nonspecific symptoms of fever, rash, headache, and abdominal pain when it does emerge, physicians might be tempted to defer treatment until after serological and histological results are in, as is the standard method. Concerns over doxycycline's tendency to stain teeth and cause enamel hypoplasia are also common. However, empirical administration could mean the difference between life and death, since treatment within the first 5 days following infection is associated with better outcomes—an algorithm complicated by the fact that symptoms caused by *R rickettsii* have been known to take as long as 21 days to appear.

In the study, Ms Tull and her colleagues found that the average time between exposure to the tick and the onset of symptoms was 6.6 days (range, 1-21 days).

Currently, there are no diagnostic tests "that reliably diagnose RMSF during the first 7 days of illness," and most patients "do not develop detectable antibodies until the second week of illness," the investigators reported. Even then, sensitivity of indirect fluorescent antibody serum testing after the second week of illness is only between 86% and 94%, they noted. Further, the sensitivity of immunohistochemical (IHC) tissue staining has been reported at 70%, and false-negative IHC results are common in acute disease when antibody response is harder to detect.

Ms Tull and her colleagues found that five of the six patients in their study had negative IHC testing; two of the six had positive serum antibody titers. For this reason, they concluded that RMSF diagnosis should be based on "clinical history, examination, and laboratory abnormalities" rather than laboratory testing, and urged that "prompt treatment should be instituted empirically."

Tull R, Ahn C, Daniel A, Yosipovitch G, Strowd LC. Retrospective study of Rocky Mountain spotted fever in children. *Pediatr Dermatol.* 2016 Dec 19. doi:10.1111/pde.13053. [Epub ahead of print]