LEGISLATIVE UPDATE
ACEP's Advocacy Led to Many Wins in 2018
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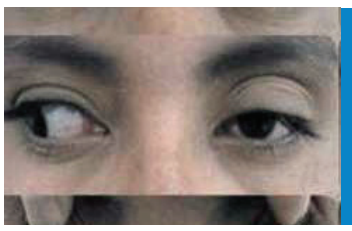

CASE REPORT
Painful Diplopia
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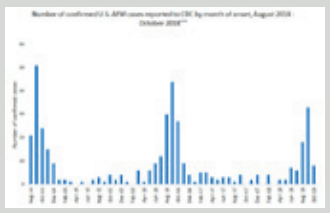

CME NOW

**WHAT YOU NEED TO KNOW ABOUT ACUTE FLACID MYELITIS**

SEE PAGE 10

SEXUAL HARASSMENT

**EMERGENCY MEDICINE'S #TIMESUP MOMENT**

SEE PAGE 29

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PEARLS FROM THE MEDICAL LITERATURE

# The Best of 2018

THE ANNUAL LITERATURE HIGHLIGHTS EPISODE

*by* RYAN PATRICK RADECKI, MD, MS

If anything can be counted on to be constant in this world, it is change. Stacks upon stacks of journal articles, further refining or altering contemporary medical practice or contradicting each other and adding to the confusion, are continuously published at an exponential rate. Then the biases of those approaching dissemination with an agenda make the literature's application to day-to-day practice even muddier.

This past year is no different. Here are 10 of the best articles from 2018, excluding a few of the tamsulosin, resuscitation, and other articles already covered in this column.

### Fluid Infusion Rates for Pediatric Diabetic Ketoacidosis

We've spent a great deal of energy over the past decade worrying about, somewhat literally, brain cells exploding when resuscitating children in diabetic ketoacidosis. In this study, four different combinations of 0.9 percent

CONTINUED *on page 31*

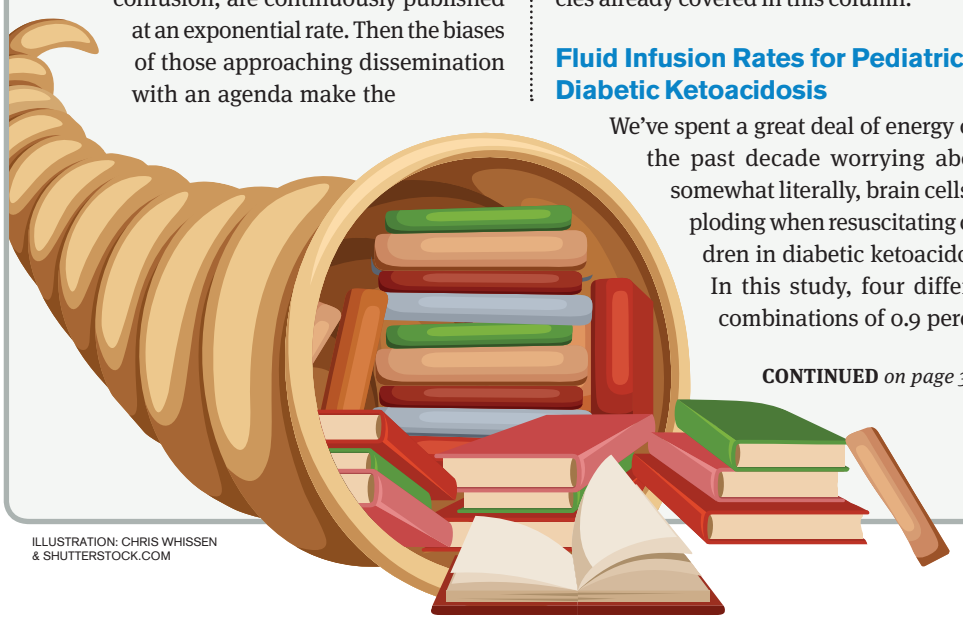


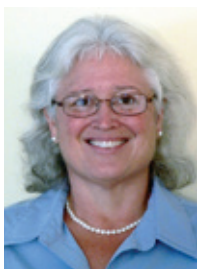
ILLUSTRATION: CHRIS WHISSEN & SHUTTERSTOCK.COM

# PRIVATE MATTERS?

*An honest admission of depression led to a 10-year fight to defend my medical license*

*by* SUSAN T. HANEY, MD, FACEP, FAAEM

I am a board-certified emergency physician licensed to practice medicine in Oregon since 2001. I am a competent and caring physician. I have never been accused of professional misconduct or incompetence, and I have never been sued for malpractice.



Susan Haney, MD, FACEP, FAAEM

I also have a history of recurrent episodes of major depression. Up until 10 years ago, I managed my depression privately without interference or oversight from any medical licensing board. I had never been hospitalized because of mental illness. I had never missed a day of work due to mental illness.

While on vacation in March 2006, I had a severe asthma exacerbation that required

CONTINUED *on page 26*

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# 2019 Fee Schedule

CMS CODING AND REIMBURSEMENT UPDATE

SEE PAGE 18

# Are you aware of the variety of support resources available for ELIQUIS patients?

Think ELIQUIS for the treatment of DVT/PE.

DVT: deep vein thrombosis; PE: pulmonary embolism.

## INDICATIONS

ELIQUIS is indicated for the treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE), and to reduce the risk of recurrent DVT and PE following initial therapy.

## IMPORTANT SAFETY INFORMATION

**WARNING: (A) PREMATURE DISCONTINUATION OF ELIQUIS INCREASES THE RISK OF THROMBOTIC EVENTS, (B) SPINAL/EPIDURAL HEMATOMA**

**(A) Premature discontinuation of any oral anticoagulant, including ELIQUIS, increases the risk of thrombotic events. If anticoagulation with ELIQUIS is discontinued for a reason other than pathological bleeding or completion of a course of therapy, consider coverage with another anticoagulant.**

**(B) Epidural or spinal hematomas may occur in patients treated with ELIQUIS who are receiving neuraxial anesthesia or undergoing spinal puncture. These hematomas may result in long-term or permanent paralysis. Consider these risks when scheduling patients for spinal procedures. Factors that can increase the risk of developing epidural or spinal hematomas in these patients include:**

- **use of indwelling epidural catheters**
- **concomitant use of other drugs that affect hemostasis, such as nonsteroidal anti-inflammatory drugs (NSAIDs), platelet inhibitors, other anticoagulants**
- **a history of traumatic or repeated epidural or spinal punctures**
- **a history of spinal deformity or spinal surgery**
- **optimal timing between the administration of ELIQUIS and neuraxial procedures is not known**

**Monitor patients frequently for signs and symptoms of neurological impairment. If neurological compromise is noted, urgent treatment is necessary.**

**Consider the benefits and risks before neuraxial intervention in patients anticoagulated or to be anticoagulated.**

## IMPORTANT SAFETY INFORMATION

### CONTRAINDICATIONS

- Active pathological bleeding
- Severe hypersensitivity reaction to ELIQUIS (e.g., anaphylactic reactions)

### WARNINGS AND PRECAUTIONS

- **Increased Risk of Thrombotic Events after Premature Discontinuation:** Premature discontinuation of any oral anticoagulant, including ELIQUIS, in the absence of adequate alternative anticoagulation increases the risk of thrombotic events. An increased rate of stroke was observed during the transition from ELIQUIS to warfarin in clinical trials in atrial fibrillation patients. If ELIQUIS is discontinued for a reason other than pathological bleeding or completion of a course of therapy, consider coverage with another anticoagulant.
- **Bleeding Risk:** ELIQUIS increases the risk of bleeding and can cause serious, potentially fatal, bleeding.
  - Concomitant use of drugs affecting hemostasis increases the risk of bleeding, including aspirin and other antiplatelet agents, other anticoagulants, heparin, thrombolytic agents, SSRIs, SNRIs, and NSAIDs.
  - Advise patients of signs and symptoms of blood loss and to report them immediately or go to an emergency room. Discontinue ELIQUIS in patients with active pathological hemorrhage.
  - The anticoagulant effect of apixaban can be expected to persist for at least 24 hours after the last dose (i.e., about two half-lives). An agent to reverse the anti-factor Xa activity of apixaban is available. Please visit www.andexxa.com for more information on availability of a reversal agent.
- **Spinal/Epidural Anesthesia or Puncture:** Patients treated with ELIQUIS undergoing spinal/epidural anesthesia or puncture may develop an epidural or spinal hematoma which can result in long-term or permanent paralysis.

  The risk of these events may be increased by the postoperative use of indwelling epidural catheters or the concomitant use of medicinal products affecting hemostasis. Indwelling epidural or intrathecal catheters should not be removed earlier than

# Eliquis®
## (apixaban) tablets 5mg 2.5mg

## In the hospital. At discharge. At home.
## Consider ELIQUIS.

To learn more about transition of care resources, contact your ELIQUIS representative or call

**1-855-ELIQUIS**

**IMPORTANT SAFETY INFORMATION**

### WARNINGS AND PRECAUTIONS (cont'd)

24 hours after the last administration of ELIQUIS.
The next dose of ELIQUIS should not be administered earlier than 5 hours after the removal of the catheter. The risk may also be increased by traumatic or repeated epidural or spinal puncture. If traumatic puncture occurs, delay the administration of ELIQUIS for 48 hours.

Monitor patients frequently and if neurological compromise is noted, urgent diagnosis and treatment is necessary. Physicians should consider the potential benefit versus the risk of neuraxial intervention in ELIQUIS patients.

- **Prosthetic Heart Valves:** The safety and efficacy of ELIQUIS have not been studied in patients with prosthetic heart valves and is not recommended in these patients.
- **Acute PE in Hemodynamically Unstable Patients or Patients who Require Thrombolysis or Pulmonary Embolectomy:** Initiation of ELIQUIS is not recommended as an alternative to unfractionated heparin for the initial treatment of patients with PE who present with hemodynamic instability or who may receive thrombolysis or pulmonary embolectomy.

### ADVERSE REACTIONS

- The most common and most serious adverse reactions reported with ELIQUIS were related to bleeding.

### TEMPORARY INTERRUPTION FOR SURGERY AND OTHER INTERVENTIONS

- ELIQUIS should be discontinued at least 48 hours prior to elective surgery or invasive procedures with a moderate or high risk of unacceptable or clinically significant bleeding. ELIQUIS should be discontinued at least 24 hours prior to elective surgery or invasive procedures with a low risk of bleeding or where the bleeding would be noncritical in location and easily controlled. Bridging anticoagulation during the 24 to 48 hours after stopping ELIQUIS and prior to the intervention is not generally required. ELIQUIS should be restarted after the surgical or other procedures as soon as adequate hemostasis has been established.

**IMPORTANT SAFETY INFORMATION**

### DRUG INTERACTIONS

- **Combined P-gp and Strong CYP3A4 Inhibitors:** Inhibitors of P-glycoprotein (P-gp) and cytochrome P450 3A4 (CYP3A4) increase exposure to apixaban and increase the risk of bleeding. For patients receiving ELIQUIS doses of 5 mg or 10 mg twice daily, reduce the dose of ELIQUIS by 50% when ELIQUIS is coadministered with drugs that are combined P-gp and strong CYP3A4 inhibitors (e.g., ketoconazole, itraconazole, or ritonavir). In patients already taking 2.5 mg twice daily, avoid coadministration of ELIQUIS with combined P-gp and strong CYP3A4 inhibitors.

  *Clarithromycin*
  Although clarithromycin is a combined P-gp and strong CYP3A4 inhibitor, pharmacokinetic data suggest that no dose adjustment is necessary with concomitant administration with ELIQUIS.
- **Combined P-gp and Strong CYP3A4 Inducers:** Avoid concomitant use of ELIQUIS with combined P-gp and strong CYP3A4 inducers (e.g., rifampin, carbamazepine, phenytoin, St. John's wort) because such drugs will decrease exposure to apixaban.
- **Anticoagulants and Antiplatelet Agents:** Coadministration of antiplatelet agents, fibrinolytics, heparin, aspirin, and chronic NSAID use increases the risk of bleeding. APPRAISE-2, a placebo-controlled clinical trial of apixaban in high-risk post-acute coronary syndrome patients treated with aspirin or the combination of aspirin and clopidogrel, was terminated early due to a higher rate of bleeding with apixaban compared to placebo.

### PREGNANCY CATEGORY B

- There are no adequate and well-controlled studies of ELIQUIS in pregnant women. Treatment is likely to increase the risk of hemorrhage during pregnancy and delivery. ELIQUIS should be used during pregnancy only if the potential benefit outweighs the potential risk to the mother and fetus.

Please see Brief Summary of Full Prescribing Information, including **Boxed WARNINGS**, on adjacent pages.

Bristol-Myers Squibb Pfizer

## ELIQUIS® (apixaban) tablets, for oral use

℞ ONLY

***Brief Summary of Prescribing Information. For complete prescribing information consult official package insert.***

**WARNING: (A) PREMATURE DISCONTINUATION OF ELIQUIS INCREASES THE RISK OF THROMBOTIC EVENTS**

**(B) SPINAL/EPIDURAL HEMATOMA**

**(A) PREMATURE DISCONTINUATION OF ELIQUIS INCREASES THE RISK OF THROMBOTIC EVENTS**

**Premature discontinuation of any oral anticoagulant, including ELIQUIS, increases the risk of thrombotic events. If anticoagulation with ELIQUIS is discontinued for a reason other than pathological bleeding or completion of a course of therapy, consider coverage with another anticoagulant *[see Dosage and Administration, Warnings and Precautions, and Clinical Studies (14.1) in full Prescribing Information]*.**

**(B) SPINAL/EPIDURAL HEMATOMA**

**Epidural or spinal hematomas may occur in patients treated with ELIQUIS who are receiving neuraxial anesthesia or undergoing spinal puncture. These hematomas may result in long-term or permanent paralysis. Consider these risks when scheduling patients for spinal procedures. Factors that can increase the risk of developing epidural or spinal hematomas in these patients include:**

- **use of indwelling epidural catheters**
- **concomitant use of other drugs that affect hemostasis, such as nonsteroidal anti-inflammatory drugs (NSAIDs), platelet inhibitors, other anticoagulants**
- **a history of traumatic or repeated epidural or spinal punctures**
- **a history of spinal deformity or spinal surgery**
- **optimal timing between the administration of ELIQUIS and neuraxial procedures is not known**

***[see Warnings and Precautions]***

**Monitor patients frequently for signs and symptoms of neurological impairment. If neurological compromise is noted, urgent treatment is necessary *[see Warnings and Precautions]*.**

**Consider the benefits and risks before neuraxial intervention in patients anticoagulated or to be anticoagulated *[see Warnings and Precautions]*.**

### INDICATIONS AND USAGE

**Reduction of Risk of Stroke and Systemic Embolism in Nonvalvular Atrial Fibrillation—** ELIQUIS® (apixaban) is indicated to reduce the risk of stroke and systemic embolism in patients with nonvalvular atrial fibrillation.

**Prophylaxis of Deep Vein Thrombosis Following Hip or Knee Replacement Surgery—** ELIQUIS is indicated for the prophylaxis of deep vein thrombosis (DVT), which may lead to pulmonary embolism (PE), in patients who have undergone hip or knee replacement surgery.

**Treatment of Deep Vein Thrombosis—**ELIQUIS is indicated for the treatment of DVT.

**Treatment of Pulmonary Embolism—**ELIQUIS is indicated for the treatment of PE.

**Reduction in the Risk of Recurrence of DVT and PE—**ELIQUIS is indicated to reduce the risk of recurrent DVT and PE following initial therapy.

### DOSAGE AND ADMINISTRATION (Selected information)

**Temporary Interruption for Surgery and Other Interventions**

ELIQUIS should be discontinued at least 48 hours prior to elective surgery or invasive procedures with a moderate or high risk of unacceptable or clinically significant bleeding *[see Warnings and Precautions]*. ELIQUIS should be discontinued at least 24 hours prior to elective surgery or invasive procedures with a low risk of bleeding or where the bleeding would be non-critical in location and easily controlled. Bridging anticoagulation during the 24 to 48 hours after stopping ELIQUIS and prior to the intervention is not generally required. ELIQUIS should be restarted after the surgical or other procedures as soon as adequate hemostasis has been established. (For complete *Dosage and Administration* section, see full Prescribing Information.)

### CONTRAINDICATIONS

ELIQUIS is contraindicated in patients with the following conditions:

- Active pathological bleeding *[see Warnings and Precautions and Adverse Reactions]*
- Severe hypersensitivity reaction to ELIQUIS (e.g., anaphylactic reactions) *[see Adverse Reactions]*

### WARNINGS AND PRECAUTIONS

**Increased Risk of Thrombotic Events after Premature Discontinuation**

Premature discontinuation of any oral anticoagulant, including ELIQUIS, in the absence of adequate alternative anticoagulation increases the risk of thrombotic events. An increased rate of stroke was observed during the transition from ELIQUIS to warfarin in clinical trials in atrial fibrillation patients. If ELIQUIS is discontinued for a reason other than pathological bleeding or completion of a course of therapy, consider coverage with another anticoagulant *[see Dosage and Administration (2.4) and Clinical Studies (14.1) in full Prescribing Information]*.

**Bleeding**

ELIQUIS increases the risk of bleeding and can cause serious, potentially fatal, bleeding *[see Dosage and Administration (2.1) in full Prescribing Information and Adverse Reactions]*.

Concomitant use of drugs affecting hemostasis increases the risk of bleeding. These include aspirin and other antiplatelet agents, other anticoagulants, heparin, thrombolytic agents, selective serotonin reuptake inhibitors, serotonin norepinephrine reuptake inhibitors, and nonsteroidal anti-inflammatory drugs (NSAIDs) *[see Drug Interactions]*.

Advise patients of signs and symptoms of blood loss and to report them immediately or go to an emergency room. Discontinue ELIQUIS in patients with active pathological hemorrhage.

*Reversal of Anticoagulant Effect*

An agent to reverse the anti-factor Xa activity of apixaban is available. The pharmacodynamic effect of ELIQUIS can be expected to persist for at least 24 hours after the last dose, i.e., for about two drug half-lives. Prothrombin complex concentrate (PCC), activated prothrombin complex concentrate or recombinant factor VIIa may be considered, but have not been evaluated in clinical studies *[see Clinical Pharmacology (12.2) in full Prescribing Information]*. When PCCs are used, monitoring for the anticoagulation effect of apixaban using a clotting test (PT, INR, or aPTT) or anti-factor Xa (FXa) activity is not useful and is not recommended. Activated oral charcoal reduces absorption of apixaban, thereby lowering apixaban plasma concentration *[see Overdosage]*.

Hemodialysis does not appear to have a substantial impact on apixaban exposure *[see Clinical Pharmacology (12.3) in full Prescribing Information]*. Protamine sulfate and vitamin K are not expected to affect the anticoagulant activity of apixaban. There is no experience with antifibrinolytic agents (tranexamic acid, aminocaproic acid) in individuals receiving apixaban. There is no experience with systemic hemostatics (desmopressin and aprotinin) in individuals receiving apixaban, and they are not expected to be effective as a reversal agent.

**Spinal/Epidural Anesthesia or Puncture**

When neuraxial anesthesia (spinal/epidural anesthesia) or spinal/epidural puncture is employed, patients treated with antithrombotic agents for prevention of thromboembolic complications are at risk of developing an epidural or spinal hematoma which can result in long-term or permanent paralysis.

The risk of these events may be increased by the postoperative use of indwelling epidural catheters or the concomitant use of medicinal products affecting hemostasis. Indwelling epidural or intrathecal catheters should not be removed earlier than 24 hours after the last administration of ELIQUIS. The next dose of ELIQUIS should not be administered earlier than 5 hours after the removal of the catheter. The risk may also be increased by traumatic or repeated epidural or spinal puncture. If traumatic puncture occurs, delay the administration of ELIQUIS for 48 hours.

Monitor patients frequently for signs and symptoms of neurological impairment (e.g., numbness or weakness of the legs, or bowel or bladder dysfunction). If neurological compromise is noted, urgent diagnosis and treatment is necessary. Prior to neuraxial intervention the physician should consider the potential benefit versus the risk in anticoagulated patients or in patients to be anticoagulated for thromboprophylaxis.

**Patients with Prosthetic Heart Valves**

The safety and efficacy of ELIQUIS (apixaban) have not been studied in patients with prosthetic heart valves. Therefore, use of ELIQUIS is not recommended in these patients.

**Acute PE in Hemodynamically Unstable Patients or Patients who Require Thrombolysis or Pulmonary Embolectomy**

Initiation of ELIQUIS is not recommended as an alternative to unfractionated heparin for the initial treatment of patients with PE who present with hemodynamic instability or who may receive thrombolysis or pulmonary embolectomy.

### ADVERSE REACTIONS

The following serious adverse reactions are discussed in greater detail in other sections of the prescribing information.

- Increased risk of thrombotic events after premature discontinuation *[see Warnings and Precautions]*
- Bleeding *[see Warnings and Precautions]*
- Spinal/epidural anesthesia or puncture *[see Warnings and Precautions]*

**Clinical Trials Experience**

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

*Reduction of Risk of Stroke and Systemic Embolism in Patients with Nonvalvular Atrial Fibrillation*

The safety of ELIQUIS was evaluated in the ARISTOTLE and AVERROES studies *[see Clinical Studies (14) in full Prescribing Information]*, including 11,284 patients exposed to ELIQUIS 5 mg twice daily and 602 patients exposed to ELIQUIS 2.5 mg twice daily. The duration of ELIQUIS exposure was ≥12 months for 9375 patients and ≥24 months for 3369 patients in the two studies. In ARISTOTLE, the mean duration of exposure was 89 weeks (>15,000 patient-years). In AVERROES, the mean duration of exposure was approximately 59 weeks (>3000 patient-years).

The most common reason for treatment discontinuation in both studies was for bleeding-related adverse reactions; in ARISTOTLE this occurred in 1.7% and 2.5% of patients treated with ELIQUIS and warfarin, respectively, and in AVERROES, in 1.5% and 1.3% on ELIQUIS and aspirin, respectively.

**Bleeding in Patients with Nonvalvular Atrial Fibrillation in ARISTOTLE and AVERROES**

Tables 1 and 2 show the number of patients experiencing major bleeding during the treatment period and the bleeding rate (percentage of subjects with at least one bleeding event per 100 patient-years) in ARISTOTLE and AVERROES.

**Table 1: Bleeding Events in Patients with Nonvalvular Atrial Fibrillation in ARISTOTLE***

| | ELIQUIS N=9088 n (per 100 pt-year) | Warfarin N=9052 n (per 100 pt-year) | Hazard Ratio (95% CI) | P-value |
|---|---|---|---|---|
| Major† | 327 (2.13) | 462 (3.09) | 0.69 (0.60, 0.80) | <0.0001 |
| Intracranial (ICH)‡ | 52 (0.33) | 125 (0.82) | 0.41 (0.30, 0.57) | - |
| Hemorrhagic stroke§ | 38 (0.24) | 74 (0.49) | 0.51 (0.34, 0.75) | - |
| Other ICH | 15 (0.10) | 51 (0.34) | 0.29 (0.16, 0.51) | - |
| Gastrointestinal (GI)¶ | 128 (0.83) | 141 (0.93) | 0.89 (0.70, 1.14) | - |
| Fatal** | 10 (0.06) | 37 (0.24) | 0.27 (0.13, 0.53) | - |
| Intracranial | 4 (0.03) | 30 (0.20) | 0.13 (0.05, 0.37) | - |
| Non-intracranial | 6 (0.04) | 7 (0.05) | 0.84 (0.28, 2.15) | - |

* Bleeding events within each subcategory were counted once per subject, but subjects may have contributed events to multiple endpoints. Bleeding events were counted during treatment or within 2 days of stopping study treatment (on-treatment period).
† Defined as clinically overt bleeding accompanied by one or more of the following: a decrease in hemoglobin of ≥2 g/dL, a transfusion of 2 or more units of packed red blood cells, bleeding at a critical site: intracranial, intraspinal, intraocular, pericardial, intra-articular, intramuscular with compartment syndrome, retroperitoneal or with fatal outcome.
‡ Intracranial bleed includes intracerebral, intraventricular, subdural, and subarachnoid bleeding. Any type of hemorrhagic stroke was adjudicated and counted as an intracranial major bleed.
§ On-treatment analysis based on the safety population, compared to ITT analysis presented in Section 14.
¶ GI bleed includes upper GI, lower GI, and rectal bleeding.
** Fatal bleeding is an adjudicated death with the primary cause of death as intracranial bleeding or non-intracranial bleeding during the on-treatment period.

In ARISTOTLE, the results for major bleeding were generally consistent across most major subgroups including age, weight, $CHADS_2$ score (a scale from 0 to 6 used to estimate risk of stroke, with higher scores predicting greater risk), prior warfarin use, geographic region, and aspirin use at randomization (Figure 1). Subjects treated with apixaban with diabetes bled more (3.0% per year) than did subjects without diabetes (1.9% per year).

**Table 2: Bleeding Events in Patients with Nonvalvular Atrial Fibrillation in AVERROES**

| | ELIQUIS (apixaban) N=2798 n (%/year) | Aspirin N=2780 n (%/year) | Hazard Ratio (95% CI) | P-value |
|---|---|---|---|---|
| Major | 45 (1.41) | 29 (0.92) | 1.54 (0.96, 2.45) | 0.07 |
| Fatal | 5 (0.16) | 5 (0.16) | 0.99 (0.23, 4.29) | - |
| Intracranial | 11 (0.34) | 11 (0.35) | 0.99 (0.39, 2.51) | - |

Events associated with each endpoint were counted once per subject, but subjects may have contributed events to multiple endpoints.

**Other Adverse Reactions**

Hypersensitivity reactions (including drug hypersensitivity, such as skin rash, and anaphylactic reactions, such as allergic edema) and syncope were reported in <1% of patients receiving ELIQUIS.

*Prophylaxis of Deep Vein Thrombosis Following Hip or Knee Replacement Surgery*

The safety of ELIQUIS has been evaluated in 1 Phase II and 3 Phase III studies including 5924 patients exposed to ELIQUIS 2.5 mg twice daily undergoing major orthopedic surgery of the lower limbs (elective hip replacement or elective knee replacement) treated for up to 38 days.

In total, 11% of the patients treated with ELIQUIS 2.5 mg twice daily experienced adverse reactions.

Bleeding results during the treatment period in the Phase III studies are shown in Table 3. Bleeding was assessed in each study beginning with the first dose of double-blind study drug.

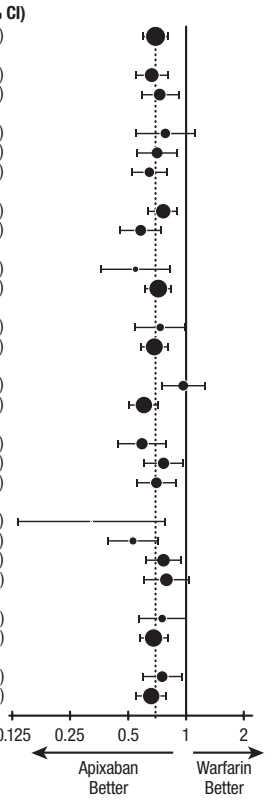
**Table 3: Bleeding During the Treatment Period in Patients Undergoing Elective Hip or Knee Replacement Surgery**

| Bleeding Endpoint* | ADVANCE-3 Hip Replacement Surgery | | ADVANCE-2 Knee Replacement Surgery | | ADVANCE-1 Knee Replacement Surgery | |
|---|---|---|---|---|---|---|
| | ELIQUIS 2.5 mg po bid 35±3 days | Enoxaparin 40 mg sc qd 35±3 days | ELIQUIS 2.5 mg po bid 12±2 days | Enoxaparin 40 mg sc qd 12±2 days | ELIQUIS 2.5 mg po bid 12±2 days | Enoxaparin 30 mg sc q12h 12±2 days |
| | First dose 12 to 24 hours post surgery | First dose 9 to 15 hours prior to surgery | First dose 12 to 24 hours post surgery | First dose 9 to 15 hours prior to surgery | First dose 12 to 24 hours post surgery | First dose 12 to 24 hours post surgery |
| All treated | N=2673 | N=2659 | N=1501 | N=1508 | N=1596 | N=1588 |
| Major (including surgical site) | 22 (0.82%)† | 18 (0.68%) | 9 (0.60%)‡ | 14 (0.93%) | 11 (0.69%) | 22 (1.39%) |
| Fatal | 0 | 0 | 0 | 0 | 0 | 1 (0.06%) |
| Hgb decrease ≥2 g/dL | 13 (0.49%) | 10 (0.38%) | 8 (0.53%) | 9 (0.60%) | 10 (0.63%) | 16 (1.01%) |
| Transfusion of ≥2 units RBC | 16 (0.60%) | 14 (0.53%) | 5 (0.33%) | 9 (0.60%) | 9 (0.56%) | 18 (1.13%) |
| Bleed at critical site§ | 1 (0.04%) | 1 (0.04%) | 1 (0.07%) | 2 (0.13%) | 1 (0.06%) | 4 (0.25%) |
| Major + CRNM¶ | 129 (4.83%) | 134 (5.04%) | 53 (3.53%) | 72 (4.77%) | 46 (2.88%) | 68 (4.28%) |
| All | 313 (11.71%) | 334 (12.56%) | 104 (6.93%) | 126 (8.36%) | 85 (5.33%) | 108 (6.80%) |

* All bleeding criteria included surgical site bleeding.
† Includes 13 subjects with major bleeding events that occurred before the first dose of apixaban (administered 12 to 24 hours post-surgery).
‡ Includes 5 subjects with major bleeding events that occurred before the first dose of apixaban (administered 12 to 24 hours post-surgery).
§ Intracranial, intraspinal, intraocular, pericardial, an operated joint requiring re-operation or intervention, intramuscular with compartment syndrome, or retroperitoneal. Bleeding into an operated joint requiring re-operation or intervention was present in all patients with this category of bleeding. Events and event rates include one enoxaparin-treated patient in ADVANCE-1 who also had intracranial hemorrhage.
¶ CRNM = clinically relevant nonmajor.

**Figure 1: Major Bleeding Hazard Ratios by Baseline Characteristics – ARISTOTLE Study**

| Subgroup | n of Events / N of Patients (% per year) Apixaban | Warfarin | Hazard Ratio (95% CI) |
|---|---|---|---|
| All Patients | 327 / 9088 (2.1) | 462 / 9052 (3.1) | 0.69 (0.60, 0.80) |
| Prior Warfarin/VKA Status | | | |
| Experienced (57%) | 185 / 5196 (2.1) | 274 / 5180 (3.2) | 0.66 (0.55, 0.80) |
| Naive (43%) | 142 / 3892 (2.2) | 188 / 3872 (3.0) | 0.73 (0.59, 0.91) |
| Age | | | |
| <65 (30%) | 56 / 2723 (1.2) | 72 / 2732 (1.5) | 0.78 (0.55, 1.11) |
| ≥65 and <75 (39%) | 120 / 3529 (2.0) | 166 / 3501 (2.8) | 0.71 (0.56, 0.89) |
| ≥75 (31%) | 151 / 2836 (3.3) | 224 / 2819 (5.2) | 0.64 (0.52, 0.79) |
| Sex | | | |
| Male (65%) | 225 / 5868 (2.3) | 294 / 5879 (3.0) | 0.76 (0.64, 0.90) |
| Female (35%) | 102 / 3220 (1.9) | 168 / 3173 (3.3) | 0.58 (0.45, 0.74) |
| Weight | | | |
| ≤60 kg (11%) | 36 / 1013 (2.3) | 62 / 965 (4.3) | 0.55 (0.36, 0.83) |
| >60 kg (89%) | 290 / 8043 (2.1) | 398 / 8059 (3.0) | 0.72 (0.62, 0.83) |
| Prior Stroke or TIA | | | |
| Yes (19%) | 77 / 1687 (2.8) | 106 / 1735 (3.9) | 0.73 (0.54, 0.98) |
| No (81%) | 250 / 7401 (2.0) | 356 / 7317 (2.9) | 0.68 (0.58, 0.80) |
| Diabetes Mellitus | | | |
| Yes (25%) | 112 / 2276 (3.0) | 114 / 2250 (3.1) | 0.96 (0.74, 1.25) |
| No (75%) | 215 / 6812 (1.9) | 348 / 6802 (3.1) | 0.60 (0.51, 0.71) |
| $CHADS_2$ Score | | | |
| ≤1 (34%) | 76 / 3093 (1.4) | 126 / 3076 (2.3) | 0.59 (0.44, 0.78) |
| 2 (36%) | 125 / 3246 (2.3) | 163 / 3246 (3.0) | 0.76 (0.60, 0.96) |
| ≥3 (30%) | 126 / 2749 (2.9) | 173 / 2730 (4.1) | 0.70 (0.56, 0.88) |
| Creatinine Clearance | | | |
| <30 mL/min (1%) | 7 / 136 (3.7) | 19 / 132 (11.9) | 0.32 (0.13, 0.78) |
| 30-50 mL/min (15%) | 66 / 1357 (3.2) | 123 / 1380 (6.0) | 0.53 (0.39, 0.71) |
| >50-80 mL/min (42%) | 157 / 3807 (2.5) | 199 / 3758 (3.2) | 0.76 (0.62, 0.94) |
| >80 mL/min (41%) | 96 / 3750 (1.5) | 119 / 3746 (1.8) | 0.79 (0.61, 1.04) |
| Geographic Region | | | |
| US (19%) | 83 / 1716 (2.8) | 109 / 1693 (3.8) | 0.75 (0.56, 1.00) |
| Non-US (81%) | 244 / 7372 (2.0) | 353 / 7359 (2.9) | 0.68 (0.57, 0.80) |
| Aspirin at Randomization | | | |
| Yes (31%) | 129 / 2846 (2.7) | 164 / 2762 (3.7) | 0.75 (0.60, 0.95) |
| No (69%) | 198 / 6242 (1.9) | 298 / 6290 (2.8) | 0.66 (0.55, 0.79) |




Note: The figure above presents effects in various subgroups, all of which are baseline characteristics and all of which were prespecified, if not the groupings. The 95% confidence limits that are shown do not take into account how many comparisons were made, nor do they reflect the effect of a particular factor after adjustment for all other factors. Apparent homogeneity or heterogeneity among groups should not be over-interpreted.

Adverse reactions occurring in ≥1% of patients undergoing hip or knee replacement surgery in the 1 Phase II study and the 3 Phase III studies are listed in Table 4.

**Table 4: Adverse Reactions Occurring in ≥1% of Patients in Either Group Undergoing Hip or Knee Replacement Surgery**

| | ELIQUIS (apixaban), n (%) 2.5 mg po bid N=5924 | Enoxaparin, n (%) 40 mg sc qd or 30 mg sc q12h N=5904 |
|---|---|---|
| Nausea | 153 (2.6) | 159 (2.7) |
| Anemia (including postoperative and hemorrhagic anemia, and respective laboratory parameters) | 153 (2.6) | 178 (3.0) |
| Contusion | 83 (1.4) | 115 (1.9) |
| Hemorrhage (including hematoma, and vaginal and urethral hemorrhage) | 67 (1.1) | 81 (1.4) |
| Postprocedural hemorrhage (including postprocedural hematoma, wound hemorrhage, vessel puncture-site hematoma and catheter-site hemorrhage) | 54 (0.9) | 60 (1.0) |
| Transaminases increased (including alanine aminotransferase increased and alanine aminotransferase abnormal) | 50 (0.8) | 71 (1.2) |
| Aspartate aminotransferase increased | 47 (0.8) | 69 (1.2) |
| Gamma-glutamyltransferase increased | 38 (0.6) | 65 (1.1) |

Less common adverse reactions in apixaban-treated patients undergoing hip or knee replacement surgery occurring at a frequency of ≥0.1% to <1%:

*Blood and lymphatic system disorders:* thrombocytopenia (including platelet count decreases)

*Vascular disorders:* hypotension (including procedural hypotension)

*Respiratory, thoracic, and mediastinal disorders:* epistaxis

*Gastrointestinal disorders:* gastrointestinal hemorrhage (including hematemesis and melena), hematochezia

*Hepatobiliary disorders:* liver function test abnormal, blood alkaline phosphatase increased, blood bilirubin increased

*Renal and urinary disorders:* hematuria (including respective laboratory parameters)

*Injury, poisoning, and procedural complications:* wound secretion, incision-site hemorrhage (including incision-site hematoma), operative hemorrhage

Less common adverse reactions in apixaban-treated patients undergoing hip or knee replacement surgery occurring at a frequency of <0.1%:

Gingival bleeding, hemoptysis, hypersensitivity, muscle hemorrhage, ocular hemorrhage (including conjunctival hemorrhage), rectal hemorrhage

*Treatment of DVT and PE and Reduction in the Risk of Recurrence of DVT or PE*

The safety of ELIQUIS has been evaluated in the AMPLIFY and AMPLIFY-EXT studies, including 2676 patients exposed to ELIQUIS 10 mg twice daily, 3359 patients exposed to ELIQUIS 5 mg twice daily, and 840 patients exposed to ELIQUIS 2.5 mg twice daily.

Common adverse reactions (≥1%) were gingival bleeding, epistaxis, contusion, hematuria, rectal hemorrhage, hematoma, menorrhagia, and hemoptysis.

AMPLIFY Study

The mean duration of exposure to ELIQUIS was 154 days and to enoxaparin/warfarin was 152 days in the AMPLIFY study. Adverse reactions related to bleeding occurred in 417 (15.6%) ELIQUIS-treated patients compared to 661 (24.6%) enoxaparin/warfarin-treated patients. The discontinuation rate due to bleeding events was 0.7% in the ELIQUIS-treated patients compared to 1.7% in enoxaparin/warfarin-treated patients in the AMPLIFY study.

In the AMPLIFY study, ELIQUIS was statistically superior to enoxaparin/warfarin in the primary safety endpoint of major bleeding (relative risk 0.31, 95% CI [0.17, 0.55], P-value <0.0001).

Bleeding results from the AMPLIFY study are summarized in Table 5.

**Table 5: Bleeding Results in the AMPLIFY Study**

| | ELIQUIS N=2676 n (%) | Enoxaparin/Warfarin N=2689 n (%) | Relative Risk (95% CI) |
|---|---|---|---|
| Major | 15 (0.6) | 49 (1.8) | 0.31 (0.17, 0.55) p<0.0001 |
| CRNM* | 103 (3.9) | 215 (8.0) | |
| Major + CRNM | 115 (4.3) | 261 (9.7) | |
| Minor | 313 (11.7) | 505 (18.8) | |
| All | 402 (15.0) | 676 (25.1) | |

* CRNM = clinically relevant nonmajor bleeding.
Events associated with each endpoint were counted once per subject, but subjects may have contributed events to multiple endpoints.

Adverse reactions occurring in ≥1% of patients in the AMPLIFY study are listed in Table 6.

**Table 6: Adverse Reactions Occurring in ≥1% of Patients Treated for DVT and PE in the AMPLIFY Study**

| | ELIQUIS N=2676 n (%) | Enoxaparin/Warfarin N=2689 n (%) |
|---|---|---|
| Epistaxis | 77 (2.9) | 146 (5.4) |
| Contusion | 49 (1.8) | 97 (3.6) |
| Hematuria | 46 (1.7) | 102 (3.8) |
| Menorrhagia | 38 (1.4) | 30 (1.1) |
| Hematoma | 35 (1.3) | 76 (2.8) |
| Hemoptysis | 32 (1.2) | 31 (1.2) |
| Rectal hemorrhage | 26 (1.0) | 39 (1.5) |
| Gingival bleeding | 26 (1.0) | 50 (1.9) |

AMPLIFY-EXT Study

The mean duration of exposure to ELIQUIS was approximately 330 days and to placebo was 312 days in the AMPLIFY-EXT study. Adverse reactions related to bleeding occurred in 219 (13.3%) ELIQUIS-treated patients compared to 72 (8.7%) placebo-treated patients. The discontinuation rate due to bleeding events was approximately 1% in the ELIQUIS-treated patients compared to 0.4% in those patients in the placebo group in the AMPLIFY-EXT study.

Bleeding results from the AMPLIFY-EXT study are summarized in Table 7.

**Table 7: Bleeding Results in the AMPLIFY-EXT Study**

| | ELIQUIS (apixaban) 2.5 mg bid N=840 n (%) | ELIQUIS 5 mg bid N=811 n (%) | Placebo N=826 n (%) |
|---|---|---|---|
| Major | 2 (0.2) | 1 (0.1) | 4 (0.5) |
| CRNM* | 25 (3.0) | 34 (4.2) | 19 (2.3) |
| Major + CRNM | 27 (3.2) | 35 (4.3) | 22 (2.7) |
| Minor | 75 (8.9) | 98 (12.1) | 58 (7.0) |
| All | 94 (11.2) | 121 (14.9) | 74 (9.0) |

* CRNM = clinically relevant nonmajor bleeding.
Events associated with each endpoint were counted once per subject, but subjects may have contributed events to multiple endpoints.

Adverse reactions occurring in ≥1% of patients in the AMPLIFY-EXT study are listed in Table 8.

**Table 8: Adverse Reactions Occurring in ≥1% of Patients Undergoing Extended Treatment for DVT and PE in the AMPLIFY-EXT Study**

| | ELIQUIS 2.5 mg bid N=840 n (%) | ELIQUIS 5 mg bid N=811 n (%) | Placebo N=826 n (%) |
|---|---|---|---|
| Epistaxis | 13 (1.5) | 29 (3.6) | 9 (1.1) |
| Hematuria | 12 (1.4) | 17 (2.1) | 9 (1.1) |
| Hematoma | 13 (1.5) | 16 (2.0) | 10 (1.2) |
| Contusion | 18 (2.1) | 18 (2.2) | 18 (2.2) |
| Gingival bleeding | 12 (1.4) | 9 (1.1) | 3 (0.4) |

Other Adverse Reactions

Less common adverse reactions in ELIQUIS-treated patients in the AMPLIFY or AMPLIFY-EXT studies occurring at a frequency of ≥0.1% to <1%:

*Blood and lymphatic system disorders:* hemorrhagic anemia

*Gastrointestinal disorders:* hematochezia, hemorrhoidal hemorrhage, gastrointestinal hemorrhage, hematemesis, melena, anal hemorrhage

*Injury, poisoning, and procedural complications:* wound hemorrhage, postprocedural hemorrhage, traumatic hematoma, periorbital hematoma

*Musculoskeletal and connective tissue disorders:* muscle hemorrhage

*Reproductive system and breast disorders:* vaginal hemorrhage, metrorrhagia, menometrorrhagia, genital hemorrhage

*Vascular disorders:* hemorrhage

*Skin and subcutaneous tissue disorders:* ecchymosis, skin hemorrhage, petechiae

*Eye disorders:* conjunctival hemorrhage, retinal hemorrhage, eye hemorrhage

*Investigations:* blood urine present, occult blood positive, occult blood, red blood cells urine positive

*General disorders and administration-site conditions:* injection-site hematoma, vessel puncture-site hematoma

## DRUG INTERACTIONS

Apixaban is a substrate of both CYP3A4 and P-gp. Inhibitors of CYP3A4 and P-gp increase exposure to apixaban and increase the risk of bleeding. Inducers of CYP3A4 and P-gp decrease exposure to apixaban and increase the risk of stroke and other thromboembolic events.

### Combined P-gp and Strong CYP3A4 Inhibitors

For patients receiving ELIQUIS 5 mg or 10 mg twice daily, the dose of ELIQUIS should be decreased by 50% when coadministered with drugs that are combined P-gp and strong CYP3A4 inhibitors (e.g., ketoconazole, itraconazole, ritonavir) *[see Dosage and Administration (2.5) and Clinical Pharmacology (12.3) in full Prescribing Information]*.

For patients receiving ELIQUIS at a dose of 2.5 mg twice daily, avoid coadministration with combined P-gp and strong CYP3A4 inhibitors *[see Dosage and Administration (2.5) and Clinical Pharmacology (12.3) in full Prescribing Information]*.

*Clarithromycin*

Although clarithromycin is a combined P-gp and strong CYP3A4 inhibitor, pharmacokinetic data suggest that no dose adjustment is necessary with concomitant administration with ELIQUIS *[see Clinical Pharmacology (12.3) in full Prescribing Information]*.

### Combined P-gp and Strong CYP3A4 Inducers

Avoid concomitant use of ELIQUIS with combined P-gp and strong CYP3A4 inducers (e.g., rifampin, carbamazepine, phenytoin, St. John's wort) because such drugs will decrease exposure to apixaban *[see Clinical Pharmacology (12.3) in full Prescribing Information]*.

### Anticoagulants and Antiplatelet Agents

Coadministration of antiplatelet agents, fibrinolytics, heparin, aspirin, and chronic NSAID use increases the risk of bleeding.

APPRAISE-2, a placebo-controlled clinical trial of apixaban in high-risk, post-acute coronary syndrome patients treated with aspirin or the combination of aspirin and clopidogrel, was terminated early due to a higher rate of bleeding with apixaban compared to placebo. The rate of ISTH major bleeding was 2.8% per year with apixaban versus 0.6% per year with placebo in patients receiving single antiplatelet therapy and was 5.9% per year with apixaban versus 2.5% per year with placebo in those receiving dual antiplatelet therapy.

In ARISTOTLE, concomitant use of aspirin increased the bleeding risk on ELIQUIS from 1.8% per year to 3.4% per year and concomitant use of aspirin and warfarin increased the bleeding risk from 2.7% per year to 4.6% per year. In this clinical trial, there was limited (2.3%) use of dual antiplatelet therapy with ELIQUIS.

## USE IN SPECIFIC POPULATIONS

### Pregnancy

*Pregnancy Category B*

There are no adequate and well-controlled studies of ELIQUIS in pregnant women. Treatment is likely to increase the risk of hemorrhage during pregnancy and delivery. ELIQUIS should be used during pregnancy only if the potential benefit outweighs the potential risk to the mother and fetus.

Treatment of pregnant rats, rabbits, and mice after implantation until the end of gestation resulted in fetal exposure to apixaban, but was not associated with increased risk for fetal malformations or toxicity. No maternal or fetal deaths were attributed to bleeding. Increased incidence of maternal bleeding was observed in mice, rats, and rabbits at maternal exposures that were 19, 4, and 1 times, respectively, the human exposure of unbound drug, based on area under plasma-concentration time curve (AUC) comparisons at the maximum recommended human dose (MRHD) of 10 mg (5 mg twice daily).

### Labor and Delivery

Safety and effectiveness of ELIQUIS during labor and delivery have not been studied in clinical trials. Consider the risks of bleeding and of stroke in using ELIQUIS in this setting *[see Warnings and Precautions]*.

Treatment of pregnant rats from implantation (gestation Day 7) to weaning (lactation Day 21) with apixaban at a dose of 1000 mg/kg (about 5 times the human exposure based on unbound apixaban) did not result in death of offspring or death of mother rats during labor in association with uterine bleeding. However, increased incidence of maternal bleeding, primarily during gestation, occurred at apixaban doses of ≥25 mg/kg, a dose corresponding to ≥1.3 times the human exposure.

### Nursing Mothers

It is unknown whether apixaban or its metabolites are excreted in human milk. Rats excrete apixaban in milk (12% of the maternal dose).

Women should be instructed either to discontinue breastfeeding or to discontinue ELIQUIS (apixaban) therapy, taking into account the importance of the drug to the mother.

### Pediatric Use

Safety and effectiveness in pediatric patients have not been established.

### Geriatric Use

Of the total subjects in the ARISTOTLE and AVERROES clinical studies, >69% were 65 years of age and older, and >31% were 75 years of age and older. In the ADVANCE-1, ADVANCE-2, and ADVANCE-3 clinical studies, 50% of subjects were 65 years of age and older, while 16% were 75 years of age and older. In the AMPLIFY and AMPLIFY-EXT clinical studies, >32% of subjects were 65 years of age and older and >13% were 75 years of age and older. No clinically significant differences in safety or effectiveness were observed when comparing subjects in different age groups.

### Renal Impairment

*Reduction of Risk of Stroke and Systemic Embolism in Patients with Nonvalvular Atrial Fibrillation*

The recommended dose is 2.5 mg twice daily in patients with at least two of the following characteristics *[see Dosage and Administration (2.1) in full Prescribing Information]*:

- age greater than or equal to 80 years
- body weight less than or equal to 60 kg
- serum creatinine greater than or equal to 1.5 mg/dL

**Patients with End-Stage Renal Disease on Dialysis**

Clinical efficacy and safety studies with ELIQUIS did not enroll patients with end-stage renal disease (ESRD) on dialysis. In patients with ESRD maintained on intermittent hemodialysis, administration of ELIQUIS at the usually recommended dose *[see Dosage and Administration (2.1) in full Prescribing Information]* will result in concentrations of apixaban and pharmacodynamic activity similar to those observed in the ARISTOTLE study *[see Clinical Pharmacology (12.3) in full Prescribing Information]*. It is not known whether these concentrations will lead to similar stroke reduction and bleeding risk in patients with ESRD on dialysis as was seen in ARISTOTLE.

*Prophylaxis of Deep Vein Thrombosis Following Hip or Knee Replacement Surgery, and Treatment of DVT and PE and Reduction in the Risk of Recurrence of DVT and PE*

No dose adjustment is recommended for patients with renal impairment, including those with ESRD on dialysis *[see Dosage and Administration (2.1) in full Prescribing Information]*. Clinical efficacy and safety studies with ELIQUIS did not enroll patients with ESRD on dialysis or patients with a CrCl <15 mL/min; therefore, dosing recommendations are based on pharmacokinetic and pharmacodynamic (anti-FXa activity) data in subjects with ESRD maintained on dialysis *[see Clinical Pharmacology (12.3) in full Prescribing Information]*.

### Hepatic Impairment

No dose adjustment is required in patients with mild hepatic impairment (Child-Pugh class A). Because patients with moderate hepatic impairment (Child-Pugh class B) may have intrinsic coagulation abnormalities and there is limited clinical experience with ELIQUIS in these patients, dosing recommendations cannot be provided *[see Clinical Pharmacology (12.2) in full Prescribing Information]*. ELIQUIS is not recommended in patients with severe hepatic impairment (Child-Pugh class C) *[see Clinical Pharmacology (12.2) in full Prescribing Information]*.

## OVERDOSAGE

Overdose of ELIQUIS increases the risk of bleeding *[see Warnings and Precautions]*.

In controlled clinical trials, orally administered apixaban in healthy subjects at doses up to 50 mg daily for 3 to 7 days (25 mg twice daily for 7 days or 50 mg once daily for 3 days) had no clinically relevant adverse effects.

In healthy subjects, administration of activated charcoal 2 and 6 hours after ingestion of a 20-mg dose of apixaban reduced mean apixaban AUC by 50% and 27%, respectively. Thus, administration of activated charcoal may be useful in the management of apixaban overdose or accidental ingestion. An agent to reverse the anti-factor Xa activity of apixaban is available.

## PATIENT COUNSELING INFORMATION

*Advise patients to read the FDA-approved patient labeling (Medication Guide).*

Advise patients of the following:

- Not to discontinue ELIQUIS without talking to their physician first.
- That it might take longer than usual for bleeding to stop, and they may bruise or bleed more easily when treated with ELIQUIS. Advise patients about how to recognize bleeding or symptoms of hypovolemia and of the urgent need to report any unusual bleeding to their physician.
- To tell their physicians and dentists they are taking ELIQUIS, and/or any other product known to affect bleeding (including nonprescription products, such as aspirin or NSAIDs), before any surgery or medical or dental procedure is scheduled and before any new drug is taken.
- If the patient is having neuraxial anesthesia or spinal puncture, inform the patient to watch for signs and symptoms of spinal or epidural hematomas *[see Warnings and Precautions]*. If any of these symptoms occur, advise the patient to seek emergent medical attention.
- To tell their physicians if they are pregnant or plan to become pregnant or are breastfeeding or intend to breastfeed during treatment with ELIQUIS *[see Use in Specific Populations]*.
- How to take ELIQUIS if they cannot swallow, or require a nasogastric tube *[see Dosage and Administration (2.6) in full Prescribing Information]*.
- What to do if a dose is missed *[see Dosage and Administration (2.2) in full Prescribing Information]*.

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# NEWS FROM THE COLLEGE

UPDATES AND ALERTS FROM ACEP

## Joint Recommendations on Emergency Care for Children Issued

ACEP, the American Academy of Pediatrics, and the Emergency Nurses Association have published the updated guidelines, "Pediatric Readiness in the Emergency Department," a revision of the 2009 policy statement. The new version highlights recent advances in pediatric emergency care and includes recommendations for quality improvement plans focusing on children and disaster preparedness.

"The joint recommendations help improve and standardize care delivery for children of all ages in the emergency department, create best practice benchmarks for emergency departments, and strengthen pediatric patient safety efforts," said Vidor Friedman, MD, FACEP, President of ACEP. Read the guidelines in *Annals of Emergency Medicine* at www.annemergmed.com.

## Emergency Physician Named CMO of Office of National Drug Control Policy

Roneet Lev, MD, director of the Scripps Mercy Emergency Department in San Diego, has been named the chief medical officer for the Office of National Drug Control Policy (ONDCP). ONDCP is part of the executive office of the president and works to reduce drug use and its consequences by leading the development, implementation, and assessment of U.S. drug policy. ONDCP provides administrative and financial support to the President's Commission on Combating Drug Addiction and the Opioid Crisis, which was established in March 2017.

## Emergency Physician Appointed to Deputy Role with Department of Veterans Affairs

Gerard R. Cox, MD, MHA, FACEP, has been appointed deputy under secretary for health in the U.S. Department of Veterans Affairs (VA). In that capacity, Dr. Cox is responsible for leading the VA's national policies and programs for health care quality improvement, patient safety, credentialing and privileging, risk management, medicolegal affairs, regulatory compliance, ethics, audit, investigation, and related areas. Dr. Cox joined the Veterans Health Administration's leadership team in January 2014 after serving more than 30 years on active duty in the U.S. Navy as a physician and health care executive.

## CMS Releases Final Rule on Changes to the Medicare Fee Schedule, and MACRA/ Quality Payment Program

The Centers for Medicare and Medicaid Services has released its Final Rule laying out changes to Medicare for 2019 that will impact emergency physicians in a number of ways. Read ACEP's summary of the changes and see how ACEP weighed in on the original proposed rule on behalf of emergency physicians in the comment letter at www.acep.org/federal-advocacy/federal-advocacy-overview.

See page 18 for a summary of how the Final Rule will affect emergency physicians.

## NEMPAC in the 2018 Elections

The National Emergency Medicine Political Action Committee (NEMPAC) supported 227 candidates (200 House and 27 Senate) during the 2018 elections. As many as 22 of the open-seat and challenger candidates who NEMPAC supported will be coming to Congress next year. NEMPAC supported the successful campaigns of several new physician candidates: John Joyce, MD (R-PA), Mark Green, MD (R-TN), and Kim Schrier, MD (D-WA). Other physicians serving in Congress supported by NEMPAC were re-elected to the House, including Reps. Raul Ruiz, MD (D-CA), an emergency physician; Ami Bera, MD (D-CA); Larry Bucshon, MD (R-IN); Mike Burgess, MD (R-TX); Ralph Abraham, MD (R-LA); Neal Dunn, MD (R-FL); Andy Harris, MD (R-MD); Roger Marshall, MD (R-KS); Phil Roe, MD (R-TN); and Brad Wenstrup, DPM (R-OH). ACEP also supported Jeff Van Drew, DDS (D-NJ), who will join three other dentists currently serving in Congress, and former Department of Health and Human Services Secretary Donna Shalala in the Florida 27 open seat, who is expected to play a major role in the health care policy space in Congress. For more details about the midterm elections, go to www.acep.org/Nempac. To learn more about ACEP's advocacy efforts and sign up for the 911 Legislative Network, go to www.acepadvocacy.org.

## ACEP Responds to Senate Bipartisan Price Transparency Workgroup Legislation

ACEP submitted a detailed response to the Senate Bipartisan Price Transparency Workgroup regarding its draft legislation on how to address out-of-network billing issues. Read the response letter at www.acep.org/federal-advocacy/acep-letters-to-congress2.

## ACEP Responds to Harvard Pilgrim Prudent Layperson Violations

ACEP responded to a new Harvard Pilgrim Health Care policy that will be implemented in New Hampshire on Jan. 1, 2019. It will apply a new 50 percent coinsurance for policyholders who seek care in an emergency department if their final diagnosis is determined to be "nonemergent," based solely upon a list of diagnosis codes. In a letter, ACEP calls for Harvard Pilgrim to halt implementation of this dangerous policy that expects patients to be able to self-diagnose to decide to seek emergency care. This policy follows efforts by other insurers to limit coverage of vital emergency care, including a similar Anthem BlueCross BlueShield policy already in effect in New Hampshire and several other states.

## Leaders Meet with NIDA About Opioids

ACEP's Pawan Goyal, MD, MHA; Sandy Schneider, MD, FACEP; Cynthia Singh, MS; and several other leaders met with the National Institute for Drug Abuse for a one-day meeting to discuss the opioid crisis.

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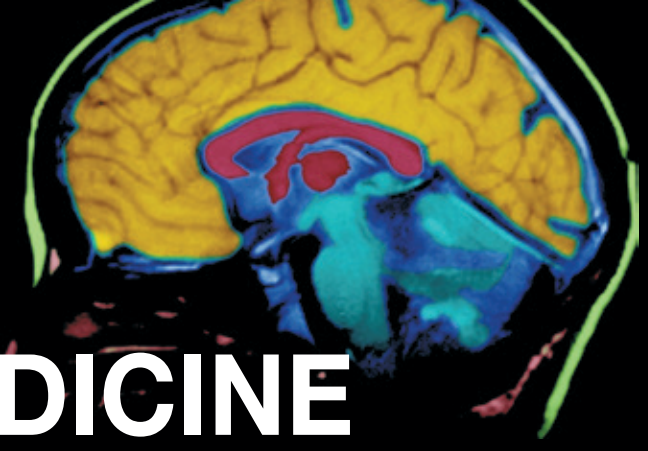

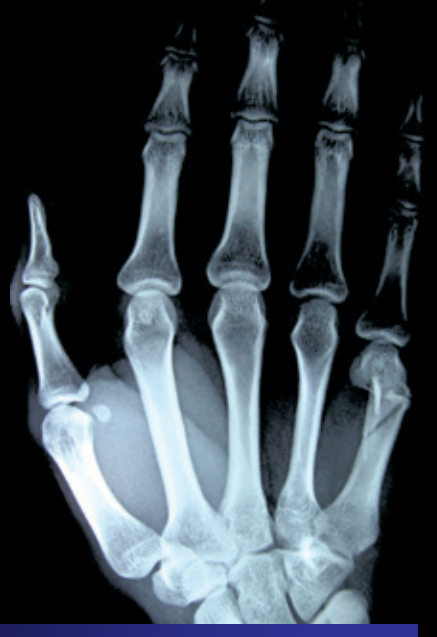

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# THE BREAK ROOM

## Dr. Bradford Walters Salutes ACEP's 50 Years of Contributions to EM

I would like to say congratulations on our 50th birthday. I have not been an ACEP member for all of that time, but I have been a member for some 38 years. While by far not the first, I am among that early generation of physicians who trained specifically in emergency medicine and whose career has been entirely within our specialty. Certainly, congratulations are in order for an organization that is a half century old. Who would have thought in those early days we would make it this far? The overriding issue facing emergency medicine was just to establish the specialty. My aim with this letter is to thank ACEP for all it has done, not just for the specialty of emergency medicine but for me personally.

Back in the early 1980s, as an emergency medicine resident on the East Coast, I was struck by the distinctly neophyte position of our specialty. Being from Michigan, the land of Krome, Tintinalli, Bock, Wiegenstein, and Rupke, where emergency medicine was more established, I found it disconcerting that as an EM resident I was constantly having to explain who I was and that I did plan on working in an "ER" my entire career. Hardly a shift went past where I was not explaining to a patient, another resident, an off-service attending, or a hospital administrator that emergency medicine was a bona fide specialty and that the care rendered in the emergency department was going to improve and grow as the result of residency-trained emergency physicians. That need to explain what emergency medicine was continued as I graduated to the role of an attending physician.

ACEP's major task at that time was to define the specialty. By going to meetings on a national and state level, I learned to articulate that message. I was also better able to apply those lessons in the various battles being fought on the hospital, local, state, and national levels. Our measure of success is that it has been a long time since I have had such a "justify emergency medicine" conversation. We have gone from being absent on the academic side of medicine to where our presence in academia and medical schools is now well-established. We are now one of the most highly sought-after specialties by graduating medical students.

First, let me say thanks to the dogged persistence of this national organization and my own state chapter for never giving up, never losing sight of the big picture, and for establishing emergency medicine as a leading voice for what is now an accepted part of the house of medicine. We just had an emergency physician as president of the American Medical Association, something unthinkable back in the beginning of my career.

It has often been said by persons of my generation that if you can't remember the 1960s, you were there. Well, I was there in the early days of ACEP, and I vividly remember those times. I was able to watch those early leaders as they struggled with the issues that shaped who and what we are today. I'm thankful that I found a place not just to speak out but where mentors would educate me and encourage me to speak up. I know it sounds corny or prosaic, but that was and still is very cool. It was the only real *Forrest Gump* moment of my life, when I was present at the very beginning of an important part of medicine in establishing the first specialty whose foundation was built on what patients needed.

> I'm thankful that I found a place not just to speak out but where mentors would educate me and encourage me to speak up.

ACEP and my state chapter mean much more to me on a personal level. I would like to say my career has been a smooth one with few bumps in the road. However, that has been far from the case. I have worked at hospitals that did not deserve or recognize the excellence of the physicians in their emergency department. I have worked for department chairs who were the antithesis of mentorship and did not support the physicians they were supposed to be leading. I have suffered through malpractice suits and, of course, my share of mistakes and being the centerpiece of a mortality and morbidity conference. Contrasting those experiences with others, I have had the extreme privilege of being an emergency physician for truly heroic patients whose courage and humanity were breathtaking, inspiring, and heartbreaking. However, like all emergency physicians, I have also experienced the opposite in patients or families whose petty crassness sucked the joy out of the interaction with them, leaving me saddened and cynical. I have felt the cold breath of burnout and came very close to losing my way.

Among the things that saved me in those dark times were ACEP and MCEP [the Michigan College of Emergency Physicians] as shining lights where I could rekindle the spark that led me to become an emergency physician in the first place. I have often said, "Get a few emergency physicians together from the same shop, and the conversation inevitably ends up devolving into a complaint session about their department, the hospital and its administration, the nurses, or the patients. However, go to a national meeting, the Council meeting, the Leadership and Advocacy Conference, your state chapter meetings, and various ACEP educational conferences and you'll interact with physicians from many different practice environments." The conversation elevates to a discussion of interesting cases, mistakes made, lessons learned, finding out that the things you have tripped over have also tripped up other good physicians. It is an opportunity to rekindle the flame and relight the furnace that underlies your love for emergency medicine.

ACEP saved me personally, saved my career, improved me both as a person and a physician, taught me great lessons, and

**CONTINUED** *on page 11*

## TOXICOLOGY Q&A

# All Fun and Games?

*by* JASON HACK, MD

**QUESTION:** Is Mario's toxic shroom harmful in reality?

**ANSWER** *on page 11*


PHOTO: JASON HACK (OLEANDER PHOTOGRAPHY)

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# Acute Flaccid Myelitis Update

## What you need to know about this emerging seasonal pediatric public health crisis

*by* DAVID E. HOGAN, DO, MPH, FACEP

Nothing is more concerning to parents and emergency health care providers than a serious illness that primarily impacts children. The concern is heightened when we don't know the cause of the illness. These are the current circumstances for acute flaccid myelitis (AFM), and there is currently an ongoing seasonal outbreak of the disease in the United States.

AFM is a rare condition that, similar to polio, destroys gray matter in the spinal cord, resulting in weakness that can progress to flaccid paralysis in hours. The condition first attracted attention in the United States in 2014 during a seasonal enterovirus outbreak.[1-4] The Centers for Disease Control and Prevention (CDC) has raised concern because AFM cases have continued to show seasonal peaks each year since 2014 (see Figure 1), and we still don't know the cause.[5-7] In addition, AFM is being discussed in the news, generating increased awareness and apprehension. Clinicians are being encouraged to enhance their knowledge about AFM and rapidly engage departments of health for information on appropriate diagnostic and sampling methods for suspected cases.

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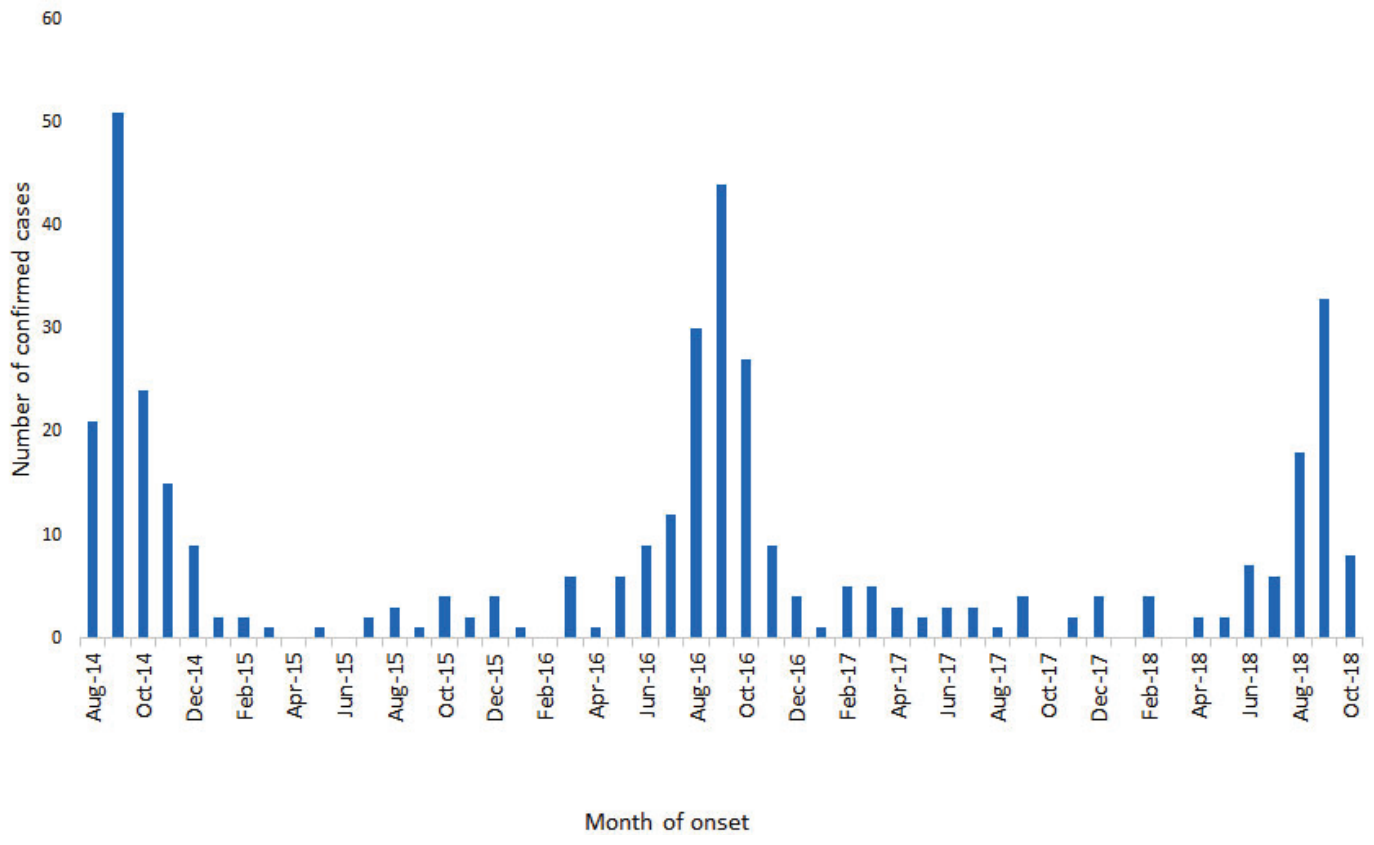
**FIGURE 1: NUMBER OF CONFIRMED AFM CASES IN THE UNITED STATES REPORTED TO THE CDC BY MONTH OF ONSET, AUGUST 2014–OCTOBER 2018.**




SOURCE: CDC

### The Background on AFM

Since it was first identified in 2014, there have been approximately 386 confirmed cases of AFM.[5-7] The disorder is extremely rare, literally about one in a million. The mean age of patients is 4 years, with 90 percent of all cases occurring in patients younger than 18 years old. Despite research, we still don't know the cause.[5] Initially, all signs pointed to an enterovirus type D68, but that theory has not panned out.[8,9] Continued investigations of possible sources including viruses, bacteria, and toxins, as well as inflammatory, autoimmune, and genetic disorders have all failed to clearly identify a culprit.

### Prognosis

Little information exists regarding long-term prognosis of AFM. A general review of the existing reports suggests that out of 138 cases followed between 30 days to six months, 89.8 percent had persistent neurologic deficits, 8.7 percent were fully recovered, and 1.5 percent resulted in death.[4,7,9,10]

### Clinical Presentation and Diagnosis

AFM should be suspected when patients (usually young) present with extremity weakness that is rapidly progressing. Early studies suggested up to 80 percent of patients reported an antecedent upper respiratory infection or enteritis.[2,11] Another report noted that 75 percent of the cases had a low-grade fever a few days prior to onset of weakness.[12,13] However, neither of these findings are consistent.[1,4,7] Some patients present with an initial tingling and/or pain in the extremities. Urinary retention or a neurogenic bladder has been noted in some. Respiratory failure requiring mechanical ventilation may develop rapidly. Additional presentations include facial palsy, ptosis, extraocular paresis, altered mental status, and bulbar findings such as slurred speech and dysphagia.[10,13]

Laboratory studies are nonspecific. Analysis of cerebral spinal fluid often demonstrates a lymphocytic pleocytosis, normal glucose, normal or slightly elevated protein, and absence of identifiable viral, bacterial, or fungal pathogens.[4,9,13]

An MRI of the spinal cord is critical for diagnosis. The MRI may be normal on an initial presentation, but eventually an area of central gray matter lesions with edema of both the anterior and posterior segments of the spinal cord will develop. Lesions frequently occur over a span of several spinal cord levels and are most commonly located in the cervical spinal cord. Cortical lesions may also be noted.[1,5,9] The classic appearance of the MRI has been described as similar to poliovirus infection.[1,5]

AFM can be difficult to diagnose, especially initially, because it shares many of the same signs and symptoms as other neurologic diseases, such as transverse myelitis and Guillain-Barré syndrome. The official elements for an AFM case definition, as defined by the Council of State and Territorial Epidemiologists, are provided in Table 1.[14] However, clinicians are being asked to report all cases of weakness or paralysis meeting the clinical

**CONTINUED** *on page 12*

**TABLE 1: ACUTE FLACCID MYELITIS CASE DEFINITION**

| | | |
|---|---|---|
| **Laboratory Criteria** | *Confirmatory laboratory evidence:* An MRI image showing spinal cord lesions largely restricted to gray matter spanning one or more vertebral segments. Note that MRI may be normal, particularly during the first 72 hours. | *Supportive laboratory evidence:* Cerebral spinal fluid pleocytosis |
| **Case Classification** | *Confirmed case:* Clinically compatible findings and MRI demonstrating spinal cord lesions as above | *Probable case:* Clinically compatible case and cerebral spinal fluid pleocytosis |

SOURCE: COUNSEL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS

### WHAT WE *DO* KNOW ABOUT AFM

- Most victims are children.
- AFM patterns are most consistent with viral illnesses such as:
  - Non-polio enteroviruses
  - Poliovirus
  - Adenovirus
  - West Nile virus
- All AFM cases have tested negative for poliovirus and West Nile virus.
- Most cases have tested negative for non-polio enteroviruses.
- No pathogen is consistently found in the serum or cerebral spinal fluid.
- The disease can progress from initial symptoms to complete flaccid paralysis within hours.
- Cases have seasonal peaks (see Figure 1).
- AFM is very rare—one in a million people.

### WHAT WE *DON'T* KNOW ABOUT AFM

- The cause of AFM.
- Why AFM has persisted seasonally since 2014.
- Who is at higher risk for AFM or why.
- The long-term effects of AFM.
- The best preventive strategies.

SOURCE: CDC

# Toxicology Q&A Answer

QUESTION ON PAGE 8

**ANSWER:** Mario was right! A. Muscaria are toxic and hallucinogenic.

The *Amanita muscaria* mushroom primarily grows in woodland areas in leaf litter. The color of the mature cap (pileus) ranges from a striking red to yellow or orange. The cap is noted for having scattered "flakes" (scales) on the top surface, which are remnants of its protective covering (veil or volva) that it grows through its maturing process. In the mature mushroom, these scales can appear to be in concentric circles. Although not seen in this image, the stem (stipe) would have a skirt (ring) of tissue around it and have a rough appearance at the bottom third. Under the cap, this species has laminae-free white gills and white spores.[1]

## Toxins

The toxins are primarily ibotenic acid and muscimol. These chemicals have GABAergic and glutamatergic effects (agonist to glutamate and GABA receptors). The symptoms of *A. muscaria* poisoning include nausea and vomiting, somnolence, dizziness, hallucinations, dysphoria, delirium, ataxia, myoclonic movements, and seizures.

The 2016 Annual Report of the American Association of Poison Control Centers' National Poison Data System shows almost 6,000 calls to poison centers about mushroom exposures but only four deaths.

*A. muscaria* is commonly known as fly agaric. This is because the cap can be placed in a saucer with milk, which both attracts and kills flies that drink the liquid.

## Myths

Although deaths are uncommon, exposures and illnesses from mushroom ingestions are not rare. There are many myths that purportedly assist neophyte mushroom hunters in differentiating poisonous mushrooms from edible ones. Myths include that safe mushrooms have a pileus (cap) that can be peeled or grow on a certain side of a tree; that poisonous mushrooms cause a silver spoon or an onion to turn black while they are being cooked or burn your mouth when you eat them; that cooking the mushroom inactivates the poison; and that insects only land on safe mushrooms. **None of these myths are true.**

## History and Popular Culture

The mushroom has a long history of being used in religion, particularly in Asia. It has been used in a sacred and hallucinogenic ritual drink called soma for more than 4,000 years. It has also been the topic of a Hindu religious hymn. Interestingly, muscimol is excreted in the urine of those intoxicated with the mushroom, leading to followers seeking to drink the urine for its hallucinatory properties.

This striking mushroom is very memorable and is prominently featured in stories and media. It is the blue caterpillar's pedestal in *Alice in Wonderland*, it kills Babar's father in the 1931 French children's book *Histoire de Babar* by Jean de Brunhoff, and is thrown to affect opponents in Super Mario Bros. video games.

PHOTO: JASON HACK (OLEANDER PHOTOGRAPHY)

AMANITA MUSCARIA

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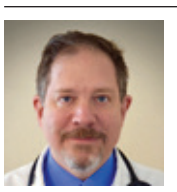

**DR. HACK (OLEANDER PHOTOGRAPHY)** is an emergency physician and medical toxicologist who enjoys taking photographs of beautiful toxic, medicinal, and benign flowers that he stumbles upon or grows in his garden. Contact him at ToxInRI@gmail.com.

## BREAK ROOM

CONTINUED FROM PAGE 8

through my activities on a state and national level, allowed me to make a very small difference to my fellow emergency physicians and to the specialty. That was an opportunity I never thought I would have. ACEP and my state chapter leadership saw things in me that I did not. A personal thank you goes to my former MCEP chapter executive, the late Diane Bollman. I am sincerely grateful to all of my colleagues, the state and national staff, the leaders of this great specialty organization, and so many others I cannot begin to name. With this 50th anniversary, I would like to thank them from the bottom of my heart. I hope my activities within the chapter have in a small way repaid some of the huge debt I owe to ACEP and MCEP.

*- Bradford L. Walters, MD, FACEP*
*Royal Oak, Michigan*

### Thank You to Emergency Physicians

Dear Emergency Room Personnel,

My name is Ron E., and I am an alcoholic. I am also a grateful member of Alcoholics Anonymous, and as such, I am advised that my own continued sobriety depends on my willingness to make amends to people and institutions that I have harmed and to directly make such amends whenever possible. Needless to say, as medical professionals staffing emergency rooms and urgent care centers, you deserve my sincerest apologies.

You have met me far too many times and in far too many locales. Perhaps I was brought to you by state police with a blood alcohol level of .35 after causing a (thankfully minor) traffic accident. Perhaps I darkened your doors in great pain from cracked ribs or a fractured spine suffered in an intoxicated fall. Perhaps you raced against the clock to staunch the blood trickling down my face from a gash in my forehead also suffered in a blackout fall. Or maybe I thanked you for your troubles by tearing an intravenous tube out of my arm and then escaping into the streets in a blood-soaked white shirt.

Whether you are an emergency physician, nurse, or social worker, or even a radiologist, dietary aide, or transport assistant, I was ungrateful and, no doubt, treated you terribly. You were never mean enough to restrain me, but looking back, I now wish someone had taped my mouth shut.

I do apologize, and if I ever have the misfortune of meeting one of you again, I will apologize in person. Until then, I hope you will share this widely with your colleagues: You all deserve to know that I now know you were doing your best for me, and I was doing my worst for humanity.

I also hope that you continue to believe that I was not a bad person. I was, am, a sick person who made many bad choices and am now trying to get better, be better. I needed the help you gave me, and I needed you, among others, to tell me that I had a problem and offer me resources—even if only Alcoholics Anonymous—to help me start the road to recovery. I might not have listened, but I believe in piling on the straws in hopes of finally breaking the camel's back.

Again, thank you. You done and do good.

*- Ron E.*

# 2018 LEGISLATIVE UPDATE

## ACEP's diligent advocacy and bipartisan approach led to many wins for emergency physicians and patients in 2018

*by* LAURA WOOSTER, MPH

Over the last year, ACEP's strong federal advocacy efforts have been rewarded with numerous, and significant, legislative victories, resulting in one of the most productive years in ACEP's history. ACEP successfully secured passage of four emergency medicine–focused bills that were signed into law:

- The **Protecting Patient Access to Emergency Medications Act** to provide needed clarity on EMS "standing orders" of key medications in the field, like opioids
- The **Sharing Health Information to Ensure Lifesaving Drug Safety (SHIELDS) Act**, included in the 2019 National Defense Authorization Act, to facilitate sharing of prescribing information for active-duty military members and their families between the Department of Defense and state prescription drug monitoring programs
- The **Alternatives to Opioids (ALTO) in the Emergency Department Act** to expand access to alternative pain management treatments in the emergency department
- The **Preventing Overdoses While in Emergency Rooms (POWER) Act** to help expand medication-assisted treatment programs for treating patients with substance-use disorders (SUDs) in the emergency department and providing a "warm hand-off" to longer term SUD treatment programs.

In addition to these specific ACEP-led and -developed priorities, ACEP also helped secure several other long-term victories in Congress' bipartisan budget deal passed in February 2018, including repeal of Medicare's Independent Payment Advisory Board, a two-year extension of the geographic practice cost index work floor, a five-year extension of Medicare ambulance add-on payments, and $6 billion in additional funding to address the opioid epidemic. We were also able to help deliver 10 years of funding for the Children's Health Insurance Program, ensuring funding through 2027.

ACEP also led the charge in addressing the worsening drug shortages that affect emergency departments throughout the country, working with Congress to request that the U.S. Food and Drug Administration (FDA) identify the root causes of drug shortages and develop solutions to address and eliminate these pervasive shortages of the medications we use every single day in the emergency department. Thanks to ACEP member advocacy during the 2018 Legislative & Advocacy Conference, more than 100 representatives and more than 30 senators signed on to the bipartisan letters. Just a few short weeks later, FDA Commissioner Scott Gottlieb announced the creation of a new Drug Shortages Task Force responsible for identifying and addressing the causes of drug shortages, and since then, ACEP has participated in stakeholder roundtables and communications with the FDA as it continues to work on this critical agency priority.

The unifying theme across all of these victories is bipartisanship. Despite the contentiousness of the political environment, legislators reached across the aisle to enact meaningful changes that will help emergency physicians provide the high-quality care our patients need and deserve.

Our history of bipartisan success will undoubtedly become even more vital as we enter next year with a House and Senate controlled by different parties. As the new 116th Congress approaches, ACEP is already preparing for the opportunities and challenges that a divided Congress will present, planning meetings with new members of Congress and staff, and identifying new champions and partners that will help ACEP continue to build on our accomplishments.

**MS. WOOSTER** is ACEP's associate executive director of public affairs.

### BY THE NUMBERS: 2018 ADVOCACY EFFORTS

**4** emergency medicine–focused bills signed into law

**30** Congressional letters of support or comment submitted

**10** regulatory comment letters submitted

**555** legislative visits conducted by ACEP members and staff

**4,000+** members in the ACEP 911 Legislative Grassroots Network

*Members respond to advocacy alerts by emailing their members of Congress about an issue of concern to EM. This network covers 95 percent of Congressional districts. Learn more at* ***acep.advocacy.org****.*

**5,215** donors to NEMPAC, the fourth largest physician specialty PAC

**$2.2M** contributed by NEMPAC to 200 House and 27 Senate candidates during the 2018 elections.

## ACUTE FLACCID MYELITIS | CONTINUED FROM PAGE 10

### CLINICAL PRESENTATION OF ACUTE FLACCID MYELITIS

Onset of extremity weakness, rapidly progressing, usually in young patients

Some patients develop:

- Extremity pain and tingling
- Facial palsy
- Paresis of extraocular muscles
- Ptosis of the eyes
- Dysphagia
- Slurred speech
- Altered mental status
- Urinary retention
- Respiratory failure requiring ventilator management

SOURCE: CDC

case presentation, regardless of MRI or laboratory results.[5]

### AFM Management

The onset of weakness may be abrupt and rapidly progress to respiratory failure. When these patients are evaluated in the emergency department or sent for MRI, the clinician should anticipate and be prepared for rapid deterioration. Hospital admission and appropriate consultation are indicated based on the condition of the patient and local institutional protocols. Patients with any indication of rapid progression or respiratory compromise should be admitted to the intensive care unit. The CDC expert panel on AFM discourages the use of steroids or other immunosuppressant agents as these may actually increase mortality.[5] Further specific recommendations on AFM management may be found at the CDC's AFM website, www.cdc.gov/acute-flaccid-myelitis.

AFM should be reported to the clinician's state department of health and the CDC. These organizations can provide guidance on obtaining epidemiologic data and specimen collection to help identify the cause of AFM.[5]

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**DR. HOGAN** is director of the TeamHealth National Academic Consortium and director of education for the TeamHealth West Group.

# Telling ACEP's Story

## PR director Laura Gore has helped shape ACEP's public story for more than two decades

They say there's no such thing as bad publicity, but public relations directors know that promoting an organization's message to the world while mitigating mistakes and managing bad news is hard work. Laura Gore, who has been ACEP's public relations director since 1997, knows how critical a strong PR team is to an organization's success and how vital it can be to accomplishing ambitious goals. After more than 20 years with ACEP, Ms. Gore is leaving in late December.

Ms. Gore recently sat down with *ACEP Now* Medical Editor-in-Chief Kevin Klauer, DO, EJD, FACEP, to discuss her experience promoting ACEP and its agenda to the public and some of the highlights of her time with the organization.

**KK: You are one of ACEP's unsung heroes behind the scenes who rarely gets the recognition she deserves. This interview is also bittersweet because you're retiring, leaving the organization. I don't know that we will ever fully fill your role because of the great service you've provided. Tell us a little bit about what serving ACEP and our membership has meant to you.**

**LG:** When I started with ACEP, there were 17,000 members. We used fax machines to send press releases. I didn't even have a personal cellphone yet. Larry Bedard was president; I missed Greg Henry by one year. It's just meant everything for me to be part of ACEP. I love what emergency physicians do, and it's been my privilege and honor to serve this organization for more than 20 years.

**KK: Well, that's very, very humble of you. Your service has been outstanding.**

**You just said something that wasn't lost on me—you missed Greg Henry as president by a year. Was that a positive or a negative? Greg did tend, during his presidency, to push the envelope a bit with making sure emergency medicine was represented. Would you have been up for such a challenge?**

**LG:** All kidding aside, he is a strong communicator. There is no one who could put a sound bite together better than Greg Henry. But I do remember being at a Scientific Assembly meeting where an NBC News reporter wanted to cover one of Greg's presentations. I do remember Greg started out by saying something like, "We all have to come to grips with we have to kill Grandma." And I leaned over to the NBC reporter and basically said, "Well, he doesn't necessarily represent ACEP's views on everything." I love Greg Henry. He has always been there whenever we've solicited information from our spokespeople.

**KK: Your job probably was very complicated when you started. I suspect it might be even more complicated now. How has public relations changed in the new age of social media and the advancement of communication tools?**

**LG:** There has, as you know, been a sea change in how you relate to the press, and social media has made it possible for organizations to become the source of news. If we can be nimble and fast enough to get out there with the story, we can be the source of news. Mike, one of my colleagues in my office, has been a TV reporter. He's used to packaging video stories, and now ACEP has that added capability. Twenty years ago, reporters had longer deadlines. You might have until the end of the day. Today, everybody's on deadline within a couple of hours, and if you can't respond within a couple of hours, you won't be included in the story.

I'm proud that ACEP has evolved into a nimble organization. Our spokespeople understand that; they are responsive. I think ACEP is probably one of the more nimble organizations out there, especially in medical specialty organizations.

**KK: What were some of the PR successes the College has had?**

**LG:** Going back many years, one of the most remarkable experiences I've ever had was after September 11, when the organization decided to move ahead and still hold the scientific assembly in Chicago. In PR, sometimes you really have to be positioned properly for breaking news situations, and of course, the whole country was focused on anthrax and on September 11. Fortuitously, *Annals of Emergency Medicine* published a study about anthrax, which we ended up parlaying into letting all the press know that we had disaster preparedness and anthrax experts at the meeting. Kevin, the press descended upon our convention.

Michael Carius was president, and Kristi Koenig was there. Bless her heart; she did interview after interview. We had 10 cameras lined up outside our press office. We were on "Good Day Chicago," and ABC's "20/20" came to interview Mike Carius. It was one of the most remarkable experiences I've ever had as a PR person.

Although not as dramatic as September 11, covering ebola was incredible in the sense that the press showed up and we were doing live interviews from Fox Business News right on the convention floor. Sometimes it's just a matter of taking advantage of breaking news situations.

**KK: Being able to position the organization well with the cards you've been dealt, along with appropriate timing, is a skill set that you and your team have. You've created some mic-drop moments for the College, and we definitely appreciate that. Now a more difficult question: Nobody's perfect, and ACEP can't be perfect every time. Do you recall a circumstance when there was a challenging topic for ACEP and it didn't go as well as you would've liked?**

**LG:** Well, it was a very tense moment for me when we did the first Report Card on Emergency Medicine. Dean Wilkerson was new, and we were under pressure to really make this resonate across America. We did 50 state press releases with talking points, working with all of the state chapters. While we were writing, we discovered a data error, but we had already gone out to reporters and presented them the data because you have to work way in advance of a big release. Now we realized we may need to recheck the whole thing.

We all agreed to step back, and without losing any credibility, we needed to tell these reporters. I ended up just being honest with them, saying that we found a data error. We were checking everything, and it all worked out fine. I will give you one that didn't work, too. The report card was very successful, but that was one of the more tense moments of my life.

We did have a situation that I recall in New York, I believe. We were at a convention center. We did a tele-news conference, but there was no sound! We had a silent news conference broadcasting to the world. I'm standing there, and our spokespeople were there. The press was in the room. We ended up giving everybody who was online the archived tele-news conference. It's hard to put a positive spin on a silent news conference.

**KK: In your years with ACEP, with the specialty and through your critical contributions, is there one thing you think was paramount to your experience with ACEP?**

ACEP

ABOVE: Ms. Gore in her office.

LEFT: Ms. Gore with "ER" cast member Maura Tierney in the U.S. Capitol during Rally at the Capitol.

**LG:** Well, that's hard. There are so many different moments, but I do remember the Rally at the Capitol in 2005.

Arthur Kellermann called it "the Woodstock of emergency medicine," which I loved. It was a crazy time; it was very difficult. After the rally, we were going into the Capitol, accepting an award on behalf of the TV show "ER." I was up on the stage, and the photographer said to me, "Can you have everybody move to the left?" I remember going to the microphone and choreographing a move of emergency physicians I was devoted to serving. It was a thrilling moment to see all those faces, all those white coats, gathered for this important event. The Rally at the Capitol was an exciting moment for me.

**KK: You and your staff do such a good job at representing all of us, and rarely do you get enough recognition. Thank you very much, Laura, for all of your support and dedication.**

**LG:** It really is a partnership with emergency physicians, and over the years we've built a network of spokespeople, 600 media-trained emergency physicians in media markets across the United States. That has been a strength for ACEP. It really is valuable, and the reporters want to hear from our doctors.

**KK: Well, that's another great accomplishment for you and your team that will be continued for generations of emergency physicians, and that's part of your legacy. Thank you again for all of your hard work and all of your support for ACEP and for the specialty of emergency medicine.**

**LG:** Thank you so much. I appreciate it, Kevin.

# DIAGNOSIS *and* MANAGEMENT *of* PEDIATRIC MILD TBI

## WHAT EMERGENCY PHYSICIANS NEED TO KNOW ABOUT THE NEW CDC GUIDELINE

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The CDC pediatric mTBI guideline includes 19 sets of recommendations on the diagnosis, prognosis, and management/treatment of pediatric mTBI that were assigned a level of obligation (ie, must, should, or may) based on confidence in the evidence.

*by* MADELINE M. JOSEPH, MD, FAAP, FACEP; ANGELA LUMBA-BROWN, MD; KEITH OWEN YEATES, PHD; AND DAVID W. WRIGHT, MD

Mild traumatic brain injury (mTBI) in children is a rapidly growing public health concern that impacts the emergency physician's daily practice. The number of emergency department visits for mTBI has been on the rise over the past decade. In 2007, there were 461,000 emergency department visits for TBI among children 14 years and younger; in 2013, that number was up to 642,000.[1,2]

Although the terms "concussion," "minor head injury," and "mTBI" often are used interchangeably, they have different connotations and could lead to misinterpretation if not used correctly. Therefore, the Centers for Disease Control and Prevention (CDC) guideline recommends the clinical use of the single term "mild traumatic brain injury." The recently published CDC pediatric mTBI guideline identifies the best practices based on the current evidence for health care professionals in various settings, including the emergency department.[3-4] The guideline was developed through a rigorous process guided by the American Academy of Neurology and 2010 National Academy of Sciences methodologies. An extensive review of scientific literature, spanning 25 years of research, formed the basis of the guideline. Importantly, research pertaining to the assessment and management of mTBI in children is rapidly evolving and advancing, and guidelines should be revised periodically to reflect new evidence.

The CDC pediatric mTBI guideline includes 19 sets of recommendations on the diagnosis, prognosis, and management/treatment of pediatric mTBI that were assigned a level of obligation (ie, must, should, or may) based on confidence in the evidence. Recommendations address imaging, symptom scales, cognitive testing, and standardized assessment for diagnosis; history and risk factor assessment, monitoring, and counseling for prognosis; and patient/family education, rest, support, return to school, and symptom management for treatment. The vast majority of these recommendations are very useful for emergency physicians as they are the frontline providers to care for most children with mTBI in the emergency department.

### Recommendations and Tools

Routine neuroimaging in the acute care setting is not recommended for mTBI in children. CT imaging should be considered when there is a suspicion of more severe forms of TBI supported by validated clinical decision instruments that evaluate a variety of risk factors (eg, Pediatric Emergency Care Applied Research Network [PECARN] head CT rules).[5] The CDC has developed guideline implementation tools, such as postconcussion symptom rating scales for emergency physicians to document their patients' presenting symptoms. These tools assist emergency physicians in making the accurate diagnosis of concussion and contribute to prognostic counseling of children and their families; they are available at www.cdc.gov/traumaticbraininjury/PediatricmTBIGuideline.html. In addition, based on best evidence, the guideline identifies premorbid history and other risk factors for prolonged recovery that can be easily assessed in the acute care setting. These include older children/adolescents, Hispanic ethnicity, lower socioeconomic status, severe presentation of mTBI including intracranial hemorrhage, and higher levels of postconcussive symptoms. The guideline also emphasizes the unique recovery trajectory for individual patients.

In addition, the guideline provides recommendations on return to cognitive and physical activity. The guideline provides specific recommendations for emergency department counseling, including the use of discharge instructions for return to activity. The guide will allow patients and families to better implement

**CONTINUED** *on page 23*


# Emergency and Critical Care Skills Lab

**Tampa, FL**
**March 5-7, 2019**

**Additional Airway Training Available**

*+ 8.5 Hours of Free CME*

**Registration Fee- Skills Lab March 6-7: $1995.00**
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Create or log into your account on http://www.ceme.org/ to register.
**Target Audience:** Emergency Medicine, Hospitalist & Critical Care physicians

**A full day of procedural instruction / practice in the cadaver lab, a full day ultrasound and an optional half day of airway instruction / practice. Each participant will demonstrate proficiency in each of the following procedures:**

## Cadaver Lab – 7.0 hours of CME

- Endotracheal intubation
- Surgical airway management
- Needle thoracostomy
- Chest tube thoracostomy
- Central venous access
- Lumbar puncture
- Arthrocentesis
- Intra-osseous cannulation
- Wound care: I & D abscesses, suture repair
- Peripheral nerve blocks (facial, rib, wrist, ankle, femoral)

## Non-Cadaver Lab - 7.0 hours of CME

- Ultrasound Techniques, including vascular access, peripheral nerve blocks, and FAST exams for physicians – taught by EMsono
- EZ-IO demonstration station

## Airway Lab – Optional – 4.0 hours of CME

- Airway station with manikin intubation using adult and pediatric models (including King Vision, LMA, Combitube, SALT and others as available)

## *Testimonials*

*"Amazing course. Top to bottom, all teachers were fantastic! This course will enhance my patient care."*

*"This Continuing Education class was the best I have been to so far. I really enjoyed it and feel like I have gained knowledge and skills to feel more competent."*

## Prerequisite – 8.5 hours of CME

Participants must successfully complete 10 on-line EM Skills and Procedures modules as prerequisites for attending the lab. You will be awarded a total of 8.5 CME credits upon completion.

**CME:** The Center for Emergency Medical Education (CEME) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

*The Center for Emergency Medical Education (CEME) designates this live activity for a maximum of **26.5 AMA PRA Category 1 Credits™.** Physicians should claim only the credit commensurate with the extent of their participation in the activity.*

# SEPSIS THEN & NOW: PART 2

ILLUSTRATION: CHRIS WHISSEN PHOTOS: SHUTTERSTOCK.COM

## A BRIEF LOOK AT TREATING SEPSIS OVER THE YEARS

*by* TIFFANY M. OSBORN, MD, MPH

*Part 1 of the history of sepsis appeared in the November issue.*

### ED-CENTRIC TREATMENT

Prior to 2000, there was no universal sense of urgency for treating septic patients. Care was generally fractured, with little collaboration among the pre-hospital service, emergency department, intensive care unit, and wards. Universal use of ultrasound in emergency departments or intensive care units (ICUs) was nonexistent during this period, although global myocardial dysfunction from sepsis was an emerging concept.

In 2001, Rivers et al reported results of a new protocolized resuscitation termed ear-

ly goal-directed therapy (EGDT).[1] EGDT was described as a structured treatment protocol that incorporated elements consistent with the 1992 consensus guidelines focusing on preload, afterload, contractility, and oxygen delivery.[2] The absolute mortality benefit of 16 percent (46.5 to 30.5 percent) represented one of the most effective modalities to date. Over the ensuing 12 years, multiple observational studies supported a mortality benefit of varying degrees.[3] EGDT was included in the first three iterations of the Surviving Sepsis Campaign (SSC) guidelines and was a central component of emergency medicine–specific guidelines.[4]

Between 2013 and 2015, three international trials found no mortality difference between EGDT and usual care, with usual care including early identification, early lactate measurement, early antibiotic administration (median: 1–3 hours from identification), and early fluid administration (median: 2–3 L).[5,7] In pinpointing reasonable causes for the mortality differences between the Rivers trial and these three international trials that showed no dfference, Nguyen et al identified evolving practice over the ensuing 15 years, the baseline central venous oxygen saturation (ScvO2) >70 percent in all three trials, and the potential of a subset of this patient population who could benefit from normalizing an abnormally low ScvO2.[8]

It is interesting that four randomized, controlled trials encompassing defining points of two decades are scientifically in opposition but philosophically in alignment. They all required the breakdown of long-held barriers and promoting intentional collaboration across levels of care, locations of care, and service lines.

> "The reality is that patients presenting with sepsis are admitted to the intensive care unit via the emergency department, general medical or surgical floors, operating rooms, and inter-hospital transport managed by a broad spectrum of specialties and care providers. As patients travel this landscape, current evidence suggests that the diagnostic and therapeutic expertise provided at each venue significantly impacts morbidity and mortality."
>
> —*Emanuel Rivers*

## ANTIBIOTICS

Although the 2018 SSC bundle recommends antibiotics within one hour of emergency department triage, this has not been adopted by the Centers for Medicare and Medicaid Services (CMS), and there are limited supportive data.

A recent study reported an 8 percent increased progression to septic shock from severe sepsis for every hour antibiotics were delayed from triage.[9] The potential to mitigate disease progression through early intervention is a core emergency medicine principle. However, prior to operationalization, the difference between retrospective sepsis database evaluations and clinical implementation should be considered. Observational and retrospective evaluation of prospectively collected data support early antibiotic administration impact as life-saving in septic shock patients.

However, benefit is less clear in less acutely ill patients. In the New York study, there was an hourly mortality benefit for treatment after diagnosis for septic shock. However, for severe sepsis, the confidence initiated with one, making the association with an hourly mortality benefit less clear.

In a recent randomized, controlled trial of approximately 2,700 patients, antibiotics were administered by EMS prior to emergency department arrival in 1,548. The difference in median time to antibiotics was approximately 96 minutes, resulting in no mortality difference between early EMS-administered antibiotics and usual care where antibiotics were administered after assessment in the ED.[10]

Attempts to meet a one-hour timeline in undifferentiated patients will result in antibiotics administration to patients who ultimately did not require them. The unanswered question is, would one or two doses of unnecessary antibiotics be harmful? That risk must be quantified and compared to the risk of antibiotics being potentially delayed in those who do need them while determining bacterial infection.

Current data are imperfect. One retrospective evaluation of gram-negative severe sepsis or septic shock found those who previously received antibiotics within 90 days of admission had an increased length of stay, increased mortality, and increased cost.[11]

At this time, adherence with the CMS measure of antibiotic administration within three hours from diagnosis of severe sepsis and septic shock is reasonable. An optimal goal of initiating antibiotics within one hour of septic shock diagnosis is also reasonable as the majority of data on time to antibiotics and benefit is are septic shock patients.

**CONTINUED** *on page 28*

# 2019 Physician Fee Schedule Summarized

## CMS EMERGENCY DEPARTMENT CODING AND REIMBURSEMENT UPDATE

*by* MICHAEL A. GRANOVSKY, MD, FACEP, CPC; AND DAVID A. MCKENZIE, CAE

The 2019 Medicare Physician Fee Schedule was released Nov. 1, 2018, with generally good news for emergency medicine. As anticipated, there were minimal changes to the emergency department evaluation and management (E/M) codes, critical care, and observation service values for 2019. Table 94 of the Final Rule lists the estimated impact by specialty based on changes to the work, practice expense, and professional liability insurance relative value units (RVUs) for 2019. Many of the specialties listed, including emergency medicine, had an estimated change of 0 percent in overall revenue. There were few winners, such as podiatry with a 2 percent increase. The losers in 2019 are extensive, including diagnostic testing facilities with a 5 percent decrease, as well as independent laboratory, pathology, nuclear medicine, optometry, and infectious disease with 1 percent decreases. Many of the specialties receiving decreases have had their revenues go down several years in a row, while emergency medicine has been stable or slightly up.

### Emergency Medicine RVUs Stable

The 2018 Physician Final Rule highlighted concerns that emergency department E/M services may be undervalued. As a result, ACEP undertook a vigorous survey process related to the emergency department E/M codes (99281–99285) that make up 83 percent of our RVUs. The survey results were robust and presented for valuation by the Relative Value Scale Update Committee (RUC). Although the RUC's deliberations remain confidential, we are able to share that the ACEP RUC advisers presented compelling arguments demonstrating the increase in the acuity of our patients, and the Centers for Medicare & Medicaid Services (CMS) will consider the RUC's recommendations as part of the 2020 Medicare Physician Fee Schedule (see "What's in the 2019 Medicare Physician Fee Schedule Proposed Rule?" September 2018). The updated RVUs, based on the recent survey and presentation, will likely be published for use in 2020. For 2019, in the interim, the emergency department RVUs for 99281–99285 remain exactly the same as last year (see Table 1). Only critical care will change for 2019 with a very small decrease at the hundredth of an RVU level.

### Conversion Factor (Medicare Payment Per RVU) Increases

The Bipartisan Budget Act of 2018 mandated a 0.25 percent increase to the conversion factor for 2019. A negative budget adjustment factor of −0.14 percent impacted the 2019 conversion factor to offset overall increases in RVUs relative to 2018. The net impact is an increase of about $0.04 to the 2019 conversion factor, as shown in Table 92 from the Final Rule, with a published conversion factor of $36.0391 (see Table 2).

**Table 1: 2018 and 2019 Emergency Medicine RVUs**

| CODE | 2018 WORK | 2019 WORK | 2018 PE | 2019 PE | 2018 PLI | 2019 PLI | 2018 TOTAL RVUS | 2019 TOTAL RVUS |
|---|---|---|---|---|---|---|---|---|
| **99281** | 0.45 | 0.45 | 0.11 | 0.11 | 0.04 | 0.04 | 0.60 | 0.60 |
| **99282** | 0.88 | 0.88 | 0.21 | 0.21 | 0.08 | 0.08 | 1.17 | 1.17 |
| **99283** | 1.34 | 1.34 | 0.29 | 0.29 | 0.12 | 0.12 | 1.75 | 1.75 |
| **99284** | 2.56 | 2.56 | 0.53 | 0.53 | 0.23 | 0.23 | 3.32 | 3.32 |
| **99285** | 3.80 | 3.80 | 0.75 | 0.74 | 0.34 | 0.35 | 4.89 | 4.89 |
| **99291** | 4.50 | 4.50 | 1.42 | 1.39 | 0.38 | 0.39 | 6.30 | 6.28 |

RVU=relative value unit; PE=practice expense; PLI=professional liability insurance

**Figure 1: CMS Payment Per RVU**

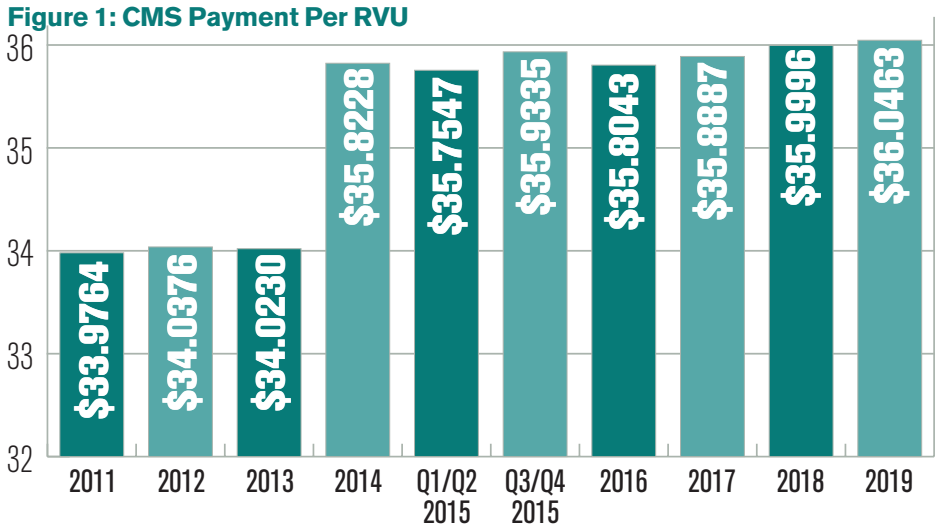



**Table 2: Calculation of the Proposed CY 2019 Physician Fee Schedule Conversion Factor**

| | |
|---|---|
| CY 2018 Conversion Factor | 35.9996 |
| Statutory Update Factor | 0.25 percent (1.0025) |
| CY 2019 RVU Budget Neutrality Adjustment | −0.14 percent (0.9986) |
| **CY 2019 Conversion Factor** | **36.0391** |

The small increase for 2019 is consistent with the trend of the final conversion factor value sticking to a fairly tight range, though it has been some time since we have broken through the $36 mark (see Figure 1).

### Documentation Guideline Reform Not for ED Codes

CMS has expressed a desire to move away from the "bean counting" history and exam requirements of the 1995 documentation guidelines and place a greater emphasis on documented time and medical decision making, a position that has been well supported by the provider community:

> ***"Stakeholders have long maintained that all of the E/M documentation guidelines are administratively burdensome and outdated with respect to the practice of medicine. Stakeholders have told CMS that they believe the guidelines are too complex, ambiguous, fail to meaningfully distinguish differences among code levels, and are not updated for changes in technology, especially electronic health record (EHR) use."***
>
> *—2019 Medicare Physician Fee Schedule Final Rule*

CMS has opted for a measured approach to updating the documentation guidelines. While there will be no changes to the emergency department code documentation requirements, the office visit codes will undergo a major restructuring in two years (2021). For 2019 and 2020, CMS will continue the existing documentation requirements. Starting in 2021, CMS will create a single code for new and established E/M office/outpatient visit levels 2 through 4 and keep level 5 separate.

### Teaching Physician Documentation Guidelines Updated

CMS has worked to decrease the potential for duplicative documentation in academic medical settings.

> ***"The purpose of these revisions to the regulations is to eliminate potentially duplicative requirements for notations that may have previously been included in the medical records by residents or other members of the medical team. The teaching physician continues to be responsible for reviewing and verifying the accuracy of notations previously included by residents and members of the medical team, along with further documenting the medical record if the notations previously provided did not accurately demonstrate the teaching physician's involvement in an E/M service."***
>
> *—2019 Medicare Physician Fee Schedule Final Rule*

However, unlike prior Teaching Physician guidance (Medicare Transmittal 1780 and 811), which provided examples of acceptable and unacceptable documentation, the 2019 Physician Final Rule does not provide such examples. Absent specific examples, ACEP will be asking CMS for further clarity.

### Telemedicine is Gaining Acceptance in 2019, But Not Yet for ED Use

In an effort to expand the use of telehealth in Medicare, CMS will begin to pay separately for two newly defined physician services furnished using communication technology:

1. **Brief Communication Technology-Based Service:** This service will cover a "virtual check-in" by a patient via telephone or other telecommunications device to decidewhether an office visit or other service is needed.
2. **Remote Evaluation of Recorded Video and/or Images Submitted by the Patient:** This service will allow practitioners to be separately paid for reviewing a patient-transmitted photo or video information (such as by text message) to assess whether a visit is needed.

However, each of these codes are intended for use only with established patients, which will limit their use in the typical emergency department setting.

### Combatting the Opioid Crisis

Importantly, beginning in July 2019, a patient's home will be eligible to be the originating site for telehealth services for opioid and substance abuse disorder treatment or co-occurring mental health disorders, which could help reduce the opioid crisis and related emergency department visits.

### Few CPT Changes for Emergency Medicine in 2019

There were no significant changes in the E/M code section of CPT and just the usual updating of the vaccine codes in the medicine section relating to tweaks of the composition or

**CONTINUED** *on page 33*

...Patient seems confused...soot around mouth...

# YOU SUSPECT YOUR PATIENT HAS CYANIDE POISONING.* TIME MAY BE RUNNING OUT.[1]



## Suspect it? Treat with CYANOKIT.

CYANOKIT is approved for the treatment of known or suspected cyanide poisoning. If clinical suspicion of cyanide poisoning is high, administer CYANOKIT without delay.[1]

**For more information, visit CYANOKIT.com.**

CYANOKIT® (hydroxocobalamin for injection)

*Prior to administration of CYANOKIT, smoke inhalation victims should be assessed for exposure to fire or smoke in an enclosed area; presence of soot around the mouth, nose, or oropharynx; or altered mental status.[1]

## IMPORTANT SAFETY INFORMATION

Cyanide poisoning may result from inhalation, ingestion, or dermal exposure. Prior to administration of CYANOKIT, smoke-inhalation victims should be assessed for: exposure to fire or smoke in an enclosed area; presence of soot around the mouth, nose, or oropharynx, and altered mental status. In addition to CYANOKIT, treatment of cyanide poisoning must include immediate attention to airway patency, adequacy of oxygenation and hydration, cardiovascular support, and management of any seizure activity.

Use caution in the management of patients with known anaphylactic reactions to hydroxocobalamin or cyanocobalamin. Consideration should be given to use of alternative therapies, if available. Allergic reactions may include: anaphylaxis, chest tightness, edema, urticaria, pruritus, dyspnea, and rash. Allergic reactions including angioneurotic edema have also been reported in postmarketing experience.

Acute renal failure with acute tubular necrosis, renal impairment and urine calcium oxalate crystals have been reported following CYANOKIT therapy. Monitor renal function for 7 days following CYANOKIT therapy.

Substantial increases in blood pressure may occur following CYANOKIT therapy. Elevations in blood pressure (≥180 mmHg systolic or ≥110 mmHg diastolic) were observed in approximately 18% of healthy subjects receiving hydroxocobalamin 5 g and 28% of subjects receiving 10 g.

Usage may interfere with some clinical laboratory evaluations. Also, because of its deep red color, hydroxocobalamin may cause hemodialysis machines to shut down due to an erroneous detection of a “blood leak.” This should be considered before hemodialysis is initiated in patients treated with hydroxocobalamin. Due to potential photosensitivity, patients should avoid direct sun until erythema resolves.

There are no adequate and well-controlled studies of CYANOKIT in pregnant women. CYANOKIT should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Safety and effectiveness of CYANOKIT have not been established in pediatric patients.

The most common adverse reactions (>5%) included transient chromaturia, erythema, oxalate crystals in urine, rash (predominantly acneiform), increased blood pressure, nausea, headache, decreased lymphocyte percentage, and injection site reactions.

Please see Brief Summary of Prescribing Information on adjacent pages.

You are encouraged to report negative side effects of prescription drugs to the US Food and Drug Administration (FDA). Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

**Reference: 1.** CYANOKIT (single 5-g vial) [package insert]. Columbia, MD: Meridian Medical Technologies, Inc.; 2017.



MERIDIAN MEDICAL TECHNOLOGIES
A Pfizer Company

**CYANOKIT®**
*(hydroxocobalamin for injection)*

**BRIEF SUMMARY:**

**Consult full Prescribing Information for complete product information**

**Use with Other Cyanide Antidotes**
Caution should be exercised when administering other cyanide antidotes simultaneously with Cyanokit, as the safety of co-administration has not been established. If a decision is made to administer another cyanide antidote with Cyanokit, these drugs should not be administered concurrently in the same intravenous line.

**Incompatibility Information**
Physical incompatibility (particle formation) and chemical incompatibility were observed with the mixture of hydroxocobalamin in solution with selected drugs that are frequently used in resuscitation efforts. Hydroxocobalamin is also chemically incompatible with sodium thiosulfate and sodium nitrite and has been reported to be incompatible with ascorbic acid. Therefore, these and other drugs should not be administered simultaneously through the same intravenous line as hydroxocobalamin.

Simultaneous administration of hydroxocobalamin and blood products (whole blood, packed red cells, platelet concentrate and/or fresh frozen plasma) through the same intravenous line is not recommended. However, blood products and hydroxocobalamin can be administered simultaneously using separate intravenous lines (preferably on contralateral extremities, if peripheral lines are being used).

**WARNINGS AND PRECAUTIONS**
**Emergency Patient Management**
In addition to Cyanokit, treatment of cyanide poisoning must include immediate attention to airway patency, adequacy of oxygenation and hydration, cardiovascular support, and management of any seizure activity. Consideration should be given to decontamination measures based on the route of exposure.

**Allergic Reactions**
Use caution in the management of patients with known anaphylactic reactions to hydroxocobalamin or cyanocobalamin. Consideration should be given to use of alternative therapies, if available.

Allergic reactions may include: anaphylaxis, chest tightness, edema, urticaria, pruritus, dyspnea, and rash.

Allergic reactions including angioneurotic edema have also been reported in postmarketing experience.

**Renal Disorders**
Cases of acute renal failure with acute tubular necrosis, renal impairment and urine calcium oxalate crystals have been reported. In some situations, hemodialysis was required to achieve recovery. Regular monitoring of renal function, including but not limited to blood urea nitrogen (BUN) and serum creatinine, should be performed for 7 days following Cyanokit therapy.

**Blood Pressure Increase**

Many patients with cyanide poisoning will be hypotensive; however, elevations in blood pressure have also been observed in known or suspected cyanide poisoning victims.

Elevations in blood pressure (180 mmHg or greater systolic or 110 mmHg or greater diastolic) were observed in approximately 18% of healthy subjects (not exposed to cyanide) receiving hydroxocobalamin 5 g and 28% of subjects receiving 10 g. Increases in blood pressure were noted shortly after the infusions were started; the maximal increase in blood pressure was observed toward the end of the infusion. These elevations were generally transient and returned to baseline levels within 4 hours of dosing.

**Use of Blood Cyanide Assay**
While determination of blood cyanide concentration is not required for management of cyanide poisoning and should not delay treatment with Cyanokit, collecting a pretreatment blood sample may be useful for documenting cyanide poisoning as sampling post-Cyanokit use may be inaccurate.

**Interference with Clinical Laboratory Evaluations and Clinical Methods**
**Clinical Laboratory Evaluations**
Because of its deep red color, hydroxocobalamin has been found to interfere with colorimetric determination of certain laboratory parameters (e.g., clinical chemistry, hematology, coagulation, and urine parameters). *In-vitro* tests indicated that the extent and duration of the interference are dependent on numerous factors such as the dose of hydroxocobalamin, analyte, methodology, analyzer, hydroxocobalamin concentration, and partially on the time between sampling and measurement.

Based on *in-vitro* studies and pharmacokinetic data obtained in healthy volunteers, the following table (Table 2) describes laboratory interference that may be observed following a 5 g dose of hydroxocobalamin. Interference following a 10 g dose can be expected to last up to an additional 24 hours. The extent and duration of interference in cyanide-poisoned patients may differ. Results may vary substantially from one analyzer to another; therefore, caution should be used when reporting and interpreting laboratory results.

**Table 2: Laboratory Interference Observed with *In-Vitro* Samples of Hydroxocobalamin**

| LABORATORY PARAMETER | | | |
|---|---|---|---|
| **Clinical Chemistry** | **Hematology** | **Coagulation** | **Urinalysis** |
| **No Interference Observed** | | | |
| Calcium<br>Sodium<br>Potassium<br>Chloride<br>Urea<br>GGT | Erythrocytes<br>Hematocrit<br>MCV<br>Leukocytes<br>Lymphocytes<br>Monocytes<br>Eosinophils<br>Neutrophils<br>Platelets | | |
| **Artificially Increased*** | | | |
| Creatinine<br>Bilirubin<br>Triglycerides<br>Cholesterol<br>Total protein<br>Glucose<br>Albumin<br>Alkaline phosphatase | Hemoglobin<br>MCH<br>MCHC<br>Basophils | | pH (with all doses)<br>Glucose<br>Protein<br>Erythrocytes<br>Leukocytes<br>Ketones<br>Bilirubin<br>Urobilinogen<br>Nitrite |
| **Artificially Decreased*** | | | |
| ALT<br>Amylase | | | pH (with equivalent doses of <5 g) |
| **Unpredictable** | | | |
| Phosphate<br>Uric Acid<br>AST<br>CK<br>CKMB<br>LDH | | aPTT<br>PT (Quick or INR) | |
| **Duration of Interference** | | | |
| 24 hours with the exception of bilirubin (up to 4 days) | 12-16 hours | 24-48 hours | 48 hours up to 8 days; color changes may persist up to 28 days |

*10% or greater interference observed on at least 1 analyzer

Analyzers used: ACL Futura (Instrumentation Laboratory), AxSYM®/Architect™ (Abbott), BM Coasys[110] (Boehringer Mannheim), CellDyn 3700® (Abbott), Clinitek® 500 (Bayer), Cobas Integra® 700, 400 (Roche), Gen-S Coultronics, Hitachi 917, STA® Compact, Vitros® 950 (Ortho Diagnostics)

**Clinical Methods**
Because of its deep red color, hydroxocobalamin may cause hemodialysis machines to shut down due to an erroneous detection of a “blood leak.” This should be considered before hemodialysis is initiated in patients treated with hydroxocobalamin.

**Photosensitivity**
Hydroxocobalamin absorbs visible light in the UV spectrum. It therefore has potential to cause photosensitivity. While it is not known if the skin redness predisposes to photosensitivity, patients should be advised to avoid direct sun while their skin remains discolored.

**ADVERSE REACTIONS**
Serious adverse reactions with hydroxocobalamin include allergic reactions, renal disorders and increases in blood pressure.

**Clinical Studies Experience**
Because clinical trials were conducted under widely varying conditions, adverse reaction rates observed in the clinical trials may not reflect the rates observed in practice.

**Experience in Healthy Subjects**
A double-blind, randomized, placebo-controlled, single-ascending-dose (2.5, 5, 7.5, and 10 g) study was conducted to assess the safety, tolerability, and pharmacokinetics of hydroxocobalamin in 136 healthy adult subjects. Because of the dark red color of hydroxocobalamin, the two most frequently occurring adverse reactions were chromaturia (red-colored urine) which was reported in all subjects receiving a 5 g dose or greater; and erythema (skin redness), which occurred in most subjects receiving a 5 g dose or greater. Adverse reactions reported in at least 5% of the 5 g dose group and corresponding rates in the 10 g and placebo groups are shown in Table 3.

**Table 3: Incidence of Adverse Reactions Occurring in >5% of Subjects in 5 g Dose Group and Corresponding Incidence in 10 g Dose Group and Placebo**

| | **5 g Dose Group** | | **10 g Dose Group** | |
|---|---|---|---|---|
| **ADR** | **Hydroxocobalamin N=66 n (%)** | **Placebo N=22 n (%)** | **Hydroxocobalamin N=18 n (%)** | **Placebo N=6 n (%)** |
| Chromaturia (red colored urine) | 66 (100) | 0 | 18 (100) | 0 |
| Erythema | 62 (94) | 0 | 18 (100) | 0 |
| Oxalate crystals in urine | 40 (61) | 1 (4) | 10 (56) | 0 |
| Rash* | 13 (20) | 0 | 8 (44) | 0 |
| Blood pressure increased | 12 (18) | 0 | 5 (28) | 0 |
| Nausea | 4 (6) | 1 (5) | 2 (11) | 0 |
| Headache | 4 (6) | 1 (5) | 6 (33) | 0 |
| Lymphocyte percent decreased | 5 (8) | 0 | 3 (17) | 0 |
| Infusion site reaction | 4 (6) | 0 | 7 (39) | 0 |

*Rashes were predominantly acneiform

In this study, the following adverse reactions were reported to have occurred in a dose-dependent fashion and with greater frequency than observed in placebo-treated cohorts: increased blood pressure (particularly diastolic blood pressure), rash, nausea, headache and infusion site reactions. All were mild to moderate in severity and resolved spontaneously when the infusion was terminated or with standard supportive therapies.

Other adverse reactions reported in this study and considered clinically relevant were:

- *Eye disorders:* swelling, irritation, redness
- *Gastrointestinal disorders:* dysphagia, abdominal discomfort, vomiting, diarrhea, dyspepsia, hematochezia
- *General disorders and administration site conditions:* peripheral edema, chest discomfort
- *Immune system disorders:* allergic reaction
- *Nervous system disorders:* memory impairment, dizziness
- *Psychiatric disorders:* restlessness
- *Respiratory, thoracic and mediastinal disorders:* dyspnea, throat tightness, dry throat
- *Skin and subcutaneous tissue disorders:* urticaria, pruritus
- *Vascular disorders:* hot flush

**Experience in Known or Suspected Cyanide Poisoning Victims**

Four open-label, uncontrolled, clinical studies (one of which was prospective and three of which were retrospective) were conducted in known or suspected cyanide-poisoning victims. A total of 245 patients received hydroxocobalamin treatment in these studies. Systematic collection of adverse events was not done in all of these studies and interpretation of causality is limited due to the lack of a control group and due to circumstances of administration (e.g., use in fire victims). Adverse reactions reported in these studies listed by system organ class included:

- *Cardiac disorders:* ventricular extrasystoles
- *Investigations:* electrocardiogram repolarization abnormality, heart rate increased
- *Respiratory, thoracic, and mediastinal disorders:* pleural effusion

Adverse reactions common to both the studies in known or suspected cyanide poisoning victims and the study in healthy volunteers are listed in the healthy volunteer section only and are not duplicated in this list.

**Postapproval Experience**

The following adverse reactions have been identified during postapproval use of Cyanokit. Because adverse reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency.

Cases of acute renal failure with acute tubular necrosis, renal impairment and urine calcium oxalate crystals have been reported in patients treated with Cyanokit.

**DRUG INTERACTIONS**

No formal drug interaction studies have been conducted with Cyanokit.

**USE IN SPECIFIC POPULATIONS**

**Pregnancy**

Pregnancy Category C. There are no adequate and well controlled studies of Cyanokit in pregnant women. In animal studies, hydroxocobalamin caused skeletal and visceral (soft tissue) abnormalities at exposures (based on AUC) similar to human exposures at the therapeutic dose. Cyanokit should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Because cyanide readily crosses the placenta, maternal cyanide poisoning results in fetal cyanide poisoning. Timely treatment of the pregnant mother may be lifesaving for both mother and fetus.

In animal studies, pregnant rats and rabbits received Cyanokit (75, 150, or 300 mg/kg/d) during the period of organogenesis. Following intraperitoneal dosing in rats and intravenous dosing in rabbits, maternal exposures were equivalent to 0.5, 1, or 2 times the human exposure at the therapeutic dose (based on AUC). In the high dose groups for both species, maternal toxicity occurred, and there was a reduced number of live fetuses due to embryofetal resorptions. In addition, decreased live fetal weight occurred in high dose rats, but not in rabbits. Incomplete skeletal ossification occurred in both rats and rabbits. In rats, two fetuses of the high dose group and two fetuses of the mid dose group (each from a different litter) had short, rudimentary or small front or hind legs. Rabbit litters and fetuses exhibited a dose dependent increase in various gross soft tissue and skeletal anomalies. The main findings in rabbits were flexed, rigid flexor or medially rotated forelimbs or hindlimbs and domed heads at external examination; enlarged anterior or posterior fontanelles of the ventricles of the brain and flat, bowed or large ribs at skeletal examination; and dilated ventricles of the brain, and thick wall of the stomach at visceral examination.

**Labor and Delivery**

The effect of Cyanokit on labor and delivery is unknown.

**Nursing Mothers**

It is not known whether hydroxocobalamin is excreted in human milk. Cyanokit may be administered in life-threatening situations, and therefore, breast-feeding is not a contraindication to its use. Because of the unknown potential for adverse reactions in nursing infants, the patient should discontinue nursing after receiving Cyanokit.

**Pediatric Use**

Safety and effectiveness of Cyanokit have not been established in this population. In non-US marketing experience, a dose of 70 mg/kg has been used to treat pediatric patients.

**Geriatric Use**

Approximately 50 known or suspected cyanide poisoning victims aged 65 or older received hydroxocobalamin in clinical studies. In general, the safety and effectiveness of hydroxocobalamin in these patients was similar to that of younger patients. No adjustment of dose is required in elderly patients.

**Renal Impairment**

The safety and effectiveness of Cyanokit have not been studied in patients with renal impairment. Hydroxocobalamin and cyanocobalamin are eliminated unchanged by the kidneys.

**Hepatic Impairment**

The safety and effectiveness of Cyanokit have not been studied in patients with hepatic impairment.

**OVERDOSAGE**

No data are available about overdose with Cyanokit in adults. Should overdose occur, treatment should be directed to the management of symptoms. Hemodialysis may be effective in such a circumstance, but is only indicated in the event of significant hydroxocobalamin-related toxicity. Because of its deep red color, hydroxocobalamin may interfere with the performance of hemodialysis machines.

**NONCLINICAL TOXICOLOGY**

**Carcinogenesis, Mutagenesis, Impairment of Fertility**

Long-term animal studies have not been performed to evaluate the carcinogenic potential of hydroxocobalamin. Hydroxocobalamin was negative in the following mutagenicity assays: *in-vitro* bacterial reverse mutation assay using *Salmonella typhimurium* and *Escherichia coli* strains, an *in-vitro* assay of the tk locus in mouse lymphoma cells, and an *in-vivo* rat micronucleus assay.

The effect of hydroxocobalamin on fertility has not been evaluated.

**PATIENT COUNSELING INFORMATION**

Cyanokit is indicated for cyanide poisoning and in this setting, patients will likely be unresponsive or may have difficulty in comprehending counseling information.

**Erythema and Chromaturia**

Patients should be advised that skin redness may last up to 2 weeks and urine coloration may last for up to 5 weeks after administration of Cyanokit. While it is not known if the skin redness predisposes to photosensitivity, patients should be advised to avoid direct sun while their skin remains discolored.

**Rash**

In some patients, an acneiform rash may appear anywhere from 7 to 28 days following hydroxocobalamin treatment. This rash will usually resolve without treatment within a few weeks.

**Renal Disorders**

Patients should be advised that renal function will be monitored for 7 days following treatment with Cyanokit or, in the event of renal impairment, until renal function returns to normal.

**Pregnancy and Breast-feeding**

Patients should be advised that maternal cyanide poisoning results in fetal cyanide poisoning. Treatment for cyanide poisoning may be lifesaving for both mother and fetus. Patients should notify their physician if they were pregnant during therapy with Cyanokit. It is not known whether hydroxocobalamin is excreted in human milk.

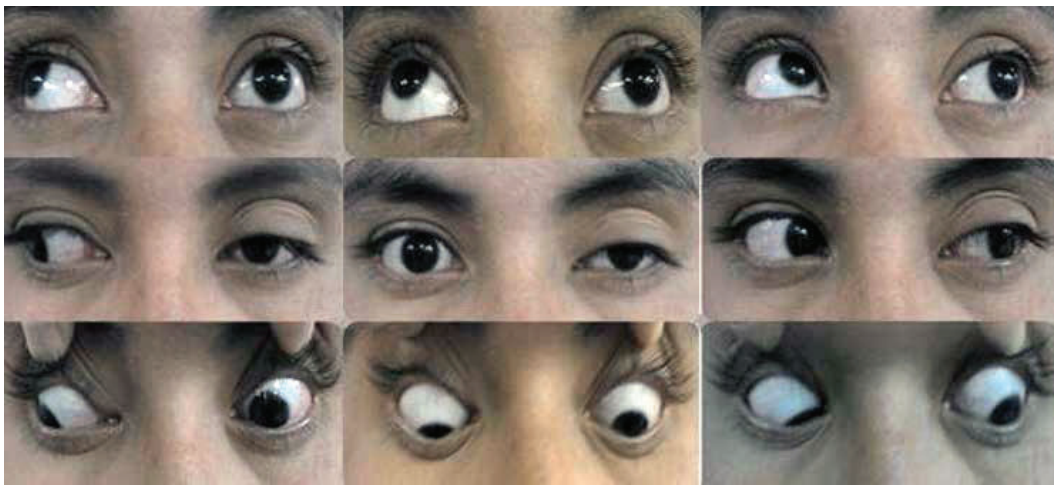
This brief summary is based on CYANOKIT® (hydroxocobalamin for injection) Prescribing Information Version 180_US_20171_NO, Issued: June 2017. For current package insert and further product information, please visit www.cyanokit.com or call Pfizer Medical Information toll-free at 1-800-438-1985.



PP-CYA-USA-0053 Printed in USA/November 2017

# Painful Diplopia

## One in a million diagnosis—don't miss yours



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An example of a neuro-ophthalmologic examination in a patient with Tolosa-Hunt syndrome, prior to treatment. Note the left palpebral ptosis, exotropia of the primary look of the left eye, and paresis of the third, fourth, and sixth left cranial nerves.

*by* ETHAN STERK, DO, FACEP

### The Case

A 69-year-old male presents to the emergency department for evaluation of diplopia. Three days prior, he had developed left-sided periorbital and ocular aching pain. He then noticed decreased peripheral vision on the left. The patient denies worsening pain with extraocular muscle movement. He also denies photosensitivity, eye redness, discharge, flashing lights, floaters, or a curtain or veil over his vision. He hasn't experienced headache, temple pain, jaw claudication, or fever, and there are no other neurological symptoms, such as extremity numbness, weakness, or slurred speech. He denies any recent trauma.

On physical examination, he is afebrile, and his vital signs are within normal limits. His ocular exam is notable for the following:

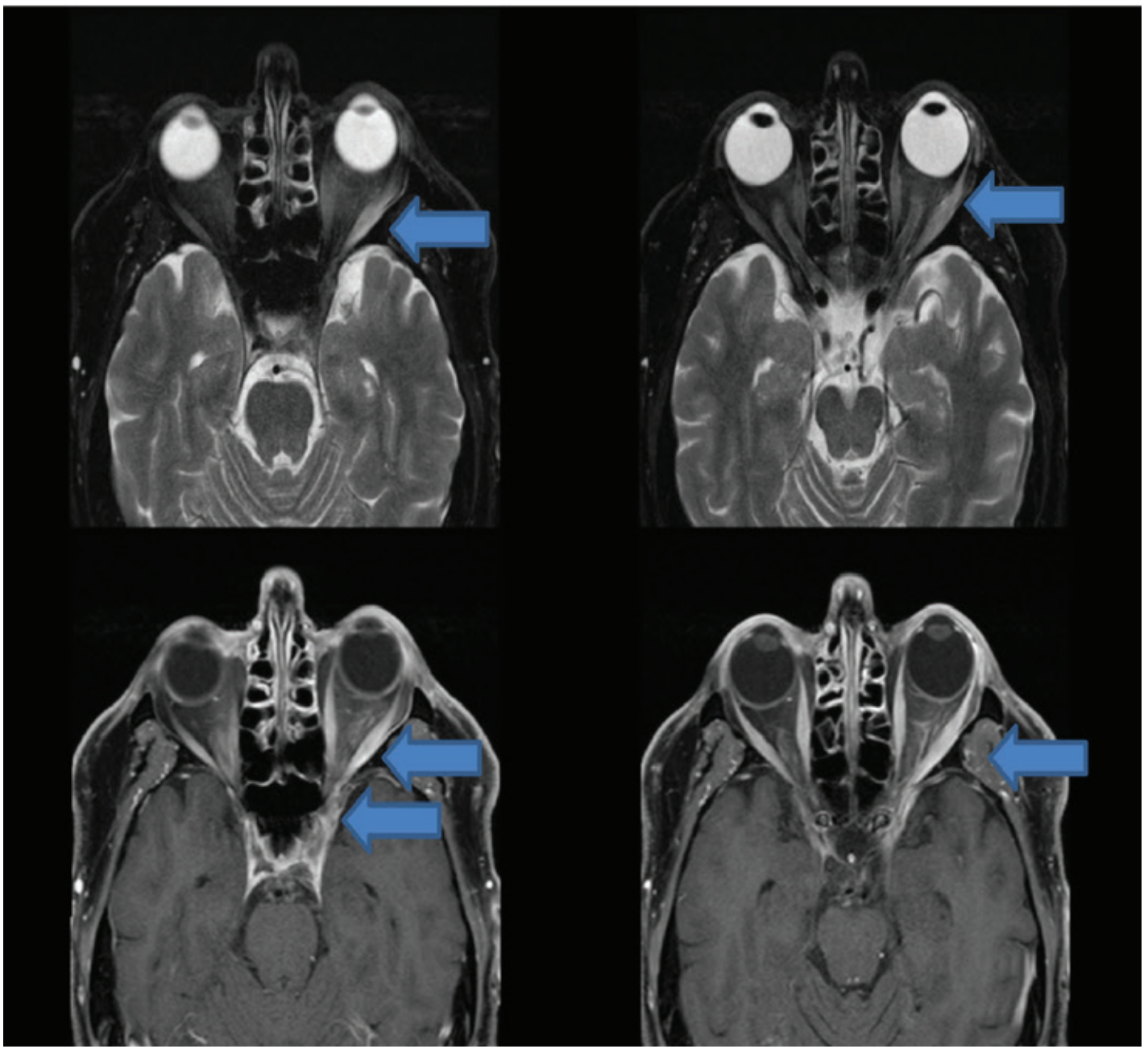
- **Left eye:** ptosis, weak adduction, no abduction
- **Pupils:** 3 mm bilaterally and reactive to light
- **Visual acuity:** right eye 20/30, left eye 20/25, no afferent pupillary defect

The remainder of his examination is normal.

The patient undergoes an MRI of the brain and orbits, which reveals an increased T2 signal with enhancement involving the left lateral rectus muscle and intraconal fat (orbital compartment) extending into the orbital apex and left cavernous sinus.

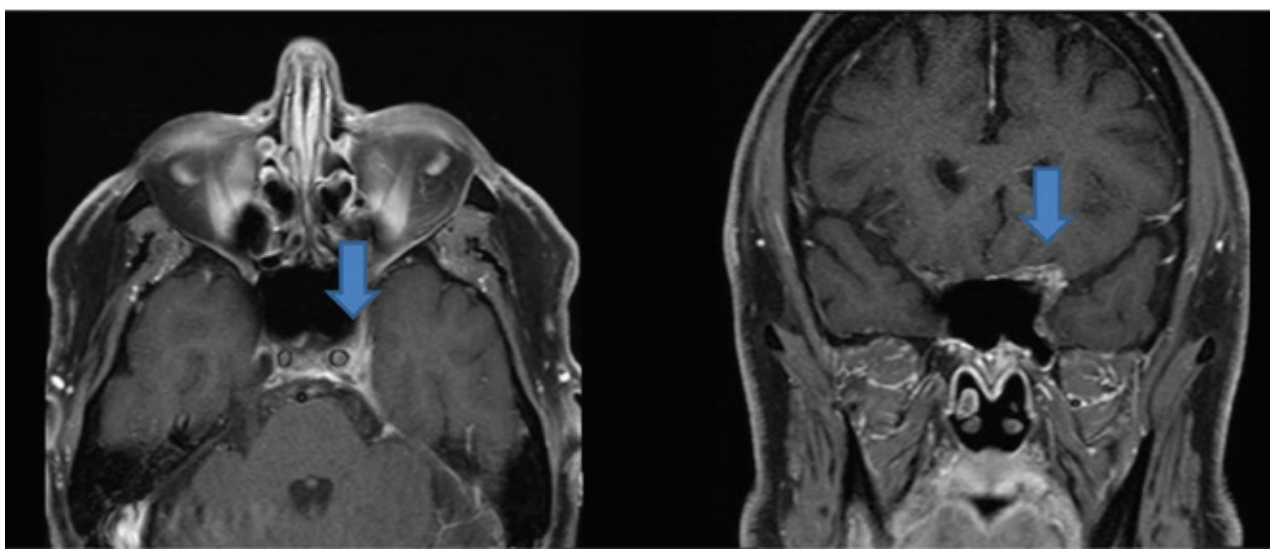
He is admitted to the neurology service, and subsequent workup includes the following tests: erythrocyte sedimentation rate, C-reactive protein, antinuclear antibody, antineutrophil cytoplasmic antibody, rapid plasma reagin, double-stranded DNA

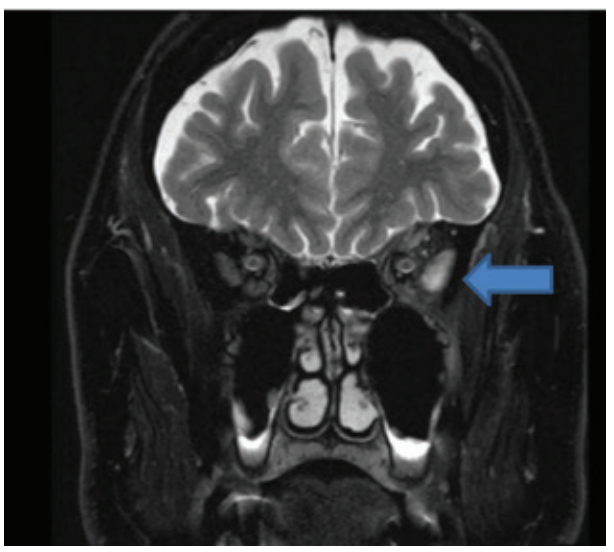
**CONTINUED** *on page 23*



ETHAN STERK

The patient's MRI revealed an increased T2 signal with abnormal enhancement within the left lateral rectus muscle and intraconal fat extending into the orbital apex and left cavernous sinus.





antibody, Lyme polymerase chain reaction, angiotensin-converting enzyme (ACE), and anti-smooth muscle antibody. They are all negative. Also, cerebrospinal fluid (CSF) testing is remarkable for a glucose of 99, a protein of 93, and one white blood cell. CSF cultures are negative; ACE and Lyme antibodies are also negative. Ophthalmology is consulted, and the patient is diagnosed with Tolosa-Hunt syndrome.

## Discussion

Tolosa-Hunt syndrome is rare, with an estimated incidence of one case per million per year. It is characterized by painful ophthalmoplegia and is caused by an idiopathic granulomatous inflammation of the cavernous sinus. The inflammation produces pressure and secondary dysfunction of the structures within the cavernous sinus, including cranial nerves III, IV, and VI, as well as the superior divisions of cranial nerve V.[1–5] Diplopia results from cranial mono- or polyneuropathy. Patients may present at any age. Men and women are affected at the same frequency.[4]

Most patients who present with painful ophthalmoplegia will not have Tolosa-Hunt syndrome. The syndrome of painful ophthalmoplegia may be caused by any process exerting a mass effect on the cavernous sinus. These include a primary intracranial tumor, lymphoma, other local or distant metastatic tumors, aneurysm, carotid-cavernous fistula, carotid dissection, cavernous sinus thrombosis, infection, vasculitis, and sarcoidosis (see Table 1). Of these conditions, tumors and vascular conditions are the most common. In addition to these structural, compressive lesions, painful ophthalmoplegia can also be caused by ophthalmoplegic migraine, giant cell arteritis, or a diabetic cranial nerve palsy.

The diagnosis of Tolosa-Hunt syndrome is based upon the clinical presentation in conjunction with neuroimaging results and a clinical response to corticosteroids. Laboratory tests and lumbar puncture are also recommended. The specific diagnostic criteria recommended by the International Headache Society are:[2]

- Unilateral headache
- Granulomatous inflammation of the cavernous sinus, superior orbital fissure, or orbit, demonstrated by MRI or biopsy
- Paresis of one or more of the ipsilateral third, fourth, and/or sixth cranial nerves
- Evidence of causation demonstrated by both:
  - » Headache has preceded oculomotor paresis by <2 weeks or developed with it.
  - » Headache is localized around the ipsilateral brow and eye
- Symptoms not accounted for by an alternative diagnosis

Glucocorticoid administration has diagnostic as well as therapeutic utility.[3] Rapid resolution of pain, within 24 to 72 hours, helps to confirm suspected Tolosa-Hunt syndrome. Improvement of cranial nerve deficits and regression of MRI abnormalities over the subsequent two to eight weeks provide further confirmation of the diagnosis.[6] A suggested regimen is prednisone 80 to 100 mg daily for three days. If pain has resolved, then taper prednisone to 60 mg, then to 40 mg, 20 mg, and 10 mg in two-week intervals. A small group of patients will require other immunosuppressive medications either to limit the complications of corticosteroid use or to keep the disorder in remission. Typically, such patients will require biopsy confirmation of the diagnosis.[7]

The prognosis for most patients is favorable. However, some patients follow a relapsing-remitting course requiring prolonged corticosteroid or other immunosuppressive therapy, and a few have permanent cranial nerve deficits.

**TABLE 1: CAUSES OF PAINFUL OPHTHALMOPLEGIA**

| TRAUMA | |
|---|---|
| **Vascular** | ▸ Intracavernous carotid artery aneurysm<br>▸ Posterior cerebral artery aneurysm<br>▸ Carotid-cavernous fistula<br>▸ Carotid-cavernous thrombosis<br>▸ Posterior communicating artery aneurysm<br>▸ Internal carotid artery dissection |
| **Neoplasm** | ▸ Primary cranial or intracranial tumor<br>▸ Pituitary adenoma<br>▸ Meningioma<br>▸ Craniopharyngioma<br>▸ Chordomawq<br>▸ Local or distant metastases<br>▸ Nasopharyngeal tumor<br>▸ Lymphoma<br>▸ Multiple myeloma |
| **Infection** | ▸ Contiguous sinusitis<br>▸ Mucocele (sphenoid sinus)<br>▸ Periostitis<br>▸ Abscess<br>▸ Herpes zoster<br>▸ Mucormycosis<br>▸ Actinomycosis<br>▸ Treponema pallidum<br>▸ Mycobacterial<br>▸ Lyme disease |
| **Inflammation** | ▸ Sarcoidosis<br>▸ Wegener's granulomatosis<br>▸ Eosinophilic granuloma<br>▸ Tolosa-Hunt syndrome<br>▸ Orbital pseudotumor |
| **Miscellaneous** | ▸ Diabetic ophthalmoplegia<br>▸ Ophthalmoplegic migraine<br>▸ Giant cell arteritis |

## DIPLOPIA PEARL

Binocular diplopia (double vision with both eyes open and absent when either eye is closed) often results from dysfunction of one or more of the extraocular muscles. In contrast, monocular diplopia, which persists when one eye is closed, suggests local eye disease or a refractive problem.

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a plan for recovery. This includes more restrictive physical and cognitive activity during the first two to three days, followed by a gradual return to activity/play that does not significantly exacerbate symptoms, and monitoring of symptom number and severity. Follow-up instructions related to longer-term activity integration cannot be determined from an emergency department setting, and joint medical (primary care physicians, neurologists, etc.) and school-based teams should address these specific issues, including "clearance" for full activity. Emergency department clinicians may also recommend sleep hygiene to facilitate recovery.

### Key Recommendations

1. Do not routinely image patients to diagnose mTBI.
2. Use validated, age-appropriate symptom scales to diagnose mTBI.
3. Assess evidence-based risk factors for prolonged recovery.
4. Provide patients with instructions on return to activity customized to their symptoms.
5. Counsel patients to return gradually to non-sports activities after no more than two to three days of rest.

To learn more about the guideline and the methodology for developing the guideline, visit www.cdc.gov/HEADSUP.

Disclaimer: *The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the CDC.*

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Richard T. Logue

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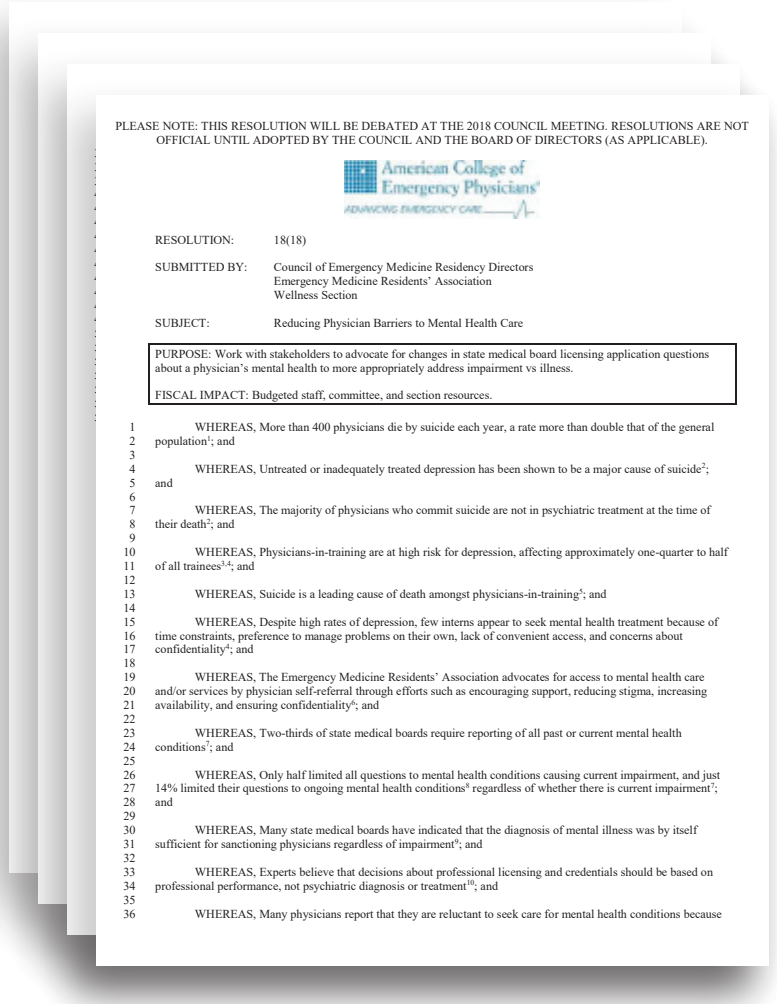
**At its 2018 meeting in September (ABOVE), the ACEP Council voted to adopt a resolution on reducing physician barriers to mental health care (BELOW).**

## PRIVATE MATTERS? | CONTINUED FROM PAGE 1

an extended course of high-dose prednisone. Experienced prescribers, and many patients, know that mild dose-dependent mood and cognitive changes are fairly common during corticosteroid therapy and that more severe psychiatric side effects are occasionally seen at higher dosage levels.[1] The prednisone caused me to become clinically manic for the first time in my life. I realized that my judgment was becoming impaired, so I reported my illness to my employer in order to arrange for a brief medical leave of absence. I also contacted my primary care physician, who had appropriately prescribed the prednisone, and my personal psychiatrist, and I re-established care with a previous psychotherapist. After discussing this matter with a colleague, I asked my employer whether I should preemptively report my illness to the state medical board in order to keep my professional credentials unblemished by rumors about the cause and severity of my symptoms. In response, my employer decided to *require* that I obtain written permission from the Oregon Board of Medical Examiners (BME) before permitting me to resume work.

I immediately called the BME's physician health program, the Health Professionals Program (HPP), hoping to obtain confidential help. The HPP staff informed me that without a "chemical component" (addiction or substance abuse) to my diagnosis, they were not able to assist me. They recommended that I instead discuss this matter directly with the BME's medical director. The medical director, a retired general surgeon, told me that the only way I could obtain written permission authorizing my return to work was to open a formal board investigation into my fitness to practice medicine. Thinking I had nothing to fear from this process (after all, I was fully cooperative and hadn't done anything wrong), I naively asked that the investigation begin.



PLEASE NOTE: THIS RESOLUTION WILL BE DEBATED AT THE 2018 COUNCIL MEETING. RESOLUTIONS ARE NOT OFFICIAL UNTIL ADOPTED BY THE COUNCIL AND THE BOARD OF DIRECTORS (AS APPLICABLE).

American College of Emergency Physicians
ADVANCING EMERGENCY CARE

RESOLUTION: 18(18)

SUBMITTED BY: Council of Emergency Medicine Residency Directors
Emergency Medicine Residents' Association
Wellness Section

SUBJECT: Reducing Physician Barriers to Mental Health Care

PURPOSE: Work with stakeholders to advocate for changes in state medical board licensing application questions about a physician's mental health to more appropriately address impairment vs illness.

FISCAL IMPACT: Budgeted staff, committee, and section resources.

WHEREAS, More than 400 physicians die by suicide each year, a rate more than double that of the general population[1]; and

WHEREAS, Untreated or inadequately treated depression has been shown to be a major cause of suicide[2]; and

WHEREAS, The majority of physicians who commit suicide are not in psychiatric treatment at the time of their death[2]; and

WHEREAS, Physicians-in-training are at high risk for depression, affecting approximately one-quarter to half of all trainees[3,4]; and

WHEREAS, Suicide is a leading cause of death amongst physicians-in-training[5]; and

WHEREAS, Despite high rates of depression, few interns appear to seek mental health treatment because of time constraints, preference to manage problems on their own, lack of convenient access, and concerns about confidentiality[4]; and

WHEREAS, The Emergency Medicine Residents' Association advocates for access to mental health care and/or services by physician self-referral through efforts such as encouraging support, reducing stigma, increasing availability, and ensuring confidentiality[6]; and

WHEREAS, Two-thirds of state medical boards require reporting of all past or current mental health conditions[7]; and

WHEREAS, Only half limited all questions to mental health conditions causing current impairment, and just 14% limited their questions to ongoing mental health conditions[8] regardless of whether there is current impairment[7]; and

WHEREAS, Many state medical boards have indicated that the diagnosis of mental illness was by itself sufficient for sanctioning physicians regardless of impairment[9]; and

WHEREAS, Experts believe that decisions about professional licensing and credentials should be based on professional performance, not psychiatric diagnosis or treatment[10]; and

WHEREAS, Many physicians report that they are reluctant to seek care for mental health conditions because

### The Investigation and Aftermath

During the investigation, which lasted nearly four months, the BME would not permit me to return to work. It required that I disclose intimate personal details of my psychological and psychiatric history to anybody at the BME who requested them. None of the BME staff who investigated me were psychiatrists or psychologists, and most of them were not even health care professionals. My only direct contact with the BME during that time was through an investigator with a background in law enforcement. This investigator successfully discouraged me from seeking legal assistance because of the potential for prolonging the BME investigation and further delaying my return to work. Despite numerous requests, BME staff would not allow me to appear in person or to testify in my own defense.

At the conclusion of the investigation, the BME issued a non-disciplinary public "corrective action order," effectively announcing my mental illness to the general public. This order required that I continue psychiatric care, that I maintain a physician-patient relationship with a primary care physician, and that I refrain from the abuse of drugs or alcohol, all of which I had already been doing. The order was published in the BME's quarterly newsletter, was picked up and published by my local newspaper, and was made available on the BME's public website, despite my objections and despite the fact that I did not act incorrectly and was not in violation of any regulation or statute as a result of my illness. Publication of this order was not based upon any actual threat that my illness posed to the general public but was rather a standard policy acted upon without regard to public safety or privacy considerations. There had been no allegations that I violated any medical practice standards at any time.

Because the BME did not have a program in place for formally monitoring physicians with mental illness, I was eventually referred back to the HPP. The HPP then constructed a psychiatric monitoring program for me so that I could finally be permitted to return to work. Despite the fact that I did not have a substance-use disorder, as a standard condition of HPP enrollment, I was required to participate in its faith-based 12-step addiction treatment program.[2,3]

I was also forced to sign release forms permitting full disclosure of sensitive, personal mental health information, including ongoing psychotherapy records, between the HPP, my health care providers, my employer, and the medical board. This information was shared and discussed (distorted and misinterpreted) by persons who were not qualified to evaluate it. As a result of this breach of my medical privacy, I fear I'll never again feel safe within the private sanctity of a psychotherapeutic relationship. I was also denied the right to freely choose my own psychiatrist or psychologist, who required "preapproval" by the medical directors of the BME and HPP.

When I attempted to assert my rights to privacy, autonomy, religious freedom, and appropriate medical and mental health care, the BME threatened me with emergency suspension of my license unless I complied fully with the HPP. In response, in the spring of 2007, I finally hired an attorney and filed a federal lawsuit against the BME. In late 2012, the U.S. Court of Appeals for the Ninth Circuit upheld a district court opinion that "employees of a state medical review board are entitled to absolute immunity from civil suit for their quasi-judicial and quasi-prosecutorial acts" and that I had no legal recourse to contest BME or HPP decisions, no matter how injurious or unjust.

In 2007, I also filed an independent complaint with the U.S. Department of Health and Human Services Office for Civil Rights (HHS-OCR), alleging violation of my civil rights under

the Americans with Disabilities Act (ADA) by the BME. Under pressure from both my civil suit and investigation by HHS-OCR in mid-2008, the BME voted to allow me to withdraw from the HPP in good standing.

I ultimately returned to full-time work as an emergency physician with an unrestricted medical license, despite the BME's "correction" and certainly not because of it. However, the discrimination I experienced as a consequence of BME sanctions and publication of my private medical history continues to this day. I have been turned away by literally dozens of potential employers and credentialing bodies because I no longer have a "clean record."

I had hoped that my legal actions against the BME and HPP could set a broader legal precedent to help protect physicians with mental illness from discrimination by state medical licensing board claims that illness equals impairment and that illness or impairment are sufficient causes for disciplinary action to "protect the public." Ultimately, I have been successful only in retaining my own right to practice at a cost of more than $150,000 and 10 years of ongoing legal battles with board officials. In the process, I have learned that courts will generally defer to decisions by licensing agencies in cases where a physician has been labeled as allegedly "impaired," even when those decisions violate the ADA and/or a physician's right to due process of law and other constitutional rights.[4]

## Not a Unique Experience

Unfortunately, my case is not that unique. Minnesota physician Steven H. Miles, MD, professor of medicine and bioethics at the University of Minnesota in Minneapolis, experienced discrimination from his state licensing board in 1996 when he disclosed the diagnosis and treatment of his mental illness on a routine relicensing questionnaire.[5] The Minnesota Medical Board subsequently demanded all of his psychiatrist's medical notes and records and threatened both Dr. Miles and his psychiatrist with disciplinary action if they did not comply. Only after spending thousands of dollars in legal fees and obtaining assistance from the U.S. Department of Justice for protection of his rights under the ADA was Dr. Miles ultimately able to preserve both his health care privacy and his unrestricted medical license.

In 1998, New York physician Michael J. Hason, MD, was initially denied a California state medical license due to his self-disclosed history of mental illness (depression).[6] After California refused to license him, New York reflexively revoked his license there.[7] After considerable outcry from disability rights advocacy groups, he was eventually granted a probationary license in California, subsequently unrestricted, where he currently practices.

In 2004, Washington physician Suzanne J. Fiala, MD, risked the humiliation and stigma of medical board scrutiny when she published her firsthand account of a practicing physician living (and working) with bipolar illness.[8] Dr. Fiala correctly pointed out in her article that statistics indicate as many as one in five physicians suffers from a diagnosable mental disorder. Nonetheless, until meaningful changes are made to this repressive system, the threat of medical board investigation and other adverse professional consequences will continue to be powerful deterrents to seeking appropriate treatment.

Ten years after her article was published, Dr. Fiala was sanctioned by her medical board following a retaliatory complaint from a former patient arising from a custody dispute over a dog.[9] This complaint would never have resulted in formal board action and a negative report to the National Practitioner Data Bank had she not revealed her history of mental illness.[10]

Acute episodes of mental illness (grief, dysthymia, depression, anxiety, insomnia, post-traumatic stress disorder, adverse medication reactions, etc.) can strike *anyone* at difficult times in their lives. People like me, Dr. Miles, Dr. Hason, Dr. Fiala, and thousands of others with recurring acute or chronic mental illness learn over time how to manage exacerbations of their symptoms, just as with any other chronic disease (eg, diabetes, asthma, arthritis, heart disease, etc.). Just as with other chronic health problems, mental illness has the potential to cause impairment in the workplace when it is not properly recognized and treated. However, unlike with other chronic health problems, in most states, physicians with *any* history of mental illness may be automatically assumed by their medical licensing board to have occupational impairment based simply upon their diagnosis.

This assumption, by definition, is prejudice. Because my state medical board chose to sanction my license, the stigma that is perpetuated by this prejudice will follow me for the rest of my professional career. I never wanted any of this to become public, but silence only perpetuates these inappropriate actions against our colleagues. I hope my openness ultimately translates to meaningful change and the rational and compassionate approach to mental health disclosures.

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## FLUID VOLUME AND TYPE

There is currently an ongoing trial to assess restrictive (at least 2 L IV fluid) compared to liberal fluid therapy. Large-volume infusions with normal saline may cause hyperchloremic acidosis. After 2 L, changing to a more balanced solution such as lactated Ringer's may be beneficial. Data surrounding albumin are conflicting because the meta-analyses performed often combine heterogeneous patient populations. If the patient is in septic shock, especially if cirrhotic, albumin may be of benefit after the first 2 L of crystalloid.[12,13]

## VASOPRESSORS

Norepinephrine is still the drug of choice in septic shock. However, with global myocardial dysfunction or baseline congestive heart failure, an inotrope may be beneficial.

## HYDROCORTISONE, THIAMINE, AND VITAMIN C

A small before-and-after evaluation of 47 patients reported reduced mortality. However, hypoglycemia case reports have been cited with high-dose vitamin C. Due to antioxidizing activity, patients with a normal serum glucose may have a point-of-care glucose reading that is falsely elevated. When treated, patients may become hypoglycemic. Although hypothesis generating, administration of high-dose vitamin C requires more extensive evaluation before general application.

## CONCLUSION

Emergency medicine has impacted sepsis research in multiple areas, including but not limited to early sepsis recognition, treatment, pathogenesis, genetics, biomarkers, microcirculation, immunomodulation, quality improvement, and a new area of compassionomics where compassionate care is linked to better outcomes, lower cost, and less clinician burnout.[14] A cursory literature search of ([Title]: septicemia OR septicaemia OR sepsis OR severe sepsis OR septic shock) OR ([Title]: pneumonia AND severe) AND ([All fields] Emergency) resulted in 2,036 total articles, broken down as follows:

- 1960–1989: 48 articles
- 1990–1999: 116 articles
- 2000–present: 1,872 articles

Emergency medicine has an increasing number of researchers with funding and multi-institutional networks investigating science at an amazing pace.

Emergency medicine initially cares for those for whom everyone else will later provide care. We see those who need us when they need us; we are the safety net. As Dr. Peter Rosen explained, "The equality, appropriateness, and timeliness of the initial care is the biology of and responsibility of our specialty. No one who hasn't trained for it, or practiced it...is capable of rendering it."[15,16]

Providing sepsis care is no different. As we begin our first steps into the next 50 years of ACEP and emergency medicine, we are better positioned than ever to impact the care of the critically ill and injured, especially in the context of sepsis.

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# Emergency Medicine's #TimesUp Moment

## TWO EMERGENCY PHYSICIANS SPEAK OUT ABOUT SEXUAL HARASSMENT IN THE *NEJM*

"The same forces that create a gender salary gap and limit opportunities for women also foster sexual harassment. You can't peel these issues apart and address them in isolation; they are absolutely connected."

*–Esther Choo, MD, MPH and Dara Kass, MD*

Sexual harassment has become a common theme in news headlines, between the #MeToo movement bringing the prevalence of harassment to light and the #TimesUp movement's call for action to combat harassment. The field of medicine is facing its own #TimesUp moment. Emergency physicians Esther Choo, MD, MPH, associate professor at the Center for Policy and Research in Emergency Medicine at Oregon Health & Science University in Portland, and Dara Kass, MD, assistant professor of emergency medicine at Columbia University Medical Center in New York City, weighed in on the prevalence of sexual harassment in the medical field and the damage it is doing to the house of medicine in a recently published article in the *New England Journal of Medicine*. The article focused on a recent report about sexual harassment, stating:

"The National Academies of Sciences, Engineering, and Medicine (NASEM) recently released a report on sexual harassment of women working in academic sciences, engineering, and medicine.[1] Its findings are deeply disturbing: sexual harassment is common across scientific fields, has not abated, and remains a particular problem in medicine, where potential sources of harassment include not just colleagues and supervisors, but also patients and their families."[2]

*AECP Now* Medical Editor-in-Chief, Kevin Klauer, DO, EJD, FACEP, posed some questions to Dr. Choo and Dr. Kass about their article and the NASEM report. Here are their responses.

**KK: What was the recent NASEM report about, and who was involved?**

**EC and DK:** The report was a review of the literature on sexual harassment in academic settings of science, engineering, and medicine. It was compiled by a team of senior scholars and leaders in these fields. It found that sexual harassment is highly prevalent across these fields, particularly in medicine, and does not appear to be improving. Institutions' approaches to sexual harassment are largely focused on avoiding litigation rather than actually improving the problem, the report states.

**KK: What is the impact of these findings? In other words, how should this help health care delivery and the specialty of emergency medicine?**

Esther Choo, MD, MPH, associate professor at the Center for Policy and Research in Emergency Medicine at Oregon Health & Science University

Dara Kass, MD, assistant professor of emergency medicine at Columbia University Medical Center

**EC and DK:** The report made clear that while sexual harassment has a profound negative effect on the targets of harassment, it also has a harmful effect on entire organizations in terms of workforce engagement and productivity. This should help us realize that in order to deliver the best health care to our patients, we need to address this issue.

**KK: Are all of the issues surrounding gender equity isolated or are they intertwined?**

**EC and DK:** The report makes clear that organizations with less gender diversity in the workforce, and particularly in the leadership team, are at greater risk for tolerance of sexual harassment. The same forces that create a gender salary gap and limit opportunities for women also foster sexual harassment. You can't peel these issues apart and address them in isolation; they are absolutely connected.

**KK: What were the most important takeaway points from the study?**

**EC and DK:** We need better measurement of the problem and more ownership by health care leaders. We need to do much more beyond trying not to get sued. We need the gatekeepers and sources of funding, like accreditation organizations and major scientific funding institutions, to provide strong incentives for health care institutions to create safe environments for their scientists. In addition, we need to change the steep hierarchies that reinforce a culture where no one can speak up about harassment. Ultimately, health care needs to make a serious investment in improving this problem, but it is one that will pay back with huge dividends.

**KK: Are there actions or steps that should be taken from the study to move the needle in the right direction, or will this serve only to raise awareness?**

**EC and DK:** The report has many levels of recommendations. There are global recommendations and immediately-actionable ones. Long-term culture change is an important goal, but that will take time. What can we do now? We can measure the occurrence of sexual harassment using standardized instruments and improve the transparency and accountability of existing policies and practices for responding to sexual harassment. It is difficult to read this report and simply feel satisfied with more awareness. This report paints a grim picture of the culture of permissiveness in medicine with regard to harassment. Our hope is that this information and this conversation will lead to meaningful action.

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PROTECT YOUR POT OF GOLD FROM BAD ADVICE

## THE END OF THE RAINBOW

**DR. DAHLE** is the author of *The White Coat Investor: A Doctor's Guide to Personal Finance and Investing* and blogs at http://whitecoatinvestor.com. He is not a licensed financial adviser, accountant, or attorney and recommends you consult with your own advisers prior to acting on any information you read here.

# You Should Invest in Mutual Funds

## These funds should be the building blocks of most investors' portfolios

*by* JAMES M. DAHLE, MD, FACEP


ILLUSTRATION: CHRIS WHISSEN & SHUTTERSTOCK.COM

**Q. My friends say I should invest in mutual funds, but I don't really understand what a mutual fund is. Can you explain how they work and why I might want to invest?**

**A.** Although mutual funds have been around since the late 1700s, the oldest mutual fund currently in existence was started in 1924. They have increased in popularity over the last century and are the primary investments available in many 401(k)s, health savings accounts, and 529 college savings plans. A mutual fund is best thought of as a group of investors banding together to hire a professional manager to invest their money. However, a mutual fund is actually a legal structure distinct from other similar funds, such as hedge funds, and is heavily regulated by the government to help ensure appropriate disclosure and accounting practices to protect the general public. Due to this regulation, compared with many available investments, they are quite safe from the risk of the manager running off with your money. Of course, mutual funds still carry the risks of the underlying investments, such as stock market risk for stocks and interest rate risk for bonds.

Mutual funds provide significant benefits that most individual investors should find very attractive. The first is professional management. By investing through a mutual fund, you are no longer responsible for making day-to-day investment decisions, buying and selling individual securities like stocks and bonds, monitoring the investments, or calculating returns. In fact, you can go away to a deserted island for years and know your money is continuing to be responsibly invested.

Another benefit of the mutual fund structure is that the investors benefit from economies of scale. While it would be very expensive to hire a professional to buy and sell investments for you, when thousands of investors go in together to hire the professional, the cost is dramatically reduced. The fund, by virtue of its size, may have access to investments that individual investors do not and certainly is in a better position to negotiate lower commissions, bid-ask spreads, and other expenses.

Mutual fund investors also benefit from easy diversification. While individual investors may find it difficult to keep track of 20 different stocks, they can buy literally thousands of them in seconds through the purchase of a broadly diversified mutual fund. This diversification reduces the uncompensated risk that an individual stock picker runs.

The final benefit of mutual funds is daily liquidity, or the ability to rapidly turn an asset into cash. If you've ever had trouble selling a house or other illiquid asset, you know how useful liquidity can be. A mutual fund can be sold and turned into cash or invested into any other investments on any day the market is open.

Of course, mutual funds can have downsides as well. Obviously, when you give up control to a professional, you have less control as to when an individual stock or bond is bought or sold. However, the two main downsides are manager risk and fees. Manager risk is the risk that the manager picks the wrong stocks to buy and sell. Mutual fund fees can be excessive as well, including expense ratios of more than 1 percent of the assets in the fund each year, marketing fees, and commissions (called loads) for the salespersons who sell them. However, both of these risks can be minimized by investing only in no-load, low-cost, broadly diversified index mutual funds, such as those available from the mutual fund giant Vanguard. In these funds, the manager is essentially a computer who works very cheaply and just buys all of the stocks, guaranteeing the investors will receive the same return as the overall market.

The two main mutual fund structures investors will run into are traditional open-ended mutual funds and exchange-traded funds (ETFs). One is not necessarily better than the other; there are low-cost, well-managed funds of both types. The main difference is that a traditional mutual fund can only be bought and sold at the close of market each day, and an ETF can be bought and sold any time the market is open.

The most important consideration when evaluating mutual funds is the type of asset a mutual fund invests in. Mutual funds generally specialize in one type of asset, such as stocks or bonds. They may even subspecialize into specific types of stocks, such as utility or real estate companies. Mutual fund selection is often the final step in putting together a written investing plan. If the plan calls for you to invest in international stocks, you need to make sure the mutual fund you are looking at for that portion of the portfolio actually invests in international stocks.

After that, many investors are tempted to simply look for the fund with the best past returns. Unfortunately, this is such a poor method of choosing mutual funds that funds are required by law to tell you in writing that past performance is not an indicator of future performance. A much better predictor of future returns is the cost (or expense ratio) of the mutual fund. Over time, higher costs going to management erode into returns, leaving less for investors.

Finally, consider the strategy of the mutual fund manager. An index fund simply buys all of the stocks (or bonds) in the market to achieve the market return. An actively managed fund tries to buy the good ones and sell the bad ones in an effort to beat the market. While in the short run, this is certainly possible (in any given year, 45 percent of funds might beat a similar index fund), over the long run, it becomes increasingly difficult to choose a winning active manager, especially after expenses and taxes. Over a lengthy investing career, the likelihood of choosing an active manager who can beat an index fund falls to less than 10 percent, and there is precious little evidence that investors can choose the winners in advance.

Mutual funds are an excellent way to invest and should be the main building blocks in the portfolios of the vast majority of investors. They provide professional management, liquidity, economies of scale, and diversification.

**EM LIT** | CONTINUED FROM PAGE 1

saline, 0.45 percent saline, and rates of fluid replacement were compared without any reliable differences observed.[1] Effectively, it is reasonable to consider that resuscitation using a wide range of clinically appropriate rates will be without specific harms.

## Preprocedural Fasting Necessary in ED Sedation in Children?

We're not anesthesiologists; we do not perform general anesthesia. However, institutional guidelines issued by anesthesiology frequently affect our practice in the emergency department. This observational study of 6,183 children undergoing sedation in Canadian emergency departments could not identify any specific adverse periprocedural outcome associated with duration of fasting prior to the procedure.[2] Carry on with expeditious sedation and management of children in the emergency department as clinically indicated.

## Antibiotic Therapy for Uncomplicated Acute Appendicitis

The concept of managing appendicitis with an antibiotics-first strategy is no longer novel. However, its acceptance into routine practice is not widespread, owing to substantial uncertainty over long-term recurrence and durability of cure. In this five-year follow-up of one of the original clinical trials, the authors found cumulative recurrence by five years was 39.1 percent.[3] While that sounds rather high, otherwise stated, 60.9 percent of patients avoided a surgical procedure. It is probably time to start rolling this out as part of the "alternatives" presented during shared decision making and informed consent.

## Jury Still Out on Procalcitonin-Guided Use of Antibiotics for Respiratory Infection

Separating out those ambulatory patients with respiratory infections who might benefit from antibiotics from those in whom antibiotics would be of no benefit is always challenging. Procalcitonin has often been touted as a biomarker capable of informing this decision, supporting antibiotic stewardship with some discriminative power between viral and bacterial etiologies. However, in this prospective trial of 1,656 patients, no reliable impact on antibiotic prescribing was seen, regardless of whether procalcitonin results were available.[4] This trial is marred by poor protocol compliance, so the question remains open whether to fault this nonspecific biomarker or the lack of appropriate use of the data (ie, knowledge translation) intended for the intervention.

## Prognostic Accuracy of qSOFA in Patients with Suspected Infection

Early sepsis triage and management are rapidly evolving, as are the various administrative burdens meted by the Centers for Medicare and Medicaid Services. The new sepsis guidelines encourage use of the quick sequential organ failure assessment (qSOFA) rather than the systemic inflammatory response syndrome (SIRS) criteria previously emphasized. In this meta-analysis of 38 studies evaluating its prognostic performance in sepsis, qSOFA was found to be 60.8 percent sensitive and 72.4 percent specific for mortality.[5] These characteristics leave qSOFA squarely in a no-man's land of disutility. Its sensitivity is obviously too low for screening, while mortality events are still rare enough that the moderate specificity is also insufficient.

## Best Fluid Choice for Resuscitating Noncritically Ill Adults?

Many clinicians have been raising very reasonable concerns regarding the use of saline in medical resuscitation, citing its various deleterious physiologic impacts. Alternatively, some suggest we ought to prefer balanced solutions such as lactated Ringer's solution or PlasmaLyte. In this prospective trial, initial fluid in the emergency department was determined by the calendar month, and 13,347 patients were treated with at least 500 mL over the course of a 16-month trial period.[6] Although it is difficult to ascertain the clinical importance of this result, there was an excess of adverse renal outcomes in the saline group. Furthermore, once admitted to the hospital, fluid choice was at the discretion of the inpatient team, confounding any minimal effect observed.

## Alteplase Versus Aspirin for Patients with Acute Ischemic Stroke and Minor Neurological Deficits

Half of the patients presenting with stroke qualify as "minor," making this cohort fertile terrain for expanding the indication for alteplase. This prospective trial compared alteplase to aspirin for patients with National Institutes of Health Stroke Scale scores from 0 to 5 without clearly disabling deficits.[7] The winner is clearly aspirin. In fact, the trial was turning out to be so futile for the alteplase arm, the funders took their ball and went home. These authors enrolled only one-third of their planned sample size, and it wasn't soon enough to hide alteplase's clear harms resulting from serious adverse events. The authors take pains to conclude early termination precludes any definitive conclusions, but the professional and financial conflict-of-interest probably makes the opposite true.

## Head Injury Clinical Decision Instruments for Pediatrics

We've been held in thrall by clinical decision instruments for pediatric head injury ever since the Pediatric Emergency Care Applied Research Network (PECARN) produced its seminal work on minor head trauma. Other countries, specifically Canada and the United Kingdom, similarly have their own preferred brands for the same purpose. Collectively, these three—known best by their acronyms PECARN, CHALICE (Children's Head injury ALgorithm for the prediction of Important Clinical Events), and CATCH (Canadian Assessment of Tomography for Childhood Head injury)—were tested against each other in Australia and New Zealand.[8] The winner: clinicians. Despite performing CTs on only 8.2 percent of the entire population, they missed only two of the 160 clinically important traumatic brain injuries, with similar sensitivity to any of the decision instruments with a fraction of the advanced imaging. Clinical judgment should not be considered inferior to these decision instruments, and our dependence on their use is out of proportion to their value.

## Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults and Children

There's a new sheriff in town for *C. difficile*, according to these recent guidelines by the Infectious Diseases Society of America and Society for Healthcare Epidemiology of America.[9] Rather than depending on the old standby, metronidazole, we are entering an era favoring oral vancomycin and fidaxomicin. The use of metronidazole is allowed only begrudgingly as third-line therapy for initial infection when cost is a serious concern. Now, it's not unreasonable to consider vancomycin and fidaxomicin as significantly more effective than metronidazole. However, cost is definitely a concern. A course of oral vancomycin is fairly expensive at prices ranging from $200 to $400, but fidaxomicin tips the scales at more than $3,500. It should be fairly unsurprising that many of the authors of these new guidelines have conflicts of interest with the pharmaceutical industry.

## HEART Score for Suspected Acute Coronary Syndrome

The HEART Score has gained in popularity over the past few years, and it has been well-validated as an effective risk-stratification tool for the early disposition of patients with chest pain. Typically, scores between 0 and 3 are considered "low risk," with rates of major adverse cardiac events (MACE) within six weeks between 0.9 percent and 1.7 percent. However, in this large "real-world" cohort, six-week MACE for the low-risk cohort was only 0.4 percent.[10] The authors propose that after an acute myocardial infarction has been ruled out with biomarkers and an ECG, the cutoff ought to be a HEART score of 5. This threshold would then confer a 30-day risk for death or acute myocardial infarction of only 1.1 percent. A protocol for early disposition of scores up to 5 could allow for early discharge of up to 90 percent of all patients presenting with chest pain.

That's it! You're all caught up, except for the 6,000 new journal articles published, on average, every day.

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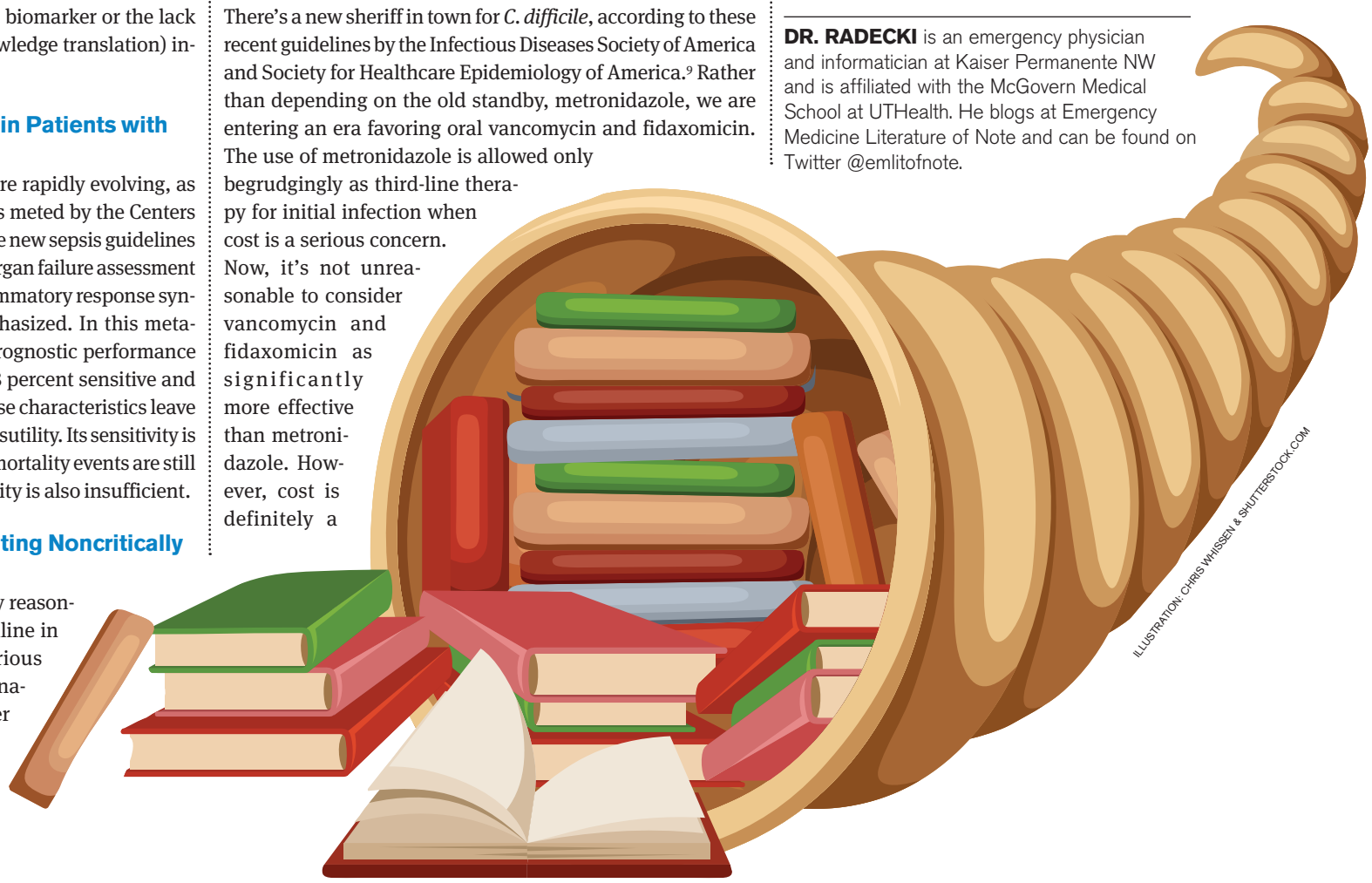

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THE BEST IN FREE EM EDUCATION

**FOAMcast**

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# Magnesium: FOAMed's Favorite Element


## The EM community loves to talk about it, but how good is it?

*by* JEREMY SAMUEL FAUST, MD, MS; AND LAUREN WESTAFER, DO, MPH

Fads come and go. However, in the world of free open access medical education (#FOAMed), some favorite topics have stood the test of time. For example, FOAMed loves to talk about ketamine, managing the difficult airway, and, for some reason, magnesium. People seem to love the idea that magnesium, a humble group 2 alkaline Earth metal, might possibly be an effective treatment for so many different medical conditions.

Recently on our podcast (www.foamcast.org), we reviewed the evidence for using magnesium for rate control in atrial fibrillation, pain relief in migraine headaches, and symptom control for asthma exacerbations. Let's take a look at some of the data we considered.

A recent randomized, double-blind, placebo-controlled trial conducted in Tunisia assessed the efficacy of intravenous magnesium sulfate as an adjunct for rate control in patients with rapid atrial fibrillation.[1] Patients who presented to the emergency department in rapid atrial fibrillation (rates greater than 120 beats per minute) received any rate control agent chosen by the treating physician. They were randomized to additionally receive either IV magnesium (either a low or a high dose) or a similar amount of IV fluid as placebo. The results? Magnesium seems to have helped achieve a heart rate of <90 beats per minute (or a 20 percent decrease from the initial rate) at four hours. Both the low and high doses of IV magnesium (4.5 g and 9 g) were effective, but the low dose was less likely to cause side effects such as flushing or bradycardia; hypotension was exceedingly rare.

However, there are some caveats to consider. Most of all, this trial does not reflect the traditional practice pattern in the United States. The most common rate control agent used in the trial was digoxin. That meant that the average time to rate control in the group that received digoxin alone (the placebo arm) was around 8.5 hours. Today, when using calcium channel blockers like diltiazem or beta blockers like metoprolol, we expect rate control far sooner. While some patients in this study did receive atrioventricular nodal blockers that more closely reflect common practice in the United States, the data for that subset were not shown in the paper.

Interestingly, the authors claim that the results in that subset also favored magnesium as an adjunct. We would call this a soft win for magnesium, but we would love to see a trial that mainly uses beta blockers or calcium channel blockers as opposed to digoxin.

Next, we looked over some evidence on the use of magnesium for migraine headaches. The highest-quality randomized, placebo-controlled trial we know about is a study that assessed 2 g magnesium IV as an adjunct to 20 mg of IV metoclopramide.[2] That study did not bode well for magnesium. Some lower-quality studies conducted since then were a little more encouraging. One study found 1 g of IV magnesium was superior to placebo but only in the subset of patients who had migraines with aura (ie, resolving neurologic symptoms).[3] Another study pitted 1 g IV magnesium against 8 mg IV dexamethasone or 10 mg of IV metoclopramide and found that magnesium reduced pain better than the other agents. While this all would seem to add up to modest support for magnesium in some patients, the studies were small and some had issues with methodology. That's why the American Headache Society makes no recommendation on the use of magnesium for emergency management of headaches, but states that it may be of benefit in patients with migraine with aura.


Lastly, we reviewed evidence on the use of IV magnesium in the management of asthma in the emergency department. The most important insight to remember when evaluating a study of asthma (or any study, in all fairness) is to focus primarily on patient-centered outcomes. Measuring peak flow rates in patients with asthma may give us some sense of the clinical picture, but there are major problems with this tool. First, it is effort related. The outcome and accuracy of the measurement rely on the patient's willingness and skill to perform the test. Sometimes peak flow measurements are falsely low because patients still feels poorly, and so they simply do not blow with enough force. What we care about are patient-centered outcomes, such as whether a patient required an admission to the hospital. In this regard, the use of IV magnesium early in the emergency department visit appears to have a consistent benefit in decreasing the number of patients who will end up needing admission to the inpatient units. This is true in both adults and children.[4,5] Magnesium seems to benefit those with more severe symptoms. The number of patients needed to treat to decrease an admission seems to range from two to six. Even using the conservative estimate of six is impressive. While the quality of the study designs was variable, the signal seems consistent.

And we can't forget the uses of magnesium that are noncontroversial. So we gave a shout out to magnesium for polymorphic ventricular tachycardia, seizures from eclampsia, and electrolyte replacement as well. If there are more uses for this favorite FOAMed element, we'll be sure to cover them in the future.

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FEE SCHEDULE | CONTINUED FROM PAGE 18

dosage information, including 18 changes in codes for influenza vaccines.

### Changes for Emergency Medicine in ICD-10 Diagnosis Coding for 2019

Unlike CPT code changes that occur on the calendar year, ICD-10 code changes are updated and effective in October. Emergency department relevant codes added, deleted, or revised include the areas of mental and behavioral presentations, cerebral infarction, and appendicitis. In keeping with the times, there are two new codes related to cannabis use:

- F12.23, cannabis dependence with withdrawal
- F12.93, cannabis use with withdrawal

Code F12.23, cannabis dependence with withdrawal, was created to distinguish cannabis withdrawal syndrome in a patient with cannabis dependence. Code F12.93, cannabis use, unspecified with withdrawal, was created for cases of physiological withdrawal from cannabis occurring in a person who is using cannabis regularly in contexts that are not specifically defined as cannabis dependence.

**Example:** A 26-year-old male presents to the emergency department with tingling in his hands and feet. He has a history of generalized anxiety disorder and has been smoking cannabis on a daily basis for the last 10 months to help with his anxiety. The patient abruptly stopped smoking cannabis three days ago and, in addition to the tingling, also complains of a cough. Physical exam was reassuring and a chest X-ray was negative. Various approaches to anxiety treatment, including counseling and pharmacotherapy, were discussed. The patient will follow up with his primary care physician and understands reasons to return to the emergency department. The final diagnoses for the visit includes cannabis use with withdrawal F12.93.

**DR. GRANOVSKY** is the president of Logix Health, an emergency department coding and billing company, and serves as the course director of ACEP's coding and reimbursement courses.

**MR. MCKENZIE** is reimbursement director for ACEP.

# CODING WIZARD

NAVIGATE THE CPT MAZE, OPTIMIZING YOUR REIMBURSEMENT

***Editor's Note:*** *Cutting through the red tape to make certain that you get paid for every dollar you earn has become more difficult than ever, particularly in our current climate of health care reform and ICD-10 transition. The ACEP Coding and Nomenclature Committee has partnered with ACEP Now to provide you with practical, impactful tips to help you navigate through this coding and reimbursement maze.*

## BILLING FOR ALCOHOL AND DRUG COUNSELING

*by* **HAMILTON LEMPERT, MD, FACEP, CEDC**

**Question: Can you bill for alcohol and drug counseling the same way you do for smoking cessation?**

**Answer:** Yes, you can. There must be some clear medical necessity documented in the chart as to why the patient is receiving these services. The requirements for 99408 (15 to 30 minutes of alcohol and/or substance abuse structured screening and brief intervention services, 0.94 relative value units [RVUs]) and 99409 (greater than 30 minutes, 1.89 RVUs) are different and more rigorous than those for tobacco cessation counseling, 99406 (0.35 RVUs) and 99407 (0.73 RVUs). First, for alcohol and/or substance abuse intervention, you must spend and document at least 15 minutes as opposed to more than three minutes for tobacco cessation. Next, you must administer a structured screening tool, such as the Alcohol Use Disorders Identification Test (AUDIT) or the Drug Abuse Screening Test (DAST).

These services may be billed on the same day as other evaluation and management (E/M) services, but they must be distinct from those E/M services and billed with a 25 modifier. However, many payers will not pay for these codes when billed on the same day as an emergency department visit. Lastly, some payers prefer to use codes G0396 (15–30 minutes) and G0397 (greater than 30 minutes), while others prefer H0050 (per 15 minutes). ⊕

*Brought to you by the ACEP Coding and Nomenclature Committee.*

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**DR. LEMPERT** is chief medical officer, coding policy, at TeamHealth, based in Knoxville, Tennessee.

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Those interested in a position or further information may contact Dr. Tyson Pillow via email pillow@bcm.edu or by phone at 713-873-7045. Please send a CV and cover letter with your past experience and interests.

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