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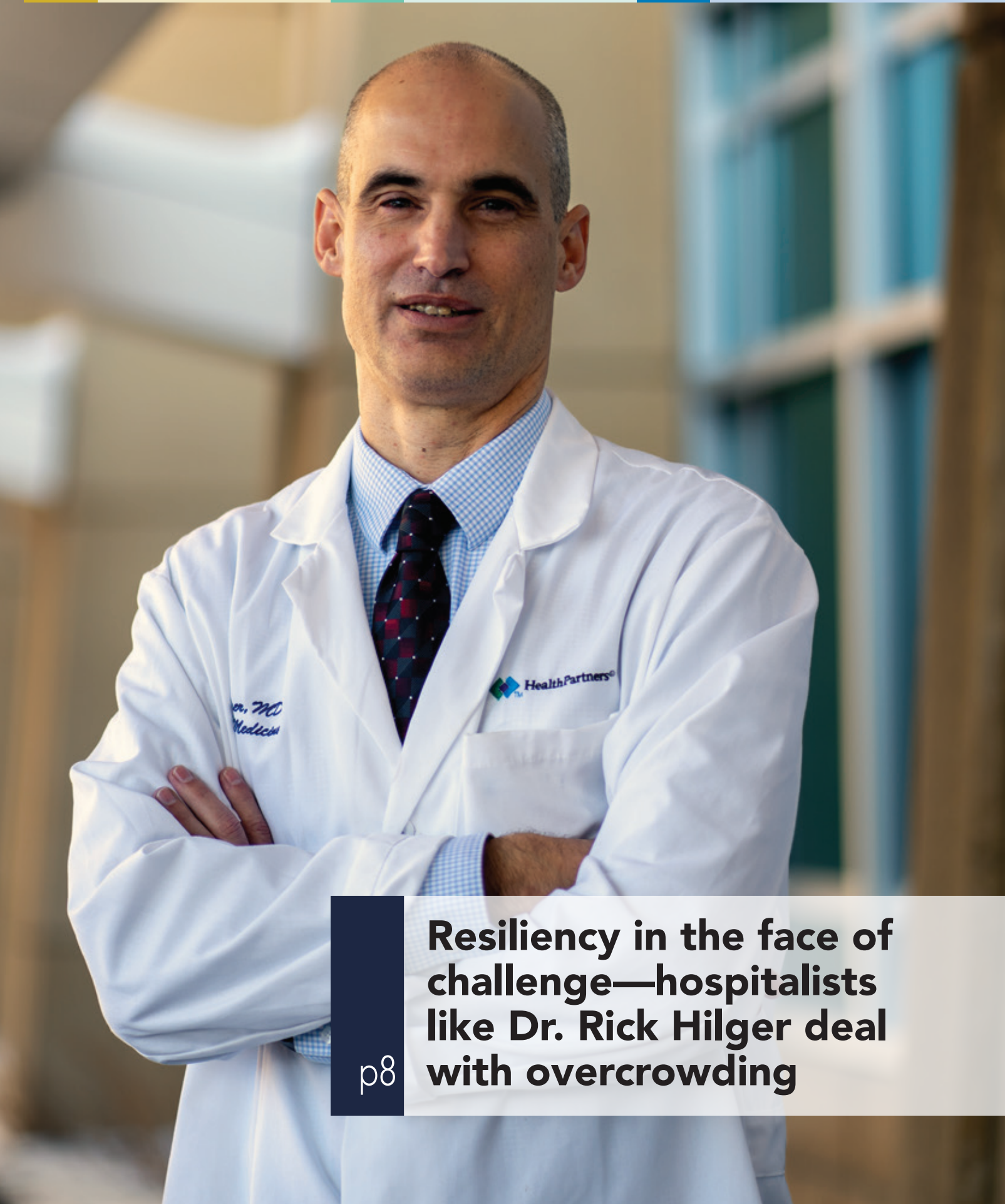
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CELEBRATE MARCH 3 National Hospitalist Day

Hospitalists across the U.S. have been and continue to be a critical part of our nation's response to COVID-19.

On National Hospitalist Day, Thursday, March 3, 2022, SHM invites you to celebrate the individuals and teams that make up the hospital medicine community.

In anticipation of this special day, SHM encourages you to share your story, showcase your team's efforts to improve patient care, express your pride for the field, or share how you're making a difference in your hospital and the lives of patients.

Here are just a few of the ways you can celebrate:

- Read special SHM spotlights in *The Hospitalist*

- Download shareable graphics, posters, Zoom backgrounds, and more
- Enter our social media photo contest and follow the #HowWeHospitalist hashtag across all platforms
- And more!

Thank you for all you do for hospital medicine and our communities. We hope you take some time to celebrate yourself and your colleagues, as well as your commendable contributions to health care and the future of the specialty.

To learn more about National Hospitalist Day and to access this year's shareable images and graphics, visit hospitalmedicine.org/hospitalistday. ■

THE HOSPITALIST AND JHM

As a hospitalist and SHM member, you have access to two exceptional, official SHM publications—*The Hospitalist* and the *Journal of Hospital Medicine* (*JHM*).

The Hospitalist is a newsmagazine, reporting on the issues and trends in hospital medicine. *The Journal of Hospital Medicine* is a peer-reviewed journal that advances excellence in hospital medicine as a defined specialty through the dissemination of research, evidence-based clinical care, and advocacy of safe, effective care for hospitalized patients.

To promote the synergy between these publications, periodically you'll find reference and access to *JHM* articles.

Scan the QR code to read *JHM*'s



editor-in-chief Samir S. Shah, MD, MSCE, Editor's Pick—Techniques and Technologies to Improve Peripheral Intravenous Catheter Outcomes in Pediatric Patients: Systematic Review and Meta-Analysis, by Tricia M Kleidon MNursPrac, Jessica Schults PhD, Claire M Rickard PhD, Amanda J Ullman PhD. ■

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WILEY



Clinician reviews of HM-centric research

By Khaalisha Ajala, MD; Sherri Bogard, MD; Joanna Bonsall, MD, PhD, SFHM; Malavika Kapuria, MD; Kevin Day, MD; Adekunle Obisesan, MD, MPH; Sahar Taghvaei, DO; Stacey Watkins, MD, PhD

Division of Hospital Medicine, Emory University School of Medicine, Atlanta

IN THIS ISSUE

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By Khaalisha Ajala, MD, FHM

- 1 A proposed scoring system to assess COVID-19-induced coagulopathy and stratification of patients for anticoagulation therapy based on risk categories

CLINICAL QUESTION: Can a proposed new scoring system triage and assess risk in COVID-19 patients with coagulopathy?

BACKGROUND: COVID-19-induced coagulopathy (CIC), marked elevation of D-dimer, cytokine storm, and in some instances, endothelial injury, are prominent features of COVID-19 infection. As a result, there is an increased risk of micro- and macrovascular thrombosis, as well as an increased incidence of anticoagulation failure in moderate to severe COVID-19 infection. Consequently, appropriate anticoagulation may help improve the chance of survival in COVID-19 patients. A scoring system to assess COVID-19-induced coagulopathy and to stratify patients for anticoagulation therapy based on risk categories might improve outcomes.

STUDY DESIGN: Scoping review.



Dr. Ajala

SETTING: Scoping review of multiple retrospective cohort studies of COVID-19 patients who had inflammatory markers, organ failure, and macrovascular thrombosis noted on serial exam, weekly imaging, or postmortem.

SYNOPSIS: This scoping review gives a brief overview of various coagulation parameters and how they function during COVID-19 infection. The CIC scoring system includes the sequential organ failure assessment (SOFA), sepsis-induced coagulopathy (SIC), and D-dimer value. This scoring system is different than SOFA and SIC because it not only combines them but also weighs the entities differently. D-dimer is weighed heavily because it correlates with mortality and response to anticoagulation. Although the CIC scoring system will need revision, it is promising because it may help triage patients' risk categories for anticoagulation. The proposed CIC scoring system will benefit from prospective validation. Lastly, there should be further research on the impact of antiplatelet therapy on survival in COVID-19.

BOTTOM LINE: Randomized clinical trials are needed to identify the benefits of anticoagulation as well as to specify the most effective agent and appropriate dosing. Moreover, the CIC scoring system will require revision, prospective validation, and further revision as new data become available. Lastly, preliminary studies suggest a promising role for antiplatelet therapy in the management of COVID-19.

CITATION: Hadid T et al. Coagulation and anticoagulation in COVID-19. *Blood Rev.* 2021 May;47:100761. doi: 10.1016/j.blre.2020.100761. Epub 2020 Oct 8. PMID: 33067035; PMCID: PMC7543932.

Dr. Ajala is a hospitalist and co-director of the division of hospital medicine's education council at Emory University School of Medicine, Atlanta.

By Sherri Bogard, MD

- 2 Direct oral anticoagulants may be safe in cancer-related venous thromboembolisms, but use caution with gastrointestinal malignancies

CLINICAL QUESTION: Are direct oral anticoagulants (DOACs) a suitable alternative to low molecular weight heparin (LMWH) for treatment of venous thromboembolism (VTE) in patients with underlying malignancy?

BACKGROUND: VTE is a frequent occurrence in patients with cancer. Although LMWH has previously been considered the standard of care, recent studies aim to compare the efficacy and safety profiles of DOACs to those of LMWH.

STUDY DESIGN: Meta-analysis of



Dr. Bogard

randomized controlled trials.

SETTING: Literature search of PubMed, Embase, and the Cochrane Collaboration Central Register of Controlled Trials.

SYNOPSIS: The authors identified four randomized controlled trials (RCTs) with a total of 2,907 participants who met their inclusion criteria: comparing DOACs to LMWH in cancer patients with therapy of at least six months. DOACs were associated with a significant reduction of VTE recurrence compared to LMWH (risk ratio 0.62; 95% confidence interval 0.44-0.87). However, the risk of clinically relevant non-major bleeding (CRNMB) was increased with the use of DOACs (RR 1.58; 95% CI 1.11-2.24). There was no significant difference in the risk of major bleeding (RR 1.33, 95% CI: 0.84-2.1) and overall mortality (RR 0.99, 95% CI: 0.84-1.17) between DOACs and LMWH. A subgroup analysis of major bleeding by cancer type found increased major bleeding with DOACs in patients with gastrointestinal cancer. Further studies directly comparing the efficacy and safety of different DOACs are needed.

BOTTOM LINE: DOACs may be an appropriate substitute for LMWH in patients with VTE and underlying malignancy, but caution should be used in patients with gastrointestinal cancer.

CITATION: Haykal T et al. Direct oral anticoagulant versus low-molecular-weight heparin for treatment of venous thromboembolism in cancer patients: An updated meta-analysis of randomized controlled trials. *Thromb Res.* 2020;194:57-65. doi:10.1016/j.thromres.2020.06.025.

Dr. Bogard is an assistant professor of medicine, division of hospital medicine, at the Emory School of Medicine, Atlanta.

By Joanna Bonsall, MD, PhD, SFHM

- 3 Breakthrough infection in COVID-19-vaccinated health care workers is associated with lower levels of neutralizing antibodies but less severe disease

CLINICAL QUESTION: How frequent are breakthrough infections in health care workers fully vaccinated against COVID-19, and how does vaccination correlate with immune response and infectivity?

BACKGROUND: While vaccines against COVID-19 are highly efficacious, a small percentage of breakthrough infections still occur. Vaccination appears to protect against severe disease. However, other characteristics of breakthrough infections are poorly understood.

STUDY DESIGN: Prospective cohort study.



Dr. Bonsall

SETTING: Large medical center in Israel.

SYNOPSIS: Fully vaccinated health care workers who either had symptoms or had a known COVID-19 exposure underwent extensive investigation, including epidemiologic investigations, SARS-CoV-2 testing through reverse transcription-polymerase chain reaction (RT-PCR), serologic assays, and genomic sequencing. The study investigators also obtained case-matched serum samples from vaccinated health care workers without symptoms or exposures, to compare vaccine-induced immune responses. Among an initial 11,453 fully vaccinated health care workers, 1,497 (13.1%) met inclusion criteria (symptomatic or exposed), and 39 breakthrough cases were identified (2.6% of the included population). In all cases, the suspected source was an unvaccinated person. While 26 (67%) of the infected workers developed symptoms, none required hospitalization. On follow-up, 19% of the infected workers had residual symptoms six weeks after diagnosis. No cases of transmission from infected health care workers (secondary infections) were identified, including household contacts. However, N-gene levels indicated likely infectivity and all health-care workers followed isolation protocols after being notified of positive results. Infected health care workers with available pre-infection serologies had a significantly lower level of neutralizing antibodies pre-infection than did uninfected controls.

BOTTOM LINE: In health care workers, COVID-19 vaccination reduces the risk of infection and prevents severe infection, but still may be associated with long-COVID-19 symptoms. This study also demonstrates a correlation between lower levels of neutralizing antibodies and breakthrough infections.

CITATION: Berg M et al. Covid-19 breakthrough infections in vaccinated health care workers. *N Engl J Med* 2021;385:1474-84.

Dr. Bonsall is an associate professor of medicine at Emory University School of Medicine in the division of hospital medicine. She is the chief of hospital medicine at Grady Memorial Hospital, Atlanta.

By Malavika Kapuria, MD

4 Aspirin increases the risk of clinically significant gastrointestinal bleeding in older persons

CLINICAL QUESTION: Does aspirin impact the risk of clinically significant gastrointestinal (GI) bleeding compared with placebo in community-dwelling older persons (aged ≥ 70 years)?

BACKGROUND: Aspirin is routinely used for the primary prevention of vascular events and is also associated with an increased risk of bleeding. The risk of aspirin-related major GI bleeding in the general population, particularly in older people, is not well known.



Dr. Kapuria

STUDY DESIGN: Data extracted from the randomized, placebo-controlled, double-blind clinical trial aspirin in reducing events in the elderly (ASPREE).

SETTING: ASPREE clinical trial conducted from 2010-2017 with an enrollment of 19,114 participants, recruited from clinical trial centers in the

SHORT TAKES

Immediate oral refeeding in mild and moderate pancreatitis reduces length of stay without causing adverse events

Investigators in a small, multicenter, randomized control trial compared a cohort of patients with mild/moderate pancreatitis who were started on a low-fat diet immediately after hospitalization with a cohort of patients who initially fasted and then had their diets slowly advanced based on clinical criteria. The patients who started on a diet immediately had significantly shorter lengths of stay without an increase in adverse events.

CITATION: Ramírez-Maldonado E et al. Immediate oral refeeding in patients with mild and moderate acute pancreatitis. *Ann Surg.* 2021;274:255-263.

An inpatient penicillin-allergy delabeling program results in improved appropriate antibiotic prescribing and reductions in restricted antibiotic use

A small, two-center Australian study targeted hospitalized patients with low-risk penicillin allergies for either single-dose oral penicillin challenge or direct label removal based on history. Using these methods, 29% of patients were able to be delabeled, resulting in a subsequent significant increase in appropriate antibiotic prescription use in delabeled patients.

CITATION: Chua KYL et al. The penicillin allergy delabeling program: a multicenter whole-of-hospital health services intervention and comparative effectiveness study. *Clin Infect Dis.* 2021;73:487-96.

A three-day course of β -lactam therapy is non-inferior to eight days of β -lactam therapy in hospitalized patients with community-acquired pneumonia who have reached clinical stability

In a multicenter, double-blind, randomized, placebo-controlled, non-inferiority trial involving 310 patients with community-acquired pneumonia who had achieved clinical stability at three days, investigators assigned patients to either continue with β -lactam therapy or a placebo for an additional five days. There were no differences in cure between the groups at 15 days.

CITATION: Dinh A, et al. Discontinuing β -lactam treatment after 3 days for patients with community-acquired pneumonia in non-critical care wards (PTC): a double-blind, randomized, placebo-controlled, non-inferiority trial. *Lancet* 2021;397:1195-203.

By Joanna Bonsall, MD, PhD, SFHM

U.S. or their primary care providers in Australia.

SYNOPSIS: Among the ASPREE trial enrollees, 9,525 were randomized to the aspirin (100 mg) group and 9,589 to the placebo group. Incidence of clinically significant GI bleeding (GIB), culminating in hospitalization, transfusion, surgery, or death, as well as GIB risk according to age and other risk factors, was studied over a median 4.7-year follow-up. Results:

162 GIB events occurred in the aspirin group versus 102 in the placebo group (HR 1.61, 95% CI 1.26-2.08, $P=0.002$). Among these, site-specific analyses identified 89 versus 48 upper GIB events occurring in the aspirin versus placebo groups, respectively (HR 1.87, 95% CI 1.32-2.66, $P<0.001$). For lower GIB, 73 versus 54 occurred in the aspirin versus placebo groups, respectively (HR 1.36, 95% CI 0.96-1.94, $P=0.08$). Older age was associated with $\sim 60\%$ increased GIB risk. Multivariable analyses identified smoking (current or former), hypertension, chronic kidney disease (CKD, stage ≥ 3), and obesity as correlated with increased GIB risk. Diabetes was not identified as a risk factor for increased GIB in this study. GIBs that did not result in hospitalization were not included but may be significant for this age group.

BOTTOM LINE: Aspirin use is associated with the increased risk of clinically significant major GI bleeding in older persons, with an incremental impact due to advancing age and additional risk factors (including smoking, hypertension, obesity, and CKD stage ≥ 3).

REFERENCE: Mahady SE et al. Major GI bleeding in older persons using aspirin: incidence and risk factors in the ASPREE randomized controlled trial. *Gut.* 2021;70(4):717-724. doi: 10.1136/gutjnl-2020-321585.

Dr. Kapuria is a hospitalist within Emory's division of hospital medicine at Grady Memorial Hospital and is an assistant professor of medicine affiliated with the Emory School of Medicine, Atlanta.

By Kevin Day, MD

5 Advocating for a patient-based approach to decisions of gastrostomy-tube placement in patients with dementia

CLINICAL QUESTION: Should providers universally not recommend feeding tubes in patients with dementia and poor oral intake?

BACKGROUND: The natural progression of advancing dementia involves decreased oral intake, which poses moral and ethical dilemmas for providers and families. Guidelines from professional societies state not to offer tube feeding based on observational studies which showed no improvement in outcome. However, there is continued controversy because there are no randomized controlled trials comparing the benefits and burdens of tube feeding versus careful hand feeding.



Dr. Day

STUDY DESIGN: Narrative literature review of relevant articles from 2000-2019.

SYNOPSIS: Burdens: One eight-year prospective study of more than 35,000 patients found no improvement in survival with a percutaneous endoscopic gastrostomy (PEG) tube. Tube feeding was found to be associated with higher rates of aspiration pneumonia as well as increased prevalence of gram-negative bacteria (e.g., *Pseudomonas* and *Klebsiella*). An evaluation of the minimum data set found that those with PEG tubes were more than twice as likely to have pressure sores (presumed due to increased neglect by caregivers). Finally costs billed to Medicare were significantly higher in tube-fed patients (\$6,994 versus \$959). Benefits: One retrospective study showed a reduced incidence of aspiration

pneumonia. Another small retrospective study showed improvement in albumin levels, which was positively correlated with survival. A larger retrospective study showed median survival times of 695 days with tube feeding versus 75 days without it. While the review of the literature was exhaustive, the studies were observational and mostly retrospective. The studies showing benefits were smaller and occurred in different regions of the world (Japan) which may not be generalizable to the U.S.

BOTTOM LINE: Medical decisions regarding the decision to start tube feeding in patients with dementia should be individually based and clear. Thorough discussions evaluating the burdens and benefits should be addressed with families.

CITATION: Ijaopo EO and Ijaopo RO. Tube feeding in individuals with advanced dementia: a review of its burdens and perceived benefits. *J Aging Res.* 2019;2019:7272067. doi:10.1155/2019/7272067.

Dr. Day is an assistant professor of medicine and assistant professor of palliative medicine at Emory University School of Medicine. He currently works at Grady Memorial Hospital, Atlanta.

By Adekunle Obisesan, MD, MPH

6 Hypertonic saline solution with furosemide infusion may be beneficial in fluid overload in patients with reduced ejection fraction

CLINICAL QUESTION: Is simultaneous infusion of hypertonic saline and IV furosemide more efficacious than IV furosemide alone in patients with fluid overload?

BACKGROUND: Diuretic-resistant fluid overload is a common problem encountered in hospitalized heart failure (HF) patients, with different interventions proposed to overcome it. Some studies have suggested that combining hypertonic saline with furosemide provided advantages over furosemide alone.



Dr. Obisesan

STUDY DESIGN: Systematic review and meta-analysis.

SETTING: A comprehensive search of several databases from each database's inception to March 17, 2020, and reference lists of retrieved articles and review articles in the field to identify additional publications.

SYNOPSIS: 11 RCTs met the criteria with a combined 2,987 patients. A random-effects model was used to estimate treatment effects across studies. Results were expressed as either relative risk (RR) for dichotomous outcomes, or mean difference (MD) for continuous. Compared to furosemide alone, hypertonic saline with furosemide was associated with reduced all-cause mortality at 57 months (RR 0.55, $P < 0.05$); reduced HF-related readmissions at 57 months (RR 0.50, $P < 0.05$); reduced hospital length of stay (MD -3.28 days, $P < 0.05$); increased daily diuresis (MD 583.87 mL, $P < 0.05$); increased weight loss (MD -1.76 kg, $P < 0.05$); greater decrease of serum Cr (MD -0.46 mg/dL, $P < 0.05$); greater increase of serum Na (MD 6.89 mEq/L, $P < 0.05$); increased 24-hour urine Na excretion (MD, 61.10 mEq, $P < 0.05$). One limitation is that studies only looked at patients with HF with ejection fraction (EF)

$< 40\%$ and without severe renal impairment, limiting generalizability to other fluid-overloaded states or more advanced renal dysfunction. The optimal dose, duration, and concentration of hypertonic saline also remain to be determined.

BOTTOM LINE: Simultaneous hypertonic saline solution infusion with intravenous furosemide is a promising approach to managing fluid overloaded patients with HF and reduced EF compared to intravenous furosemide alone.

CITATION: Liu, C et al. Simultaneous use of hypertonic saline and IV furosemide for fluid overload. *Critical Care Medicine.* 2021;49:e1163-e1175.

Dr. Obisesan is an assistant professor in the division of hospital medicine, Emory University School of Medicine, and associate site director at Grady Memorial Hospital, Atlanta.

By Sahar Taghvaei, DO

7 Most patients meeting sepsis criteria in the emergency department do not have a sepsis diagnosis

CLINICAL QUESTION: What percentage of patients treated for sepsis in the ED are diagnosed with sepsis at discharge?

BACKGROUND: Sepsis is a leading cause of death around the world and the single most expensive diagnosis for inpatient care. Early intervention including invasive procedures, large-volume fluid resuscitation, and broad-spectrum empiric antibiotic therapy, have all demonstrated proven mortality benefits.



Dr. Taghvaei

STUDY DESIGN: Retrospective observational cohort study.

SETTING: An urban academic ED in the U.S. upper Midwest with >100,000 visits per year

SYNOPSIS: The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3), published in 2016, were used for inclusion criteria, with vital signs and laboratory results from the first six hours of presentation. Patients with a primary trauma diagnosis and those with missing ICD-9 codes were excluded from the study. 3,121 patients met the inclusion criteria of Sepsis-3 definitions and received IV antibiotics in the ED. Discharge criteria for sepsis diagnosis included explicit sepsis ICD-9 code listed and implicit infection plus end-organ damage and were used to determine the percentage of patients with a final diagnosis of sepsis. Approximately 30% of patients with suspected sepsis treated with early antibiotics were determined to have had a noninfectious cause of their physiologic derangement. In addition, 39% of patients with suspected sepsis who were not ultimately diagnosed with sepsis at discharge had at least one risk factor for potential harm from large-volume fluid resuscitation, including heart failure or cirrhosis. Combined, these results show potential harm due to overly sensitive sepsis criteria. The limitations of the study include single-site data, possible improvement in end-organ damage with early intervention, and coding errors.

BOTTOM LINE: Sepsis criteria for early intervention need to be modified further to be more specific. Current guidelines for volume resuscitation and IV antibiotics may expose a large subset of patients without sepsis to potential harm.

CITATION: Litell JM et al. Most emergency department patients meeting sepsis criteria are not diagnosed with sepsis at discharge. *Acad Emerg Med.* 2021 Jul;28(7):745-752. doi:10.1111/acem.14265.

Dr. Taghvaei is an assistant professor of medicine, division of hospital medicine, at the Emory School of Medicine, Atlanta.

By Stacey Watkins, MD, PhD

8 Treatment of acute pain in adults with sickle cell disease in an infusion center versus the emergency department resulted in faster treatment and fewer hospitalizations

CLINICAL QUESTION: Are outcomes better for sickle cell patients experiencing vaso-occlusive crises (VOCs) when treated in an infusion center (IC) rather than an emergency department (ED)?

BACKGROUND: VOCs are the most common complication of sickle cell disease (SCD), with a high burden of ED care often followed by subsequent inpatient hospitalization. Established guidelines have recommended rapid initiation of analgesia followed by frequent reassessment and redosing to achieve pain control. This can be difficult with the competing acuity of patient care seen in standard EDs. Limited data surrounding ICs, as alternatives to EDs, has shown a decrease in inpatient admissions and improved outcomes, but no direct comparison of EDs versus ICs exists.

STUDY DESIGN: Prospective observational study.

SETTING: Four sites in four U.S. cities with both ICs and EDs (Baton Rouge, La., Cleveland, Milwaukee, and Baltimore).

SYNOPSIS: The authors identified participants who had acute-care visits during weekdays to allow for direct comparison of ICs, which have limited hours, compared to traditional EDs. Patients who met the criteria for complicated VOC, including acute chest syndrome, priapism, and stroke, were excluded. The mean time to the first dose of parenteral pain medication was 70 minutes faster in ICs compared to EDs (62 minutes versus 132 minutes, respectively, 95% CI, 54 to 98 minutes; $P < 0.001$; E-value, 2.8). The probability that patients would have their pain reassessed 30 minutes following their first dose of parenteral medication was 3.8 times greater in ICs compared to EDs (CI, 2.63 to 5.64 times greater; $P < 0.001$; E-value, 4.7). The probability that the patient's evaluation would result in subsequent hospital admission was smaller by a factor of 0.25 in ICs compared to EDs (CI, 0.18 to 0.33; $P < 0.001$; E-value, 5.4).

BOTTOM LINE: ICs adhere more strictly to sickle cell patient guideline-based care, including faster time to the first dose of parenteral medication and faster reassessment for continued management. The probability of the patient being admitted is also decreased when managed in an IC.

CITATION: Lanzkron S et al. Treatment of acute pain in adults with sickle cell disease in an infusion center versus the emergency department: a multicenter prospective cohort study. *Ann Intern Med.* 2021;174(9):1207-1213. doi:10.7326/M20-7171.

Dr. Watkins is an assistant professor of medicine, division of hospital medicine, at the Emory School of Medicine, Atlanta. ■

Key Clinical Question

Can I use DOAC in a patient with renal disease?

Quiz: Use of DOACs in patients with CKD



1. A 36-year-old man with a history of heart failure with reduced ejection fraction secondary to non-ischemic cardiomyopathy comes to the ED with a two-day history of diarrhea and palpitations. An ECG shows atrial fibrillation with a heart rate of 180. Basic laboratories showed Cr 2.2 CrCl 59, Na 157, and K 3.9. The patient received intravenous fluids and intravenous metoprolol leading to a controlled heart rate. The patient asks you what medication is the best option to reduce his stroke risk.

- a. Apixaban
- b. Warfarin
- c. Rivaroxaban
- d. None of the above

Correct option: D. Patient's CHADSVASc score is 1 (heart failure) therefore his stroke risk is low, and the experts recommend no anticoagulation in this group of patients.

2. A 77-year-old female with a history of hypertension, diabetes, gout, CKD stage 3, and atrial fibrillation comes to your clinic. She is worried about her atrial fibrillation and wants to know how she can decrease the risk of developing a stroke. Her medications include amlodipine, metformin, allopurinol, and amiodarone. Which of the following anticoagulants should we recommend in this patient?

- a. Apixaban
- b. Dalteparin
- c. Unfractionated heparin
- d. Warfarin

Correct option: A. Apixaban will be the most appropriate option for this patient. Warfarin can also be used in CKD stage 3 but given that the patient is taking two drugs (amiodarone and allopurinol) that inhibit the metabolism of warfarin she is at a higher risk of bleeding, making apixaban the safest option in this case.

3. A 72-year-old man with a history of heart failure with reduced ejection fraction secondary to ischemic heart disease, diabetes, hypertension, and CKD comes to the ED complaining of new-onset palpitations. An ECG is obtained, and it shows atrial fibrillation. His current regimen includes metformin, lisinopril, and carvedilol. Laboratories show Cr 1.9, CrCl 20, hemoglobin 11g/dL. Which of the following drugs is the best next step?

- a. Apixaban
- b. Dabigatran
- c. Rivaroxaban
- d. Warfarin

Correct option: D. In patients with CrCl <30, data supporting the safety and effectiveness of DOACs is very limited; hence warfarin would be the best choice for this patient.

4. A 69-year-old man with a history of coronary artery disease, ischemic cardiomyopathy, CKD, hypertension, and diabetes is diagnosed with atrial fibrillation. His most recent renal function panel showed a Cr 2.0, CrCl 24mL/min. Which of the following drugs will be the best option for anticoagulation?

- a. Apixaban
- b. Edoxaban
- c. Rivaroxaban
- d. Warfarin

Correct option: D. There is not sufficient evidence supporting DOACs in patients with CrCl <30. Guidelines in this patient population are inconsistent. Therefore, until an RCT is performed to study the safety of DOACs in this population, warfarin will be the safest choice.

By Karolina Viquez-Beita, MD and Jagriti Chadha, MD, MPH

Case

A 76-year-old man is diagnosed with non-valvular atrial fibrillation. His comorbid conditions are hypertension, diabetes complicated by neuropathy, and chronic kidney disease stage 3. His current medications include metformin, lisinopril, gabapentin, and aspirin. His most recent laboratories showed a creatinine 1.8, creatinine clearance (CrCl) 35 mL/min, hemoglobin 11g/dL, and international normalized ratio 1.0. His congestive heart failure, hypertension, age, diabetes, stroke, vascular disease, and sex (CHADSVASc) score is 4. Which medication should we use to prevent stroke in this patient?

Brief overview of the issue

Chronic kidney disease (CKD) affects approximately 15% of adults worldwide. This disease co-exists with other major cardiovascular diseases such as atrial fibrillation (AF). The prevalence of AF in CKD ranges between 12% and 18% in different studies and increases further with decreasing CrCl.¹

Current guidelines recommend anticoagulation to reduce thromboembolic events in patients with AF if the CHADSVASc score is >2 for men and >3 for women. Warfarin is therapeutically satisfactory, but it is the narrow therapeutic window, complex drug-interaction profile, and need for frequent laboratory monitoring which makes it cumbersome for many patients.

Direct oral anticoagulants (DOACs) have emerged as a promising option because of more reliable anticoagulation activity at fixed dose and fewer drug-drug interactions (DDIs).² Several well conducted, randomized, controlled trials (RCTs) have established DOACs as noninferior or superior to warfarin. However, the use of DOACs in CKD patients with AF remains controversial.

Review of available data

Several DOACs have been approved for the prevention of thromboembolic events in atrial fibrillation including apixaban, edoxaban, rivaroxaban (Xa inhibitors), and dabigatran (a thrombin inhibitor). Regardless of the mechanism of action, DOACs have been shown to be superior to warfarin for thromboembolic prevention and safer in terms of bleeding in patients with AF. However, this evidence is hard to extrapolate in patients with CKD.

DOACs have varying degrees of renal clearance and patients with advanced renal impairment (CrCl <30 mL/min) were excluded from most major trials. Specifically, the trials ROCKET AF, RE-LY, and ENGAGE AF-TIMI 48 excluded patients with a CrCl <30 mL/min. The ARISTOTLE trial excluded patients whose CrCl was <25 mL/min, and only 269 patients with CrCl 25-30mL/min were included.³

Considering all available data in patients with mild to moderate CKD, warfarin and DOACs have shown similar efficacy. In terms of safety profile, DOACs are noninferior or even superior to warfarin. Therefore, the Food and Drug Administration (FDA) has approved apixaban, rivaroxaban, dabigatran, and edoxaban in patients with CKD stages 1-3. Apixaban and rivaroxaban are the two DOACs that have been used the most in patients with advanced CKD (CrCl of <30 mL/min). Also, these are the only two DOACs with FDA approval for patients undergoing hemodialysis.

It is important to note that the FDA approval for these medications in advanced CKD was a result of small pharmacokinetics studies. Multiple authors have conducted retrospective studies with DOACs in advanced renal disease, but the results are inconsistent.⁴

Siontis et al studied a total of 26,111 patients with end-stage renal disease and AF, 2,351 of whom were on apixaban. The authors reported a decreased risk of bleeding in patients taking apixaban compared

Key Points

- DOACs are safe in patients with CKD and CrCl >30mL/min
- In patients with CrCl <30mL/min, data on DOACs are very limited; therefore, warfarin should be considered as first-line
- Apixaban seems to have the best side-effect and safety profiles in most studies

Table 1. Recommendations for anticoagulation in patients with CKD

CRCL	GUIDELINES	WARFARIN	APIXABAN	DABIGATRAN	EDOXYBAN	RIVAROXABAN
30-59ML/MIN	AHA 2019	Adjusted dose INR 2-3	5 or 2.5*mg BID	150mg BID	30mg QD	15mg QD
	CHEST 2018	Adjusted dose TTR >70%	5 or 2.5*mg BID	150 or 110mg BID	30mg QD	15mg QD
	KDIGO 2018	Adjusted dose INR 2-3	5 or 2.5*mg BID	150 or 110mg BID	30mg QD	15mg QD
	EHRA 2018	Adjusted dose INR 2-3	5 or 2.5*mg BID	150 or 110mg BID	30mg QD	20mg (15mg if CrCl<50) QD
	ESC 2016	Adjusted dose INR 2-3	5 or 2.5*mg BID	150 or 110mg BID	30mg (15mg if CrCl <50) QD	15mg QD
15-29ML/MIN	AHA 2019	Adjusted dose INR 2-3	5 or 2.5*mg BID	75mg BID	Not recommended	15mg QD
	CHEST 2018	Adjusted dose TTR >70%	2.5mg BID	75mg BID‡	30mg QD	15mg QD
	KDIGO 2018	Consider Adjusted dose INR 2-3	Consider 2.5mg BID	Unknown (consider 75mg BID)	Consider 30mg QD	Consider 15mg QD
	EHRA 2018	Adjusted dose INR 2-3	2.5mg BID	Not recommended	30mg QD	15mg QD
	ESC 2016	Adjusted dose INR 2-3	Not recommended if CrCl<25mL/min	Not recommended	Not recommended	Not recommended
<15	AHA 2019	Adjusted dose INR 2-3	5 or 2.5*mg BID	Not recommended	Not recommended	Not recommended
	CHEST 2018	Adjusted dose TTR >70%	5mg BID‡	Not recommended	Not recommended	Not recommended
	KDIGO 2018	Equipoise	Consider 2.5mg BID	Not recommended	Not recommended	Unknown (15mg QD mentioned)
	EHRA 2018	Not discussed	Not recommended	Not recommended	Not recommended	Not recommended
	ESC 2016	Not discussed	Not recommended	Not recommended	Not discussed	Not recommended

*Use apixaban 2.5 mg BID if any two patient characteristics are present: Cr >1.5 mg/dL (133 mmol/L), >80 years of age, body weight <60 kg. Apixaban is not recommended in patients with severe hepatic impairment. ‡In the United States only. AHA: American Heart Association. BID: twice a day. EHRA: European Heart Rhythm Association. ESC: European Society of Cardiology. INR: International normalized ratio KDIGO: Kidney disease: improving global outcomes. QD: once a day. TTR: time in the international normalized ratio target range.



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to warfarin with an equal risk of stroke, systemic embolization, and death. There was increased efficacy of apixaban 5 mg twice daily over warfarin in terms of stroke prevention and mortality, but not of the 2.5 mg dose.⁵

Mavrakanas et al showed that apixaban 5 mg twice daily in dialysis patients resulted in supratherapeutic levels, while a 2.5 mg dose did not.²

Shin et al retrospectively evaluated 20,727 patients with AF and CKD and found DOAC efficacy for stroke prevention was equal to that of warfarin, but there was a 23% higher risk of bleeding in patients taking DOACs with a CrCl <60 mL/min. However, only 4% of this patient cohort had CrCl <30 mL/min.⁶

Lastly, a recent systematic review, including 10 observational studies (three studies including patients with CrCl <25 mL/min), found no difference for stroke prevention in dialysis patients between the DOACs (apixaban, rivaroxaban, dabigatran) and warfarin. Rivaroxaban and dabigatran were associated with an increased major bleeding risk as compared to warfarin, but this was not seen with apixaban.⁷

Based on this study, the FDA recommended apixaban 5 mg in patients with dialysis. Further, they recommended that the 2.5

mg dose should be used only if the patient meets two of three characteristics, namely, Cr >1.5 mg/dL (133 mmol/L), age >80 years, or body-weight <60 kg.⁵

Given the sparse evidence in CKD, it is safer to use warfarin in individuals with CKD stage 4-5 and AF as the recommendations for DOACs are inconsistent between societies.¹⁻³ (Table 1).

Application of the data to our case

Our patient with a newly diagnosed AF and a CHADSVASc score of 4 will benefit from anticoagulation. Because his CrCl is >30 mL/min, DOACs can be used safely. Therefore, we can use either of the four available DOACs in our patient.

Bottom line

Literature suggests that DOACs are safe in patients with renal disease and CrCl >30. In this population, DOACs are not inferior when compared with warfarin both in

terms of efficacy and safety. ■

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Hospitalists demonstrate resiliency in the face of challenge

Dealing with overcrowding during the pandemic

By Karen Appold

As he reflected upon his days as a hospitalist and unit medical director within the division of hospital medicine at NYU Langone Health in New York, since the COVID-19 pandemic began, Benjamin Verplanke, MD, FACP, said, “It can be daunting to know that as soon as you discharge someone, two people are waiting for that bed.”



Dr. Verplanke

The coronavirus, and now the delta variant, have contributed to overcrowding at hospitals and other challenges such as resource shortages. For the AdventHealth Medical Group, Central Florida Division, a six-county region in and surrounding metro Orlando, Fla., retaining enough nurses has been the biggest challenge. Many existing nurses were travelers, and some employees left to become travelers to hotspots, said Neil Finkler, MD, senior vice president, and chief clinical officer. As the pandemic wore on, the physician workforce also experienced significant constraints at the 4,500-bed system, which has hospitals in urban and rural areas, including specialty hospitals for women and

children.

Oregon Health & Science University (OHSU) in Portland, Ore., stopped all elective surgeries and procedures during the first wave of COVID-19, per a state mandate, and consequently had a large backlog to manage when it offered them again. Then, during the delta surge, the hospital had a high volume of local COVID-19 patients as well as a high burden of non-COVID transfer patients due to extremely severe COVID-19 outbreaks in other parts of the state, said Stephanie Halvorson, MD, FACP, associate professor of medicine and division chief of hospital medicine at the 576-bed adult and pediatric hospital.

Brian Clay, MD, health sciences clinical professor of medicine, chief medical information officer, and associate chief medical officer for inpatient care in the department of medicine at University of California San Diego (UCSD) Health in San Diego, is seeing more outpatient volume at the 808-bed academic facility—which can lead to increased hospital-based surgical procedures and referrals to the emergency department. Like OHSU, UCSD is also seeing a fair amount of



Dr. Clay

deferred care in the region given the previous COVID-19 waves last winter and summer.

The pandemic has also had negative impacts on many community-based systems of support and care. Nejat Zeyneloglu, MD, MBA, FHM, chief medical officer at Central Vermont Medical Center in Berlin, Vt., has seen an increase in mental health needs, uncontrolled chronic medical problems, and delayed care at the 122-bed, non-profit, rural community hospital. Additionally, placements in short-term rehabilitation or long-term-care facilities have been hampered by outbreaks.

With the latest coronavirus surge in late 2021, Rick Hilger, MD, SFHM, system utilization management medical director and hospitalist in the department of hospital medicine at HealthPartners in Minneapolis, an urban, tertiary-care, health system with more than 1,000 beds, has also seen a lack of staffing and beds at skilled nursing facilities (SNFs). “It has become difficult to discharge patients requiring rehabilitation services due to a lack of staffing in the post-acute care setting,” he said. He attributes this to the Centers for Medicare & Medicaid



Dr. Hilger

Services (CMS) waiving the three-day requirement to qualify for SNF coverage, and most commercial health plans waiving pre-authorization requirements under these circumstances. “These changes revealed the inefficiencies created by these artificial hurdles to progressing care; we need to find a better way forward.”

Addressing staffing shortages

As a result of overcrowding, hospitalists at regional sites affiliated with Aspirus Medical Group, a rural health system in Wausau, Wis., often care for patients at higher acuity levels than they’re accustomed to, said Steve Phillipson, MD, FHM, director of hospital medicine. They assist emergency-medicine colleagues when boarded patients in the emergency department are awaiting transfer. The system has about 300 beds in Wausau and around 400 more in the region.

At one point, a national disaster medical assistance team augmented intensive care unit (ICU) staff capability at one of Aspirus’ critical-access hospitals, which enabled it to open additional beds there. “That extra capacity was crucial to our patients and system during the last wave,” Dr. Phillipson said. “We also have data on bed availability at SNFs and hospitals outside our system in case we need to transfer patients there.”

Since the coronavirus began, NYU Langone Health has increased its acute medical floor census, therefore requiring more physicians and nurses at the 760-bed, urban academic center. “We have increased our hiring pool of hospitalists and nurses; we use per-diem nurses as well to help fill in gaps,” Dr. Verplanke said. “We have increased moonlighting to residents, fellows, advanced-care providers, and physicians.”

AdventHealth strives to have nurses work at the top of their licenses and found implementing telenursing to respond to COVID-19-patient care to be quite invaluable.

AdventHealth began using new predictive models for planning. “Our leadership asked us to forecast what would happen in the next week regarding peaks, troughs, and future surges,” Dr. Finkler said. By using new data sources, the health system learned that an increase in the outpatient antigen testing positivity rate (APR) at urgent care centers consistently correlated with a subsequent increase, two weeks later, in the number of COVID-19 hospitalizations and ICU admissions.¹

Managing resources

In addition to staff, some health systems grappled with having enough supplies. Although supplies were plentiful at AdventHealth’s Central Florida Division locations, new processes were developed to distribute supplies among the organization’s 50 hospital campuses that needed them most. “We used predictive models to quickly develop a system to move around supplies and other assets, such as pharmaceuticals, when one region was in a surge and another wasn’t,” Dr. Finkler said. “This was the first time we ever had to do this.”

Dr. Zeyneloglu has seen the value of reusable or multi-use spaces and supplies. “We think about sustainability and flexibility much more,” he said. “We have regular meetings to review the availability of supplies and assess whether availability triggers turning off a service.”

Working with other partners

Increasing communications within departments, health systems, and external partners has been crucial to hospitals’ success in battling the coronavirus. Hospitals’ relationships with health departments, government officials, and communities grew during the pandemic.

As a health system that serves a small state (Vermont), Central Vermont Medical Center already had solid connections to the community and state health department, which strengthened during the pandemic, Dr. Zeyneloglu said. “Partnerships with health and human services agencies and non-profits were invaluable in terms of mobilizing cloth-mask production and reducing ED visits at the pandemic’s onset,” he said. “Our emergency preparedness team is much better connected to small volunteer efforts that serve towns with populations ranging from 1,300 to 9,000 within our health care system. The vaccination effort also improved our ties to area first responders and community health providers.”

Aspirus established local incident command centers at each of its 17 hospitals and a system-wide, emergency operating command center to address pandemic issues. Each day, center personnel meet to discuss issues specific to the site and disseminate information relative

to the region and the regional response. “This has helped us to stay nimble in the face of a shifting crisis,” Dr. Phillipson said. Other measures included creating a medical operations command cell that helps facilitate inpatient transfers among hospitals in its system to move patients closer to home and optimize bed usage.

Internally, Aspirus provided daily COVID-19 updates to team members and leveraged standard tools such as the intranet and newsletters to facilitate effective communication among staff. The emergency operating command center



Dr. Phillipson

“Hospitalists are truly the ‘hub’ in a hub-and-spoke model of hospital systems. We interact with everyone. We understand the importance of every person and role and have a good understanding of what they do. This allows us to partner and creatively solve problems with colleagues across disciplines and job types.”

served as the clearinghouse for information.

Public education has also been critical throughout the pandemic. Early on, Aspirus established three key public information sources:

- Regular media briefings featuring clinical and non-clinical leaders held at its tertiary-care center, live-streamed to media partners in its service area and beyond
- A robust COVID-19 resource center on its public website
- A dedicated COVID-19 call center hotline, where people could ask questions and schedule COVID-19 testing and vaccination

Dr. Halvorson found it helpful to have close relationships with other hospitalist leaders in Portland. “We communicated regularly to address questions and concerns in real time,” she said. Some topics included the timing of mask mandates, strategies for effective team communications, and how systems were managing PPE. “This shared experience and learning at the leadership level has been extraordinarily helpful.”



Dr. Halvorson

Changes in discharge processes

Hospitalists have been on the front lines of decision making regarding discharge processes and other operations. Getting patients discharged faster has been a priority during the pandemic. “Some patients that Aspirus previously might have kept in the hospital were sent home with close outpatient follow-up by their primary care team,” Dr. Phillipson said. “Discharge protocols were developed with home health services for ED patients who would have stayed in the past.” He reports success in managing patients at home at higher levels of acuity than in the past.

Although previously NYU Langone Health wouldn’t discharge patients to their homes if

they needed supplemental oxygen, that protocol changed. Now patients who are otherwise feeling better but are still mildly hypoxic are sent home with supplemental oxygen and pulse oximeters.

Because all subacute rehabilitation and SNFs require COVID-19 tests within one to two days of accepting a patient, NYU Langone Health uses rapid polymerase chain reaction (PCR) tests to ensure they can be completed quickly.

Further, NYU Langone Health created a unit for lower acuity patients who weren’t ready to leave. “This allowed us to open space for more acute patients and create a dedicated team to focus on patients with more complicated discharge plans,” Dr. Verplanke said.

To discharge more patients due to overcrowding, AdventHealth began remotely monitoring patients through a new service called Dispatch-Health. COVID-19-positive patients who met certain criteria could leave and have their oxygen levels monitored at home. If anything alarming occurred, the patient was asked to return to the hospital. “This has been a remarkable way to save space, particularly during the Delta surge in August when space was at a premium,” Dr. Finkler said.

UCSD Health expanded its use of discharge lounges, which allowed discharged patients to wait for transportation without having to continue to occupy a hospital bed.

Changes in operations

In addition to discharging patients faster, hospitals made other changes to their operations. One of OHSU’s biggest changes was to transfer patients with long lengths of stay but low medical complexity (e.g., patients awaiting guardianship, or those who were stabilized after a long duration of IV antibiotics) to one of its two community hospital partners to free up beds at the academic site. This successful effort opened up more than 350 hospital bed days at its academic site in the first quarter of 2021.

That said, this strategy has contributed to a chronically higher census at one of its community sites, so OHSU is looking to increase staffing to support the team there. Going forward, Dr. Halvorson anticipates maintaining this model because it also consolidates case management and nursing needs to allow for stronger discharge planning for these complex patients.

OHSU tried another strategy,² which wasn’t successful, early in the initial coronavirus surge, in which it transferred a similar patient population (such as patients awaiting discharge) down to its outpatient care unit/day surgery center. These patients required complex discharge care coordination involving the pharmacy, laboratory, nutrition services, and environmental services.

“Ultimately, this initiative was not worth the small number of patients who we were able to transfer, so we abandoned the effort,” Dr. Halvorson said. “I think we’ve been more successful in transferring these patients to one of our partner, community hospitals because they already had all of the necessary services in place and dedicated case management.”

NYU Langone Health increased its ICU staff and acute medicine staff to make it possible to almost completely fill its hospital with COVID-19 patients. This included all medical and surgical floors, as well as its pediatric floor. The health system had recently built a state-of-the-art facility in which every floor could be converted to an ICU, which was a great help, Dr. Verplanke said. Leadership recruited outpatient physicians and advanced-practice providers from the commu-

nity to work on COVID-19 floors. It also recruited physicians and nurses from other states.

Throughout the pandemic, AdventHealth's workforce and shift resources became more nimble. Because the Accreditation Council for Graduate Medical Education suspended rules for medical residents during the pandemic by implementing crisis standards of care, AdventHealth could use graduate medical education students and medical residents to cover for hospitalists who moved to the ICU to help intensivists. By having crisis documentation standards approved at the state level, nurses could limit their documentation to just the essential, safety components. This alleviated how much time nurses spent documenting in electronic medical records (EMRs) and freed them up to be at the bedside in the middle of an unprecedented staffing crisis.

Hospitalists' roles

Hospitalists have played multiple integral roles in making significant changes. "Hospitalists have been at the table and involved in every decision we've made," Dr. Finkler said. "They've been at command centers—both at the corporate and national levels—and within the localized Central Florida division

level."

At OHSU, hospitalist leadership worked to implement acute care and surge plans throughout its three institutions and participated in other key efforts such as committees focused on securing PPE supplies, patient cohorting, and developing COVID-19 testing pathways and protocols. "We drew from strong relationships with other inpatient services (e.g., cardiology, oncology) to get support when needed (e.g., surge planning)," Dr. Halvorson said.

"Hospitalists are truly the 'hub' in a hub-and-spoke model of hospital systems. We interact with everyone. We understand the importance of every person and role and have a good understanding of what they do. This allows us to partner and creatively solve problems with colleagues across disciplines and job types."

Hospitalists at UCSD Health serve in numerous leadership positions, including chairing multiple hospital committees, leading quality and safety efforts, and running clinical-informatics teams. "Hospital medicine worked closely with infection preventionists to implement standard COVID-19 management protocols, and with the EMR team to build the necessary COVID testing algorithms, patient instruc-

tion content, and clinical-decision support tools," Dr. Clay said.

Lessons learned

Many lessons have already been learned from working during the pandemic. "Adapt, adapt, adapt, and learn to be resilient," Dr. Zeyneloglu said. "Our staff is our most precious resource and we must do what we can to prevent stress and burnout."

Perhaps the most important lesson AdventHealth learned was to accept failure as part of innovation. "Overcoming the fear of failure and accepting that failures are important steps along the road to transformation is a necessary change in the mindset of future clinical leaders," Dr. Finkler said.¹

Dr. Halvorson has learned that "relationships are everything. The pre-existing relationships we had throughout the hospital and with the executive leadership team allowed us to quickly collaborate and develop surge plans," she said.

And communication is key. OHSU developed a single system of communication including a daily huddle and email during the surge's busiest part. "This was a quick way to share information and address concerns in real time," Dr. Halvorson said.

Leaders can learn a lot from one another, even though they work at competing health systems, Dr. Halvorson continued. "I have borrowed many good ideas from my peers," she said. "I joined the multi-site leaders' special interest group through SHM, and have similarly found this to be a wealth of practical information."

Finally, hospitalists are essential. "If there was ever doubt about that before, we have proven our value to our systems and communities," Dr. Halvorson said. "We showed up for work consistently, even in the early days when little was known about COVID-19 and anxiety was high. I will forever have a deep appreciation for my colleagues and hospitalists everywhere." ■

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Guardianship issues lead to unnecessarily prolonged hospitalizations

Hospitals provide safety net

By Ruth Jessen Hickman, MD

Minors requiring guardianship are sometimes hospitalized for much longer than medically necessary because of placement issues. The same can happen for incapacitated adults who require some form of guardianship prior to discharge. Both these scenarios can cause medical and mental health issues for patients, as well as an increased burden on staff, hospitals, and the overall health care system.

Prolonged hospitalizations in minors without guardians

Nicole Webb, MD, who is an assistant clinical professor at Stanford University in Stanford, Calif., and a pediatric hospitalist at Valley Children's Hospital in Madera, Calif., noted a common scenario: A child in a foster placement might have a crisis of their underlying medical problem, like type 2 diabetes, requiring hospitalization, and then their previous foster placement



Dr. Webb

might not reaccept them when they are ready for discharge. Sometimes children with such medical issues are hospitalized for weeks or months between foster placements even if no acute need for hospitalization was ever present (sometimes termed a "social admission").

Other hospitalized children sometimes need foster placement as well, e.g., if the hospital makes an initial report of abuse to child protective services (CPS) for a toddler. However, most of those children are not prone to extended, unnecessary hospital stays, because it's usually relatively easy for hospital social work systems to work with CPS and find an appropriate placement.

But placement can be extremely challenging for older children, who may have severe behavioral issues from a long history of trauma and unmet social and mental health needs. These children may fail multiple placements in several different counties because of such issues, which makes them even harder to place in the future.

Dr. Webb said, "Generally teens and people with more medical problems are harder to place, and so they may end up in the hospital for a long time. That is really challenging for these kids, and every-

one involved in their care, and it's a drain on health care resources." Dr. Webb noted that the strain falls particularly heavily on the bedside nursing staff, but for a hospitalist, addressing questions about such patients often takes considerable time.

Nancy Chen, MD, a clinical assistant professor of pediatrics at Banner-University Medical Center in Tucson, Ariz., said her hospital also sometimes has such medically unnecessary prolonged hospitalizations, although they are rare. Here as well, the problem is often children with complex medical issues who are awaiting foster placement through CPS. At Dr. Chen's hospital they also occasionally treat unaccompanied minors for reasons related to immigration, but this population is promptly released to U.S. Customs and Border Protection or charitable organizations and is not prone to such extended stays.

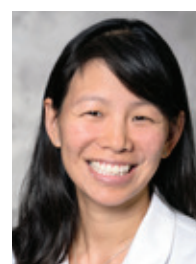
Dr. Chen said, "While we try our best as hospital staff—and we have a lot of in-house resources for

children, like through child life services—it's still not a normal place for a kid to be."

Deonna Villegas-McPeters, LCSW, the director of social work at Valley Children's Hospital, explained that hospitals have become part of the safety net for these children. "But we are not set up to meet all of their mental health needs or their ongoing behavioral health needs. We become a holding ground, and with RSV and flu season, our beds become more of a commodity. When we have a kiddo or two sitting there that doesn't require medical care, that's really hard."

Addressing the root causes of these challenges is extremely difficult for hospitals. Clear and regularly scheduled communication among clinicians, hospital social workers, CPS staff, and other relevant parties may help move the process along, but such diligent outreach is often already in place. Limitations in CPS resources still pose a major obstacle. "The reality is, CPS does not have nearly enough resources for the referrals that they get," said Dr. Webb.

Certain areas of the country with greater socioeconomic disparities, higher need for foster placements, and fewer resources overall may particularly struggle with this



Dr. Chen

issue. Other local factors can also play a role. Maria Gutierrez, LCSW, a social work manager at Valley Children's Hospital, pointed out that in California, a 2017 legislative change in the way the state organizes its foster placements in its short-term residential therapeutic programs (STRTPs) has made it even more difficult to get foster placements for medically and behaviorally complex patients, although that was not the law's intention.

Dr. Chen said, "When we get these kids, we do our best to take care of them and be there for them, but it does make you realize that there are a lot of greater issues [in broader social systems] that we can't fix."

Adults who require surrogate decision makers

Adults may also require the establishment of a legal guardian before hospital discharge can take place. For example, this might happen if an adult without a pre-designated health care proxy cannot make informed decisions due to the medical problems that necessitated hospitalization. In this instance, the hospital cannot complete discharge to a long-term care facility until a surrogate decision maker is established.

Daniel N. Ricotta, MD, is an assistant professor of medicine at Harvard and a hospitalist at Beth Israel Deaconess Medical Center in Boston, Mass.



Dr. Ricotta

He said, "At any given time in a typical hospital, we might have 10-20 people awaiting guardianship. That's 10-20 beds you could be using for someone else who needs them." He said, "The increased length of stay reduces throughput to the hospital, so you have a backlog of patients who are waiting for beds."

States vary in their surrogate-consent laws, in terms of the ease with which surrogates (such as a family member) can step in and make various specific decisions. Some states, including Massachusetts, have no surrogate-consent laws. In this case, the person wanting to be a surrogate must complete extensive guardianship documentation, notify all relevant parties, and get official guardianship bestowed at a court date—all steps in which mistakes might be made, causing delays.¹

Dr. Ricotta said, "Part of the

reason that the guardianship process takes so long, especially in Massachusetts, is that courts ... don't meet often enough to review the cases in a timely manner." He noted that at his institution they make efforts to identify such potential patients early, to start this process as soon as possible, and help prevent these delays.

The process can be even longer and more involved for patients who have no family members or friends to step in. In these cases, it may fall primarily to the hospital's in-house legal counsel to take steps to establish a formal guardianship, working through the courts.

Most states have public-guardianship programs that can help match appropriate guardians to patients in these cases. But some states, such as Massachusetts, have no such programs. This leaves even more work for hospitals trying to establish professional or volunteer guardians for these patients. In Massachusetts, a bill to enact a public guardianship has come before the state legislature, but it has not been passed yet.

Dr. Ricotta and colleagues studied this issue at his institution and found, accounting for potential confounders, that the process of obtaining guardianship was associated with a 37% longer total

length of stay and 23% higher total charges.² Perhaps even more importantly, one in six such patients awaiting guardianship experienced a hospital-related complication (such as hospital-acquired pneumonia) after having been medically ready for discharge.²

Because the legal pursuit of guardianship via the courts can be necessary even when a patient has a willing family member or friend, encouraging able adults to establish their own official health care proxies is key. Dr. Ricotta said, "The biggest and most important strategy is the push to get health care proxies completed by all of our patients in our network as a quality-improvement initiative." ■

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SHM Converge promises a lively return to live

By Thomas R. Collins

In 1998, about 200 hospitalists and hospital medicine-related professionals came together in San Diego at the first annual conference of the National Association of Inpatient Physicians (NAIP).

The specialty of hospital medicine was still new at the time, and the main point of the conference—beyond medical societies adopting the habit of hosting an annual meeting in the first place—was to “figure out the direction” of the society and specialty, said Michelle Kann, CMP, DES, and associate chief of operations at SHM. SHM Converge 2022 will be her 13th annual meeting.

The evolution

A lot has changed in 24 years. The NAIP is now the Society of Hospital Medicine, thousands attend the conference each year, and the program has expanded tremendously. But in some ways, this meeting will feel like a first—it will be the first live meeting in three years (after two virtual meetings due to COVID-19), and it will be the first annual conference held in Nashville, Tenn.

“We wanted to start getting back to business,



Kann

wanted to start getting back to doing live—live meetings—because that is a core function of SHM,” Ms. Kann said.

The evolution of the conference, in part, tells the story of why the conference will be held live, rather than virtually, or as a combination of live sessions and live-streamed sessions, she said. In the early years of the conference, the focus was on providing continuing medical education (CME) opportunities. To meet this demand, the session offerings kept growing. With these expanded educational offerings, Ms. Kann said, the attendance grew. And as the number of attendees grew, networking became more central to the identity of the conference, she said.

“The networking and the family that has come with us has grown year over year. I’ve really noticed the number of people who want to go, not even for the education necessarily, but because they want to see each other,” she said. The annual meeting has become “much more of a family get-together than an educational conference.” Such an event, Ms. Kann said, is meant to be live—with face-to-face conversations, fist bumps, and, for some, friendly hugs. This year, on-demand content will be available for nine or

10 tracks, up from the traditional four to seven, she said—so the meeting will, in a sense, still have a hybrid format.

Heather Nye, MD, PhD, SFHM, this year’s course director and professor of medicine at the University of California, San Francisco, said the name change to SHM Converge has been a helpful segue to a somewhat different look and feel for the meeting.

“It gave us the opportunity to sort of branch out in terms of how we did things with the schedule, with tracks, with having a little fun with classic names, and moving to a newer way of describing things,” she said. “We took all the good things from prior meetings, including a heavily clinical focus, and then arranged it in a way that we felt would be fun.”



Dr. Nye

This year’s Converge

Dr. Nye has opted for a music and entertainment theme in the program—appropriately

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enough for Nashville. This year's program includes four new tracks:

- **Showtime:** Includes sessions with more audience interaction woven into their fabric—such as The Diagnosis is Right, Stump the Professor, and Medical Jeopardy. It's described as "learning with a little glitz, glamor, and fun."
- **Beyond Four Walls:** Delves into the new reality of hospital medicine that much of the work of the field—such as disaster preparedness and post-acute care—takes place outside the hospital.
- **Grand Ole Communication:** "Communication with patients, doctors, and other providers is critical to our profession," Dr. Nye said. "It's been a track before, but it was rested, and this year we brought it back." Part of the reason for the return is the new aspects of communication, including open notes, in which patients have a right to see what doctors write about them.
- **Encore:** This is a track that, for quick reference, houses the very popular sessions that will be repeated to accommodate those who missed them because of conflicting sessions or because room capacity was reached.

"We acknowledge there are Converge sessions you'll have to miss," Dr. Nye said. "But there is a solution for some of our most highly attended clinical sessions."

Over the years, she said, the meeting has also evolved to be more inclusive, with an open call for session speakers in recent years.

"We've done a lot of trying to even the playing field, get as many people from as many institutions," she said. "That's been a huge focus for us."



Evans

Brittany Evans, CAPM, senior manager of meetings for SHM, said the conference this year offers a chance for hospital medicine professionals to engage with each other on issues that have affected them so profoundly during the pandemic.

"The past couple of years have been really, really tough in a million different aspects, but really with the social issues that were going on," she said. "And I think it really touched the ACC [annual conference committee] to be able to be in person and have content in regard to those issues, whether it was disaster preparedness or things around racial biases."

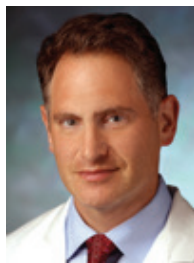
Content is key

Christopher Whinney, MD, FACP, SFHM, a hospitalist at the Cleveland Clinic, Ohio, and the assistant course director who has attended the conference since the NAIP days, said the conference content recognizes that resilience and self-care are critical, and that's rejuvenating.

"It just has so much more resonance now," he said. "You leave with this catalyzing energy to really just take on the world."

For new attendees, he suggested having a plan beforehand—choose which sessions to attend to address, "what you want to know more about or what you'd like to learn about."

Daniel Brotman, MD, MHM, professor of medicine at Johns Hopkins, Baltimore, and two-time conference course director, said that, even as the conference has changed over time, one of its main strengths has been what's stayed the same, including the emphasis on clinical updates, and on catering to a wide variety of interests. He said the experience of being a course director



Dr. Brotman

prompted him to expand his horizons at the conference.

"After being course director, I really see the value in the different tracks, and I strongly encourage people to at least try one session from each track," he said. "They're likely to get out of it more than they realize, and it may spark some cross-fertilization and interest in areas that they may not have appreciated before the meeting."

Jill Wener, MD, a wellness and meditation expert who is a first-time speaker (outside of a workshop session) this year, will discuss wellness techniques at a time when the topic is more relevant than ever. Before burnout took a deep toll on her life in 2011, she was the "least likely person ever to meditate," but eventually found it to be "life-changing in so many ways," she said.

The session comes as more physicians have been turning to her for help after becoming overwhelmed by the demands of COVID-19 care. Even for those who might not have considered themselves as having "burnout," per se, wellness is now a topic of importance, she said.

"For so long, so many people have been really unhappy in medicine, and feeling unheard, overworked, undervalued, and like cogs in a system a little bit," she said. "And so, I think COVID really just amplified a lot of issues that were already there." ■

Tom Collins is a medical writer in South Florida, who has written about everything from lethal infections to thorny ethical dilemmas, runaway tumors to tornado-chasing doctors. He gathers health news from around the globe and lives in West Palm Beach.



Dr. Wener

Shorter course of anticoagulant therapy adequate for provoked VTE in children

By Reuters Staff

NEW YORK (Reuters Health)—For children with acute provoked venous thromboembolism (VTE), six weeks of anticoagulant therapy is as effective as a three-month course of anticoagulant therapy, results of a new clinical trial suggest.

"When treatment should be stopped is as important as when it should be started," said the authors of an editorial published with the study in *JAMA* (2022; 327(2):124-125).

"The findings suggest that anticoagulant therapy could be stopped sooner than currently recommended and that doing so is likely to be as safe as longer treatment. Quality of life may be improved in many children by decreasing the duration of subcutaneous injections," said Dr. Jacques Lacroix of the University of Montreal, in Canada, and colleagues.

Among patients younger than 21 years, the optimal duration of anticoagulant therapy for VTE is

unknown. However, the standard of care for provoked VTE (that is, VTE temporally associated with a prothrombotic clinical risk factor) has been a three-month course of anticoagulant therapy, as recommended for adults.

The Kids-DOTT trial was a non-inferiority randomized trial that compared the efficacy and safety of six weeks versus three months of anticoagulant therapy to prevent recurrent VTE in 417 patients younger than age 21 years (median age, 8.3 years) who experienced an acute provoked VTE.

Provoking factors included recent hospitalization, traumatic injury, central venous catheterization. The chief exclusion criteria were prior VTE, active malignancy, systemic lupus erythematosus, pulmonary embolism unaccompanied by deep vein thrombosis, thrombolytic therapy for the index VTE, and clinically significant deficiencies of natural anticoagulants (protein C, protein S, antithrombin).

The primary efficacy and safety endpoints were symptomatic re-

current VTE and clinically relevant bleeding events within one year by blinded assessment.

The cumulative incidence of symptomatic recurrent VTE was 0.66% with six weeks of treatment and 0.70% with three months of treatment and clinically relevant bleeding events within one year were 0.65% and 0.70%, respectively.

"Based on absolute risk differences in recurrent venous thromboembolism and clinically relevant bleeding events between groups, noninferiority was demonstrated," said Dr. Neil Goldenberg of the Institute for Clinical and Translational Research, Johns Hopkins All Children's Hospital in St. Petersburg, Fla.

Adverse events occurred in 26% of patients in the six-week group and in 32% of patients in the three-month group; fever was the most common adverse event (1.9% and 3.4%, respectively).

This study shows that a "short period of anticoagulant therapy of six weeks can effectively and safely prevent recurrent thrombosis,"

the editorial writers said.

"Given that the study was conducted at 42 centers in five countries over 13 years, it is unlikely to be repeated. Although the data reported by Goldenberg et al are compelling enough that some practitioners may want to apply them immediately, the results should be applied judiciously and not be extrapolated to patients with unprovoked venous thromboembolism and older patients," they said.

The Kids-DOTT study was funded by grants from the National Heart, Lung, and Blood Institute; the Bridge Award from the American Society of Hematology; the Thrombosis Studies Award from the Hemophilia and Thrombosis Research Society of North America; an investigator-initiated studies award from Eisai Inc; and an institutional research award from the Johns Hopkins All Children's Foundation. Dr. Goldenberg reported receiving personal fees from Anthos, Bristol Myers Squibb, Bayer, Daiichi-Sankyo, Pfizer, and Novartis. ■



Interpreting Diagnostic Tests

To treat or not to treat: interpreting syphilis serologies

By Annie N. Cowell, MD, MPH; Ali Farkhondehpour, MD; Meghan Sebasky, MD, FACP, SFHM

Case

A 32-year-old man with history of intravenous heroin use presents to the emergency department

Key Points

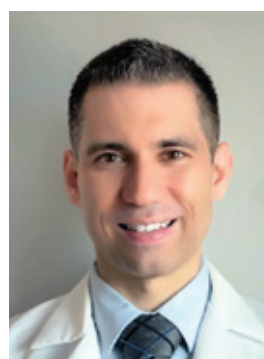
- Syphilis EIA testing is more sensitive than specific in a low-prevalence population
- Reverse-algorithm testing for syphilis is being used more commonly than the traditional algorithm
- Discordant test results generated from the reverse algorithm need to be interpreted in the context of clinical history (e.g., recent syphilis exposure, prior syphilis treatment, current symptoms, and sexual history)

(ED) for fevers and redness with purulence over the left forearm. He is started on IV vancomycin and admitted for purulent cellulitis with sepsis. The ED checks a rapid human immunodeficiency virus (HIV), hepatitis C antibody, and syphilis enzyme immunoassay (EIA). The syphilis EIA comes back reactive. Is further testing necessary? Does he require treatment for syphilis?

Brief overview of the issue

Syphilis is a sexually transmitted, infectious disease caused by the bacterium *Treponema pallidum*. Symptoms correspond to the four stages of infection.

In primary syphilis, a painless ulcer occurs at the site of introduction 10-90 days after exposure. Secondary syphilis indicates a disseminated infection that can manifest with rash, mucous membrane lesions, and constitutional symptoms. Latent syphilis is asymptomatic and classified as early (<12-24 months after exposure) or late (>12-24 months after expo-



Dr. Farkhondehpour



Dr. Sebasky



Dr. Cowell

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sure). Tertiary syphilis is a chronic, end-organ disease that can affect any organ. Neurosyphilis can occur at any stage.¹

The manifestations of syphilis are often non-specific and may progress if the disease is not

identified and treated. Early diagnosis of syphilis is particularly important in HIV-infected patients as they may progress to tertiary syphilis in six months.

Risk factors for acquiring syphilis include HIV infection, history

Table 1. Syphilis reverse-algorithm serology interpretation¹⁻⁸

EIA/CIA/MFI	RPR	TP-PA	INTERPRETATION
Non-reactive	---	---	Syphilis not detected. or If clinical history is suggestive of early syphilis, consider empiric treatment and retesting in 2-4 weeks.
Reactive	Reactive	---	Likely untreated or newly acquired syphilis that requires staging and treatment. (If patient asymptomatic, does not recall known history of syphilis/treatment, and no previous titers to review, then usually treated as late latent.) or History of syphilis in the past that was treated (if RPR titers have at least a 4-fold increase compared to last known titers, then suspect reinfection that requires treatment).
Reactive	Non-reactive	Non-reactive	Likely false-positive initial screen.
Reactive	Non-reactive	Reactive/Indeterminate	Previously treated syphilis, latent, tertiary, or early syphilis. These results require clinical correlation with a person's sexual history and symptoms to assist with interpretation (If patient asymptomatic, does not recall known history of syphilis/treatment, and no previous titers to review, then usually treated as late latent.)

AU FRANKENHOFER, MD

of syphilis, and more than four sex partners in the preceding year. Higher prevalence rates are associated with certain sociodemographic groups including young adult men, sex workers, men who have sex with men, and individuals who are black or live in metropolitan areas in the southern and western United States.²

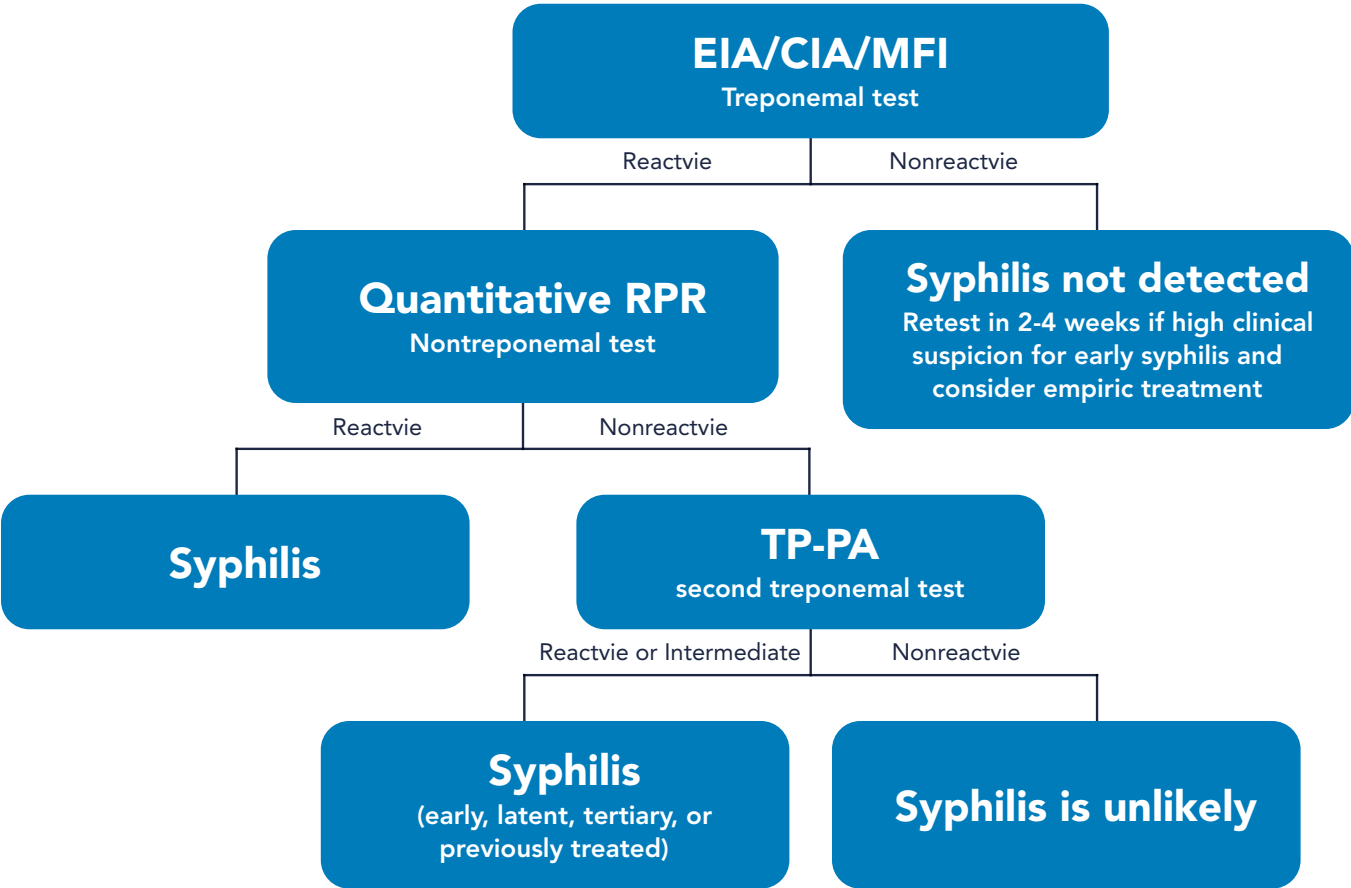
Many institutions and clinical laboratories are moving away from the traditional syphilis testing algorithm that begins with a non-treponemal test (e.g., rapid plasma regain (RPR) or venereal disease research laboratory (VDRL)) and instead they're using the reverse screening algorithm which starts with a treponemal test (e.g., EIA; chemiluminescence immunoassay (CIA); or multiplex flow immunoassay (MFI)).

Overview of the data

The definitive method for diagnosing syphilis is visualizing the *Treponema pallidum* bacterium using darkfield microscopy or direct fluorescent antibody testing. These tests are not widely available; therefore, diagnosis predominantly relies on serology. The current standard method for diagnosing syphilis uses a combination of clinical history and serologic testing. There are two types of serologic tests available for syphilis: nontreponemal and treponemal tests. Both types of tests are needed to confirm the diagnosis. The order of testing is by either the traditional syphilis testing algorithm or the reverse algorithm.

The traditional algorithm for diagnosing syphilis starts with a screening nontreponemal test, such as the RPR, and verifies positive results with a confirmatory treponemal test, such as fluorescent treponemal antibody absorption (FTA-ABS) or *T. pallidum* particle agglutination assay (TP-PA). The traditional algorithm, however,

Figure 1. Syphilis reverse-algorithm serology interpretation



EIA—enzyme immunoassay, MFI—multiplex flow immunoassay, RPR—rapid plasma regain, TP-PA—*Treponema pallidum* particle agglutination assay. Note: The type of treponemal and nontreponemal tests for the reverse algorithm can vary across institutions and clinical labs. This figure does not address the diagnosis of neurosyphilis, which requires cerebrospinal fluid (CSF) studies.

often misses early primary syphilis since the RPR can take up to four weeks to become positive and can also fail to identify latent or tertiary disease because antibody levels wane over time. In addition, the RPR can be positive due to conditions other than syphilis such as autoimmune disorders, particularly systemic lupus erythematosus. From a clinical laboratory perspective, the traditional algorithm is labor-intensive, involves subjective interpretation by laboratory technicians, and has a slow turnaround time.³

Due to increasing automation and lower processing cost, more clinical laboratories and institutions have adopted the reverse

testing algorithm which screens first with a treponemal test (e.g., EIA, CIA, or MFI).⁴ Reactive sera are then sent for a confirmatory nontreponemal test (usually RPR). A recent study found the sensitivity for EIA testing (Trep-Sure EIA) to be 98.5% with a specificity of 82.6% in a low-prevalence population for most stages of syphilis (primary, secondary, and early/late latent).⁵

A prospective cohort study from the U.S. (n = 1000 samples) compared traditional screening to the reverse-algorithm strategy using MFI in a low-prevalence population. Fifteen samples reacted when screened with MFI compared to four samples that reacted with

RPR as the initial test (1.5% versus 0.4%, *P* = .01). All four samples that were positive by RPR were also identified as positive by MFI. Although the reverse screening strategy yielded a higher false-positive rate than traditional testing (0.6% versus 0%, *P* = .03), two patients with latent syphilis identified by the reverse screening algorithm went undetected when screened with the traditional algorithm.² Similar findings have been demonstrated in other studies comparing traditional screening with RPR to the reverse-algorithm strategy using EIA.⁶

As more clinical laboratories adopt reverse-sequence screening, clinicians may encounter discor-



Quiz: Testing your knowledge

1. A 56-year-old male is admitted to the hospital for treatment of community-acquired pneumonia. The ED resident decides to screen for syphilis. The syphilis EIA returns negative the next day. The patient reports no sexual activity in the past six months. He has no symptoms or exam findings that suggest syphilis. How do you counsel the patient regarding this lab result?

- a. Inform him that a negative test result can often be an error and that he will need additional blood work.
- b. Advise the patient that even though the test is negative, treatment for primary syphilis is recommended.
- c. Reassure the patient that a negative EIA test in this situation is unlikely to miss a patient who has syphilis and that no treatment is necessary as he has no other symptoms to suggest early syphilis and has not had any recent sexual partners.
- d. Tell that patient that the negative test is 100% accurate and he has nothing to worry about.

Correct answer: C. Because the treponemal EIA test is highly sensitive, false negatives are unlikely. And, because the patient hasn't had any sexual partners in the last six months, it is also unlikely that the negative EIA is missing a case of early syphilis. No further testing or treatment is recommended.

2. You triage a 22-year-old female who was admitted overnight for management of an ulcerative colitis flare. While reviewing her recent lab results, you notice she had a treponemal EIA screen sent after a recent visit to her primary care physician (PCP) which returned positive. The patient was unaware of this test result and is concerned about the implications. She reports that her PCP recommended the test as routine screening. She has been monogamous with

one female partner for the last year. She has not noticed any clinical symptoms aside from those related to her inflammatory bowel disease. You recently learned about the reverse treatment algorithm for diagnosing syphilis, so you send off additional tests. Both the RPR and TP-PA return non-reactive. What do you tell the patient?

- a. Inform her that the initial EIA screen was most likely a false-positive result and that she does not require treatment for syphilis or further testing.
- b. Recommend that she undergo treatment for syphilis because her discordant labs are difficult to interpret.
- c. Tell her you will need to contact the local public health department because she may have been treated for syphilis in the past.
- d. Counsel her that she is at risk for neurosyphilis and consent her for a lumbar puncture.

Correct answer: A. The fact that both the RPR and TP-PA were negative indicates that the positive EIA was most likely a false positive. Her clinical history and exam are not suggestive of early syphilis. No treatment is necessary. If clinical history were concerning for early syphilis, consideration of empiric treatment and repeat EIA testing in two to four weeks is recommended.

3. You are called by the ED to admit a 22-year-old male who presented with a rash. Physical exam shows diffuse papules involving the trunk and extremities, including the palms and soles. You are concerned about secondary syphilis and decide to test using the reverse algorithm. Which results would confirm the diagnosis?

- a. EIA -, RPR -
- b. EIA +, RPR -, TP-PA -
- c. EIA +, RPR +

Correct answer: C. A positive screening EIA followed by a positive non-treponemal RPR in a patient with a rash characteristic of secondary syphilis is consistent with a diagnosis of untreated syphilis. In this case, it is unnecessary to send a second treponemal test (such as TP-PA) since the initial two serologic tests were both positive.

4. A 54-year-old female was admitted after a syncopal event that resulted in a humerus fracture. The ED tested for sexually transmitted infections, and she had a positive EIA and RPR with a titer of 1:2. On further questioning, the patient reports she was treated for primary syphilis six months ago at a different hospital. You call the public health department for more information and learn that the patient's previous RPR titer was 1:32. The patient requests another course of treatment because she is concerned that the tests are still positive. She denies any clinical signs or symptoms of primary syphilis and has not engaged in sexual activity since her last course of treatment. How do you proceed?

- a. Agree that another course of treatment is necessary since the RPR is still positive.
- b. Inform her that since her RPR titer decreased by at least four-fold she was effectively treated.
- c. Ask the lab to perform definitive testing with dark field microscopy to determine if she still has active disease.
- d. Counsel the patient that she has been re-infected with syphilis since the RPR is still detectable.

Correct answer: B. Patients who demonstrate at least a four-fold reduction in the RPR titer after treatment, along with a resolution of any clinical symptoms, are considered to have been treated adequately.

dant results such as a positive EIA/CIA/MFI followed by a negative RPR. To distinguish between a falsely reactive screening result and true infection, the Centers for Disease Control and Prevention (CDC) recommends a second treponemal-specific antibody test, such as TP-PA, that is different from the initial screening test.⁷ If the TP-PA is negative, the screening result is likely a false positive. A positive or indeterminate TP-PA is suggestive of previously treated syphilis, latent syphilis, or early syphilis. These results require clinical correlation with a person's sexual history and symptoms to assist with interpretation.

A retrospective study in the U.S. reviewed 21,623 CIAs as the initial syphilis test. A total of 439 (2%) yielded positive results, and 255 of these (58%) were followed by a negative RPR result. All patients with discordant syphilis serology results underwent TP-PA confirmatory testing, with 72% testing positive. CIA positive, RPR negative, and TP-PA positive patients were more likely to

have risk factors for syphilis than those who tested TP-PA negative, a pattern which persisted after excluding patients with a known history of syphilis. The CDC recommends that patients who are EIA/CIA positive, RPR negative, and TP-PA positive are assessed for exposure to and signs and symptoms of syphilis, staged, and offered stage-appropriate antibiotic treatment if not previously treated.⁸

Application of the data to our original case

The patient's EIA was reactive. Using the reverse sequence algorithm (see Figure 1), a quantitative RPR was checked and was non-reactive. This discordant result of a reactive EIA and nonreactive quantitative RPR led to testing with a second treponemal test, TP-PA, which was reactive. Further history was negative for any recent syphilis exposure or history of prior treatment, and clinical evaluation did not find any signs or symptoms of early disease. Therefore, the patient was

treated for late latent syphilis per the CDC guidelines.

Since syphilis EIA testing is highly sensitive, it is prone to false positives when screening a low-prevalence population. A reactive EIA requires further testing to discriminate between a false positive and a true positive.

Bottom line

Using the reverse algorithm, +EIA, -RPR, +TP-PA (see Table 1) in the absence of recent syphilis exposure, prior treatment, and clinical signs of early disease is most consistent with late latent syphilis, which requires treatment. ■

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Insights into HM and PHM fellowship programs

By Heidi Splete

A hospital medicine fellowship combines the best of hospital medicine with the opportunity for physicians to specialize early in their careers. According to directors of successful programs at the University of California, San Francisco (UCSF), Deaconess Hospital, the Medical College of Wisconsin, and Akron Children's Hospital, the best fellowship programs benefit the hospital as well as the fellow. These directors shared their ideas on creating and optimizing fellowships, notably in the establishment of pediatric hospital medicine (PHM) programs, which are a relatively new option.

Opportunities for enrichment

"Not every adult hospitalist should do, or needs to do, a hospital medicine fellowship," said Margaret Fang, MD, director of the adult academic hospital medicine fellowship program at the University of California, San Francisco. "However, depending on what you want to do in your career, a fellowship can be an extremely valuable experience that can give you skills, experiences, and mentorship opportunities that might not otherwise be as easy to acquire." While fellowships provide many opportunities, Dr. Fang recommends evaluating the benefits, because fellow salaries are lower than faculty salaries. "Therefore, individuals need to balance the benefits of doing a fellowship program with deferring a full faculty salary," she said.

Fellowship programs are uniquely structured and may emphasize different aspects of practice, such as medical education, clinical skills, and quality improvement. As an example, the

academic hospital medicine fellowship at UCSF is tailored to hospitalists who are interested in careers as clinician-educators or clinician-administrators. "A successful fellowship program needs to offer training and experiences that would otherwise be difficult to obtain in general clinical practice," Dr. Fang said. "It is crucial to have strong mentors in the program and to give fellows ample access to diverse projects and opportunities." In her experience, successful fellowship programs also have infrastructures dedicated to helping fellows succeed. This might include access to data and statisticians or opportunities to develop specific skills. Dr. Fang encourages program leaders to "make sure that fellows who graduate from your program are well-equipped to start a faculty position."

Start small

Fellowship programs with a single fellow have their place as well, and many of the same challenges and benefits apply. The biggest keys to a successful program are "recruiting, sub-specialist participating in electives, and a good mix of patient types," said Mathias Kolleck, II, MD, director of the hospitalist fellowship program at Deaconess Hospital in Evansville, Ind. He advises hospitalists who want to create a fellowship program to start slowly with one fellow. Dr. Kolleck emphasized the need for support from subspecialist preceptors before taking on a fellow. He also noted that existing fellowship programs are ideal sources of guidance for curriculum development, evaluation formats, and program structure. One issue in managing an adult hospital medicine fellowship program is tailoring educa-

tional needs to fellows' different ability levels. Dr. Kolleck said, "additional focused education [alleviates the issue] most of the time."

PHM programs

In 2015, the American Board of Pediatrics (ABP) recommended that the American Board of Medical Specialties recognize PHM as a specialty. The ABP allows subspecialists already practicing the discipline to access the exam without having to complete a formal fellowship for a limited time. The final exam year in the practice pathway is 2024. "Given that the 'practice pathway' to PHM board certification is now closed to new residency graduates, fellowship training will be required for those who wish to become board-certified pediatric hospitalists," said Patrick J. McCarthy, MD, MME, program director of the PHM fellowship program at the Medical College of Wisconsin, Milwaukee. "With the evolving medical complexity, higher acuity, and psychosocial complexity of hospitalized children, PHM fellowships provide an opportunity to allow fellows greater focus on providing high-quality specialty care to the patients we serve."

Dr. McCarthy said that hospitalists' roles include participation in research, quality improvement, medical education, advocacy, and leadership, in addition to patient care. "Having time within a two-year fellowship to conduct a scholarly project under faculty mentorship also provides an opportunity to develop expertise in relevant methodologies and a chosen subject," he said.

Tap into existing resources

If you're considering establishing a hospitalist fellowship program, specifically a pediatric



Dr. Fang



Dr. Kolleck



Dr. McCarthy

program, Dr. McCarthy recommends learning and understanding the Accreditation Council for Graduate Medical Education's (ACGME) program requirements.

He and his colleagues have used content for in-training and certification exams from the ABP to shape their pediatric hospitalist fellowship. "The PHM core competencies also describe the current roles and expectations for pediatric hospitalists that can be used to inform the development of curricula," Dr. McCarthy said. The PHM program directors' council also has tools, practical advice, and support for those creating programs.

Dr. McCarthy also recommends using your local graduate medical education office, designated institutional officials, and department leaders to help in developing a successful program and ACGME application. "I personally learned a lot from our vice-chair of education and current program directors of other pediatric subspecialty fellowships," he said.

Dr. McCarthy advised working with leaders at your institution to make sure your goals align; this will help PHM programs define a niche within the institution. He also suggested taking advantage of existing training programs, clinical divisions outside of hospital medicine, and established resources.

"We also have tried to meet the diverse need of a heterogeneous group of fellowship applicants and have tried to carve out a niche for our program as a 'med/peds friendly' program," said Dr. McCarthy.

For example, PHM fellows can gain experience in the adult setting in techniques such as ultrasound, which they can apply to children. "We have a strong group of med/peds hospitalists who work at Children's Wisconsin and Froedtert Hospital (Milwaukee), our adult hospital partner, and a unique aspect of our program is the opportunity for med/peds trained fellows to have up to one month of adult hospital medicine ward experience each year," he said. "This allows trainees to maintain competence in adult medicine skills while focusing on applicability to the care of hospitalized children, including the importance of effective transitions to adult medical care for medically complex patients."

For Dr. McCarthy, one of the challenges of creating a PHM fellowship program was establishing guidelines for supervision, including faculty development sessions on working with multiple levels of learners and rounding, with appropriate evaluation and feedback methods. "We worked to craft our fellows' clinical schedules to best align with resident schedules to allow continuity of supervision and patient care while maintaining a high-autonomy environment for all," he said. Now, two years after launching the program, "it's exciting to see how our fellows have integrated into the ward's teams as clinicians and educators," he said.

The PHM fellowship program at the Medical College of Wisconsin started in July 2020—in the middle of the coronavirus pandemic. "We had to reinvent our planned community-hospital-medicine rotation and curriculum," Dr. McCarthy said. "Figuring out how to do Zoom meetings, virtual recruitment, and modified clinical experiences was initially a challenge. The resiliency and investment in learning exhibited by our leadership, faculty, and fellows are really the keys to our success in the implementation and delivery of the first two years of our program."

It takes a village

Fellowship programs are important vehicles to advance the body of knowledge associated with



a particular field, but there's more to a fellowship than keeping up with scientific discovery, according to Jeffrey Solomon, MD, immediate past director of the PHM fellowship at Akron Children's Hospital, Akron, Ohio.

"Pediatric hospital medicine fellowships are organized to ensure that trainees participate in patient safety and quality improvement initiatives, gain familiarity with family-centered-care principles and transition-of-care models, and learn how to leverage health information technology," Dr. Solomon said. "Instruction on these and other topics related to health care system delivery will make it easier to enact the changes needed to achieve high-value care for all hospitalized children."



Dr. Solomon

At Akron Children's Hospital, successful PHM fellowship programs enjoy support from all corners of the institution, said Dr. Solomon. A successful program needs hospital administrators willing to incur the short-term costs for the long-term return on investment, leaders of other educational programs who work to ensure a comprehensive training experience, and individual division members who commit to educating the next generation of inpatient providers. "It truly does take a village to 'raise' a successful hospital medicine fellowship program," Dr. Solomon said.

Dr. Solomon encourages anyone planning to start a hospitalist fellowship program to reach out to current fellowship directors. "[They're] some of the most generous people I know when it comes to sharing their time and talent," he said. He highlighted the value of the PHM fellowship directors' council in providing advice and support to directors and potential directors at all stages of program development. "When starting a hospital medicine fellowship program, rest assured that there will be hurdles, but know that there is probably a program director who has already faced a similar challenge who is willing to share with you how they were able to overcome that obstacle," Dr. Solomon said.

Dr. Solomon also credited the resiliency of his team in navigating the ongoing COVID-19 pandemic. "I think the pandemic has forced many educators to develop novel methods by which to ensure that trainees gain exposure to the clinical and educational experiences necessary to develop competency," he said. "Whether delaying and then restructuring a surgery rotation

at a time when the hospital suspended elective procedures or figuring out how to convene an interactive educational conference when no more than four people are permitted to meet in the allotted space, being a program director requires a willingness to try new things if you really want to ensure the best possible experience for your trainees."

A fellow's perspective

As a PHM fellow at the Medical College of Wisconsin, Leann Madion, MD, said her fellowship experience has prepared her to "hit the ground running," when she starts her first job after training. "As the field of pediatric hospital medicine grows, the fellowships provide a unique opportunity to strengthen important knowledge and skills which will ultimately help with career advancement, likely at a faster pace," she said.



Dr. Madion

Because the Medical College of Wisconsin has a diverse, experienced group of hospitalists with various interests, Dr. Madion said she's been involved in research projects with different focuses including clinical, medical education, and quality improvement. "Our program provides dedicated research time for our projects, which makes it feasible to complete them in just two years," she said. Dr. Madion also credits the program for making her a better medical educator and providing sufficient autonomy, "with the help of my attending coaching me through difficult patient and learner encounters."

Dr. Madion advises incoming fellows to "have an idea of where you want to focus extra time for research and skill development, such as sedation, POCUS, clinical research, leadership, quality initiative work, or medical education."

She also encourages them to assess the strengths of each program during the pre-interview and interview process. "It's cliché, but true it's a lot about where you think you will fit in based on your instincts and general feeling," Dr. Madion said. ■

Heidi Splete is a medical journalist based in the Washington, D.C. area. Her more than 20 years of experience includes live and online news coverage of internal medicine, dermatology, rheumatology, pediatrics, gastroenterology, allergy, oncology, cardiology, obstetrics/gynecology, and primary care.

SIG Spotlight: Perioperative/Co-management

By Richard Quinn

Hospitalists don't focus much on the ins and outs of perioperative care in medical school and residency, but rising surgical volumes in recent years, combined with the ever-growing recognition that hospitalists manage inpatients best, has led to a boom in using hospital medicine professionals to bookend care around procedures.

So, if it's not taught well up front, where are hospitalists going to learn best practices, clinical pearls, and rookie mistakes to avoid?

Welcome to SHM's perioperative/co-management special interest group (SIG).

The online community is one of 27 SIGs sponsored by SHM to create communities of hospitalists around topics of interest, practice areas and/or care models.

For co-management, the group started in 2018 and is led by Steven Cohn, MD, medical director of the UHealth Preoperative Assessment Cen-



Dr. Cohn

ter and Jackson Memorial Hospital medical consultation service at the University of Miami Miller School of Medicine in Miami, and Kurt Pfeifer, MD, chief of the section of perioperative and consultative medicine in the department of medicine at the Medical College of Wisconsin in Milwaukee.

"More and more hospitalists are having to participate in perioperative medical care all the time," Dr. Pfeifer said. "And yet it's an area that many hospitalists feel that they're not fully prepared for in residency training. We've previously had much experience over the years working with other professional organizations in promoting perioperative medicine within internal medicine and hospital medicine, and that's when SHM reached out to Steven and me to help lead this group, which I think has been very active to date. We are probably one of the more active special interest groups, starting with fewer than 100 members at our first meeting, and we now have more than 750."

The group started a monthly journal club, webinars where one of the authors of a newly published study is invited to present.

"It's very helpful to be able to



have access to the people who are actually producing the research and publishing these papers," Dr. Cohn said. "In addition, we've been using a case of the month, a clinical case submitted by one of the people in the group, and it's open for people to chime with what they think they would do. And then, the following month, the person who submitted the case outlines what the issues were and what they actually did. It's very helpful for people to see the different opinions and then what the actual outcome was. We also have an open forum for members to ask questions about difficult cases, management decisions, or other related issues."

In addition, Dr. Cohn edited and authored a book that was published in 2021 with the help of some group members, "Decision Making in Perioperative Medicine: Clinical Pearls." And Dr. Pfeifer developed an online educational tool (www.preopevalguide.com).

It's the combination of experts and novices that creates the sense of community in the SIG, Dr. Pfeifer said.

"It's so important for providers working in a space that they are uncomfortable or new with, to have a community of support," he said. "The challenge at a lot of institutions is that there isn't a community of support there. There are no other hospitalists there yet who know perioperative medicine very well. Without having that kind

of local support, it's even more important that you find it outside. That's what our special interest group can provide—that community of people you can go to and lean on when you need assistance with things."

Whether it's the monthly journal club, or a case-of-the-month discussion, or just Dr. Cohn posting a recent article for others, the repetitive cadence of the SIG is another factor to its success.

"COVID has made it a bit of a challenge," Dr. Pfeifer said. "But, if you lose momentum like that, it's often very hard to keep things rolling and keep people engaged. Just like with the in-person meeting—you don't really want to go more than a year without it because then it starts to fall out of people's memory as something important to them. So, I think the special interest groups play an important role for SHM in that way, to keep people engaged, make them continue to see SHM as their professional home."

The challenges of COVID-19 also

meant that the SIG served as a place for hospitalists to be honest about challenges.

"It's so important to have a group you can email and contact and text during that period because nobody knew what to do," Dr. Cohn said. "We didn't know what to do with perioperative patients or preoperative evaluations for patients who had COVID. The whole testing process, canceling or postponing elective surgery cases as everything was evolving, you also had a place where you could go and ask people, 'What are you doing in your hospital?'"

"We're still struggling mightily with everything," Dr. Pfeifer said. "You're never on solid ground. Things are always shifting, especially for people who might be working in places where there isn't as much support structure built in for keeping people updated. Societies, SHM in particular, are really important to help with that." ■

Richard Quinn is a freelance writer in New Jersey.

Show off your SIG

SHM's special interest groups are designed to create communities of hospitalists around topics of interest, practice areas, and/or care models.

If you'd like to see your SIG in the spotlight, let us know. Email lcasinger@wiley.com and tell us what's so special about YOUR special interest group.



Chapter Spotlight: Atlanta

By Richard Quinn

Hospitalist John Vazquez, MD, calls it cross-pollination.

As the immediate past president of the SHM chapter in Atlanta, he's referring to the value of networking and the role personal and professional development plays in the busy world of hospital medicine.



Dr. Vazquez

"The big topic of the day is physician burnout and this kind of plays into that in a way," said Dr. Vazquez, associate director of operations at Emory University School of Medicine's division of hospital medicine, Atlanta. "I think hospitalists, day in and day out, they come in and do their job, and they get trapped in a box of showing up and going to work, and that's a very dangerous place to be. Cross-pollination helps turn on the creative juices."

With more than 60 chapters stateside and another half-dozen abroad, SHM chapters are the fabric of networking for hospitals. Whether it's local dinners, question-and-answer sessions, or Jeopardy (more on that in a minute), active chapters serve as the front lines of physician engagement with the specialty.

The Atlanta chapter dates back at least to 2005, but it was revitalized around 2010 and quickly started growing. In 2012, membership was 352. By the end of 2019, it was up 33% to 465.

Then, of course, COVID-19 happened.

Membership lapsed as hospitalists shouldered the brunt of mass hospitalization, and in 2020 it dropped to 400, a four-year low.

In May 2021, Ingrid Pinzon, MD, FACP, an assistant professor of hospital medicine at Emory Johns Creek Hospital, Johns Creek, Ga., took over as president. Engagement is the key to any active chapter, so in October, she and Dr. Vazquez put on a virtual "Jeopardy" show: HM trivia, a fake host, and contestants.



Dr. Pinzon

Silly, fun—and an absolutely essential touchstone for hospitals and other HM professionals who were already 15 months into a pandemic.

"It was a real lifeline for those who really need the social interaction that they just weren't getting," Vazquez said.

Now, membership is at an all-time peak of 482. The chapter has added board members in Athens and Columbus, two suburbs more than an hour away, to grow its presence. The chapter has collaborated with counterparts in Alabama's Wiregrass region and in Southwest Georgia, as well as with the Georgia chapter of the American College of Physicians.

Moving forward, having as many in-person events as safely possible is a priority. That's because, in today's world of social distancing and Zoom meetings, those connections are even more important, Dr. Pinzon said.

"One of the comments I had from one doctor who came to the

last meeting was, 'I am looking forward to continuing meeting with you guys,'" she said. "I really liked these topics, and I really like coming and seeing faces and mingling. I met new people."

"As doctors, we are so overwhelmed with everything that happened with COVID that to have the opportunity to meet with a group of people who have the same feeling, it's kind of really important. You feel like you're on to something."

Dr. Vazquez, who was Atlanta chapter president for six years and now chairs the regional SHM chapter district that spans four Southeast states, said the value of being involved in such activities is the "joy of practice."

"You go to an event, and you mingle with people from other hospitals, and you're able to see, 'Well, they do things very differently,'" he said. "And then you start to remember your passion for patient care, and the times you've gone above and beyond, and the special things your hospital does. And you start to share those ideas, and it creates excitement."

Take the meeting in August where SHM CEO Eric Howell, MD, MHM, visited Atlanta for an in-person presentation. Attendance was good, despite a surge at that time

of the delta variant cases to area hospitals.

"To have Eric, for me, was like, 'Oh, my God. We have the CEO,'" Dr. Pinzon said. "It was huge for all of us."

"I've always been pleased with how the national SHM has supported the chapters. I think they really understand that the local community is really what SHM is all about. Finding ways to support the hospitalists in a local community is really important. So, they've really worked on sharpening the chapters over the last several years and finding ways to mentor chapters, motivate chapters, and we're happy to be part of that network."

In fact, Dr. Pinzon wants to network more: Thirty-minute topic sessions. Small-group meetings. Meeting with advanced practice providers. Maybe an HM-themed "Who Wants to be a Millionaire?" production.

"Certainly, flexibility and resiliency are part of what is needed to run a chapter," Dr. Vazquez said. "These are unprecedented times, and (Dr. Pinzon) has done a great job of pivoting and making sure we keep our eye on serving our hospitalists as best as we can. That's what it's all about." ■

Richard Quinn is a freelance writer in New Jersey.

Celebrate your chapter

Chapters are your local SHM home to network with your peers, establish new relationships with the community, receive education, and grown in your profession as a hospitalist. If you'd like to see your chapter in the spotlight, let us know. Email lcasinger@wiley.com and tell us what makes your chapter exceptional.

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Functional outcomes improving in patients with ischemic stroke

By Lisa Rapaport
(Reuters Health)

Over the past two decades, stroke onset has been at older ages and stroke severity has become milder for both sexes and for both ischemic and hemorrhagic stroke, a Japanese study suggests.

Researchers examined records from the Japan Stroke Data Bank on 183,080 patients who developed acute stroke between 2000 and 2019. They assessed initial stroke severity based on the National Institutes of Health Stroke Scale for ischemic stroke and intracerebral hemorrhage and by the World Federation of Neurological Surgeons grading for subarachnoid hemorrhage. Symptoms at discharge were assessed based on modified Rankin Scale scores and considered “favorable” with scores

of 0-2 and “unfavorable” with scores of 5-6.

Overall, the study included 135,266 patients with ischemic stroke, 36,014 with intracerebral hemorrhage, and 11,800 with subarachnoid hemorrhage. During the study period, the median age at onset increased for all three types of stroke and the severity based on the National Institutes of Health Stroke Scale and World Federation of Neurological Surgeons scores decreased, researchers report in *JAMA Neurology* (2022; 79(1):61-69).

With hemorrhagic strokes, the proportion of patients with favorable outcomes didn’t significantly increase over time. However, unfavorable outcomes and in-hospital deaths decreased in both sexes.

For intracerebral hemorrhage in particular, the study found that favorable outcomes decreased

in both sexes, and unfavorable outcomes and deaths decreased only in women. With subarachnoid hemorrhage, the analysis found no significant change in the proportion of favorable outcomes, but there was a decline in the proportion of patients of both sexes who died or had unfavorable outcomes.

With ischemic stroke, the proportion of women with scores indicating favorable outcomes increased over time in analysis adjusted for age, while scores were little changed for men. Once researchers adjusted for reperfusion therapy, however, there was no longer a significant change in scores for women or men.

“It seems to clearly indicate differences in development of therapeutic techniques between acute ischemic stroke and acute hemorrhagic strokes in the last 20

years,” said lead study author Dr. Kazunori Toyoda of the National Cerebral and Cardiovascular Center, Suita, in Osaka, Japan.

“We have not yet obtained decisively effective acute therapeutic strategies for hemorrhagic strokes just as powerful as reperfusion therapy for ischemic stroke,” Dr. Toyoda said.

One limitation of the study is that several sites included in the registry either joined or dropped out from participation during the study period, researchers note. Another drawback is that functional outcomes were assessed at discharge, around a median of 20 days after the stroke, without longer-term data to determine future functional outcomes. ■

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Program Director: **Naitik Patel, MD**

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