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THE Hospitalist

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IN THE NEXT ISSUE...
Retrospective look at HIV treatments

Finding the Magic: Reflections from PHM 2025

By Patricia A. Tran, MD, MS, FAAP

This year the Pediatric Hospital Medicine conference opened with a simple challenge: "Find the magic." After four days in Anaheim, Calif., watching more than 1,100 pediatric hospitalists share research, debate best practices, and reconnect with colleagues, their conclusion felt both inevitable and deeply resonant—the magic was here with us all along.

What struck me wasn't just the clinical content, though the science was compelling. It was watching people light up while describing a quality improvement initiative and listening to people share how mentorship helped them navigate difficult times. This year's conference articulated something many of us already felt: the magic we were asked to find was the meaningful work already happening in our daily practice.

Foundations Already in Place

This was highlighted by three incredible plenary speakers who wove together themes that felt both timely and timeless. They challenged us to recognize that equity isn't specialized work for the particularly motivated among us—it's fundamental to providing good care to every hospitalized child. They reminded us that effective communication with families requires meeting people where they are, acknowledging emotions before presenting facts, and recognizing when our scientific explanations fail to address parents' underlying concerns about their child's well-being. And they asked us to examine how our assumptions about disability might limit the care we provide, encouraging us to see difference rather than deficit.

These weren't revolutionary concepts, but they reflected something important about where pediatric hospital medicine stands today. The speakers weren't introducing foreign ideas, they were helping us recognize the principles already embedded in our best clinical work. When we adjust our approach based on a family's cultural background, involve interpreters even for families who speak some English, or consider social circumstances in discharge planning, we're already practicing equity-informed care. When we acknowledge a parent's fear before explaining why antibiotics won't help their child's viral illness, we're already meeting families where they are.

Dr. Tran

Dr. Tran is an assistant professor of clinical pediatrics at the University of Illinois College of Medicine and a pediatric hospitalist at Children's Hospital of Illinois, both in Peoria, Ill., deputy editor of digital media for the Journal of Hospital Medicine, and pediatric editor for The Hospitalist.

Everyday Magic

The conference co-chairs' conclusion that "the magic was already here" reflects something I've been thinking about since I became a pediatric hospitalist. The magic isn't in dramatic saves or breakthrough discoveries—though those matter too. It's in the daily work of providing excellent care for children and families during some of their most vulnerable moments.

I think about the nurse who notices subtle changes in a patient's breathing pattern, the respiratory therapist who helps a toddler feel comfortable with high-flow oxygen, the social worker who connects families with resources that address root causes of health issues. I think about colleagues who mentor learners through difficult procedures, who design quality improvement projects that reduce health disparities, who advocate for policies that improve child health beyond hospital walls.

The magic is also in the professional community that supports this work. It's in the research collaborations that emerge from shared clinical questions, in the informal mentorship that happens at conferences like this one, in the way experienced hospitalists make time to guide those of us still figuring things out. This community is being tested in unprecedented ways, but our collective commitment to caring for hospitalized children never wavers, despite extraordinary challenges.

Continued on page 11

THE Hospitalist®

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Veklury®
remdesivir 100 MG FOR INJECTION

LEADING THE WAY

THE ONLY COVID-19 ANTIVIRAL WITH
OUTCOMES ACROSS 3 KEY TREATMENT GOALS:

DISEASE PROGRESSION, RECOVERY TIME, AND READMISSION[1-3]

INDICATION

VEKLURY is indicated for the treatment of COVID-19 in adults and pediatric patients (birth to <18 years of age weighing ≥1.5 kg), who are:

- Hospitalized, or
- Not hospitalized, have mild-to-moderate COVID-19, and are at high risk for progression to severe COVID-19, including hospitalization or death.

THE ONLY NIH RECOMMENDED COVID-19 TREATMENT OPTION
included for adult patients hospitalized for COVID-19[4]

- Not requiring supplemental O_2 and
- Requiring low- or high-flow O_2

Turn the page for details

IMPORTANT SAFETY INFORMATION

Contraindication

- VEKLURY is contraindicated in patients with a history of clinically significant hypersensitivity reactions to VEKLURY or any of its components.

Please see Brief Summary of full Prescribing Information on the last page.

VEKLURY® REDUCED DISEASE PROGRESSION AND RECOVERY TIME, AND DEMONSTRATED READMISSION OUTCOMES ACROSS A BROAD RANGE OF COVID-19 SEVERITY[1-3]

Disease progression[2]

10% **Absolute reduction in incidence of new mechanical ventilation or ECMO with VEKLURY in ACTT-1** (13%, n=402) vs placebo (23%, n=364) in patients who did not receive either at baseline (95% CI, -15 to -4)

Recovery time[1,2]

5 **Days shorter recovery time with VEKLURY in the ACTT-1 overall study population**

Median 10 days with VEKLURY vs 15 days with placebo; recovery rate ratio: 1.29 (95% CI, 1.12 to 1.49), $P < 0.001$

Adverse reaction frequency was comparable between VEKLURY and placebo—any adverse reactions (ARs), Grades ≥3: 41 (8%) with VEKLURY vs 46 (9%) with placebo; serious ARs: 2 (0.4%)* vs 3 (0.6%); ARs leading to treatment discontinuation: 11 (2%)† vs 15 (3%).[1]

ACTT-1 study design: a randomized, double-blind, placebo-controlled, phase 3 clinical trial in hospitalized adult patients with confirmed SARS-CoV-2 infection and mild, moderate, or severe COVID-19. Patients received VEKLURY (n=541) or placebo (n=521) for up to 10 days. The primary endpoint was time to recovery within 29 days after randomization. Disease progression was a secondary endpoint. Recovery was defined as patients who were no longer hospitalized or hospitalized but no longer required ongoing COVID-19 medical care.[1,2]

Real-world readmission data[3]

40% reduced likelihood of 30-day, COVID-19–related readmission was observed with VEKLURY; aOR: 0.60 (95% CI, 0.58 to 0.62), $P < 0.0001$

- In the overall cohort, 10,396 out of 191,816 (5.4%) non-VEKLURY patients compared to 7,453 out of 248,785 (3%) VEKLURY patients

27% reduced likelihood of 30-day, all-cause readmission was observed with VEKLURY; aOR: 0.73 (95% CI, 0.72 to 0.75), $P < 0.0001$

- In the overall cohort, 17,437 out of 191,816 (9.1%) non-VEKLURY patients compared to 15,780 out of 248,785 (6.3%) VEKLURY patients

A large, real-world, retrospective observational study examined 30-day COVID-19–related‡ and all-cause§ readmission to the same hospital after being discharged alive from the index hospitalization for COVID-19 in adult patients (≥18 years of age) who were treated with VEKLURY vs those not treated with VEKLURY across variant periods: pre-Delta, Delta, and Omicron, from 5/2020-4/2022. Data were examined using multivariate logistic regression.‖

- **Data Source:** PINC AI™ Healthcare Database
- This study was sponsored by Gilead Sciences, Inc.
- The study included index patients on room air, low- and high-flow supplemental oxygen, and IMV/ECMO
- VEKLURY-treated patients received at least 1 dose of VEKLURY during the index COVID-19 hospitalization¶

Study population and select characteristics[3]

- **440,601 patients** with a primary diagnosis of COVID-19 and who were discharged alive
- **248,785 VEKLURY patients** were compared to **191,816 non-VEKLURY patients**

Compared to nonreadmitted patients, readmitted patients:

- **Were older:** median 71 years vs 63 years
- **Had more comorbidities:** CCI ≥4: 36% vs 16%
- **Were more likely to have NSOc** (42% vs 39%) and **less likely to be on low-flow oxygen** (40% vs 42%)
- **Were less likely to be treated with VEKLURY:** 48% vs 57%
- **Were more likely to have received corticosteroid monotherapy during index hospitalization:** 38% vs 29%

Compared to non-VEKLURY patients, VEKLURY patients:

- **Were younger:** median 62 years vs 64 years
- **Were more likely to have received some level of supplemental oxygen support (any supplemental oxygen support, 1-NSOc):** 70% vs 48%

Study considerations[3]

Real-world studies should be interpreted based on the type and size of the source datasets and the methodologies used to mitigate potential confounding bias. Real-world data should be considered in the context of all available data. Results may differ between studies.

Strengths: This large study population enabled subgroup analyses across variant periods and supplemental oxygen requirements and considered a well-defined cohort of patients hospitalized for COVID-19.

Limitations: There exists a potential for residual confounding due to unmeasured variables, including differences in groups that could not be accounted for. The database did not capture data relating to time from symptom onset, infecting viral lineages, and prehospital care such as other treatments. Some patients who received supplemental oxygen could be misclassified as NSOc due to the absence of billing charges for supplemental oxygen.

*Seizure (n=1), infusion-related reaction (n=1).
†Seizure (n=1), infusion-related reaction (n=1), transaminases increased (n=3), ALT increased and AST increased (n=1), GFR decreased (n=2), acute kidney injury (n=3).
‡Defined as a readmission with a primary or secondary discharge diagnosis of COVID-19.
§Defined as readmission to the same hospital within 30 days of being discharged alive from the hospitalization for COVID-19.
‖The model adjusted for age, corticosteroid use, variant era, Charlson Comorbidity Index, maximum oxygenation requirements, and ICU admission during COVID-19 hospitalization.
¶Refer to the VEKLURY Prescribing Information for dosing and administration recommendations.

Veklury® remdesivir 100 MG FOR INJECTION | LEADING THE WAY

IMPORTANT SAFETY INFORMATION (cont'd)

Warnings and precautions

- **Hypersensitivity, including infusion-related and anaphylactic reactions:** Hypersensitivity, including infusion-related and anaphylactic reactions, has been observed during and following administration of VEKLURY; most reactions occurred within 1 hour. Monitor patients during infusion and observe for at least 1 hour after infusion is complete for signs and symptoms of hypersensitivity as clinically appropriate. Symptoms may include hypotension, hypertension, tachycardia, bradycardia, hypoxia, fever, dyspnea, wheezing, angioedema, rash, nausea, diaphoresis, and shivering. Slower infusion rates (maximum infusion time of up to 120 minutes) can potentially prevent these reactions. If a severe infusion-related hypersensitivity reaction occurs, immediately discontinue VEKLURY and initiate appropriate treatment (see Contraindications).
- **Increased risk of transaminase elevations:** Transaminase elevations have been observed in healthy volunteers and in patients with COVID-19 who received VEKLURY; these elevations have also been reported as a clinical feature of COVID-19. Perform hepatic laboratory testing in all patients (see Dosage and administration). Consider discontinuing VEKLURY if ALT levels increase to >10x ULN. Discontinue VEKLURY if ALT elevation is accompanied by signs or symptoms of liver inflammation.
- **Risk of reduced antiviral activity when coadministered with chloroquine or hydroxychloroquine:** Coadministration of VEKLURY with chloroquine phosphate or hydroxychloroquine sulfate is not recommended based on data from cell culture experiments, demonstrating potential antagonism, which may lead to a decrease in the antiviral activity of VEKLURY.

Adverse reactions

- The most common adverse reaction (≥5% all grades) was nausea.
- The most common lab abnormalities (≥5% all grades) were increases in ALT and AST.

Dosage and administration

— Administration should take place under conditions where management of severe hypersensitivity reactions, such as anaphylaxis, is possible.

- **Treatment duration:**
  - — For patients who **are hospitalized**, VEKLURY should be initiated as soon as possible after diagnosis of symptomatic COVID-19.
  - — For patients who are hospitalized and do not require invasive mechanical ventilation and/or ECMO, the recommended treatment duration is 5 days. If a patient does not demonstrate clinical improvement, treatment may be extended up to 5 additional days, for a total treatment duration of up to 10 days.
  - — For patients who are hospitalized and require invasive mechanical ventilation and/or ECMO, the recommended total treatment duration is 10 days.
  - — For patients who are **not hospitalized**, diagnosed with mild-to-moderate COVID-19, and are at high risk for progression to severe COVID-19, including hospitalization or death, the recommended total treatment duration is 3 days. VEKLURY should be initiated as soon as possible after diagnosis of symptomatic COVID-19 and within 7 days of symptom onset for outpatient use.
- **Testing prior to and during treatment:** Perform hepatic laboratory and prothrombin time testing prior to initiating VEKLURY and during use as clinically appropriate.
- **Renal impairment:** No dosage adjustment of VEKLURY is recommended in patients with any degree of renal impairment, including patients on dialysis. VEKLURY may be administered without regard to the timing of dialysis.

Pregnancy and lactation

- **Pregnancy:** Available clinical trial data for VEKLURY in pregnant women have not identified a drug-associated risk of major birth defects, miscarriage, or adverse maternal or fetal outcomes following second- and third-trimester exposure. There are insufficient data to evaluate the risk of VEKLURY exposure during the first trimester. Maternal and fetal risks are associated with untreated COVID-19 in pregnancy.
- **Lactation:** VEKLURY can pass into breast milk. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for VEKLURY and any potential adverse effects on the breastfed child from VEKLURY or from an underlying maternal condition. Breastfeeding individuals with COVID-19 should follow practices according to clinical guidelines to avoid exposing the infant to COVID-19.

Please see Brief Summary of full Prescribing Information on the last page.

Learn more at vekluryhcp.com

aOR=adjusted odds ratio; CCI=Charlson Comorbidity Index; ECMO=extracorporeal membrane oxygenation; IMV=invasive mechanical ventilation; NSOc=no supplemental oxygen charges.

PINC AI™ is a trademark of Premier, Inc. (formerly Premier Healthcare Database).

References: 1. VEKLURY. Prescribing Information. Gilead Sciences, Inc.; 2025. **2.** Beigel JH, Tomashek KM, Dodd LE, et al; ACTT-1 Study Group Members. Remdesivir for the treatment of COVID-19 — final report. *N Engl J Med*. 2020;383(19):1813-1826. doi:10.1056/NEJMoa2007764 **3.** Mozaffari E, Chandak A, Gottlieb RL, et al. Treatment of patients hospitalized for COVID-19 with remdesivir is associated with lower likelihood of 30-day readmission: a retrospective observational study. *J Comp Eff Res*. 2024;13(4):e230131. doi:10.57264/cer-2023-0131. **4.** National Institutes of Health. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. Updated February 29, 2024. Accessed February 6, 2025. https://www.ncbi.nlm.nih.gov/books/NBK570371/pdf/Bookshelf_NBK570371.pdf

GILEAD

VEKLURY® (remdesivir)
Brief summary of full Prescribing Information. Please see full Prescribing Information.
Rx Only.

INDICATIONS AND USAGE

VEKLURY is indicated for the treatment of COVID-19 in adults and pediatric patients (birth to <18 years of age weighing ≥1.5 kg), who are:

- Hospitalized, or
- Not hospitalized, have mild-to-moderate COVID-19, and are at high risk for progression to severe COVID-19, including hospitalization or death.

DOSAGE AND ADMINISTRATION *[Also see **Warnings and Precautions, Adverse Reactions, and Use in Specific Populations**]*:

Testing Before Initiation and During Treatment: Perform eGFR, hepatic laboratory, and prothrombin time testing prior to initiating VEKLURY and during use as clinically appropriate.

Recommended Dosage in Adults and Pediatric Patients ≥28 Days Old and Weighing ≥3 kg:

- For adults and pediatric patients weighing ≥40 kg: 200 mg on Day 1, followed by once-daily maintenance doses of 100 mg from Day 2, administered only via intravenous infusion.
- For pediatric patients ≥28 days old and weighing ≥3 kg: 5 mg/kg on Day 1, followed by once-daily maintenance doses of 2.5 mg/kg from Day 2, administered only via intravenous infusion.

Treatment Duration:

- For patients who are hospitalized and require invasive mechanical ventilation and/or ECMO, the recommended total treatment duration is 10 days. VEKLURY should be initiated as soon as possible after diagnosis of symptomatic COVID-19.
- For patients who are hospitalized and do not require invasive mechanical ventilation and/or ECMO, the recommended treatment duration is 5 days. If a patient does not demonstrate clinical improvement, treatment may be extended up to 5 additional days, for a total treatment duration of up to 10 days.
- For patients who are not hospitalized, diagnosed with mild-to-moderate COVID-19, and at high risk for progression to severe COVID-19, including hospitalization or death, the recommended total treatment duration is 3 days. VEKLURY should be initiated as soon as possible after diagnosis of symptomatic COVID-19 and within 7 days of symptom onset.

Renal Impairment: No dosage adjustment of VEKLURY is recommended in patients with any degree of renal impairment, including patients on dialysis. VEKLURY may be administered without regard to the timing of dialysis.

Dose Preparation and Administration *[See full **Prescribing Information** for complete instructions on dose preparation, administration, and storage]*:

VEKLURY must be prepared and administered under supervision of a healthcare provider and must be administered via intravenous infusion only, over 30 to 120 minutes. Do not administer the prepared diluted solution simultaneously with any other medication.

- VEKLURY for injection (supplied as 100 mg lyophilized powder in vial) must be reconstituted with Sterile Water for Injection prior to diluting in a 100 mL or 250 mL 0.9% sodium chloride infusion bag.
- Care should be taken during admixture to prevent inadvertent microbial contamination; there is no preservative or bacteriostatic agent present in these products.

Dosage Preparation and Administration in Pediatric Patients ≥28 Days of Age and Weighing 3 kg to <40 kg:

The only approved dosage form of VEKLURY for pediatric patients ≥28 days of age and weighing 3 kg to <40 kg is VEKLURY for injection (supplied as 100 mg lyophilized powder in vial). Carefully follow the product-specific preparation instructions.

CONTRAINDICATIONS *[Also see **Warnings and Precautions**]*:

VEKLURY is contraindicated in patients with a history of clinically significant hypersensitivity reactions to VEKLURY or any of its components.

WARNINGS AND PRECAUTIONS *[Also see **Contraindications, Dosage and Administration, Adverse Reactions,** and **Drug Interactions**]*:

Hypersensitivity, Including Infusion-related and Anaphylactic Reactions: Hypersensitivity, including infusion-related and anaphylactic reactions, has been observed during and following administration of VEKLURY; most reactions occurred within 1 hour. Monitor patients during infusion and observe for at least 1 hour after infusion is complete for signs and symptoms of hypersensitivity as clinically appropriate. Symptoms may include hypotension, hypertension, tachycardia, bradycardia, hypoxia, fever, dyspnea, wheezing, angioedema, rash, nausea, diaphoresis, and shivering. Slower infusion rates (maximum infusion time ≤120 minutes) can potentially prevent these signs and symptoms. If a severe infusion-related hypersensitivity reaction occurs, immediately discontinue VEKLURY and initiate appropriate treatment.

Increased Risk of Transaminase Elevations: Transaminase elevations have been observed in healthy volunteers and in patients with COVID-19 who received VEKLURY; the transaminase elevations were mild to moderate (Grades 1-2) in severity and resolved upon discontinuation. Because transaminase elevations have been reported as a clinical feature of COVID-19, and the incidence was similar in patients receiving placebo versus VEKLURY in clinical trials, discerning the contribution of VEKLURY to transaminase elevations in patients with COVID-19 can be challenging. Perform hepatic laboratory testing in all patients.

- Consider discontinuing VEKLURY if ALT levels increase to >10x ULN.
- Discontinue VEKLURY if ALT elevation is accompanied by signs or symptoms of liver inflammation.

Risk of Reduced Antiviral Activity When Coadministered With Chloroquine or Hydroxychloroquine: Coadministration of VEKLURY with chloroquine phosphate or hydroxychloroquine sulfate is not recommended based on data from cell culture experiments, demonstrating potential antagonism which may lead to a decrease in the antiviral activity of VEKLURY.

ADVERSE REACTIONS *[Also see **Warnings and Precautions**]*:

Clinical Trials Experience: The safety of VEKLURY is based on data from three Phase 3 studies in 1,313 hospitalized adult subjects with COVID-19, one Phase 3 study in 279 non-hospitalized adult and pediatric subjects (12 years of age and older weighing at least 40 kg) with mild to moderate COVID-19, four Phase 1 studies in 131 healthy adults, and from patients with COVID-19 who received VEKLURY under the Emergency Use Authorization or in a compassionate use program. The NIAID ACTT-1 study was conducted in hospitalized subjects with mild, moderate, and severe COVID-19 treated with VEKLURY (n=532) for up to 10 days. Study GS-US-540-5773 (Study 5773) included subjects hospitalized with severe COVID-19 and treated with VEKLURY for 5 (n=200) or 10 days (n=197). Study GS-US-540-5774 (Study 5774) was conducted in hospitalized subjects with moderate COVID-19 and treated with VEKLURY for 5 (n=191) or 10 days (n=193). Study GS-US-540-9012 included non-hospitalized subjects, who were symptomatic for COVID-19 for ≤7 days, had confirmed SARS-CoV-2 infection, and had at least one risk factor for progression to hospitalization treated with VEKLURY (n=279; 276 adults and 3 pediatric subjects 12 years of age and older weighing at least 40 kg) for 3 days.

Adverse Reactions: The most common adverse reaction (≥5% all grades) was nausea.

Less Common Adverse Reactions: Clinically significant adverse reactions reported in <2% of subjects exposed to VEKLURY in clinical trials include hypersensitivity reactions, generalized seizures, and rash.

Laboratory Abnormalities: In a Phase 1 study in healthy adults, elevations in ALT were observed in 9 of 20 subjects receiving 10 days of VEKLURY (Grade 1, n=8; Grade 2, n=1); the elevations in ALT resolved upon discontinuation. No subjects (0 of 9) who received 5 days of VEKLURY had graded increases in ALT.

Laboratory abnormalities (Grades 3 or 4) occurring in ≥3% of subjects receiving VEKLURY in Trials NIAID ACTT-1, Study 5773, and/or Study 5774, respectively, were ALT increased (3%, ≤8%, ≤3%), AST increased (6%, ≤7%, n/a), creatinine clearance decreased, Cockcroft-Gault formula (18%, ≤19%, ≤5%), creatinine increased (15%, ≤15%, n/a), eGFR decreased (18%, n/a, n/a), glucose increased (12%, ≤11%, ≤4%), hemoglobin decreased (15%, ≤8%, ≤3%), lymphocytes decreased (11%, n/a, n/a), and prothrombin time increased (9%, n/a, n/a).

DRUG INTERACTIONS *[Also see **Warnings and Precautions**]*:

Due to potential antagonism based on data from cell culture experiments, concomitant use of VEKLURY with chloroquine phosphate or hydroxychloroquine sulfate is not recommended.

Remdesivir and its metabolites are in vitro substrates and/or inhibitors of certain drug metabolizing enzymes and transporters. Based on a drug interaction study conducted with VEKLURY, no clinically significant drug interactions are expected with inducers of cytochrome P450 (CYP) 3A4 or inhibitors of Organic Anion Transporting Polypeptides (OATP) 1B1/1B3, and P-glycoprotein (P-gp).

USE IN SPECIFIC POPULATIONS *[Also see **Dosage and Administration** and **Warnings and Precautions**]*:

Pregnancy

Risk Summary: Available clinical trial data for VEKLURY in pregnant women have not identified a drug-associated risk of major birth defects, miscarriage, or adverse maternal or fetal outcomes following second- and third-trimester exposure. There are insufficient data to evaluate the risk of VEKLURY exposure during the first trimester. Maternal and fetal risks are associated with untreated COVID-19 in pregnancy. COVID-19 is associated with adverse maternal and fetal outcomes, including preeclampsia, eclampsia, preterm birth, premature rupture of membranes, venous thromboembolic disease, and fetal death.

Lactation

Risk Summary: A published case report describes the presence of remdesivir and active metabolite GS-441524 in human milk. Available data (n=11) from pharmacovigilance reports do not indicate adverse effects on breastfed infants from exposure to remdesivir and its metabolite through breastmilk. There are no available data on the effects of remdesivir on milk production. In animal studies, remdesivir and metabolites have been detected in the nursing pups of mothers given remdesivir, likely due to the presence of remdesivir in milk. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for VEKLURY and any potential adverse effects on the breastfed child from VEKLURY or from the underlying maternal condition. Breastfeeding individuals with COVID-19 should follow practices according to clinical guidelines to avoid exposing the infant to COVID-19.

Pediatric Use

The safety and effectiveness of VEKLURY for the treatment of COVID-19 have been established in pediatric patients ≥28 days old and weighing ≥3 kg. Use in this age group is supported by the following:

- Trials in adults
- An open-label trial (Study GS-US-540-5823) in 53 hospitalized pediatric subjects

Geriatric Use

Dosage adjustment is not required in patients over the age of 65 years. Appropriate caution should be exercised in the administration of VEKLURY and monitoring of elderly patients, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of potential concomitant disease or other drug therapy.

Renal Impairment

No dosage adjustment of VEKLURY is recommended for patients with any degree of renal impairment, including those on dialysis.

Hepatic Impairment

Perform hepatic laboratory testing in all patients before starting VEKLURY and while receiving VEKLURY as clinically appropriate.

OVERDOSAGE

There is no human experience of acute overdosage with VEKLURY. Treatment of overdose with VEKLURY should consist of general supportive measures including monitoring of vital signs and observation of the clinical status of the patient. There is no specific antidote for overdose with VEKLURY.

214787-GS-017

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In the Literature

Duke Regional Hospital Medical Research Reviews

By Vernee Belcher, MD, FACP, Grace Revenaugh Dreyer, PA-C, Douglas Hilbert, MD, Neil Stafford, MD, Yasmin Marcantonio, MD, MPH, Pahresah L. Roomiany, MD, MS, FACP, and Jared Giordano, MD

Duke Regional Hospital, Durham, N.C

IN THIS ISSUE

By Vernee Belcher, MD, FACP

1 New Picture Stimuli for the NIHSS Validated

CLINICAL QUESTION: Does an updated National Institutes of Health Stroke Scale (NIHSS) language assessment tool perform well in a sample of diverse, neurologically unimpaired English-speaking adults?

Dr. Belcher

BACKGROUND: For more than 30 years, the NIHSS has been a vital tool for evaluating stroke patients worldwide. The original picture used in the NIHSS, cookie theft, was developed in 1972. The National Institute of Neurological Disorders and Stroke commissioned new visual stimuli for a contemporary global audience, including relevant and identifiable picture elements that depict easily recognizable and relatable scenes and objects. The new picture, the precarious painter, shows a scene with major and minor areas of interest for patients to describe. In addition, six new object illustrations were developed.

STUDY DESIGN: Prospective cohort validation study

SETTING: Convenience sample from the community at large and family members accompanying patients to Johns Hopkins Outpatient Center, the University of South Carolina, and Prisma Health

SYNOPSIS: The study enrolled 101 healthy, fluent English speakers, mostly from the U.S. In Phase I, a 50-participant subsample selected to reflect stroke age distribution and U.S. population demographics described the picture. Descriptions were used to generate content units (CUs), specifically nouns, verbs, modifiers, or prepositional phrases. There were 44 CUs identified, reported by at least 5% of participants. Descriptions were evaluated to examine four discourse variables: total CUs, left:right proportion of CUs, syllables, and syllables per CU. Performance was consistent across all discourse variables irrespective of demographic differences. In Phase II, performance with all participants showed no significant differences related to age, ethnicity, or education. A small but significant difference in left:right CUs by race was noted. Authors suggest this may be spurious, given the small sample size, or reflect an interaction between viewer culture and image content. The average performance and standard deviation were nearly identical between the two phases across all four discourse variables. Forty-one participants were asked to name object illustrations, resulting in high name agreement for six illustrations.

BOTTOM LINE: The new NIHSS visual stimuli, the precarious painter image, and six naming objects, have been validated to produce descriptive samples for language assessment supporting their use in a global population.

CITATION: Stockbridge MD, et al. New picture stimuli for the NIH stroke scale: a validation study. *Stroke*. 2024;55(2):443-451. doi: 10.1161/STROKEAHA.123.044384.

Dr. Belcher is a hospitalist at Duke Regional Hospital and an assistant professor of medicine at Duke University, both in Durham, N.C.

By Grace Revenaugh Dreyer, PA-C

2 Comparing Efficacy and Safety Between Patients with AF Taking DOACs or Warfarin After a DOAC Failure

CLINICAL QUESTION: Is warfarin better as a second-line anticoagulant than another direct oral anticoagulant (DOAC) in patients with atrial-fibrillation-induced ischemic strokes after failure of a first DOAC?

Ms. Dreyer

BACKGROUND: There is a relatively high (9.6%) risk of recurrent stroke in patients with atrial fibrillation (AF) despite compliance with DOAC use. Previous studies have shown that the risk ratios of ischemic safety endpoints are higher in patients switched to warfarin than in those without DOAC regimen changes after a DOAC failure. This study investigated the efficacy and safety of treatment with each of four different DOACs or warfarin after DOAC failure.

STUDY DESIGN: Retrospective cohort study

SETTING: National Health Research Database published by the Taiwan National Health Insurance Bureau between January 2003 and December 2016

SYNOPSIS: Retrospective analysis of the database identified 3,759 Asian patients with AF with ischemic stroke who experienced DOAC failure. The different outcomes of these patients with DOAC failure, including recurrent ischemic stroke (IS), major cardiovascular events (MACE), intracranial hemorrhage (ICH), subarachnoid hemorrhage (SAH), mortality, and net composite outcomes, were compared according to switching to the different DOACs or warfarin after index ischemic stroke. A total of 84 patients were identified who experienced a third IS after switching to different oral anticoagulants; 51 patients had ICH/SAH, 30 had recurrent fatal stroke, 164 had MACE, and 218 died. Four DOAC groups and one warfarin group were analyzed, and the data showed that compared against warfarin, switching to any of the four DOACs was associated with a 69% to 77% reduced risk of MACE and 69% to 83% reduced risk of net composite outcomes. Limitations include the inability to confirm that warfarin was in the therapeutic range for the analyzed patients, and that a relatively small number of patients were on edoxaban (7%), which could lead to unreliable statistics.

BOTTOM LINE: In Asian patients with DOAC failure, continuing DOACs after a second stroke was associated with fewer adverse outcomes than switching to warfarin.

CITATION: Hsieh MT, et al. Comparing efficacy and safety between patients with atrial fibrillation taking direct oral anticoagulants or warfarin after direct oral anticoagulant failure. *J Am Heart Assoc*. 2023;12(23):e029979. doi:10.1161/JAHA.123.029979.

Ms. Dreyer is a physician assistant in the department of hospital medicine at Duke Regional Hospital in Durham, N.C.

By Douglas Hilbert, MD

3 Beta-Blockers Didn't Reduce Mortality After Acute MI in Patients with Preserved Ejection Fraction

CLINICAL QUESTION: Do beta-blockers still reduce mortality after acute myocardial infarction (MI) in the modern era of faster and better reperfusion strategies?


Dr. Hilbert

BACKGROUND: Beta-blockers have historically been a cornerstone of post-MI management. However, in the era of earlier detection of acute MI with high-sensitivity troponin, superior reperfusion strategies, newer anti-thrombotic agents, and renin-angiotensin-aldosterone system (RAAS) blockade agents, there is less post-MI myocardial dysfunction. It is not certain that beta-blockers still impart significant mortality reduction in this context.

STUDY DESIGN: Prospective, registry-based, randomized, open-label, clinical trial

SETTING: The majority of participants were from Sweden's SWEDEHEART registry

SYNOPSIS: More than 50% of 5,020 patients from a national patient registry with acute MI, proven obstructive coronary disease on cardiac angiography, and left ventricular ejection fraction were randomized to receive beta-blocker treatment versus no beta-blocker. The median follow-up period was 3.5 years. Over that time, there was no significant difference between study groups with respect to the annual event rate of death from any cause or recurrent MI. However, a notable limitation is the open-label design. Additionally, as this was a pragmatic trial, there was a nearly 14% rate of crossover between treatment groups despite efforts to mitigate this.

BOTTOM LINE: It is no longer clear that beta-blockers reduce mortality after MI in the era of modern reperfusion techniques and anti-thrombotic agents.

CITATION: Yndigegn T, et al. Beta-blockers after myocardial infarction and preserved ejection fraction. *N Engl J Med*. 2024;390(15):1372-1381. doi: 10.1056/NEJMoa2401479.

4 Weekly Tirzepatide Increases the Rate of Resolution for MASH

CLINICAL QUESTION: Does tirzepatide improve the rate of resolution of Metabolic Dysfunction-Associated Steatohepatitis (MASH) or decrease the fibrosis stage in patients with steatohepatitis and moderate to severe (F2 to F3) fibrosis?

BACKGROUND: Prior studies have shown the efficacy of glucagon-like peptide 1 (GLP-1) receptor agonists for treating MASH but they have not shown benefit in reducing fibrosis. Tirzepatide, a glucose-dependent insulinotropic polypeptide (GIP) receptor agonist and GLP-1 receptor agonist, has not previously been studied in its effect on MASH. GIP receptor activation leads to improved lipid storage in white adipose tissue and thereby may decrease lipid deposition in the liver.

STUDY DESIGN: Prospective, phase 2, randomized, double-blinded, placebo-controlled trial

SETTING: Multicenter (Japan, U.S., Mexico, Europe, and Israel)

SYNOPSIS: Across all sites, 157 patients were randomized to either treatment with weekly tirzepatide versus placebo. Those treated with tirzepatide showed significantly higher rates of MASH resolution (44% to 62%) compared to placebo (10%) over a 52-week period (P <0.001) as assessed by liver biopsy. Higher doses of tirzepatide showed higher rates of resolution in a dose-dependent response. However, although suggestive of decreasing fibrosis stage, this relationship was not statistically significant. This study is limited by its relatively small size and the results are similar to the data already known showing efficacy of GLP-1 receptor agonists in reducing MASH. It may need a longer follow-up period to see if there are meaningful changes in the degree of fibrotic disease imparted by the added GIP receptor activation of tirzepatide.

BOTTOM LINE: Tirzepatide was effective at decreasing MASH but does not clearly reduce the fibrosis stage over a one-year period.

CITATION: Loomba R, et al. Tirzepatide for metabolic dysfunction-associated steatohepatitis with liver fibrosis. *N Engl J Med*. 2024;391(4):299-310. doi: 10.1056/NEJMoa2401943.

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By Neil Stafford, MD

5 iStopMM Risk Score Helps Predict Which MGUS Patients Need Bone Marrow Biopsy

CLINICAL QUESTION: Does my patient with a monoclonal protein and probable monoclonal gammopathy of undetermined significance (MGUS) need a bone marrow biopsy to rule out smoldering multiple myeloma (SMM)?


Dr. Stafford

BACKGROUND: MGUS is found in 4.2% of adults over the age of 50. Overall rates of progression to multiple myeloma (MM) are low (0.5% to 1% per year), with most never progressing. Only bone marrow biopsy (BMbx) can tell SMM bone marrow plasma cells (BMPC) (10% to 59%) from MGUS (BMPC less than 10%).

STUDY DESIGN: Observational cohort study

SETTING: A sub-study within the iStopMM (Iceland Screens, Treats, or Prevents Multiple Myeloma) MM screening study

SYNOPSIS: Within the iStopMM study, the data for a cohort of 1,043 persons with monoclonal gammopathy on blood testing were used to develop a statistical model. All had undergone BMbx, which showed 880 had MGUS, 158 had SMM, and two had MM. The model predicts risk of "SMM or worse" on BMbx. The iStopMM model outperformed the Mayo Clinic risk prediction model. The concordance statistic was 0.85 versus 0.67. If a risk threshold of SMM below 10% was selected, then 58.8% would be spared BMbx, only missing 3.6% who had SMM. With the Mayo Clinic model, you would spare only 37% BMbx and miss 6.2% who had SMM. Limitations include: a screening population (not hospitalized patients), a largely white and genetically homogeneous population, the need for external validation, and a lack of outcomes studies. This model outputs risk of "SMM or worse" as opposed to risk categories. This allows shared decision making based on individual risk tolerance. This model should not be applied if patients have signs or symptoms of gammopathy complications, such as bone pain, fatigue, bleeding, lymphadenopathy, B symptoms, amyloid symptoms, or proteinuria.

BOTTOM LINE: If your patient with a monoclonal gammopathy has an iStopMM risk score less than 10%, they can safely forego a bone marrow biopsy.

CITATION: Eythorsson E, et al. Development of a multivariable model to predict the need for bone marrow sampling in persons with monoclonal gammopathy of undetermined significance : a cohort study nested in a clinical trial. *Ann Intern Med*. 2024;177(4):449-457. doi: 10.7326/M23-2540.

Dr. Stafford is a hospitalist in the department of medicine at Duke Regional Hospital and an assistant professor of medicine at Duke University in Durham, N.C.

By Yasmin Marcantonio, MD, MPH

6 Anticoagulation Safety in Patients with Cirrhosis and AF

CLINICAL QUESTION: Do patients with cirrhosis and AF who are treated with anticoagulation have increased adverse safety events compared with patients with cirrhosis and AF who are not treated with anticoagulation?


Dr. Marcantonio

BACKGROUND: Randomized controlled trials have demonstrated that anticoagulation decreases the risk of ischemic stroke in patients with AF and risk factors for stroke. However, little is known about the safety of anticoagulation in patients with cirrhosis and AF, as all trials to date have excluded this population.

STUDY DESIGN: Retrospective cohort study

SETTING: University of California, Los Angeles Health System, a large academic public healthcare system

SYNOPSIS: Using the UCLA Data Discovery Repository of all patients interacting with the UCLA Health System, the authors identified 1,063 adults with cirrhosis and concurrently or subsequently diagnosed AF. Patients were grouped based on whether they had an outpatient prescription for anticoagulants or not; they were followed for targeted safety outcomes and compared across different classes of anticoagulants. Patients on anticoagulation had increased binary risk of hospitalization (odds ratio [OR], 1.54; P = 0.010), hospitalization count (OR , 1.74; P <0.001), and risk of intensive care unit admission (OR, 1.41; P <0.047) compared with propensity-matched non-anticoagulated patients. However, anticoagulation was not associated with increased mortality, blood product transfusion, or hospital length of stay. Direct oral anticoagulants were associated with increased binary risk of hospitalization compared with warfarin (OR, 4.70; P <0.001) and with no anticoagulation (OR, 1.52; P <0.038). This study presents new information on anticoagulation safety in this population; however, results may not be generalizable outside of a large academic center with high volumes of complex patients with cirrhosis.

BOTTOM LINE: Anticoagulation in patients with cirrhosis who develop AF is associated with an increased rate of hospitalization and intensive care unit admission, but not with increased mortality or transfusion requirement.

CITATION: Song JJ, et al. Assessing safety of anticoagulation for atrial fibrillation in patients with cirrhosis: a real-world outcomes study. *J Cardiovasc Pharmacol Ther*. 2024;29:10742484241256271. doi: 10.1177/10742484241256271.

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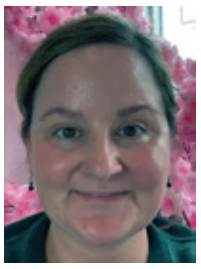
By Pahresah L. Roomiany, MD, MS, FACP

7 Timely Cessation of PPIs in Critically Ill Patients is Associated with Mortality and Morbidity Reduction

CLINICAL QUESTION: Does the timely cessation of proton pump inhibitors (PPIs) in critically ill patients impact morbidity and mortality compared to those who continue PPI therapy?



Dr. Roomiany

BACKGROUND: PPIs are commonly used to manage stress ulcers and gastrointestinal bleeding in critically ill patients. However, their use has been associated with potential risks, including increased rates of infections and adverse effects. Given the severity of conditions in critically ill patients, the timing of PPI discontinuation may play a critical role in influencing patient outcomes. This study explored whether stopping PPI therapy at an appropriate time can lead to better clinical outcomes, including reduced morbidity and mortality.

STUDY DESIGN: The study employed a propensity-score-matched cohort in a retrospective study. Matched groups of patients based on various baseline characteristics to control for confounding factors were created.

SETTING: Critical care settings at multiple hospitals

SYNOPSIS: PPIs are often started in the intensive care unit for stress ulcer prophylaxis, which itself is a controversial issue. The proportion of patients who continued PPI therapy without indication after leaving the intensive care unit in this study was 41.7%. These patients had a 27% greater risk of pneumonia (OR, 1.27; 95% confidence interval [CI], 1.15 to 1.39; P <0.001) and a 17% greater risk of cardiovascular events (OR, 1.17; 95% CI, 1.08 to 1.26; P <0.001). Continued PPI therapy was associated with a 34% greater risk of re-hospitalization (OR, 1.34; 95% CI, 1.23 to 1.47) and a nearly 20% greater two-year mortality risk (hazard ratio, 1.17; 95% CI, 1.08 to 1.27; P = 0.006).

BOTTOM LINE: Timely cessation of PPIs in critically ill patients is associated with a significant reduction in both morbidity and mortality. The study suggests that reconsidering the duration of PPI therapy and implementing a strategy for its timely discontinuation could enhance patient outcomes in formerly critically ill patients.

CITATION: Palmowski L, et al. Timely cessation of proton pump inhibitors in critically ill patients impacts morbidity and mortality: a propensity score-matched cohort study. *Crit Care Med*. 2024;52(2):190-199. doi: 10.1097/CCM.0000000000006104.

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SHORT TAKES

Outpatient Management of Low-Risk PE Still Underutilized in the U.S.

By Jared Giordano, MD

Serial cross sections of emergency department discharge diagnosis codes from 2012 to 2020 found that outpatient management of low-risk pulmonary embolism remained underutilized (about 33% of the time).

CITATION: Watson NW, et al. Trends in discharge rates for acute pulmonary embolism in U.S. emergency departments. *Ann Intern Med*. 2024;177(2):134-143. doi: 10.7326/M23-2442.

Decision-Making for Hospitalized Incarcerated Patients Lacking Decisional Capacity

This unique retrospective descriptive study of academic medical centers found that not only were prison employees involved in medical decisions for half of all incarcerated patients admitted, but also that uncertainty about the prison employees' role and privacy violations were common.

CITATION: Batbold S, et al. Decision-making for hospitalized incarcerated patients lacking decisional capacity. *JAMA Intern Med*. 2024;184(1):28-35. doi: 10.1001/jamainternmed.2023.5794. ■

By Jared Giordano, MD

8 Apixaban Versus Aspirin for Subclinical AF: Stroke Prevention and Bleeding Risk

CLINICAL QUESTION: Does apixaban reduce the risk of stroke or systemic embolism compared to aspirin in patients with subclinical atrial fibrillation and elevated stroke risk?

Dr. Giordano

BACKGROUND: Subclinical AF, often detected via implantable cardiac devices, is associated with an increased risk of stroke based on observational data. Previously, NOAH-AFNET6, a trial of 2,536 patients, did not show reduced risk of stroke but did note a 31% increase in major bleeding when comparing edoxaban versus placebo in patients with subclinical AF. Thus, ARTESIA was designed as a larger trial with longer follow-up, meant to answer this question.

STUDY DESIGN: Multicenter, double-blind, randomized controlled trial

SETTING: 263 sites across Europe and North America

SYNOPSIS: In this study, 4,102 patients aged 55 years and older with subclinical AF lasting six minutes to 24 hours and with a CHA_2DS_2-VASc score of 3 or higher were randomized to receive either aspirin 81 mg daily or apixaban 5 mg twice daily. Most patients had AF detected for less than six hours. After a mean follow-up of 3.5 years, the rate of stroke or systemic emboli was higher in the aspirin group versus the apixaban group (1.24% versus 0.78% per patient-year, P = 0.007). However, patients in the apixaban group had more major bleeding events than their controls in the aspirin group (1.53% versus 1.12% per patient year, P = 0.04).

BOTTOM LINE: In patients with subclinical AF and elevated stroke risk, apixaban reduced the incidence of stroke or systemic embolism compared to aspirin but was associated with a higher risk of major bleeding.

CITATION: Healey JS, et al. Apixaban for stroke prevention in subclinical atrial fibrillation. *N Engl J Med*. 2024;390(2):107-117. doi:10.1056/NEJMoa2310234.

9 Octreotide LAR Reduced Transfusion Needs and Endoscopic Interventions in Angiodysplasia-Related Anemia

CLINICAL QUESTION: Does octreotide long-acting release (LAR) reduce transfusion requirements in patients with angiodysplasia-related anemia?

BACKGROUND: Angiodysplasias frequently cause refractory bleeding and anemia, particularly in elderly patients. While thalidomide and endoscopic ablation have been used to treat this condition, the side effects of the former and the high rebleeding rate (one-third within two years) of the latter leave much to be desired. A recent meta-analysis suggested that octreotide LAR improves hemoglobin levels and decreases transfusion needs, though prior studies were limited by small sample sizes and retrospective designs.

STUDY DESIGN: Multicenter, open-label, randomized, controlled trial

SETTING: 17 hospitals in the Netherlands

SYNOPSIS: In this study, 62 patients who had received at least four units of red blood cells or parenteral iron infusions in the preceding year were randomized 1:1 over one year to either 40 mg of octreotide LAR intramuscularly every 28 days or standard care, including endoscopic therapy. Of note, the majority of patients were elderly (mean age, 72 years), had angiodysplasias located in the small bowel (87%), had been tried on thalidomide (over 65%), and were on antiplatelet therapy (45%) or anticoagulation (29%). The total number of transfusions was lower with octreotide compared with standard of care (11.0 versus 21.2), and octreotide reduced the annual volume of endoscopic procedures by 0.9 (95% CI, 0.3 to 1.5). Limitations included the lack of blinding and between-group differences that had to be controlled for with analyses of covariance.

BOTTOM LINE: Octreotide LAR effectively reduced transfusion requirements and the need for endoscopic interventions in patients with angiodysplasia-related anemia. The authors concluded that octreotide could be considered a beneficial treatment option for managing this tough condition.

CITATION: Goltstein LCMJ, et al. Standard of care versus octreotide in angiodysplasia-related bleeding (the OCEAN study): a multicenter randomized controlled trial. *Gastroenterology*. 2024;166(4):690-703. doi: 10.1053/j.gastro.2023.12.020.

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Should We Use Non-Insulin Diabetic Agents on Inpatients?

By Ethan Molitch-Hou, MD, MPH, SFHM, and Kevin Donohue, MD

Since endocrinologists proved they could name studies equally as well as cardiologists with the RABBIT 2 and NICE SUGAR trials, guidelines have recommended the use of insulin for inpatients with type 2 diabetes to maintain a blood sugar between 140 and 180 mg/dL for most patients due to the ease of titration and predictable pharmacokinetics. Oral agents have been avoided as they are difficult to titrate and have side effects that could be exacerbated in inpatients who have variable oral intake, are experiencing acute illness, have renal and hepatic dysfunction, are undergoing imaging procedures, or are in the peri-operative phase and face an increased risk.

With newer anti-diabetic agents being used and often started as inpatients for other indications, in this Flipside, we argue over the use of non-insulin diabetic agents in the hospital.

Limited Unpredictability with Insulin Therapy Alone

It's my first day back on a busy hospitalist service. I've settled in with my morning coffee and started to review my patients when a rapid response is called overhead to room 764. Looking down at my list and recognizing the patient that was signed out to me with type 2 diabetes mellitus, chronic systolic congestive heart failure (CHF), mild acute kidney injury (AKI), and advanced peripheral artery disease (PAD), who is on the schedule for peripheral intervention later that day, I quickly get up and rush to the elevator.

Upon arriving in the room, I see a toxic-appearing 55-year-old male, diaphoretic, tachypneic, lethargic, and largely obtunded. Vital checks reveal a blood pressure of 108/67, a heart rate of 123, a respiratory rate of 28, O_2 saturation of 94% on room air, and a temperature of 98.3 ˚F. His morning labs have yet to return, and his nurse is visibly shaken because the patient was "fine" when he went to sleep the prior evening. A glucose is checked: 188 mg/dL. Given this unexpected and undifferentiated decompensation, I order a transfer to a higher level of care for a more thorough workup.

As I dig into the chart while the patient is being moved, I notice he has had his peripheral intervention rescheduled twice this week due to OR availability. His medications include sliding scale insulin and continued dapagliflozin on admission reconciliation. Shortly after, his comprehensive metabolic panel (CMP) returns with a high-anion-gap metabolic acidosis and a CO2 of 11. Recognizing that prolonged nil per os status combined with his SGLT2 inhibitor had pushed him into euglycemic diabetic ketoacidosis (DKA), I start 2 liters of IV fluids and insulin and dextrose infusions. By the afternoon, his acidosis and lethargy have resolved, but his peripheral stent has been pushed back another week by a nervous surgeon.

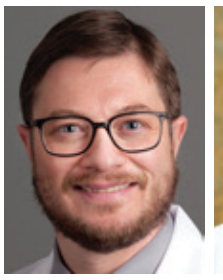
Good hospital medicine practice has always been about reducing unpredictability in an inherently unpredictable environment. Glycemic management is one of those areas where we can exert control, and basal-bolus insulin therapy has long been the tool that allows us to do so safely. Oral agents, by contrast, add unnecessary uncertainty. Inpatients often have variable or unreliable oral intake, are kept nil per os for procedures, or become acutely ill in ways that change their nutritional intake overnight. In that context, medications designed for stable outpatients can precipitate dangerous hypoglycemia, and in this patient, euglycemic DKA. The juice of continuing these medications is generally not worth the squeeze.

Renal and hepatic dysfunction are frequent companions of hospitalization, making medications like metformin and sulfonylureas particularly hazardous. What works at home in a stable setting can suddenly become toxic in the hospital, where AKI or hypoperfusion may push a patient into lactic acidosis or prolonged hypoglycemia. Add to this the common exposures to contrast, high-dose steroids, or perioperative metabolic shifts, and the risks of continuing oral therapy quickly add up.

Decrease the Sticks and Use Oral Agents in Certain Circumstances

My sixth admission comes into the hospital, and before truly digging through my chart, I've already placed diabetes as a problem on my problem list and have my inpatient insulin order set pre-clicked to make sure at least Accu-Chek, sliding scale insulin, and hypoglycemia protocols are ordered. Yesterday, I overheard nurses complaining about drawing up one unit of insulin for a blood sugar of 185 mg/dL, and the patient was annoyed at another stick for such a small amount of medication. He argued with the nurses that he's not on insulin at home, so why don't we just continue his home medications?

I think about the recent heart failure patient whom I inherited, who had their dapagliflozin continued when they were re-admitted after their new diagnosis, where guideline-directed medical therapy (GDMT) was started. I monitored him for DKA; he had no issues, and he needed less insulin. A colleague mentioned that they routinely use sitagliptin where he practiced to reduce the amount of sliding scale. Admission six was stable, his kidneys were working well, and he didn't get any contrast. What is the harm in continuing his metformin? If he develops lactic acidosis, I can just stop it, and currently, he's at such low risk. I also think about how, with sliding scale, I'm constantly chasing the sugar. Administering medication after the patient has eaten can lead to complications, especially when considering the post-prandial check and the late timing of the sliding scale. I often notice that guideline-based basal-bolus recommendations are not followed, resulting in patients relying on a sliding scale throughout their hospitalization, with blood



Dr. Molitch-Hou

Dr. Donohue

Dr. Molitch-Hou is an assistant professor, the director of the hospital medicine sub-internship, core faculty for the internal medicine residency program, and co-director of the Care Transition Clinic at the University of Chicago Medical Center in Chicago. Dr. Donohue is a practicing hospitalist and regional medical director for Team Health as well as the chief of medicine at Georgetown Community Hospital in Georgetown, Ky. He serves as the medical director of telemedicine for Team Health's Strategic Account Group and is a member of SHM's Community Hospitalist Advisory Board.

sugar levels frequently remaining in the 300s.

Coming back to admission six, a patient with a mild cellulitis and normal kidneys, and who is not getting nephrotoxic meds or imaging, I continue his home oral regimen of metformin, linagliptin, and dapagliflozin. His sugars stay okay, as does his renal function, and he doesn't require any doses of sliding scale. He is happy; the nurses are happy. For this low-risk patient, where unpredictability is more limited and he's being actively monitored for side effects, oral meds were a safe and decent choice. It reduced the amount of wasted medications, the number of needle sticks, and avoided some of the risks of fluctuations that sliding scale can cause. Now he wants to just use his continuous glucose monitoring device instead to completely avoid the needles...a debate we can have another time.

Discussion

While insulin should remain the mainstay of therapy, as new evidence and clinical practice changes, our inpatient practice should adapt. Guidelines for inpatient management of diabetes have recently been updated to include the use of dipeptidyl peptidase 4 (DPP-4) inhibitors.[1] Strong, randomized, controlled trials have shown the efficacy of the use of sitagliptin and linagliptin for inpatients for better glycemic control and also for less overall insulin need, which may mean a few fewer sticks for our inpatients.[2,3] Clinically, they can be used for mild-to-moderate hyperglycemia in stable, noncritically ill patients with type 2 diabetes mellitus. They may be most beneficial when we have those folks in between 180 and 200 mg/dL, and our nurses are using one unit of sliding scale to cover their mild hyperglycemia. Consistent oral intake is still important, and if sitagliptin is used, it has to be renally adjusted.

SGLT2 inhibitors are being used clinically. With so much evidence toward starting these medications for our patients with heart failure as inpatients, we are now seeing these folks when they come back to the hospital. There isn't great evidence on what to do with these agents in terms of randomized control trials, but in practice, they are being used and continued. A nationwide cohort study using Veterans Affairs healthcare system data showed some benefits of continuing these agents.[4] However, the risk of euglycemic DKA is real, and they should be stopped peri-operatively or during periods of prolonged poor oral intake. Additionally, they should be stopped in patients with acute urinary infections or pyelonephritis. Volume status may be another consideration for holding.

Sulfonylureas and thiazolidinediones still don't have a role in inpatient medicine. However, metformin, our tried-and-true oral medication, is one that is generally not continued as an inpatient. Our fellow hospitalists have argued that it is one of the Things We Do For No Reason™ and that there are scenarios where metformin can be used, especially if a patient has stabilized and is nearing the end of discharge.[5] The risk of metformin-associated lactic acidosis may be exaggerated from the proguanil days, but still should be avoided in patients with sepsis, renal failure, recent contrast imaging, or other reasons to be at high risk for lactic acidosis.

GLP-1s are now commonplace as well; typically, they are not on formulary and are somewhat impractical for inpatient use given the pen delivery system. However, GLP-1s are something for hospitalists to think about on discharge for patients with obesity or those who were admitted for a stroke, with their proven cardiovascular benefits.[6]

There may be a role for oral diabetic agents in select patients, and it should be individualized based on the clinical setting and patient. However, blindly continuing SGLT2 inhibitors is not advised due to the risks associated with them. The role of DPP-4 inhibitors has good data and should be considered in non-critically ill patients, while metformin can provoke a continued argument over whether we hold it for no reason. When patients have added unpredictability in their renal and hepatic function, perfusion, or oral intake status, sticking with insulin is the safest approach. ■

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Editor's Note

Continued from page 2

Moving Forward

The challenge to find magic and the conclusion that it was already present offers a framework for thinking about professional development that feels both realistic and aspirational. Rather than asking us to transform our practice completely, the conference encouraged us to recognize the excellence already happening and build on those foundations.

This doesn't mean accepting current limitations or ignoring areas where we need to improve. We have been offered concrete guidance on strengthening our approach to equity, communication, and disability-informed care. This message feels encouraging rather than overwhelming; we already have strong foundations to build on.

The magic was indeed here all along. Our responsibility is to ensure it reaches every child who needs it, recognizing that this requires not just clinical expertise, but also commitment to equity, effective communication, and perspectives that challenge our assumptions about what constitutes optimal care. The work continues, but it's work we're already doing—and doing well. ■

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New Diabetes Medications and Holistic Management

What hospitalists need to know

By Ruth Jessen Hickman, MD

Nearly one in four hospitalized 12patients in the U.S. has diabetes. These patients have almost twice the hospital readmission rate as those without diabetes, making it a critical area for hospitalist expertise.[1] Ideally, hospitalists should consult with a specialized glucose management team to optimize care, per guidelines from the American Diabetes Association (ADA), but such assistance is not always available.[2]

Practice standards are evolving in some aspects of diabetes management, especially with respect to certain new medications for type 2 diabetes. In addition to blood glucose control, some of these provide additional benefits for cardiovascular, renal, and/or metabolic health, but questions remain about the best ways to employ them in a hospital setting.[2]

Goutham Talari, MD, an internal medicine hospitalist at AdventHealth in Deland, Fla., said, "Hospitalists have a great opportunity to initiate and continue these medications to improve outcomes like decreased mortality and decreased length of stay, benefits which have been demonstrated in research."


Dr. Talari

"Especially for uninsured and underserved patient populations who are only getting their diabetes care in the hospital, we as hospitalists are often the ones starting and adjusting these medications," said Lily Ackermann, MD, a hospitalist and clinical associate professor of medicine at Thomas Jefferson University in Philadelphia.


Dr. Ackermann

These newer drugs must be employed in the context of overall best practices for diabetes management in the hospital, in which both extreme hyperglycemia and hypoglycemia should be avoided for best patient care, with a target of 100–180 mg/dL (if this can be achieved without significant hypoglycemia).[2]

Guillermo E. Umpierrez, MD, is a professor of medicine in the division of endocrinology at Emory University School of Medicine in Atlanta, and a lead author on the Endocrine Society and ADA guidelines on the management of hyperglycemia in hospitalized adults in non-critical care settings.[3] Dr. Umpierrez pointed out that endocrinologists are less available in many hospital settings than in the past. "So, it's important for hospitalists to be aware of the new drugs and how to improve glycemic control overall, because improving glycemic control reduces complications."


Dr. Umpierrez

In the past, Dr. Umpierrez noted, hospitalized patients with diabetes were almost always managed with insulin monotherapy, regardless of their home treatment. This might include some combination of a long- or intermediate-acting basal insulin, bolus (prandial) insulin taken at mealtime, sliding scale insulin (correctional, short-acting insulin), or a continuous IV drip for severe hyperglycemia. This insulin-only approach has the benefit of reducing adverse effects from noninsulin medications during illness and surgery while allowing for flexibility in dosing.

However, this practice is evolving, as reflected in the newest guideline from the ADA, which emphasizes an individualized approach to glycemic management. Dr. Umpierrez noted that some trials have demonstrated that certain outpatient medications may be safely continued during hospitalization in select patients, including metformin and some newer diabetes drugs such as sodium-glucose transport protein-2 (SGLT2) inhibitors and dipeptidyl peptidase 4 (DPP-4) inhibitors.[1,2,4]

The Hospitalist talked with Drs. Umpierrez, Ackermann, and Talari, as well as Ethan Molitch-Hou, MD, a hospitalist and an assis-


Dr. Molitch-Hou

tant pofessor of medicine at the University of Chicago in Chicago, about these newer agents as part of inpatient diabetes management.

SGLT2 Inhibitors

Originally developed to treat type 2 diabetes mellitus, SGLT2 inhibitors block SGLT2 transporters in the renal tubules, preventing the reabsorption of glucose and thereby increasing its excretion through the urine. Four oral agents are currently approved by the U.S. Food and Drug Administration: dapagliflozin, empagliflozin, canagliflozin, and ertugliflozin.[5]

SGLT2 inhibitors have a low risk of causing hypoglycemia and a very good safety profile, even in frail adults. Importantly, these drugs have significant physiological impacts beyond glucose control, such as decreased fibrosis and tissue remodeling, and they may reduce the risk of major adverse cardiovascular events, heart failure, and chronic kidney disease. This is particularly important given the high rates of these comorbidities in the diabetes population, but they can also sometimes be used in patients with normal HbA1c.[5]

Dr. Molitch-Hou, part of the inpatient diabetes management workgroup at the University of Chicago in Chicago, said, "We see a mortality benefit for starting SGLT2 inhibitors in multiple studies, like in heart failure and kidney disease, and so now we see a huge population of people coming to the hospital already on these drugs, not just for diabetes."

Dr. Umpierrez said, "Everybody with heart failure should be considered a candidate for SGLT2 inhibitors, because they decrease hospital readmissions, mortality, and length of hospital stay." He explained that these agents shouldn't be employed in a hospital setting solely for glucose control, for which they only provide mild improvement, but to prevent progression of kidney disease and cardiovascular complications. In fact, Dr. Molitch-Hou noted that his hospital will not approve the drugs during hospitalization for diabetes alone but only in the context of one of these other conditions.

Thus, the most recent guidelines from the ADA recommend that for stable patients with type 2 diabetes hospitalized with heart failure, these agents should be initiated or continued from their previous outpatient use (when clinically appropriate) and continued after discharge.[2]

Dr. Talari pointed to a recent key study that explored the continued use of SGLT2 inhibitors during hospitalization. Continued use of these agents during hospitalization was associated with a 45% decrease in mortality risk compared to patients who were taken off the drug, with no increased risk of acute kidney injury and with a modestly decreased length of stay.[6]

SGLT2 Inhibitors: Safety Considerations

Dr. Molitch-Hou shared that it's now common practice at his institution to continue SGLT2 agents in most patients with heart failure, but it's still important to temporarily hold them in some cases, as per the new ADA guidelines.[2]

Dr. Ackermann added that these SGLT2 inhibitors have a diuretic effect and carry an increased risk of genitourinary infections. They may need to be held temporarily in patients with volume depletion, acute kidney injury, or acute illness, especially urinary tract infections.

Although rare, a key safety concern for these patients is the development of euglycemic diabetic ketoacidosis (DKA), a potentially fatal complication. Dr. Umpierrez pointed out that despite the name, these patients often still have glucose that is above normal (e.g., 100 mg/dL), although it may be less than the levels traditionally associated with DKA (over 200 mg/dL). Dr. Molitch-Hou advised practitioners to maintain a high index of suspicion, watch out for potential clinical signs, and keep a close eye on the anion gap to make sure that it isn't widening (due to elevated ketones from DKA).

Due to these risks of DKA or euglycemic DKA, the ADA currently recommends discontinuing SGLT2 inhibitors three to four days before scheduled surgery, as surgical stress, altered oral intake, and dehydration increase the likelihood of euglycemic DKA.[2]

GLP-1 Receptor Agonists

The glucagon-like peptide-1 (GLP-1) receptor agonists such as exenatide, liraglutide, dulaglutide, and semaglutide are increasingly being prescribed in the outpatient setting for their glycemic control, cardiovascular, and weight loss benefits, with some non-diabetic people pursuing them primarily for the latter role. In some patients, they can be added to SGLT2 inhibitors for additional cardiometabolic benefits.[7]

Semaglutide is now available in a once-daily oral formulation, but the rest are only available as injections. GLP-1 agents can be combined agents that also act on GIP (glucose-dependent insulinotropic polypeptide) receptors, as in the combined agent, tirzepatide.

The ADA recommends GLP-1 receptor agonists for patients who have type 2 diabetes, obesity, and symptomatic heart failure. The

guidelines also recommend GLP-1 inhibitors in patients with type 2 diabetes and advanced chronic kidney disease, as well as type 2 diabetes with obesity and metabolic dysfunction associated steatotic liver disease (MASLD).[4]

GLP-1 agonists can also help reduce stroke incidence in diabetic patients, and they may play a particularly important role in preventing future heart attacks and stroke in stroke survivors.

"We're seeing a lot of people come in on GLP-1 medications," shared Dr. Ackermann, "and there will probably be more and more people coming in on them for things like [MASLD] and obstructive sleep apnea." Dr. Ackermann noted that many hospitals do not have them on the formulary, and they typically would not be given in an inpatient setting. However, Dr. Talari noted that it may be appropriate to allow patients to bring in their home GLP-1 medications in certain settings, like an extended stay in a rehabilitation facility.

Dr. Umpierrez agrees that starting such agents in the hospital would not usually be desirable, even if practically feasible, because of the risk of gastrointestinal side effects, which occur most frequently at treatment initiation.

However, Dr. Umpierrez pointed out that several of these agents are given weekly, so they continue to work—and carry relevant risks of side effects—if the patient took them prior to their hospital stay. This can sometimes be an issue for patients who need urgent procedures, as these drugs are partly designed to slow gastric emptying, and they might increase the risk of aspiration. This might be an even greater concern in patients with longstanding diabetes who are already at risk of gastroparesis.

This area is a somewhat controversial one, explained Dr. Umpierrez. Although the latest multi-society guidance recommends holding GLP-1 agents for a week before surgery (for once-weekly agents), he noted that several studies have shown that this may not be necessary. It's important to assess if the patient has any gastrointestinal symptoms, noted Dr. Ackermann, and notify anesthesiology about a patient's recent use, in case different precautions are needed (e.g., following a "full stomach" protocol).[8]

Dr. Ackermann added that it's also important to ask patients about the source of their GLP-1 medications; some patients take compounded GLP-1 medications, which may be of uncertain quality and dose, which they've received with little oversight, increasing the risk of symptoms such as intense vomiting. Hospitalists should also be aware of acute cholecystitis and pancreatitis as potential side effects.

DPP-4 Inhibitors

Although not quite as new as the SGLT2 drugs or the oral GLP-1 medications, DPP-4 inhibitors are another important class in terms of evolving management and the use of non-insulin agents to control glucose levels during hospitalization. These include sitagliptin, saxagliptin, linagliptin, and alogliptin.

Per the new ADA guidelines, these agents can be initiated in the hospital for select groups of patients with type 2 diabetes and mild to moderate hyperglycemia, with lower risks of hypoglycemia compared to insulin. Dr. Umpierrez added that for patients with slightly higher blood glucose, e.g., over 200 mg/dL, insulin can be added.[2,4]

"They don't have specific cardiovascular or renal benefits, but they are very safe, and they are simple and easy to use," said Dr. Talari, "although saxagliptin and alogliptin might need to be held in people with heart failure."

Dr. Ackermann added, "I think DPP-4 inhibitors are a great way to control mild hyperglycemia in the hospital, especially for those at risk of hypoglycemia like elderly patients, or those with kidney disease and poor oral intake; it's another tool which doesn't have the same risks and patient inconvenience as multiple injections of basal insulin." She noted that when continued post-discharge, they pose less risk of hypoglycemia compared to some other agents.

Dr. Molitch-Hou also shared that DPP-4 inhibitors in appropriate patients can be a way to reduce the use of sliding scale insulin, which some hospitalists still rely on for the sole management of hyperglycemia in many patients, despite current recommendations to the contrary. Dr. Umpierrez has been arguing against the drawbacks of sole sliding scale insulin use for decades. He noted that the method may be used initially for very mild hyperglycemia, with basal insulin added as needed, but sliding scale insulin should never be used alone for patients with blood glucose of over 200 mg/dL.[9]

"If practitioners are nervous about starting basal insulin, a DPP-4 inhibitor is a nice sort of incremental step that potentially can be used for glycemic control," shared Dr. Molitch-Hou.

Discharge Planning and Proactive Management

Beyond direct inpatient management, hospitalists can play an important role in enhancing continuity of care and improving long-term patient outcomes for diabetes patients.

Cost can sometimes be prohibitive with these newer agents, sometimes even for patients who have insurance coverage. Dr. Molitch-Hou noted that at his institution, they regularly check for insurance coverage for SGLT2 inhibitors for appropriate patients with heart failure, trying to initiate necessary prior-authorization processes and clearly communicating this as part of discharge to outpatient care. The prior-authorization process for many medications can take several days, and for these and other reasons, Dr. Ackermann advised starting early on discharge planning and patient education, e.g., for a new potential therapy.

Typically, GLP-1 agents haven't been prescribed directly at discharge. Dr. Ackermann noted that for a patient who is a good candidate for a GLP-1 drug, it's important to connect them with providers comfortable prescribing them and who are able to undertake the prior authorization process, since not all primary care doctors are currently doing so.

At Dr. Molitch-Hou's institution, hospitalists do sometimes start GLP-1 drugs at discharge, particularly for patients with a strong indication, such as diabetic patients who've had a stroke. He explained, "In the past, we've sometimes been reluctant to start GLP-1 drugs on discharge, but then we miss a lot of patients who could benefit." His hospital recently changed some of the order sets concerning such patients to help encourage proper prescription of these agents.

Dr. Ackermann pointed out that close communication with outside providers is also helpful for patients previously prescribed GLP-1 drugs. Depending on the medical context and the length of their hospitalization, patients may need to gradually increase their dose again when they begin resuming it as an outpatient.

Dr. Talari noted that medication reconciliation at admission, hospitalization, and discharge presents unique opportunities to assess and revise patients' home diabetes medications. He shared that it's important to fully understand the pre-hospitalization picture as well as the full hospital clinical course to make sure that the patients are properly stabilized at discharge and avoid potential readmission.

For example, it's helpful to look at the patient's recent hemoglobin A1c to get a sense of how their previous treatment regimen was working, retesting in the hospital if no results from the last three months are available. Dr. Molitch-Hou explained that some patients hospitalized with very high hemoglobin A1c may need to start receiving outpatient insulin, and hospitalists shouldn't be hesitant to prescribe it at discharge to appropriate patients.

Some patients may need adjustments in the other direction, with deprescribing of previous medications to reduce risks of hypoglycemia. Dr. Ackermann also shared that hypoglycemia post-discharge is a very prevalent problem as patients readjust to their normal life and recover from stress-induced hyperglycemia, and it's a major cause of hospital readmissions, particularly in the elderly.

Patients sent home on insulin need particularly close follow-up care, as they may need to have their insulin doses reduced post-discharge, and Dr. Ackermann takes a particularly active role in scheduling outpatient care for patients with high hypoglycemia risks. Dr Umpierrez also recommended sending all patients with risk factors for hypoglycemia home with a glucagon prescription to treat severe hypoglycemia if it occurs.

"We have to actively titrate medications according to patients' hypoglycemic and hyperglycemic risks, their severity of illness, and their hemoglobin A1c, to help decrease their length of stay, decrease mortality, and prevent readmissions," said Dr. Talari. ■

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PLQS: Innovative Merit Pathway for Hospitalist Recognition and Career Development

By Chenwei Wu, MD, and Mehraneh Khalighi, MD

Over the past two decades, quality improvement and patient safety (QI/PS) have become integral to the mission of hospital medicine, driving system-wide problem solving and practice changes to improve patient care. With the introduction of the Accreditation Council for Graduate Medical Education requirements to integrate QI/PS activities into graduate medical education, the significance of structured QI/PS work and its incorporation into promotion criteria, especially for academic hospitalists, has become increasingly evident.[1]

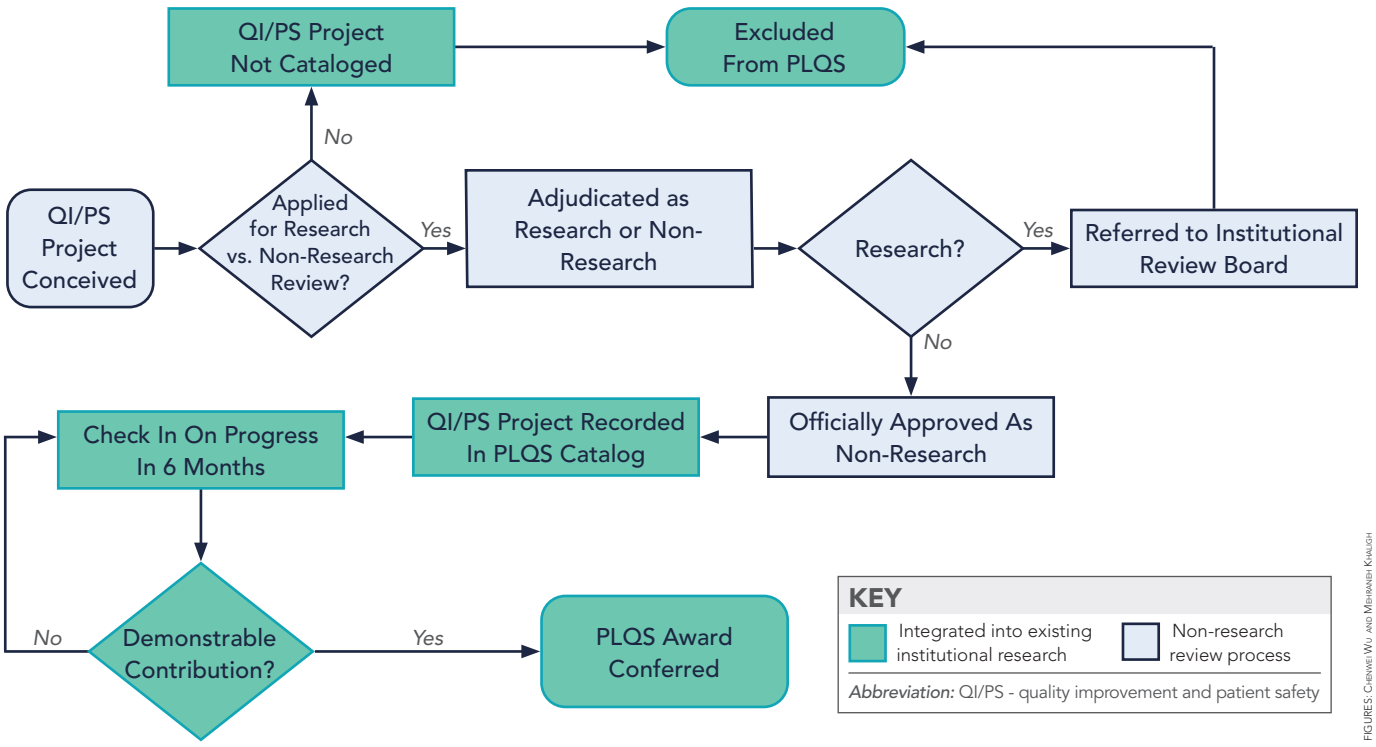
Additionally, early-career academic hospitalists identify meaningful engagement in QI/PS projects as critical factors for their professional satisfaction and development.[2] The role of QI/PS activities in the growth and promotion of academic hospitalists was also underscored in a recent scoping review on faculty development in academic hospital medicine.[3] Therefore, integrating QI/PS activities into the four pillars of hospital career satisfaction identified by the Society of Hospital Medicine not only supports the professional development of hospitalists but also aligns their work with institutional missions and patient care improvement.[4]

However, other than peer-reviewed publications, identifying promotional scholarship in QI/PS has been challenging in traditional academic pathways.[5] We set out to systematically capture QI/PS activities and promote their recognition at our institution.

Solution Overview

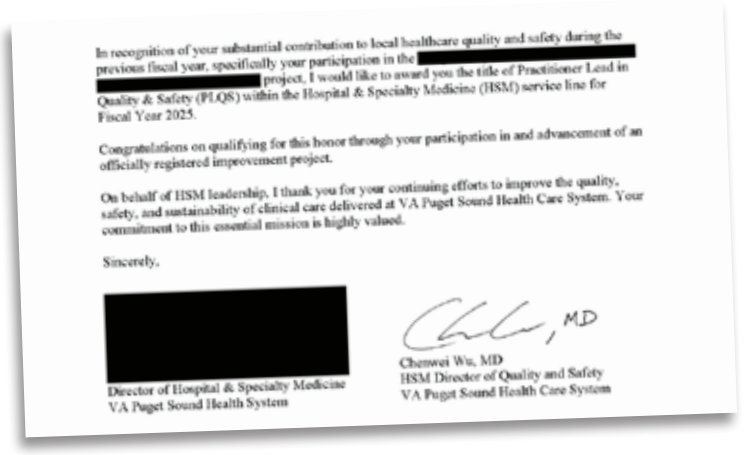
Our efforts culminated in the Practitioner Leads in Quality & Safety Merit Pathway, or PLQS Award for simplicity, within our medicine service line, which includes the hospital medicine section. The goals of this program were to 1) catalog QI/PS activities conducted by hospital medicine practitioners and other clinicians, ensuring that all initiatives comply with approved guidelines and do not involve unapproved research, 2) establish award mechanisms to recognize those efforts, thereby enhancing recipients' curricula vitae, 3) coach the development and execution of QI/PS projects using robust methodology, and 4) support the generation of scholarly work. Prior to this, QI/PS activities across the medicine service were largely ad hoc, pursued in isolated pockets with varying degrees of support and poor visibility, unless they achieved publication.

Figure 1: Process map illustrating novel PLQS Award functions



FIGURES: CHENWEI WU AND MEHRANEH KHALIGHI

Figure 2: Sample PLQS Award letter sent to first-time recipients and affiliated academic faculty leadership



In recognition of your substantial contribution to local healthcare quality and safety during the previous fiscal year, specifically your participation in the [redacted] project, I would like to award you the title of Practitioner Lead in Quality & Safety (PLQS) within the Hospital & Specialty Medicine (HSM) service line for Fiscal Year 2025.

Congratulations on qualifying for this honor through your participation in and advancement of an officially registered improvement project.

On behalf of HSM leadership, I thank you for your continuing efforts to improve the quality, safety, and sustainability of clinical care delivered at VA Puget Sound Health Care System. Your commitment to this essential mission is highly valued.

Sincerely,

[redacted]
Director of Hospital & Specialty Medicine
VA Puget Sound Health System

Chenwei Wu, MD
HSM Director of Quality and Safety
VA Puget Sound Health Care System

Implementation Process

Implementation of the PLQS Award was first chartered and then approved as a non-research QI project sponsored by the chief of the medicine service line. A set of outcome, process, and structure measures was compiled, which included:

1. Number of PLQS Award recipients each year (outcome measure)
2. Operational impact, both locally and beyond, categorized as yes or no (outcome measure)
3. Scholarship evidenced by conference presentations or publications, categorized as yes or no for each (outcome measure)
4. Project progression and final disposition (hybrid outcome and process measure)
5. Clinical section affiliation (structure measure)
6. Presence of multidisciplinary project team, categorized as yes or no (structure measure)
7. Involvement of medical trainees, categorized as yes or no (structure measure)

All measures were tracked in a Microsoft Excel spreadsheet by one of the authors (CW), a hospital medicine provider with 50% full-time equivalent allocation to manage our institution's QI office. This office, alongside the medical center's Human Research Protection Program, shares responsibility for classifying projects as either research or non-research. Through this review process, which acted as a natural funnel for cataloging QI/PS activities, PLQS Award candidates were conveniently identified. In return, PLQS procedures encouraged compliance with hospital policies, as only projects officially approved as non-research could qualify for the award.

Projects classified as non-research were subsequently inducted into the PLQS Award database. Project progress was monitored, and core measures were updated every six months through brief check-ins with team members until one of three outcomes materialized: 1) the adoption of changes into everyday workflow, 2) conclusion without adoption or completion of analysis if no intervention was performed, or 3) cancellation. Demonstrable effort, identified through these regular reviews, was honored with the PLQS Award for one year.

Figure 1 illustrates the integration of the novel PLQS Award functions into the existing research versus non-research review process. The award was automatically renewed if QI/PS contributions were sustained beyond the first year. Newly inducted and renewing PLQS Award recipients' names were announced at a medicine staff meeting, and letters of recognition were sent to first-time honorees and affiliated academic leadership. (Figure 2) A notice about the award also appeared in the departmental electronic newsletter.

Dr. Wu

Dr. Khalighi

Dr. Wu is an assistant professor in the division of general internal medicine at the University of Washington and a hospitalist physician and director of quality and safety for hospital and specialty medicine at the VA Puget Sound Health Care System in Seattle. Dr. Khalighi is a clinical associate professor of medicine at the University of Washington and director of the preoperative medicine consult clinic at the VA Puget Sound Health Care System in Seattle.

Our historical experience over the past five years indicates that a commitment of approximately six hours per year was sufficient to sustain PLQS Award functions, including database maintenance, preparation of letters of recognition using a standard template, and award presentations. This commitment was in addition to an initial six-hour investment required to program the master spreadsheet and design the template for the letters of recognition. Reflecting on this time allotment, we found that managing the PLQS Award imposed only a minor burden and was well-suited for a hospitalist with dedicated QI/PS time to oversee.

Outcomes and Impact

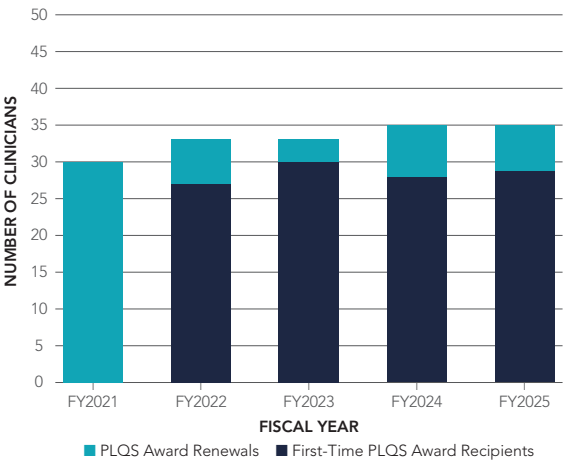
Since the implementation of our PLQS Award in 2021, between 30 and 35 clinicians annually have been recognized for their demonstrable contributions to approved QI/PS projects. In each of the past five years, three to eight PLQS Award recipients (average, 16% of the annual roster, ranging from 9% to 20%) were new inductees, while the majority consisted of renewals from the preceding year. (Figure 3) PLQS Award recognition has been conferred to 52 unique individuals across the program's lifespan, of whom 19 (37%), including both authors, have earned the award in four or more consecutive years. Over the same period, 59 projects were cataloged, with 56 (95%) progressing to full-fledged analysis or implementation. Of these 56 projects, 27 (48%) led to scholarship traditionally valued in academic promotion, specifically 23 (41%) resulting in conference presentations and eight (14%) in publications. Importantly, the remaining 29 projects (52%) without scholarship would not have earned recognition outside of the PLQS Award. Figure 4 shows the operational and scholarly outcomes of all cataloged PLQS Award projects. Some published projects were never presented at conferences. Hence, the counts for presentations and publications are neither independent nor fully overlapping.

Operationally, 33 out of 56 non-cancelled projects (59%) resulted in local practice changes, while four (7%) yielded regional or national impact. (Figure 4) Thirty-eight projects (68%) were multidisciplinary, and 23 (41%) incorporated medical trainees. The PLQS Award has been cited by name in faculty promotion highlights, including for individuals advancing to full professor rank. The reception from both PLQS Award recipients and academic leadership has been resoundingly positive, as highlighted in the following representative quotes:

- "Well, this is a nice little surprise. Thanks for all your help with this project. I didn't know what I was doing when I started."
- "[Dr. A] is fabulous. It's nice to see her recognized for her QI and patient safety work. Thanks for the note, and we'll get this in our division records."
- "This is such exciting news! Congratulations to [Dr. B]! I will share this with the division."
- "[Dr. C] has been a wonderful chief resident this year, and I'm so happy to see her get this recognition."

Lastly, the PLQS Award has provided significant value to hospital leadership by safeguarding research funding through careful review of both research and non-research projects. Additionally, it has supported the Joint Commission Hospital Accreditation process by including the project catalog in survey materials, and it has strengthened Accreditation Council for Graduate Medical Education accreditation by reporting medical trainee participation to our affiliated graduate medical education office.

Figure 3: Annual growth and retention since the launch of the PLQS Award in fiscal year (FY) 2021



Lessons Learned

The PLQS Award represents a small-footprint, low-effort intervention with the potential to deliver significant value to hospital medicine providers engaged in QI/PS activities, especially at academic centers where promotion traditionally hinges on research and publication. Incorporating the PLQS Award model into established incentive structures, such as pay-for-performance, is similarly attractive. By customizing tracked measures, it can also be adapted to benefit a wider range of operational and educational stakeholders, as we have done. We believe the key to successfully replicating our model elsewhere lies in effectively integrating it into established research versus non-research review procedures at those sites. Without such a framework, the workload required to routinely and systematically identify qualifying QI/PS activities may become prohibitively high.

Future Directions

Although project coaching services were offered in the initial implementation phase of the PLQS Award, few individuals used them. Instead, many have used it as a central hub to inquire about research versus non-research criteria and clarify other technicalities. While we fully intend to retain this consultative function, we hope to intensify efforts around the third and fourth pieces of our objectives: coaching QI/PS projects from execution to scholarly translation. This might involve introducing more advanced QI concepts, such as run charts and statistical process control charts, encouraging the use of the Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) writing guidelines, or recommending journals that frequently accept QI/PS manuscripts.[6,7] If such elements can be fully developed and assembled, they could create a standard pathway for the regular and reliable production of QI/PS scholarship, further enhancing career advancement opportunities in academic hospital medicine. ■

Key Points

- Quality improvement and patient safety play a central role and have become core to hospital medicine, improving patient care and driving systemic changes.
- Hospitalists view QI/PS activities as essential for professional satisfaction, yet identifying and promoting QI/PS scholarship remains difficult in traditional academic pathways.
- The PLQS Award model requires minimal time investment, operates efficiently with limited resources, and allows for tailored tracking of measures to meet diverse needs.
- The PLQS Award has enhanced workplace visibility, practice change, and scholarly output by systematically cataloging QI/PS activities and offering recognition, coaching, and support for scholarly work.

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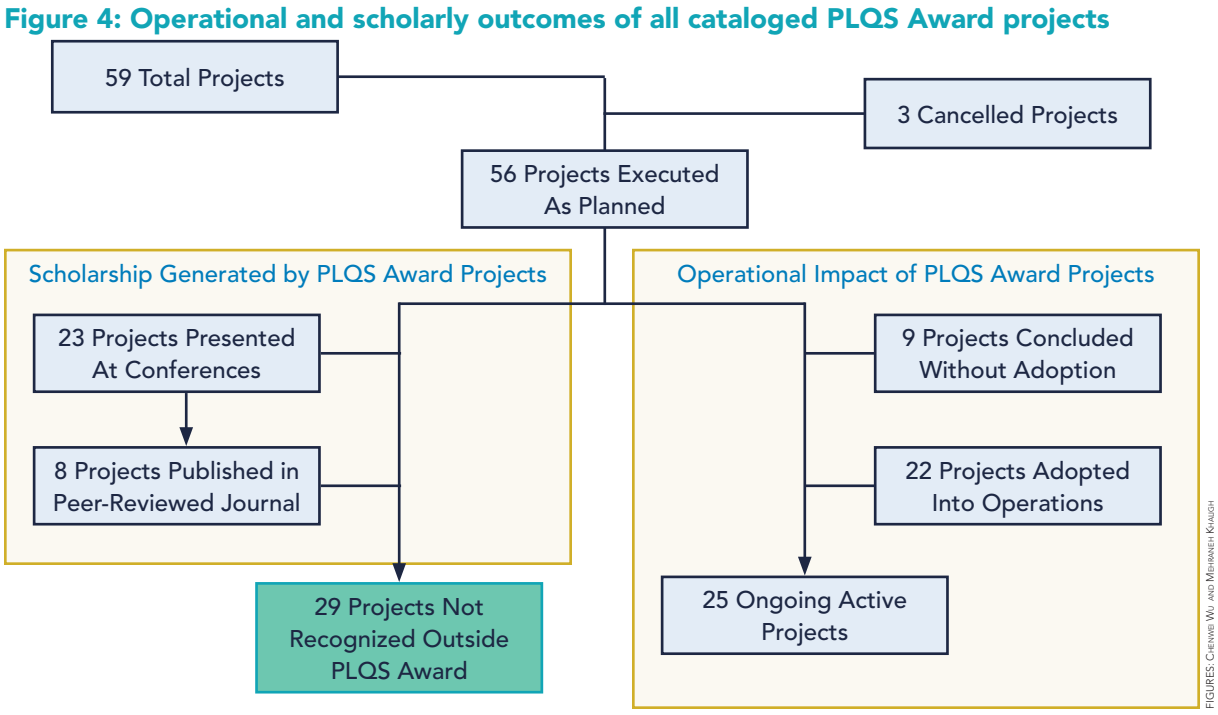
Figure 4: Operational and scholarly outcomes of all cataloged PLQS Award projects



FIGURES: CHEWEI WU AND MEHRANEH KHALIGH

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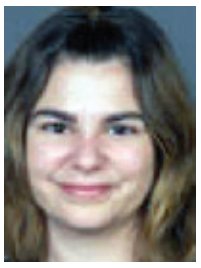
VA Hospitalists' Commitment to Quality Improvement includes Support for Research, Education, and Collaboration

By Larry Beresford

In 2012, after completing her medical training at George Washington University, Jessica Logan, MD, FACP, was selected to be a chief resident for quality and safety at the Washington, D.C., Veterans Affairs Medical Center (VAMC). The chief resident program, started by Veterans Affairs (VA) in 2008, annually trains 110 resident physicians across 60 VAMC sites in the skills of quality-improvement research and dissemination.



Dr. Logan

Qualified applicants demonstrate a strong commitment to quality improvement (QI) and patient safety. The experience and training impart the knowledge, skills, and attitudes necessary to become future leaders in QI, said Dr. Logan, now associate section chief of hospital medicine at the VAMC and assistant professor of medicine at George Washington University, both in Washington, D.C. She counts herself an advocate.

The VAMC currently has two chief residents for quality and safety, and she is one of their mentors. "They are doing tremendous work, and it really helps us with recruitment and retention. It's an amazing program and helps build the culture of quality in the VA, identifying the people who will do the work of QI." Participants spend part of their year on a capstone project, which they present to local and regional Veterans Integrated Service Network (VISN) leadership.

Other academic medicine settings with chief residents could learn from the VA's experience, building similar programs to train and retain physicians adept in QI, thereby creating a pipeline of future QI experts for conducting high-quality projects, Dr. Logan said.

The Veterans Health Administration (VHA) is among the nation's largest integrated health systems, with a commitment to being a learning health system, and with measurement science at the core of its learning. VHA is known for supporting medical research and for focusing research on quality improvements that can be disseminated systemwide. It has also made a significant commitment to supporting researchers, with an emphasis on collaboration across sites and disciplines. And it has been shown, in several comparative studies in different areas (for example, cardiac care[1]), to outperform non-VA hospitals in patient satisfaction and hospital quality ratings.

Varied Quality Initiatives

VA's QI initiatives, in addition to the chief resident, include the Quality Enhancement Research Institute (QUERI) in the VA's office of research and development, established in 1998.[2] QUERI funds VA investigators across the country to work with key stakeholders in transforming the care delivered to veterans. It leverages scientifically supported QI methods, paired with a deep understanding of veterans' preferences and needs, to rapidly implement evidence-based practices into routine care.

While QUERI doesn't have a hospital medicine-specific research agenda, it does fund and support significant research relevant to hospitalists. It emphasizes small-scale quality projects, but also plans for how they can be successfully disseminated to other VAMCs and sustained over time. The QUERI Implementation Roadmap aims to demystify the application of new implementation strategies to help clinicians overcome common barriers to adoption.

Quality-scholar fellowships at 11 VA sites are designed to train the next generation of health professionals to improve healthcare through innovative QI and patient safety projects. This two-year interprofessional fellowship uses a broad curriculum and individualized approaches for doctoral and post-doc nurses and doctors of nursing practice (DNPs), psychologists, pharmacists, physical therapists, and physicians who are completing their residency and have an interest in quality or implementation research.

The fellowship offers paid full-time experiences in QI and patient safety, with opportunities to meet and collaborate with other physicians across the country. All fellows are paired with a primary mentor, participate in a site-based curriculum, and enjoy 75% protected time for research and education.

Other examples of the VA's involvement in quality initiatives include:

- National Center for Patient Safety, which has promoted best practices for safe patient care and optimal utilization throughout the organization since 1999, guiding VHA and external stakeholders on policies and strategies to measure and mitigate harm to veterans and to those who support their care, modeling characteristics of a high-reliability organization
- VA Centers of Excellence, a network of specialized programs, some focusing on a single disease, with comprehensive services at designated VA facilities for veterans seeking the highest quality of care for specific conditions
- VA's national hospital medicine program, which provides a national framework within the VA to standardize and improve inpatient care for veterans, drawing upon 18 national hospital medicine consultants, based at each VHA VISN, to guide network chiefs to solve problems and share best practices
- The Diffusion Marketplace, a collaborative tool that curates promising clinical, operational, and strategic innovations in the VA, and the annual Shark Tank Competition, which identifies the best innovations in QI from all the VAMCs across the country and then helps to disseminate them
- Hospital Medicine Analytics Team (HMAT), established to improve overall care of hospitalized patients in the VA, starting with creating a data infrastructure to help identify problems that need to be fixed

Med Rec and ED Throughput

Dr. Logan's chief resident for quality and safety capstone project, whose results were published in the *Journal of Graduate Medical Education*[3] assessed an educational intervention focused on QI principles and effective medication reconciliation techniques for internal medicine residents. The accuracy of discharge medication instructions was compared before and after the intervention. Improvements were shown in lower rates of duplicate medications, extraneous medications, and discrepancies between discharge instructions and summaries.

After completing her chief resident year, Dr. Logan joined the hospitalist faculty at the Washington, D.C., VAMC. She is also associate chief of the VA's national hospitalist section. At the VAMC, the hospitalist group's quality work focuses on department-based projects, borne out of self-reflection and a desire to address frustrations clinicians sometimes feel in their practice, Dr. Logan said. "But we also join facility-wide initiatives involving interdisciplinary teams, which are supported by the medical center."

The QI model they most commonly use is the plan, do, study, act (PDSA) approach taught by the Institute for Healthcare Improvement.[4] It breaks down tasks into discrete steps, evaluates outcomes in terms of improvements, and then tests again. The VA also likes Lean management philosophy and offers Lean certifications at various levels, Dr. Logan said.[5] "I've gone on to earn a Lean Yellow Belt. But I prefer PDSA. Training in PDSA methodology is widely available."

One major topic area Washington VAMC hospitalists have been pursuing involves throughput times in the emergency room, a major concern for many emergency departments. This multidisciplinary project uses rapid process improvement groups, regular meetings, and specified target dates for deliverables.

For instance, the team learned that there weren't enough inpatient telemetry boxes to meet patient demand from the emergency room. Many of these patients were getting mis-triaged. Overuse of telemetry can result in delays in care and wasted health care dollars, Dr. Logan said.[6] "We performed a gap analysis and spun out improvement projects led by other members of the hospitalist group." They created an order set for the optimal use of telemetry drawn from American Heart Association telemetry guidelines, which led to further improvement projects.

But so far, the initiative has produced mixed results, Dr. Logan said. There can be a tendency for clinicians not to follow the order set, even though it was derived from American Heart Association guidelines with triggers incorporated into the electronic health record. "Trainees and other clinicians get nervous (about patient outcomes) and don't want to go by the guidelines. In practice, a cultural shift is needed, but cultural change is hard. That is why systems changes beyond the individual are stronger QI interventions," she said.

"Even though they say education is a lower yield in QI, we still do a lot of education," said Monee Amin, MD, a hospitalist affiliated with the Atlanta VAMC and assistant professor of medicine at Emory University Medical School. QI has to be role-modeled by the faculty, she added. "And repetition is key. The more you provide it, the more it sticks. And making the electronic health record accessible and easy for people to use."


Dr. Amin

Dr. Amin's group has worked on building order sets that do not require a lot of thought to follow. "Having things pre-populated and put right in front of providers helps." Her group also convenes a monthly virtual Faculty Patient Safety Conference. "That was something I spearheaded because we needed a forum for talking about important issues. I also mentor our chief resident to make presentations to the faculty, with ample opportunity for discussion of their topics."

Dr. Amin returned to work at the VA six years ago, although she still teaches residents and medical students at Emory in QI and patient safety. "My focus was on the triage process for a very high-volume walk-in clinic, coming up with criteria for triaging people." That includes guideline-directed medical therapy for heart failure at hospital discharge.

Working on Readmissions, Medications

For Jeydith Gutierrez, MD, MPH, clinical associate professor of internal medicine-hospital medicine at the University of Iowa and founding director of the telehospitalist service at the Iowa City VAMC, her experience with QI reflects a large degree of partnering between VA and academic medical centers.


Dr. Gutierrez

"Through my time at the VA, I have worked on several quality improvement initiatives. One of the first was called the Transitions of Care Clinic, a program we established at the Iowa City VAMC to do follow-ups soon after patients were discharged home from the hospital," she said.

"We know there has been a lot of emphasis on preventing readmissions within 30 days after discharge. Not all readmissions are preventable, you know, but some are." Often, those that are preventable are due to things like medication mismanagement, where the patient didn't take the right medications when they were discharged home, or maybe didn't pick them up at the pharmacy, or something else that might have been missed on discharge.

The researchers found that for patients who had certain conditions or other factors associated with readmissions, their readmission rates were reduced by having this type of close follow-up after discharge by the hospitalist group—virtually or in person, depending on how far away the patient lived—in collaboration with outpatient clinics.

Another QI project at the Iowa City VAMC, with perhaps the biggest impact to date, involves how alcohol withdrawal—a major cause of morbidity in the veteran population—is treated in the inpatient setting. Order sets for inpatient alcohol treatment are normally developed locally and can be highly variable between medical centers. In some cases, those protocols haven't been revised for years, despite advances in national guidelines.

"I was involved in a project to help our rural VAMCs that we work with through our telehospitalist program," Dr. Gutierrez said. She connects with many VA hospitals and was able to review their policies and order sets in order to improve processes of care to make them consistent with the most updated clinical practice guidelines from the American Society of Addiction Medicine.

"We developed a comprehensive quality improvement initiative to look at these processes of care, when existing policies were written, whether providers and staff were trained in how to identify patients that were at risk, and how to score patients in their system's withdrawal scale. We also look at treatment protocols and incorporation of medications to treat alcohol use disorder and referral to substance use treatment programs on discharge," Dr. Gutierrez said.

"We started in a small rural VA hospital that I was working with, but it evolved into a bigger national initiative across the VA." A multidisciplinary National Alcohol Withdrawal Syndrome inpatient workgroup was convened and sponsored by the National Hospital Medicine Program Office in conjunction with the National Mental Health Program Office.

The experts produced guidance and specific recommendations about what should be standardized or tailored to the specific local resources, and then developed a notice instructing all VA hospitals in the country to review their treatment of alcohol withdrawal and improve the care of veterans, she explained.

This is an example of how the VHA invests in providing seed funding and other financial resources to make these projects happen. "A lot of our funding has come from the Office of Rural Health, but there is also health services research funding, along with other initiatives like QUERI, which issues calls for grant proposals, and has really made it possible to have people who are dedicated and committed to do the work. Otherwise, it's difficult to make QI projects happen."

Relentless Pursuit of Measurement

For Robert Burke, MD, MS, a hospitalist clinician with the VA in Philadelphia since 2011 and a core investigator with the Center for Healthcare Evaluation, Research, and Promotion, the VA embodies a relentless pursuit of measuring and improving quality of care. This center is a VA Health Systems Research Scientific Center of Innovation dedicated to understanding and improving health and healthcare outcomes to support the VA in providing excellent care and service to all veterans.


Dr. Burke

"One of the nice things about this health system is that it's national, using the same electronic medical record, with many similarities in terms of staffing and processes," he said. If you can execute a good quality improvement project in one place, it's a lot easier to spread it to more places in the VA than might be possible in the private sector.

Dr. Burke reflected on the VA's philosophy about quality improvement. "It's hard to do high-quality, rigorous QI without institutional support. Funding allows people not to have to do QI on their nights and weekends, and allows improved access to data and analytic resources." The VA has dedicated financial support through the mechanism of QUERI, among others. "They fund a variety of different types of projects. You can partner with hospital administrators, with operations leaders, even across VA VISNs," he said.

"You might not be a full-time QI researcher, but if you have a position at the VA, you will be encouraged to apply what you've learned." Projects vary in size and funding. The mechanism might provide two years of funding to start up in a small number of sites, he said. "And then there might be a second phase that is much larger, spreading it to 20, 30, or 40 sites."

Currently, Dr. Burke spends a lot of his work time writing grants and pursuing health services and health policy research projects, much of that within the VA system. "We are trying to implement evidence-based practice that improves care at the bedside at scale. It's easier to do things at scale in the VA. One of the projects I'm working on now is implementing four different evidence-based practices at nine VA medical centers, all related to the care of older adults in the hospital."

Dr. Burke runs one of the VA's QUERI Program Centers with colleagues in the Philadelphia area, with a focus over the next five years on implementing evidence-based, age-friendly practices in the hospital for older adults. One of its goals is to reduce veterans' need for nursing home care. There are 8,000 patients enrolled in the study, the first large-scale randomized trial implementing age-friendly, evidence-based practices, he said.

Called SAGE—Safer Aging Through Geriatrics-Informed Evidence-Based Practices—in its first iteration, it attempted to implement four evidence-based practices aligned with the Age-Friendly Health System model. That is one practice for each of the Four Ms of age-friendly care: what matters to the patient, medications, mobility, and mentation.

"For example, for medications, we did an intervention to help people stop taking potentially harmful medications—a deprescribing intervention. For what matters, we identified people who were going into surgery who were frail and unlikely to do well from it. We had a conversation with them before they went into surgery to say, 'This is what your outcomes might look like. We want to make sure that's consistent with your goals.'" That process is also called the Surgical Pause, and it has been among the most successful age-friendly innovations to date."

Hospitalists' Role in QI

Dr. Burke described his own initial training in QI as "informal, as with many hospitalists. I wish I could say I have a badge that attests that I'm a QI expert. That would normally come from completing a fellowship. But like a lot of people, my QI training was small-scale and experiential, from IHI [the Institute for Healthcare Improvement] or Lean Six Sigma training," he said.

"I practiced as a full-time bedside clinical hospitalist for four years after I finished residency. But then I decided I really wanted to try to impact the underlying policies and payments and practices that affect a lot of veterans. So I went back and got a master's degree in clinical research, to be able to become a researcher leading larger-scale projects," he said.

"I could see some readers reacting to this article and saying, 'Well, it's all really nice that this investment in QI exists in the VA, but I don't work in the VA.' But I think there have been important efforts of a similar kind in the non-VA world to also do this kind of work." The HOMERuN Collaborative's multi-center hospitalist network is an example.

Dr. Burke noted that when QI first got started, there was a sense that most QI was local. "But I think the field has evolved, and now the focus is on what can be generalizable about QI. How can we spread successful QI initiatives as far and as effectively as possible?" he said.

Dr. Logan also believes that the culture of quality is strong in the VA. "That is shown in a number of ways: The chief resident program is one. Institutional leadership support for research initiatives is another. The VA is a repository of so much information, it's easier to get the data you need to help you improve things," she said.

Another helpful resource has been the VA's Academic Hospitalist Listserv. "You can pose questions, and the response is just extraordinary. I've even seen offers from one institution to another, 'We'll lend you our IT expert for a one-hour consultation on Microsoft Teams.'"

"It's clear that there is a desire to provide high-quality care in the VA," Dr. Amin added. "We have a patient safety office with multiple officers. There is a culture of always trying to find opportunities to change and improve. At its best, the VA is a place where providers from multiple disciplines work together on projects—with a focus on making sure that all of the stakeholders are in the room." ■

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Geographic Cohorting—What Have We Learned?

By Khanh T. Nguyen, MD, SFHM, and Andrew Schram, MD, MBA, SFHM

The authors review Geographic Cohorting of Adult Inpatient Teams: A Scoping Review, recently published in the Journal of Hospital Medicine (doi:10.1002/jhm.70096).

Geographic cohorting (GCh) refers to the assignment of patients and their clinician team to a specific hospital unit. This approach has been adopted broadly, with 64% of hospitalists reporting participation in geographic localization in a pre-pandemic survey.[1] GCh adoption has been driven by a desire to improve communication and workflow efficiency through proximity and by enabling collaborative care teams.[2] However, data on patient outcomes and workflow efficiency are mixed and limited by study methodology, while the heterogeneity of interventions further complicates the assessment of results.[3]

In their comprehensive review, Kashiwagi et al. examined published studies that deployed GCh interventions for adult patients to physician-based units prior to July 2024.[4] Their goal was to identify specific aims, implementation strategies, methods, and measured outcomes of cohorting hospitalized patients and their clinician teams.

Of the 30 studies reviewed, 25 or 92.6% were set at academic medical centers. All were in the U.S., with the majority (26, or 96.3%) located in non-intensive-care units, and most included general medicine patients. Twenty-five of the studies included details of their clinician teams; 23 included attending physicians, 10 included advanced practice practitioners, and 18 studies included resident physicians. About half of the studies used pre-post analysis at a single center, while the rest had various other designs. The aims were wide-ranging, from a single specific outcome, e.g., the number of pages received, to broader high-level outcomes, e.g., patient experience.

The authors identified four key implementation styles: (1) standalone GCh; (2) accountable care units (ACU) which contained elements of structured interprofessional bedside rounds, established registered nurse-physician partners as unit leaders, and accountability of unit teams for their metrics; (3) GCh + multiple elements separate from ACU; and (4) enhanced ACU that included additional processes. The spread of implementation styles was relatively equal for the first three, while only two studies used the enhanced ACU intervention. Process measures were limited in that the majority reported post-intervention measurement of GCh, a quarter reported target goals for the percentage of patients cohorted, and only three studies measured the fidelity of implementation of GCh or the uptake of ACU elements.

Outcome measures were sorted into eight categories: healthcare utilization (patient clinical outcomes such as length of stay and readmissions), patient safety (falls, hospital acquired infections, mortality), patient experience (patient satisfaction scores), workflow (efficiency metrics such as rounding times, time of discharge), workload (relative value units), clinical experience (participant opinions), communication or teamwork, and cost. Outcomes differed by implementation strategies, such that 67% of stand-alone GCh interventions measured workflow outcomes, while 67% of ACU interventions measured patient safety, and 60% of bundled non-ACU interventions measured healthcare utilization. Cost was the least reported, and unintended consequences, such as longer length of stay and increased interruptions, were described by just a few studies.

Key Points

- Geographic cohorting is a common practice.
- There may not be a one-size-fits-all solution, and it is tough to understand the impact of geographic cohorting, especially with bundled interventions.
- More structured studies with robust methodologies may help delineate intervention and impact.

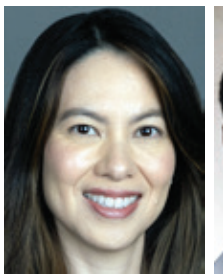
Why it Matters for Hospitalists

While geographic localization is not a new strategy for hospitalist practices to potentially enhance workflow efficiency, clinician satisfaction, and even patient outcomes, the heterogeneity in aims, implementation strategies, and outcome measures makes the data difficult to interpret. The varied needs and makeup of hospitalist practices also challenge the reproducibility of prior studies. Although a recent narrative review and perspectives on geographic localization summarized key patient and provider outcomes, Kashiwagi et al. provide a thorough and well-structured synopsis of the last 15 years' work on geographic localization, focusing on the aim, implementation strategies, and outcomes of various interventions, as well as providing insight into opportunities to learn more about GCh practices.[2,3]

One notable finding from the review is that more than two-thirds of the studies used a bundled intervention that included other components in addition to GCh. This raises questions about whether GCh alone can produce meaningful clinical outcomes, which specific elements within the bundle have the greatest impact, or whether it is the interaction between GCh and those other elements that drives the clinical effect. Very few studies attempted to quantify the impact or degree of implementation of the individual bundled elements. The variability in aims, implementation strategies, and outcome measures suggests that there is not a one-size-fits-all solution when adapting GCh or its bundled elements. The authors recognized that a careful approach in future studies could help delineate the individual impact of bundle elements, allowing for a more tailored design for different practice needs. Similarly, not enough studies reported balancing measures or unintended consequences of GCh, which would also help inform practices in choosing their strategy.

Cautions and Considerations

While they are comprehensive, some caution is warranted in interpreting the data presented in the review. As the authors noted, most studies employed a pre-post analysis, with no study using a randomized controlled design, thus limiting direct causal linkage between GCh and its measured outcomes. Admittedly, implementing a multicenter RCT using GCh or a bundled GCh intervention faces substantial real-world barriers from the daily and varying operational demands of hospitals. In helping hospitalists weigh the different GCh interventions, we would have liked to see outcome measures aggregated by similar intervention styles or a general synthesis of the outcomes data. The scoping review, due to its broad nature and design, falls short of providing the same level of insight that a systematic review may offer into the potential clinical consequences of geographic cohorting.


Dr. Nguyen


Dr. Schram

Dr. Nguyen is a hospitalist at the University of Chicago, director of triage for the section of hospital medicine, the patient logistics medical director, and senior medical director for throughput and efficiency for UChicago Medicine, and the hospitalist quality improvement director at UChicago Medicine's Ingalls Memorial Hospital, all in Chicago. Dr. Schram is a hospitalist at the University of Chicago, the director of throughput and efficiency for the UChicago Medicine's section of hospital medicine, senior medical director for throughput and efficiency for UChicago Medicine, and medical director at UChicago Medicine's Mitchell Hospital Hyde Park, all in Chicago.

Additionally, most studies were conducted at academic medical centers, which contrasts significantly with the scale, scope, and participant makeup of smaller community hospitals that make up the majority of hospitalist practices. In the case of our hospital system, we were able to implement and sustain GCh for hospitalist patients at the primary academic site, but for the smaller community site, our hospitalists opted, after a several-month GCh trial, to break geography in favor of fewer patient handoffs. Understanding the outcomes from the aims and implementation styles may bring us closer to a tailored guide for geographic localization. While we await future studies with more robust methodology, this comprehensive review may help steer practices looking to implement GCh towards studies with similar aims or practice characteristics and provide guidance on how to measure impact.

Bottom Line

This review provides a timely and thorough update on the geographic localization of patients to physician units, in an era of increased hospital crowding and consolidation that places pressure on hospitalist practices to work more efficiently and move patients through the hospital faster. There is no one-size-fits-all solution;

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Top 10 Articles in Pediatric Hospital Medicine Literature, 2025

By Madeline F.E. Parr, MD, Tai Kyung Hairston, MD, MEHP, and Parvathi Kumar, MBBS

Pediatric Hospital Medicine (PHM) is a field rich with ambition and new advancements, and it is an annual tradition that the top 10 publications within the PHM literature are presented at the PHM 2025 conference.

To select the top 10 articles, 33 journals were chosen, which included relevant pediatric journals along with the journal with the highest impact factor in each pediatric field, comprising a total of 57,399 articles. After applying an inclusive pediatric-term filter, 11,173 articles were evaluated utilizing Covidence review software, with 676 articles undergoing abstract screening and 125 articles for full-text screening to select the top 10. In the selection of the top 10, the three authors sought to represent the diversity of practice within PHM, including community and general PHM, newborn medicine, community health, quality improvement, and equitable care. Screening questions included: Is it research? Is it relevant to pediatric hospital medicine? Is it practice changing?

The following review highlights the top 10 articles.

1 Management and Clinical Outcomes of Neonatal Hypothermia in the Newborn Nursery

This large retrospective single-center study (n = 24,009) analyzed late preterm and term infants (up to 35 weeks) to assess the management and outcomes of hypothermia in the newborn nursery.[1] Both mild hypothermia (defined as one temperature 36.0˚ to 36.4˚C) and moderate or recurrent hypothermia (under 36.0˚C and/or at least 2 temperature measurements under 36.5˚C) were associated with increased odds of NICU transfer, sepsis workup, antibiotic administration, and hypoglycemia. However, there was no associated increased risk for early onset sepsis (EOS) in hypothermic infants with zero cases of culture-positive sepsis, and no increased rates of culture-negative sepsis (defined as antibiotic use for 72 hours or longer). These findings suggest that hypothermia may trigger potentially unnecessary interventions in otherwise healthy infants.

This study helps to reassure newborn physicians that hypothermia was not associated with increased EOS risk. With additional studies, nursery protocols could re-evaluate their response to mild or moderate hypothermia in late preterm and term infants. Avoiding unnecessary NICU transfers, sepsis evaluations, and antibiotic use could reduce healthcare costs, minimize interventions for well-appearing infants, and promote high-value care.

2 Implementing Critical Care Billing on a Pediatric Hospital Medicine Service

This is a quality improvement (QI) initiative at a tertiary children's hospital aimed at increasing critical care billing for PHM patients receiving 5 L oxygen or more via high-flow nasal cannula or continuous albuterol.[2] From a baseline of 21%, critical care billing rose to 74% through structured interventions including provider education, electronic health record (EHR) tools, documentation templates, and clinician audits. These interventions also led to a threefold increase in relative value units (RVUs) (from 709 to 2,092) and a fourfold rise in estimated reimbursement (from $55,051 to $222,934). Documentation supporting billing also improved from 31% to 70%. Interventions were sustained with minimal insurance denials. This initiative highlights an opportunity to capture a revenue stream in PHM for critically ill patients managed outside of the intensive care unit.

PHM teams can implement structured systems—including education, documentation templates, and EHR tools—to consistently identify and bill for critical care services delivered outside of the ICU. Doing so can substantially increase RVUs and reimbursement with minimal additional effort, helping optimize resource use and support institutional financial health.

3 First-Attempt Success in Ultrasound-Guided vs Standard Peripheral Intravenous Catheter Insertion: The EPIC Superiority Randomized Clinical Trial

In this randomized clinical trial (n = 164), ultrasound-guided peripheral IV catheter (PIV) insertion significantly outperformed standard palpation techniques in achieving first-attempt success in hospitalized children across all difficulty levels.[3] Success rates were 86% with ultrasound versus 33% with the standard technique. The benefit was observed regardless of the difficulty of IV access, with risk differences favoring ultrasound across low, medium, and high-risk groups. Though ultrasound guidance incurred slightly higher immediate costs (approximately $6 per patient), ultrasound guidance improved efficiency, boasted fewer failed attempts, and improved patient and parent satisfaction.

Expansion of the use of ultrasound-guided PIV insertion for children of all IV access risk levels, not just those with difficult access, has the potential to improve efficiency and patient and parent satisfaction. Training generalist staff in ultrasound-guided techniques could significantly improve first-attempt success, reduce patient distress, and enhance procedural efficiency despite slightly higher upfront costs.

4 Twenty-four Month Outcomes of Extended- Versus Standard-Course Antibiotic Therapy in Children Hospitalized with Pneumonia in High-Risk Settings: A Randomized Controlled Trial

Among 324 high-risk children hospitalized with radiograph-confirmed, uncomplicated community-acquired pneumonia (CAP), extending amoxicillin-clavulanate from five to six days to 13 to 14 days did not reduce chronic respiratory symptoms, rehospitalizations, or radiographic abnormalities at 24 months, supporting shorter courses of antibiotics for hospitalized CAP.[4]

Dr. Parr

Dr. Hairston

Dr. Kumar

Dr. Parr is a second-year fellow at Cohen Children's Medical Center in New Hyde Park, N.Y., and is passionate about pediatric research. Her work encompasses prospective clinical studies and pioneering the use of artificial intelligence to advance both medical education and clinical decision-making in pediatric hospital medicine. Dr. Hairston is a pediatric hospital medicine fellow at Johns Hopkins University in Baltimore, where his clinical focus is caring for children with medical complexity. He has developed innovative curricula addressing social determinants of health, published scholarship in leading pediatric journals, and presented nationally on hospital medicine and complex care. Dr. Kumar is a pediatric hospitalist and pediatric infectious disease provider at Ochsner Children's Hospital and a volunteer adjunct faculty at Tulane University, both in New Orleans, and a senior lecturer with the University of Queensland in Brisbane, Australia.

5 Comparison of Procedural Sedation Outcomes in Children With and Without Autism Spectrum Disorder

In an analysis of 64,708 patients from the Pediatric Sedation Research Consortium database, 4,421 children with autism spectrum disorder undergoing non-OR procedural sedation experienced significantly more airway-related complications (hypoxia, complete or partial obstruction) and required more respiratory interventions, highlighting the need for heightened airway vigilance and preparation when sedating this population.[5]

6 Low-Intensity Social Care and Child Acute Health Care Utilization: A Randomized Clinical Trial

A double-blinded trial of a low-intensity, automated, resource-referral program including automated text messaging and discharge support for caregivers of hospitalized children lowered 12-month emergency department visits (30% versus 52%) and hospital readmissions (15% versus 34%) among food-insecure families.[6]

7 External Validation of Brief Resolved Unexplained Events Prediction Rules for Serious Underlying Diagnosis

In this multicenter Canadian cohort study of 1,042 infants with brief resolved unexplained events, or BRUE, newly derived and calibrated BRUE prediction rules significantly outperformed

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the American Academy of Pediatrics higher-risk criteria in predicting both serious underlying diagnoses and event recurrence, providing clinicians with more accurate, individualized risk estimates.[7]

8 Accuracy of Screening Tests for the Diagnosis of Urinary Tract Infections in Young Children

In a 4,188-child multicenter study, 20% of febrile infants and toddlers with catheter-culture-confirmed urinary tract infections (UTIs) had no pyuria, and all available pyuria tests had only 76% to 88% sensitivity, indicating that "requiring pyuria" will miss many UTIs and reflex culturing based solely on pyuria is unsafe.[8]

9 Intravenous Immunoglobulin Alone for Coronary Artery Lesion Treatment of Kawasaki Disease: A Randomized Clinical Trial

In a Taiwanese, multicenter, non-inferiority, randomized, clinical trial of 134 patients, intravenous immunoglobulin (IVIG) alone was as effective as IVIG plus high-dose aspirin for preventing six-week coronary artery lesions, questioning whether high-dose aspirin adds meaningful benefit in acute kidney disease management.[9]

10 Management of Pustules and Vesicles in Afebrile Infants up to 60 Days Evaluated by Dermatology

A review of 183 afebrile hospitalized infants up to 60 days old, seen by dermatology, found no invasive bacterial infections, 7% with neonatal herpes simplex virus (HSV) (mostly term infants), and 3% with angioinvasive fungal disease (all extremely preterm), supporting limited serious bacterial infection work-ups in well-appearing term infants once HSV is excluded.[10] ■

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Commentary

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thus, understanding the data in terms of objectives, methodology, and implementation strategies, as well as outcomes, can provide hospitalist practices with practical approaches to geographic localization. However, more robust studies are needed to better predict the appropriate implementation strategy and the full impact of geographic cohorting. ■

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Hospitalist

Spartanburg, South Carolina

Spartanburg Regional Healthcare System is seeking full-time internal medicine physicians to join the Medical Group of the Carolinas – Inpatient Medicine hospitalist group.

Highlights:

- Well-established group of 70+ hospitalists
- Collegial, diverse group with a focus on work-life balance
- Nurse practitioner and physician assistant support
- 2 week orientation focused on new hire transition
- Great ancillary staff, including case managers to assist with all discharge planning
- 7 on, 7 off scheduling
- Comprehensive specialists support services provided
- Days only; nights staffed by internal full-time nocturnist team
- No procedures
- Epic EMR

Exceptional physician benefits:

- Up to $100,000 in recruitment incentives to include sign-on bonus, relocation assistance and student loan forgiveness
- Competitive compensation and attractive retirement options
- $6,000 annual CME allowance
- Paid malpractice insurance, including tail coverage
- PSLF-approved institution

1k+ PHYSICIANS & ADVANCED PRACTICE PROVIDERS

6 HOSPITAL CAMPUSES

10k+ EMPLOYEES

120+ PHYSICIAN OFFICES

35 SPECIALTIES

CONTACTS:

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864-560-6331
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Team Lead, Provider Recruitment
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Spartanburg Regional Healthcare System
SpartanburgRegional.com

UT San Antonio™
The University of Texas at San Antonio

Clinical Track & Nocturnist Hospitalists

The Division of Hospital Medicine at the UT San Antonio Long School of Medicine is currently seeking Clinical Track (day-time) and nocturnist Hospitalists. These positions involve clinical work on house staff and non-house staff services at University Hospital as well as admissions, cross-cover, and participating in medical student and resident education as well as other scholarly activities. Clinical Track Hospitalist positions involve clinical work on house staff and non-house staff services on our physician-only service lines.

Qualified candidates must possess a MD or DO degree, have completed 3 years of an ACGME-accredited Internal Medicine residency, and be board-eligible or board-certified in Internal Medicine through the American Board of Internal Medicine (ABIM). Candidates must also be licensed by the Texas Medical Board. Interested candidates should send their CV to Dr. Saket Kottewar, Section Chief, (Kottewar@uthscsa.edu) and Megan Wibright, Program Coordinator (wibright@uthscsa.edu).

UTSA offers excellent benefits and competitive salaries. The San Antonio area provides outstanding quality of life for individuals of all ages as well as those with families. Explore all that the UTSA Division of Hospital Medicine has to offer here: https://lsom.uthscsa.edu/hospital-medicine/employment/

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