June 2018
Volume 22 | No. 6

The Hospitalist

shm
the-hospitalist.org

p10 POLICY
Reporting the CMS sepsis measure

p17 KEY CLINICAL QUESTION
Diagnosing TB in the hospital

p19 IN THE LITERATURE
Excluding low probability pulmonary embolism

Dr. Paul Grant

Lou Ferraro/Park South Photography

Rethinking preop testing

Risk assessment a key role for hospitalists

By Thomas R. Collins
REPORTING FROM HM18

ORLANDO / Michael Rothberg, MD, a nocturnist who works at Presbyterian Rust Medical Center in Albuquerque, often is torn when asked to routinely perform preoperative tests, such as ECGs, on patients.

On the one hand, Dr. Rothberg knows that for many patients there is almost certainly no benefit to some of the tests. On the other hand, surgeons expect the tests to be performed – so, for the sake of collegiality, patients often have tests ordered that hospitalists suspect are unnecessary.

This was a big part of why Dr. Rothberg decided to come a day early to HM18, held in early April in Orlando, to attend the pre-course "Essentials of Perioperative Medicine and Co-Management for the Hospitalist." He was looking for expert guidance on which patients need what tests before surgery, and also how to better determine what preoperative tests are a waste of time and money for certain patients, so that he'll be armed with useful information when he went back to his medical center.

Continued on page 14

LEADERSHIP
Leonard J. Marcus, PhD
p9 Two major forces are combining to reshape health care delivery.

PRACTICE MANAGEMENT
John Nelson, MD, MHM
p31 Build a work schedule that prevents hospitalist burnout.

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For patients with cUTIs and, in combination with metronidazole, cIAIs caused by designated pathogens

ZERBAXA—a novel cephalosporin combined with a proven beta-lactamase inhibitor

Proven clinical efficacy against some of the most common Gram-negative pathogens, including *E. coli, K. pneumoniae,* and *P. aeruginosa*

Adverse reactions profile: The most common adverse reactions occurring in ≥5% of patients were headache (5.8%) in the cUTI trial, and nausea (7.9%), diarrhea (6.2%), and pyrexia (5.6%) in the cIAI trial

In vitro activity against select ESBL-producing *E. coli* and *K. pneumoniae* and *P. aeruginosa* with certain mechanisms of resistance

The clinical significance of in vitro data is unknown.

Indications

ZERBAXA is indicated in adult patients for the treatment of complicated urinary tract infections (cUTI), including pyelonephritis, caused by the following Gram-negative microorganisms: *Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis,* and *Pseudomonas aeruginosa.*

ZERBAXA used in combination with metronidazole is indicated in adult patients for the treatment of complicated intra-abdominal infections (cIAI) caused by the following Gram-negative and Gram-positive microorganisms: *Enterobacter cloacae, Escherichia coli, Klebsiella oxytoca, Klebsiella pneumoniae, Proteus mirabilis, Pseudomonas aeruginosa, Bacteroides fragilis, Streptococcus anginosus, Streptococcus constellatus,* and *Streptococcus salivarius.*

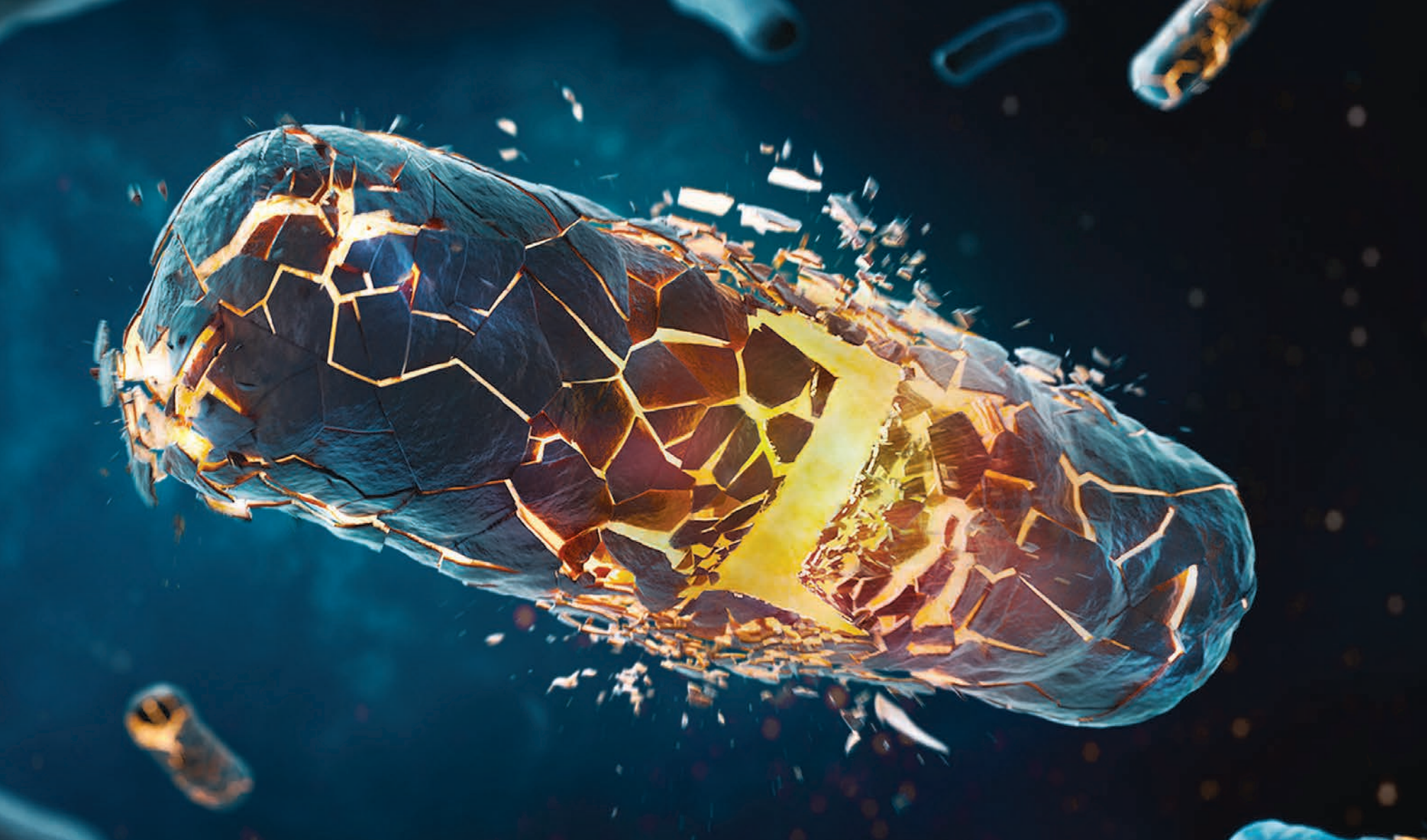
Usage

To reduce the development of drug-resistant bacteria and maintain the effectiveness of ZERBAXA and other antibacterial drugs, ZERBAXA should be used only to treat infections that are proven or strongly suspected to be caused by susceptible bacteria. When culture and susceptibility information are available, they should be considered in selecting or modifying antibacterial therapy. In the absence of such data, local epidemiology and susceptibility patterns may contribute to the empiric selection of therapy.

Important Safety Information

- **Patients with renal impairment:** Decreased efficacy of ZERBAXA has been observed in patients with baseline CrCl of 30 to ≤50 mL/min. In a clinical trial, patients with cIAIs with CrCl >50 mL/min had a clinical cure rate of 85.2% when treated with ZERBAXA plus metronidazole vs 87.9% when treated with meropenem. In the same trial, patients with CrCl 30 to ≤50 mL/min had a clinical cure rate of 47.8% when treated with ZERBAXA plus metronidazole vs 69.2% when treated with meropenem. A similar trend was also seen in the cUTI trial. Monitor CrCl at least daily in patients with changing renal function and adjust the dose of ZERBAXA accordingly.

ESBL= extended-spectrum beta-lactamase.



Visit ZERBAXA.com to see how ZERBAXA may be able to help your appropriate patients with cUTI or cIAI

Important Safety Information *(continued)*

- **Hypersensitivity:** ZERBAXA is contraindicated in patients with known serious hypersensitivity to ceftolozane/tazobactam, piperacillin/tazobactam, or other members of the beta-lactam class. Serious and occasionally fatal hypersensitivity (anaphylactic) reactions have been reported in patients receiving beta-lactam antibacterials. Before initiating therapy with ZERBAXA, make careful inquiry about previous hypersensitivity reactions to cephalosporins, penicillins, or other beta-lactams. If an anaphylactic reaction to ZERBAXA occurs, discontinue use and institute appropriate therapy.
- ***Clostridium difficile*–associated diarrhea (CDAD),** ranging from mild diarrhea to fatal colitis, has been reported with nearly all systemic antibacterial agents, including ZERBAXA. Careful medical history is necessary because CDAD has been reported to occur more than 2 months after the administration of antibacterial agents. If CDAD is confirmed, antibacterial use not directed against *C. difficile* should be discontinued, if possible.
- **Development of drug-resistant bacteria:** Prescribing ZERBAXA in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to the patient and increases the risk of the development of drug-resistant bacteria.
- **Adverse reactions:** The most common adverse reactions occurring in ≥5% of patients were headache (5.8%) in the cUTI trial, and nausea (7.9%), diarrhea (6.2%), and pyrexia (5.6%) in the cIAI trial.

Before prescribing ZERBAXA, please read the adjacent Brief Summary of the Prescribing Information.

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ZERBAXA®
ceftolozane and tazobactam
for injection (1.5 g)

ZERBAXA® (ceftolozane and tazobactam) for injection, for intravenous use
BRIEF SUMMARY OF PRESCRIBING INFORMATION

INDICATIONS AND USAGE

ZERBAXA® (ceftolozane and tazobactam) for injection is indicated for the treatment of patients 18 years or older with the following infections caused by designated susceptible microorganisms.

Complicated Intra-abdominal Infections ZERBAXA used in combination with metronidazole is indicated for the treatment of complicated intra-abdominal infections (cIAI) caused by the following Gram-negative and Gram-positive microorganisms: *Enterobacter cloacae, Escherichia coli, Klebsiella oxytoca, Klebsiella pneumoniae, Proteus mirabilis, Pseudomonas aeruginosa, Bacteroides fragilis, Streptococcus anginosus, Streptococcus constellatus,* and *Streptococcus salivarius*.

Complicated Urinary Tract Infections, including Pyelonephritis ZERBAXA is indicated for the treatment of complicated urinary tract infections (cUTI), including pyelonephritis, caused by the following Gram-negative microorganisms: *Escherichia coli*, *Klebsiella pneumoniae, Proteus mirabilis,* and *Pseudomonas aeruginosa*.

Usage To reduce the development of drug-resistant bacteria and maintain the effectiveness of ZERBAXA and other antibacterial drugs, ZERBAXA should be used only to treat infections that are proven or strongly suspected to be caused by susceptible bacteria. When culture and susceptibility information are available, they should be considered in selecting or modifying antibacterial therapy. In the absence of such data, local epidemiology and susceptibility patterns may contribute to the empiric selection of therapy.

CONTRAINDICATIONS

ZERBAXA is contraindicated in patients with known serious hypersensitivity to the components of ZERBAXA (ceftolozane and tazobactam), piperacillin/tazobactam, or other members of the beta-lactam class.

WARNINGS AND PRECAUTIONS

Decreased Efficacy in Patients with Baseline Creatinine Clearance of 30 to ≤50 mL/min

In a subgroup analysis of a Phase 3 cIAI trial, clinical cure rates were lower in patients with baseline creatinine clearance (CrCl) of 30 to ≤50 mL/min compared to those with CrCl >50 mL/min (see table below). The reduction in clinical cure rates was more marked in the ZERBAXA plus metronidazole arm compared to the meropenem arm. A similar trend was also seen in the cUTI trial. Monitor CrCl at least daily in patients with changing renal function and adjust the dosage of ZERBAXA accordingly.

Clinical Cure Rates in a Phase 3 Trial of cIAI by Baseline Renal Function (MITT Population)

Baseline Renal Function	ZERBAXA plus metronidazole n/N (%)	Meropenem n/N (%)
Normal/mild impairment (CrCl >50 mL/min)	312/366 (85.2)	355/404 (87.9)
Moderate impairment (CrCl 30 to ≤50 mL/min)	11/23 (47.8)	9/13 (69.2)

Hypersensitivity Reactions Serious and occasionally fatal hypersensitivity (anaphylactic) reactions have been reported in patients receiving beta-lactam antibacterial drugs. Before initiating therapy with ZERBAXA, make careful inquiry about previous hypersensitivity reactions to other cephalosporins, penicillins, or other beta-lactams. If this product is to be given to a patient with a cephalosporin, penicillin, or other beta-lactam allergy, exercise caution because cross sensitivity has been established. If an anaphylactic reaction to ZERBAXA occurs, discontinue the drug and institute appropriate therapy.

***Clostridium difficile*-associated Diarrhea** *Clostridium difficile*-associated diarrhea (CDAD) has been reported for nearly all systemic antibacterial agents, including ZERBAXA, and may range in severity from mild diarrhea to fatal colitis. Treatment with antibacterial agents alters the normal flora of the colon and may permit overgrowth of *C. difficile*.

C. difficile produces toxins A and B which contribute to the development of CDAD. CDAD must be considered in all patients who present with diarrhea following antibacterial use. Careful medical history is necessary because CDAD has been reported to occur more than 2 months after the administration of antibacterial agents.

If CDAD is confirmed, discontinue antibacterials not directed against *C. difficile*, if possible. Manage fluid and electrolyte levels as appropriate, supplement protein intake, monitor antibacterial treatment of *C. difficile*, and institute surgical evaluation as clinically indicated.

Development of Drug-Resistant Bacteria Prescribing ZERBAXA in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to the patient and risks the development of drug-resistant bacteria.

ADVERSE REACTIONS

The following serious reactions are described in greater detail in the Warnings and Precautions section:

- Hypersensitivity reactions
- *Clostridium difficile*-associated diarrhea

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

ZERBAXA was evaluated in Phase 3 comparator-controlled clinical trials of cIAI and cUTI, which included a total of 1015 patients treated with ZERBAXA and 1032 patients treated with comparator (levofloxacin 750 mg daily in cUTI or meropenem 1 g every 8 hours in cIAI) for up to 14 days. The mean age of treated patients was 48 to 50 years (range 18 to 92 years), across treatment arms and indications. In both indications, about 25% of the subjects were 65 years of age or older. Most patients (75%) enrolled in the cUTI trial were female, and most patients (58%) enrolled in the cIAI trial were male. Most patients (>70%) in both trials were enrolled in Eastern Europe and were White.

The most common adverse reactions (5% or greater in either indication) occurring in patients receiving ZERBAXA were nausea, diarrhea, headache, and pyrexia. The table below lists adverse reactions occurring in 1% or greater of patients receiving ZERBAXA in Phase 3 clinical trials.

Adverse Reactions Occurring in 1% or Greater of Patients Receiving ZERBAXA in Phase 3 Clinical Trials

Preferred Term	Complicated Intra-abdominal Infections		Complicated Urinary Tract Infections, Including Pyelonephritis	
	ZERBAXA[a] (N=482) n (%)	Meropenem (N=497) n (%)	ZERBAXA[a] (N=533) n (%)	Levofloxacin (N=535) n (%)
Nausea	38 (7.9)	29 (5.8)	15 (2.8)	9 (1.7)
Headache	12 (2.5)	9 (1.8)	31 (5.8)	26 (4.9)
Diarrhea	30 (6.2)	25 (5)	10 (1.9)	23 (4.3)
Pyrexia	27 (5.6)	20 (4)	9 (1.7)	5 (0.9)
Constipation	9 (1.9)	6 (1.2)	21 (3.9)	17 (3.2)
Insomnia	17 (3.5)	11 (2.2)	7 (1.3)	14 (2.6)
Vomiting	16 (3.3)	20 (4)	6 (1.1)	6 (1.1)
Hypokalemia	16 (3.3)	10 (2)	4 (0.8)	2 (0.4)
ALT increased	7 (1.5)	5 (1)	9 (1.7)	5 (0.9)
AST increased	5 (1)	3 (0.6)	9 (1.7)	5 (0.9)
Anemia	7 (1.5)	5 (1)	2 (0.4)	5 (0.9)
Thrombocytosis	9 (1.9)	5 (1)	2 (0.4)	2 (0.4)
Abdominal pain	6 (1.2)	2 (0.4)	4 (0.8)	2 (0.4)
Anxiety	9 (1.9)	7 (1.4)	1 (0.2)	4 (0.7)
Dizziness	4 (0.8)	5 (1)	6 (1.1)	1 (0.2)
Hypotension	8 (1.7)	4 (0.8)	2 (0.4)	1 (0.2)
Atrial fibrillation	6 (1.2)	3 (0.6)	1 (0.2)	0
Rash	8 (1.7)	7 (1.4)	5 (0.9)	2 (0.4)

[a]The ZERBAXA for injection dose was 1.5 g intravenously every 8 hours, adjusted to match renal function where appropriate. In the cIAI trials, ZERBAXA was given in conjunction with metronidazole.

Treatment discontinuation due to adverse events occurred in 2.0% (20/1015) of patients receiving ZERBAXA and 1.9% (20/1032) of patients receiving comparator drugs. Renal impairment (including the terms renal impairment, renal failure, and renal failure acute) led to discontinuation of treatment in 5/1015 (0.5%) subjects receiving ZERBAXA and none in the comparator arms.

Increased Mortality

In the cIAI trials (Phase 2 and 3), death occurred in 2.5% (14/564) of patients receiving ZERBAXA and in 1.5% (8/536) of patients receiving meropenem. The causes of death varied and included worsening and/or complications of infection, surgery and underlying conditions.

Less Common Adverse Reactions

The following selected adverse reactions were reported in ZERBAXA-treated subjects at a rate of less than 1%:

Cardiac disorders: tachycardia, angina pectoris

Gastrointestinal disorders: gastritis, abdominal distension, dyspepsia, flatulence, ileus paralytic

General disorders and administration site conditions: infusion site reactions

Infections and infestations: candidiasis including oropharyngeal and vulvovaginal, fungal urinary tract infection

Investigations: increased serum gamma-glutamyl transpeptidase (GGT), increased serum alkaline phosphatase, positive Coombs test

Metabolism and nutrition disorders: hyperglycemia, hypomagnesemia, hypophosphatemia

Nervous system disorders: ischemic stroke

Renal and urinary system: renal impairment, renal failure

Respiratory, thoracic and mediastinal disorders: dyspnea

Skin and subcutaneous tissue disorders: urticaria

Vascular disorders: venous thrombosis

DRUG INTERACTIONS

No significant drug-drug interactions are anticipated between ZERBAXA and substrates, inhibitors, and inducers of cytochrome P450 enzymes (CYPs).

USE IN SPECIFIC POPULATIONS

Pregnancy - Pregnancy Category B. There are no adequate and well-controlled trials in pregnant women with either ceftolozane or tazobactam. Because animal reproduction studies are not always predictive of human response, ZERBAXA should be used during pregnancy only if the potential benefit outweighs the possible risk. Embryo-fetal development studies performed with intravenous ceftolozane in mice and rats with doses up to 2000 and 1000 mg/kg/day, respectively, revealed no evidence of harm to the fetus. The mean plasma exposure (AUC) values associated with these doses are approximately 7 (mice) and 4 (rats) times the mean daily human ceftolozane exposure in healthy adults at the clinical dose of 1 gram thrice-daily. It is not known if ceftolozane crosses the placenta in animals. In a pre-postnatal study in rats, intravenous ceftolozane administered during pregnancy and lactation (Gestation Day 6 through Lactation Day 20) was associated with a decrease in auditory startle response in postnatal Day 60 male pups at maternal doses of greater than or equal to 300 mg/kg/day. The plasma exposure (AUC) associated with the NOAEL dose of 100 mg/kg/day in rats is approximately 0.4 fold of the mean daily human ceftolozane exposure in healthy adults at the clinical dose of 1 gram thrice-daily. In an embryo-fetal study in rats, tazobactam administered intravenously at doses up to 3000 mg/kg/day (approximately 19 times the recommended human dose based on body surface area comparison) produced maternal toxicity (decreased food consumption and body weight gain) but was not associated with fetal toxicity. In rats, tazobactam was shown to cross the placenta. Concentrations in the fetus were less than or equal to 10% of those found in maternal plasma. In a pre-postnatal study in rats, tazobactam administered intraperitoneally twice daily at the end of gestation and during lactation (Gestation Day 17 through Lactation Day 21) produced decreased maternal food consumption and body weight gain at the end of gestation and significantly more stillbirths with a tazobactam dose of 1280 mg/kg/day (approximately 8 times the recommended human dose based on body surface area comparison). No effects on the development, function, learning or fertility of F1 pups were noted, but postnatal body weights for F1 pups delivered to dams receiving 320 and 1280 mg/kg/day tazobactam were significantly reduced 21 days after delivery. F2-generation fetuses were normal for all doses of tazobactam. The NOAEL for reduced F1 body weights was considered to be 40 mg/kg/day (approximately 0.3 times the recommended human dose based on body surface area comparison).

Nursing Mothers It is not known whether ceftolozane or tazobactam is excreted in human milk. Because many drugs are excreted in human milk, exercise caution when administering ZERBAXA to a nursing woman.

Pediatric Use Safety and effectiveness in pediatric patients have not been established.

Geriatric Use Of the 1015 patients treated with ZERBAXA in the Phase 3 clinical trials, 250 (24.6%) were 65 years or older, including 113 (11.1%) 75 years or older. The incidence of adverse events in both treatment groups was higher in older subjects (65 years or older) in the trials for both indications. In the cIAI trial, cure rates in the elderly (age 65 years and older) in the ceftolozane and tazobactam plus metronidazole arm were 69/100 (69%) and in the comparator arm were 70/85 (82.4%). This finding in the elderly population was not observed in the cUTI trial.

ZERBAXA is substantially excreted by the kidneys and the risk of adverse reactions to ZERBAXA may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection and it may be useful to monitor renal function. Adjust dosage for elderly patients based on renal function.

Patients with Renal Impairment Dosage adjustment is required in patients with moderate (CrCl 30 to 50 mL/min) or severe (CrCl 15 to 29 mL/min) renal impairment and in patients with ESRD on HD.

OVERDOSAGE

In the event of overdose, discontinue ZERBAXA and provide general supportive treatment. ZERBAXA can be removed by hemodialysis. Approximately 66% of ceftolozane, 56% of tazobactam, and 51% of the tazobactam metabolite M1 were removed by dialysis. No information is available on the use of hemodialysis to treat overdosage.

For more detailed information, please read the full Prescribing Information, available at ZERBAXA.com.

uspi-mk7625a-iv-1610r002

Revised: 10/2016

ZERBAXA®
ceftolozane and tazobactam
for injection (1.5 g)

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COMMENTARY

A U.S. model for Italian hospitals?

By Valerio Verdiani, MD, Francesco Orlandini, MD, Micaela la Regina, MD, Giovanni Murialdo, MD, Andrea Fontanella, MD, and Mauro Silingardi, MD

In the United States, family physicians (general practitioners) used to manage their patients in the hospital, either as the primary care doctor or in consultation with specialists. Only since the 1990s has a new kind of physician gained widespread acceptance: the hospitalist ("specialist of inpatient care").[1]

In Italy the process has not been the same. In our health care system, primary care physicians have always transferred the responsibility of hospital care to an inpatient team. Actually, our hospital-based doctors dedicate their whole working time to inpatient care, and general practitioners are not expected to go to the hospital. The patients were (and are) admitted to one ward or another according to their main clinical problem.

Little by little, a huge number of organ specialty and subspecialty wards have filled Italian hospitals. In this context, the internal medicine specialty was unable to occupy its characteristic role, so that, a few years ago, the medical community wondered if the specialty should have continued to exist.

Anyway, as a result of hyperspecialization, we have many different specialists in inpatient care who are not specialists in global inpatient care.

Nowadays, in our country we are faced with a dramatic epidemiologic change. The Italian population is aging, and the majority of patients have not only one clinical problem but multiple comorbidities. When these patients reach the emergency department, it is not easy to identify the main clinical problem and assign him/her to an organ specialty unit. And when he or she eventually arrives there, a considerable number of consultants are frequently required. The vision of organ specialists is not holistic, and they are more prone to maximizing their tools than rationalizing them. So, at present, our traditional hospital model has been generating care fragmentation, overproduction of diagnoses, overprescription of drugs, and increasing costs.

"In Italy, this is the first concrete initiative to train, and better define, this new type of physician expert in the management of inpatients."

It is obvious that a new model is necessary for the future, and we look with great interest at the American hospitalist model.

We need a new hospital-based clinician who has wide-ranging competencies, and is able to define

Continued on page 8

ALANFIN/GETTY IMAGES

Piazza di Ferrari fountain in Genoa, Italy, is shown.

THE Hospitalist

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Q&A

Pediatric Special-Interest Group to open new era of opportunity

More visible, systemic pediatric presence within SHM

By Felicia Steele

Editor's note: *Each month, the Society of Hospital Medicine puts the spotlight on some of our most active members who are making substantial contributions to hospital medicine. Visit* www.HospitalMedicine.org *for more information on how you can lend your expertise to help improve the care of hospitalized patients.*

This month, *The Hospitalist* is spotlighting Jeffrey Grill, MD, a professor in the department of pediatrics, the chief of the division of pediatric hospital medicine at the University of Louisville (Ky.), and the director of Just for Kids Hospitalist Service at Norton Children's Hospital in Louisville. Dr. Grill has been a member of the Pediatrics Committee since 2012, has been instrumental in leading the transition from committee to special-interest group (SIG), and is on the Pediatric Hospital Medicine 2018 Planning Committee.

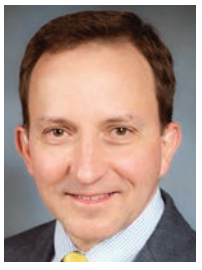
Why did you become a member of SHM?

After being in a general pediatrics practice for a few years, I saw a lot of value in and got a lot of support from working with other outpatient pediatricians and the American Academy of Pediatrics. When I left that outpatient practice to focus on hospital pediatrics 13 years ago, I needed to find people who knew a lot more than I did about inpatient work and an organization that could support my growth and development in this new role. Of course, SHM was the answer.

I knew there was a ton I could learn from the internists who had been doing this work a lot longer and senior pediatric hospitalists who could share their experiences. I found all of that, and more, and was honored to join the Pediatrics Committee in 2012 to help serve the community that's helped me so much.

During your time on the Pediatrics Committee, what goals were accomplished?

Over the years, this great committee has been very active at the direction of some fantastic leaders. We have had the privilege and responsibility to advise the SHM Board on pediatric issues and concerns, and we've developed some interesting pediatric-specific educational content in areas such as quality and safe handoffs. We've worked on the Choosing Wisely campaign and are now in the process of updating the Pediatric Hospital Medicine Core Competencies.



Dr. Grill

Each year we develop the content for the Pediatric Track of the SHM annual conference, and for several years, I was also on the Annual Conference Committee, which was a fantastic opportunity to bring the pediatric world to the broader work of SHM.

The Pediatrics Committee is transitioning from a committee to a Pediatric Special-Interest Group. What can members look forward to in this transition?

I was asked to lead the subcommittee that is working on the SIG transition, and I must say: I am excited! You know, as great as the Pediatrics Committee is, it's still only 15-20 people. And there are opportunities for pediatric hospitalists to join other SHM committees, but even at that, the footprint of active, engaged pediatric hospitalists within SHM is fairly small.

The transition to a much more open-ended pediatric hospitalist SIG will allow many more hospitalists who take care of children to become involved. That's more people, from more places, with more perspectives and ideas. It's more energy, more collaboration, and hopefully, in the long run, a more visible and systemic pediatric presence within SHM.

Sure, there are questions and a few concerns, and I'm not sure all the details have been quite worked out, but in the big picture, I think it's good for pediatric hospital medicine and good for SHM. Stay tuned as the process develops, but I think SHM members are going to see the new opportunity to get involved directly in SIG projects and goals, collaborate with more pediatric hospitalists, and see some real dynamic and forward-thinking leadership in the SIG executive council ... and opportunities to be on that Executive Council in a transparent, collegial way.

What were your main takeaways from Pediatric Hospital Medicine 2017? What can attendees expect at PHM 2018?

The annual Pediatric Hospital Medicine (PHM) meeting is always a bit of a whirlwind and our meeting in Nashville in 2017, hosted by SHM and our very own board member, Kris Rehm, MD, SFHM, was no different. There is always so much to experience and a diversity of offerings, which is really representative of how broad and rapidly growing our field is.

Of course, the "Top Articles in PHM" review is always popular and well received, and the poster and platform research sessions really show how far PHM has come and how much incredibly detailed and diligent work is being done to advance it further. There were some particularly thought-provoking plenary sessions last year on evidence-based health policy challenges and how some things we take as PHM dogma might not even be true! Left us all scratching our heads a bit. The final plenary on magic and pediatrics was inspiring and hilarious.

As far as PHM 2018, I suppose for full disclosure I should mention that I'm on the planning committee, so of course it's going to be awesome! We really are putting together a fantastic experience. We had so many high-quality submissions for workshops, clinical sessions, research – truly spanning the whole range of PHM work. Whatever you're coming to learn about, you'll find it.

We have some tremendously gifted plenary speakers lined up; some are sure to inspire, some will make you smile with pride about being a hospitalist, and at least one will almost certainly crack you up. We've shortened the length of many of the workshops to allow attendees to have more experiences while making sure the content is still meaningful. There will be several opportunities to mentor and be mentored in a comfortable, casual setting. I could go on and on, but if you take care of kids, come to Atlanta and see for yourself in July!

Do you have any advice for early-stage pediatric hospitalists looking to advance their careers?

This is an exciting time to be a pediatric hospitalist. Like it or hate it, subspecialty designation in PHM is around the corner, the new SHM pediatric SIG is going to open up a new era of opportunities, research in the field is gathering tremendous momentum, and fellowship training is going to only fuel that.

But PHM is still so far from becoming a single, one-size-fits-all path. There is still a huge range of practice locations, settings, responsibilities, and challenges.

I tell my junior folks: "Put yourself out there. Try some things. Try a lot of things. If you have opportunities to practice in a few different settings, try it. If there are learners, teach. Join a research or quality improvement group. Go to some big meetings; talk to 50 new people. If you hear someone give a great talk that gets you fired up about something you have a passion for, stick around, go talk with them; they get it, they were you once, and probably not even that long ago. Throw your hat in a ring and help out with a project. It might turn out to not be your 'thing,' but it might lead you to your 'thing.' Or not, but you'll come away with some experience and two new friends."

That's what makes this journey fun. There is no goal, no endgame. It's all about the journey and the joy you find in the ride.

Ms. Steele is a marketing communications specialist at the Society of Hospital Medicine.

Sneak Peek: *The Hospital Leader*

Giving hospitalists a larger clinical footprint

By Christopher Moriates, MD, SFHM

"We are playing the same sport, but a different game," the wise, thoughtful emergency medicine attending physician once told me. "I am playing speed chess – I need to make a move quickly, or I lose – no matter what. My moves have to be right, but they don't always necessarily need to be the optimal one. I am not always thinking five moves ahead. You guys [in internal medicine] are playing master chess. You have more time, but that means you are trying to always think about the whole game and make the best move possible."

Dr. Moriates

In recent years, the drive toward "efficiency" has intensified on the wards. I am seeing us playing much more speed chess as hospitalists, and I don't think that is a good thing.

The pendulum has swung quickly from, "problem #7, chronic anemia: stable but I am not sure it has been worked up before, so I ordered a smear, retic count, and iron panel," to "problem #1, acute blood loss anemia: now stable after transfusion, seems safe for discharge and GI follow-up." (*NOTE: "Acute blood loss anemia" is a phrase I learned from our "clinical documentation integrity specialist" – I think it gets me "50 CDI points" or something.*)

> *"Our job is not merely to work shifts and stabilize patients – there already is a specialty for that, and it is not the one we chose."*

Our job is not merely to work shifts and stabilize patients – there already is a specialty for that, and it is not the one we chose.

Clearly the correct balance is somewhere between the two extremes of "working up everything" and "deferring (nearly) everything to the outpatient setting."

There are many forces that are contributing to current hospitalist work styles. As the work continues to become more exhaustingly intense and the average number of patients seen by a hospitalist grows impossibly upward, the duration of on-service stints has shortened.

In most settings, long gone are the days of the month-long teaching attending rotation. By day 12, I feel worn and ragged. For "nonteaching" services, hospitalists seem to increasingly treat each day as a separate shift to be covered, oftentimes handing the service back-and-forth every few days, or a week at most. With this structure, who can possibly think about the "whole patient"? Whose patient is this anyways?

Read the full post at hospitalleader.org.

Also in *The Hospitalist Leader*

- How Hospitalists See the Forgotten Victims of Gun Violence by Vineet Arora, MD, MAPP, MHM
- Hospitals, Hospice and SNFs: The Big Deceit by Brad Flansbaum, DO, MPH, MHM
- But He's a Good Doctor by Leslie Flores, MHA, SFHM

Continued from page 6

priorities and appropriateness of care when a patient requires multiple specialists' interventions; is autonomous in performing basic procedures and expert in perioperative medicine; is prompt to communicate with primary care doctors at the time of admission and discharge; and is prepared to work in managed-care organizations.

We wonder: Are Italian hospital-based internists – the only specialists in global inpatient care – suited to this role?

We think so. However, current Italian training in internal medicine is focused mainly on scientific bases of diseases, pathophysiology, and clinical aspects. Concepts such as complexity or the management of patients with comorbidities are quite difficult to teach to medical school students and therefore often neglected. As a result, internal medicine physicians require a prolonged practical training.

Inspired by the Core Competencies in Hospital Medicine published by the Society of Hospital Medicine, this year in Genoa (the birthplace of Christopher Columbus) we started a 2-year second-level University Master course, called "Hospitalist: Managing complexity in Internal Medicine inpatients" for 35 internal medicine specialists. It is the fruit of collaboration between the main association of Italian hospital-based internists (Federation of Associations of Hospital Doctors on Internal Medicine, or FADOI) and the University of Genoa's Department of Internal Medicine, Academy of Health Management, and the Center of Simulation and Advanced Training.

> *"The U.S. hospitalist model has led to consistent and pronounced cost saving with no loss in quality."*

In Italy, this is the first concrete initiative to train, and better define, this new type of physician expert in the management of inpatients.

According to SHM's definition of a hospitalist, we think that the activities of this new physician should also include teaching and research related to hospital medicine. And as Steven Pantilat, MD, wrote, "patient safety, leadership, palliative care and quality improvement are the issues that pertain to all hospitalists."[2]

Theoretically, the development of the hospitalist model should be easier in Italy when compared to the United States. Robert Wachter, MD, and Lee Goldman, PhD, wrote in 1996 about the objections to the hospitalist model of American primary care physicians ("to preserve continuity") and specialists ("fewer consultations, lower income"), but in Italy family doctors do not usually follow their patients in the hospital, and specialists have no incentive for in-hospital consultations.[3] Moreover, patients with comorbidities, or pathologies on the border between medicine and surgery (for example, cholecystitis, bowel obstruction, polytrauma), are already often assigned to internal medicine, and in the smallest hospitals, the internist is most of the time the only specialist doctor continually present.

Nevertheless, the Italian hospitalist model will be a challenge. We know we have to deal with organ specialists, but we strongly believe that this is the most appropriate and the most sustainable model for the future of the Italian hospitals. Our wish is not to become the "bosses" of the hospital, but to ensure global, coordinated, and respectful care to present and future patients.

Published outcomes studies demonstrate that the U.S. hospitalist model has led to consistent and pronounced cost saving with no loss in quality.[4] In the United States, the hospitalist field has grown from a few hundred physicians to more than 50,000,[5] making it the fastest growing physician specialty in medical history.

Why should the same not occur in Italy?

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Leadership

Health care, technology, and the future

Major forces combining to reshape care delivery

By Leonard J. Marcus, PhD

What will be the role of humans in the future health system?

At first blush, this is a peculiar question. Health care is all about humans. How could one doubt their presence or role? It is working with and for people that attracted many to this profession.

On the cusp of a significant health system reformulation, it is the very question that hospitalists now must ponder. Just as ATMs replaced bank cashiers, online shopping replaced retail stores, and autonomous cars will soon replace drivers, the human landscape of health care is about to change. What pressures will force the changes?

Like the massive shifting tectonic plates that spark earthquakes, two major forces are combining to reshape service delivery as we know it.

On one hand, there is increasing demand. The Affordable Care Act opened the insurance door for people previously uncovered. Aging is delivering the baby boomer bubble into their sicker years. Hospitalists witness this phenomenon every day in the ballooning parade of patients they serve. At times, those pressures can overwhelm.

On the other hand, the political will to provide government subsidized health coverage is waning. Washington is tripping over itself to dismantle Obamacare with glancing concern for how it will inflate the ranks of the uninsured. Employers are eager to free themselves from the burden of providing increasingly expensive health coverage benefits. By removing the mandate to buy health care insurance, the current political health system architects are liberating the healthy paying population from their contributions to the overall insurance pool. Simply put, there is and will be less money and less of all that it buys.

Combine building demand with decreasing budget into a system that does not follow general market forces: You get that earthquake. A consumer can forgo that new phone in hard times but not that cardiac procedure. People will be caught in the fissures of the system. Waits, quality, burnout, morale problems, and financial losses will all trend in the wrong directions. The process will evolve in slow motion. Some might argue that we have already arrived.

Enter entrepreneurs, technologic advances, and a growing savvy and willingness to engage tech solutions to everyday problems. If Alexa can turn on your toaster, could it take your blood pressure? If a robot can vacuum your rug, could a different robot provide personal care services? And, if an algorithm can drive your car, could it similarly diagnose what ails you?

On Jan. 30, 2018, one of the greatest disrupters of all time, Amazon, announced that it is joining forces with Berkshire Hathaway and JP-Morgan Chase to leap into health care. While they are initially experimenting with health care changes for their corporate employees, the ultimate marketwide goal is to apply technology to both reduce costs and improve patient care. Warren Buffet, Berkshire Hathaway's founder, said in a statement, "The ballooning costs of health care act as a hungry tapeworm on the American economy." (And yes, I imagine that many hospitalists would take umbrage with that characterization.) In addition to the Amazon alliance, CVS Health and Aetna also recently agreed to join forces.

The rising health care interest by Amazon begs the imagination. Technology already is far along in automating routine procedures, elevating patient safety protocols, and recalculating patient flows and information. This added corporate interest and investment will further expand new ideas and innovative technologies. And, for sure, it will challenge long-held beliefs and practices that shape the health system we have today.

Hospitalist insight needed

What is the role of hospitalist leaders in this shifting equation? Hospitalists already can claim significant credit for introducing major changes in the landscape of hospital care in this country, with all the concomitant improvements in the efficiencies and quality of more integrated service delivery. Can you also guide the system in strategically selecting where and how technology can best be applied to automate and reconfigure service delivery?

The most important questions are: What is it that humans in health care uniquely do that cannot otherwise be accomplished? Are we able to hold onto the humane sides of health care, even as we seek to introduce cost-saving efficiencies?

Top of mind come the most personal sides of health service delivery: touch, empathy, understanding, and care itself. Next come human analysis, understanding, and translation. And beyond that, leadership, direction, and the vision to craft a health care system that meets our societal expectations – not just for the wealthy who can afford it – but for everyone.

It would be easy to dismiss this conversation. Society never decided whether those bank tellers, travel agents, or journalists were critical to our functioning. Along these same lines, you and your patients are more than mere algorithms.

As I often share in my leadership seminars, one key function of leaders is to identify and ask the right questions and to be at the decision-making table. What are those questions?

As a hospitalist leader, which part of your work and your activities could be eased by automation? Where might technology ease pressures and enhance your interactions with patients? How do we improve the efficiencies and effectiveness of health service delivery while we preserve the very human qualities that are fundamental to its values? No patient wants to speak to a physician who stares at a computer screen without eye contact, reassurance, or genuine interest. We can do better than that.

Business stakeholders in the system – and clearly, they are positioning and are powerful – will hold great sway on the contours of our future health care system. They could see humans – with all their costs, imperfections, and distractions – as replaceable.

Know that as you lead and pose your questions, there are people interested in listening. Certainly, the tech industry is looking for opportunities to generate broad market appeal. Similarly, health system decision makers looking to enhance how the system functions likewise seek guidance on what could – and could not – work. And who knows: Those decision makers could very well be you.

This is a conversation the country deserves. There is nothing more intimate, more personally important, and more professionally satisfying than the genuine person-to-person quality of what we do in health care. What we arrive at in the end should be achieved by intent, not by accident.

"Technology already is far along in automating routine procedures, elevating patient safety protocols, and recalculating patient flows and information."

Dr. Marcus is coauthor of "Renegotiating Health Care: Resolving Conflict to Build Collaboration," 2nd ed. (San Francisco: Jossey-Bass Publishers, 2011) and is director of the program for health care negotiation and conflict resolution, Harvard T.H. Chan School of Public Health, Boston. Dr. Marcus teaches regularly in the SHM Leadership Academy. He can be reached at ljmarcus@hsph.harvard.edu.

CMS sepsis measure a challenge to report

Hospitalists can champion sepsis-improvement efforts

By Kelly April Tyrrell

In October 2015, the Centers for Medicare & Medicaid Services implemented its first meaningful policy to attempt addressing sepsis.

The condition – one of the leading causes of mortality among hospitalized patients – afflicts more than a million people each year in the United States, and between 15% and 30% of them die. Sepsis is one of the leading drivers of hospital readmissions, sending more patients back to the hospital than heart failure, pneumonia, and chronic obstructive pulmonary disease.[1]

However, while providers seem to agree that the time to address sepsis is past due, not everyone has embraced the Sepsis CMS Core Measure program, or SEP-1, as the means to best achieve it. This is, in part, because of discrepancies in how sepsis is defined, the burden of reporting, and what some consider to be arbitrary clinical requirements that may not correlate with better patient outcomes.

"Sepsis is indeed a critical public health problem, and it's appropriate and valuable that Medicare and other policy makers are focusing on sepsis," said Jeremy Kahn, MD, professor of critical care medicine and health policy and management at the University of Pittsburgh. "This was really the first approach at that ... but at 85 pages long, it really is an enormous effort for hospitals to adhere to this measure."

This is because of the tension between the "intense desire to improve sepsis outcomes" and the "incredible burden" of keeping up with the necessary documentation while also providing quality care, Dr. Kahn said.

In December 2017, Dr. Kahn helped lead a study published in the Journal of Hospital Medicine aimed at trying to understand hospital perceptions of SEP-1. Over the course of 29 interviews with randomly selected hospital quality leaders across the United States, including physicians and nurses, the results came as a surprise.[2]

"Generally, hospitals were very supportive of the concept, and there was no pushback on the idea that we should be measuring and reporting sepsis quality to CMS," he said.

However, the research team found that respondents believed the program's requirements with respect to treatment and documentation were complex and not always linked to patient-centered outcomes. Meeting the SEP-1 bundles consistently required hospitals to dedicate resources that not all may have, especially those in small, rural communities and those serving as urban safety nets.

Some, like emergency medicine physician Annahieta Kalantari, DO (who did not participate in the survey), feel that SEP-1 forces providers to practice "check-box" medicine and undermines successful efforts that don't necessarily align with the CMS policy.

She arrived at her institution, Aria-Jefferson Health in Philadelphia, before CMS adopted SEP-1; at that time, she took note of the fact that the rate of sepsis mortalities in her hospital was, in her words, not great when compared with that at similar institutions. And then she helped do something about it.

"I thought, 'We're a Premier reporting hospital,' so we did a gap analysis as to why and put together protocols for the hospital to follow with our sepsis patients, including a sepsis alert and a lot of education," said Dr. Kalantari, associate program director for the emergency medicine residency program at Aria-Jefferson and a former chair of its sepsis management committee. "Before you knew it, mortalities were below benchmark."

Dr. Jeremy Kahn

"At 85 pages long, it really is an enormous effort for hospitals to adhere to this measure."

Dr. Annahieta Kalantari

"CMS basically picked definitions, and most of us don't know what they're basing them on because no one can agree on a definition."

But once SEP-1 began, she said, the hospital was unable to check all of the boxes all of the time.

"We kept track, but we weren't hitting all the bundles exactly within the periods of time recommended, but our mortalities were still amazing," she said. "CMS basically picked definitions [for sepsis], and most of us don't know what they're basing them on because no one can agree on a definition anyway. Now they're penalizing hospitals if they don't hit the check marks in time, but we'd already demonstrated that our mortality and patient care was exceptional."

She added: "I am extremely dissatisfied, as someone who provides frontline patient care, with how CMS is choosing to measure us."

Dr. Kalantari wrote a piece in the Western Journal of Emergency Medicine in July 2017 in which she and coauthors outline the issues they take with SEP-1. They lay out the tension among the varied definitions of what sepsis is – and isn't – and they also illuminate the apparent conflict between what CMS has officially defined and what evidence-based studies conducted since 2001 have suggested.[3]

In particular, CMS defines severe sepsis as an initial lactate above 2 mmol/L and septic shock as an initial lactate presentation of greater than 4 mmol/L. However, Dr. Kalantari and here coauthors argue in the paper that there is no standard definition of sepsis and that decades of attempts to achieve one have failed to reach consensus among providers. CMS, she said, fails to acknowledge this.

Defining sepsis

In fact, in 2016, another new definition of sepsis emerged by way of a 19-member task-force of experts: The Third International Consensus Definitions for Sepsis and Septic Shock, also called Sepsis-3.[4] In March 2017, the Surviving Sepsis Campaign adopted this definition, which defined sepsis as a "life-threatening organ dysfunction caused by a dysregulated host response to infection."[5]

"I think the definition has always been a challenging part of sepsis," said Kencee Graves, MD, a hospitalist at the University of Utah, Salt Lake City. "The definitions came about for research purposes, so ... they are not perfectly sensitive nor specific."

However, Dr. Graves believes SEP-1 is a step in the right direction in that it brings awareness to sepsis and holds providers accountable. Several years ago, she and her colleague Devin Horton, MD, also a hospitalist at the University of Utah, embarked on a massive undertaking to address sepsis in their hospital. It was, at the time, lacking in "sepsis culture," Dr. Horton said.

"One of the big things that motivated both of us was that we started doing chart review together and – it's always easier with 20/20 hindsight – we were noticing that residents were missing the signs of sepsis," Dr. Horton explained. "The clinical criteria would be there,

but no one would say the word." This is important, he said, because sepsis is time critical.

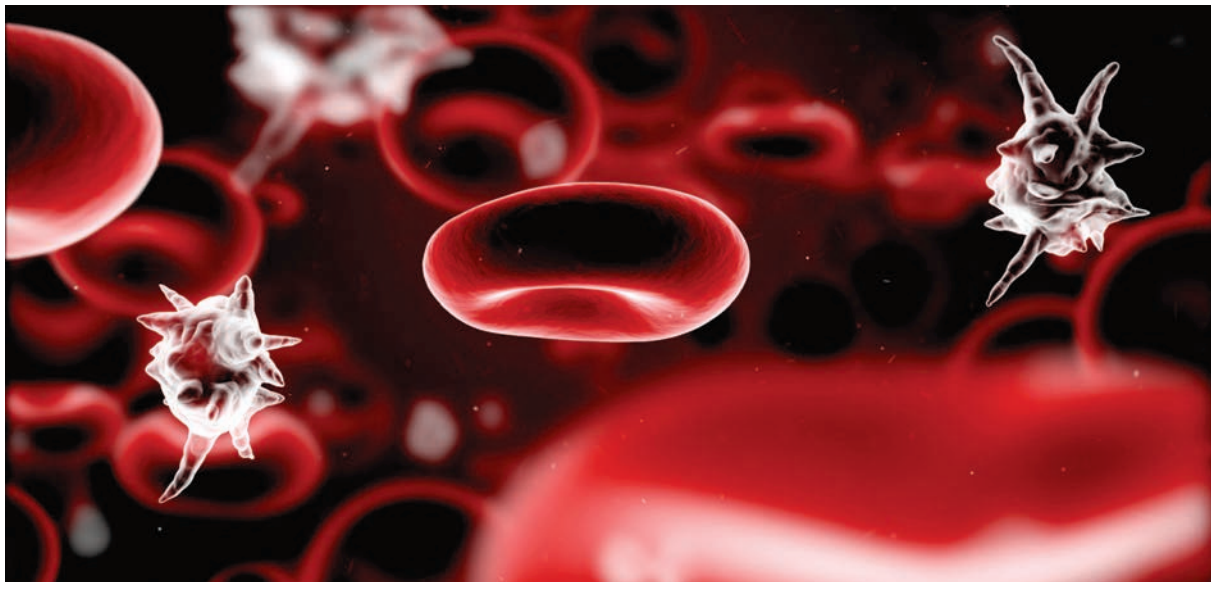
So the pair set out to create a cultural change by sharing data and collecting input from each service and unit, which relied heavily on nursing staff to perpetuate change. They created an early warning system in the medical record and worked with units to achieve flexibility in their criteria.


Dr. Graves

While the early warning system seemed helpful on the floor, SEP-1 adherence rates changed little in the emergency department. So Dr. Graves and Dr. Horton worked out an ED-specific process map that started at triage and was modeled after myocardial infarction STEMI protocols. From April through December 2016, the ED achieved between 29.5% adherence to the SEP-1 bundles, they said according to CMS abstractor data. After the change, between January and March 2017, the ED saw 52.2% adherence.

Dr. Kalantari would like to see CMS allow hospitals to evaluate and alter their processes more individually, with the required result being lower sepsis mortality. Hospitalists, said Dr. Kahn, are well poised to champion these sepsis improvement efforts.

"Hospitalists are uniquely positioned to lead in this area because they are a visible presence and a link between providers doing multidisciplinary acute care," he said. "The other thing hospitalists can do is insist on rolling out approaches that are evidence based and not likely to cause harm by leading to over resuscitation, or ensuring patients are receiving central-line insertions only when needed."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Dr. Horton

This is currently a moment for hospitals to innovate and provide meaningful feedback to CMS, which, he said, is listening.

"It's a myth that CMS rolls out policy without listening to the clinical community, but what they want is constructive criticism, not just to hear 'We're not ready and we have to push this down the road,'" Dr. Kahn said. "The time is now in the era of accountability in health care."

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A patient portal for the inpatient experience

Hospitalists, nurses most impacted

Hospitalists see patients at their most fragile – and, as a result, they have a unique opportunity to affect their health going forward.

"These moments can transform the way patients see their health and their behaviors, and any opportunity to position patients as empowered to influence their experience is one that can not be squandered," said Timothy Huerta, PhD, MS, lead author on a study of patient portals and tablets during inpatient care.[1] "In that context, hospitals have the opportunity to set expectations for engagement that can be influenced by technology. Patient portals, positioned within the inpatient setting, offer a platform to engage, empower, and educate."

His experience – at the first and largest academic medical center to provide this technology across the entire hospital system – offers the first insight into the demands that such a process shift requires, he said. The researchers ran a 90-day pilot program giving tablets to 179 patients; subsequently, the health system committed to providing tablets for accessing inpatient portals in all seven of its hospitals. "Adopting this technology is not easy, and we continue to explore how we can use it more effectively. Our hope is that our experience can make the journey of others easier."

SHAPECHARGE/GETTY IMAGES

Providing the technology is a necessary but insufficient component of implementation, he added. "This is not like the movie 'Field of Dreams' – if you build it they will come. It requires leaders to see the value proposition, champions throughout the organization to make a reality where the technology matters to the provision of care, and clinicians to see the tool as a means to a greater good."

In hospitals, nursing staff and hospitalists are likely to be most impacted by the addition of these tools. "They will require choices – for example who will respond on what timeline to patient communication when using these tools – which requires collaboration across the institution."

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Implementing a health literacy assessment

Limited health literacy results in poor outcomes

Hospitalists regularly treat patients with limited health literacy, and in many cases, the hospitalist may not even be aware of it. "Patients are unlikely to know or, more importantly, disclose their limited health literacy status," according to a recent study.[1] But hospitalists certainly see its effects: Limited health literacy often results in poor outcomes and high rates of readmittance.

"We know patients with limited health literacy are common and that they have poor health outcomes," said study coauthor Robert Leverence, MD. "We also know there are ways to mitigate those outcomes. For that reason, we believe screening is important. In our study, we showed such routine screening is feasible in a large teaching hospital."

The study describes the implementation of a hospitalwide routine health literacy assessment at an academic medical center initiated by nurses and applied to all adult inpatients. "We incorporated the health literacy screen and care plan into our electronic health record," the authors wrote. "When a patient screens positive for limited health literacy, two automated responses are triggered: a one-time alert on chart entry for all users ... and a nursing care plan containing relevant educational recommendations."

"To me it is a cringe-worthy event to give a 10-page AVS [after-visit summaries] to a patient who can't read," Dr. Leverence added. "Health literacy screening allows us to tailor the discharge process to meet the needs of the individual patient. Once these patients are identified, then appropriate efforts can be efficiently deployed."

Those efforts might include, at discharge, offering easy-to-read materials and teach-back, and having a caregiver in the room and a pharmacist performing bedside medication education.

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Creating a digital pill

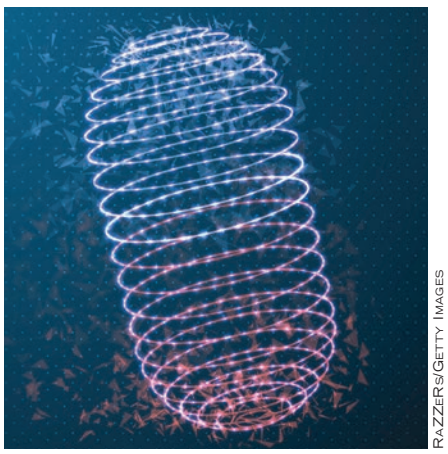
Technology battles medication noncompliance

Hospitalists and other physicians have long struggled with medication noncompliance, which can lead to sicker patients and higher rates of readmittance, and costs some $100-$289 billion a year.

There is a growing field of digital devices being developed to address this problem. The Food and Drug Administration has just approved the newest one: a medication with a sensor embedded that can tell doctors if, and when, patients take their medicine, according to an article in the New York Times.[1] It's expected to become available in 2018.

The digital medication is a version of the antipsychotic Abilify. Patients who agree to take it will sign consent forms allowing their doctors (and up to four other people) to receive electronic data showing the date and time pills are ingested.

The sensor, created by Proteus Digital Health, contains copper, magnesium, and silicon, all said to be safe ingredients found in foods. The electrical signal is created when stomach fluids contact the sensor; a patch worn on the rib cage detects that signal and sends the message.



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Other companies are joining the race to create digital medication technologies; these are being tested in medications for patients with conditions including heart disease, diabetes, and HIV infection. Some researchers predict the technology might have applications for monitoring the opioid intake of postsurgical patients or patients in medication clinical trials.

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Quick byte: PrEP advances

There are recent advances in preexposure prophylaxis as a promising prevention option for HIV, according to a recent study.[1]

"Modeling studies suggest that pre-exposure prophylaxis has the potential to curtail the HIV epidemic when used as part of a combination public health prevention strategy. The estimated number needed to treat to prevent one new infection might be as low as 13 when pre-exposure prophylaxis is given to a group at high risk of HIV (for example, incidence of 9%)."

MARC BRUXELLE/GETTY IMAGES

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Addressing malnutrition and improving performance

Stakeholders develop a malnutrition toolkit

Hospitalists are key players in improving hospital performance, but they may be overlooking a leading cause of morbidity and mortality, especially among older adults.

Research suggests that, at the time of hospital admission, some 20%-50% of all patients are at risk for malnutrition or are malnourished, but only 7% of those patients are diagnosed during their stay, according to research cited in an abstract presented at HM17.[1]

"Because individuals who are malnourished lack sufficient nutrients to promote healing and rehabilitation, and are at increased risk of medical complications, it can have a serious impact on patient safety indicators, such as rates of pressure ulcers, wound healing, and risk of falls," said lead author Eleanor Fitall of Avalere Health. "Early identification and subsequent treatment of these patients is the best way to prevent this risk."

To address the issue, Avalere Health and the Academy of Nutrition and Dietetics established the Malnutrition Quality Improvement Initiative (MQii), a multi-stakeholder effort to identify tools to support hospital-based care teams in improving malnutrition care quality. They developed a malnutrition toolkit, which was piloted in 2016 and was shown to effectively improve malnutrition care.

"Since the poster presentation in May, we have successfully implemented the toolkit at 50 hospitals via a multi-hospital Learning Collaborative," Ms. Fitall said. They are now recruiting hospitals and health systems to participate in an expanded Learning Collaborative. Interested sites should contact the MQii team at MalnutritionQuality@avalere.com.

"By supporting efforts to improve malnutrition care in the inpatient setting, hospitalists can help reduce the incidence of these problems as well as decrease rates of readmissions and reduce patient lengths of stay," Ms. Fitall said. "Hospitalists are critical to addressing malnutrition care gaps in the hospital. Dietitians that have undertaken malnutrition quality improvement projects using the MQii Toolkit have found that they are most successful when hospitalists are actively engaged in the team, particularly when looking to improve the rate of malnutrition diagnosis. Hospitalists are ideally positioned to champion these efforts."

Support for MQii was provided by Abbott, she said.

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Rethinking preop testing

Continued from page 1

"I can slap something on the surgeon's desk and say, 'Here's why we're not doing it,'" Dr. Rothberg said.

At the HM18 pre-course, experts gave guidance on the benefits of hospitalist involvement in perioperative care and offered points to consider when assessing cardiac and pulmonary risk before surgeries. Hospitalists then broke into groups to brainstorm techniques that could improve their perioperative work.

Pre-course director Rachel Thompson, MD, MPH, SFHM, head of the section of hospital medicine at the University of Nebraska in Omaha, pointed to the enormous swath of surgical care that could benefit from hospitalist involvement. In the United States, at least 52 million surgeries a year are performed, with 9 surgical procedures per lifetime on average. Of the 50,000 hospitalists in the United States, 87% are involved in preoperative care, she said.

She noted how surgical safety checklists have been shown to improve morbidity and mortality, as seen with a checklist developed by the World Health Organization and in California, where an enhanced recovery program at 20 hospitals has been successful.

Dr. Rachel Thompson

"I think the reason we see changes in each of those ... from pre to post when they implement, is because people start to communicate and collaborate," she said. "I think that's the secret sauce, and you can take that back home with you."

An enormous swath of surgical care could benefit from hospitalist involvement. ... Of the 50,000 hospitalists in the U.S., 87% are involved in preoperative care.

- Dr. Rachel Thompson

Assessing risk

Paul Grant, MD, SFHM, codirector of the perioperative medicine precourse, said that risk assessment is a crucial part of hospitalists' role, and although risk calculators are available, "they're not perfect – in fact, it's important to think about using them very individualized for your patient." Dr. Grant has begun using the Frailty Risk Analysis Index more often in his own work as director of the consultative and perioperative medicine program at Michigan Medicine, Ann Arbor, since frailty has been shown to be such a telltale indicator of perioperative risk.

Dr. Cohn

Dr. Pfeifer

As for preoperative testing, history is replete with examples of tests once considered crucial but that have proven to be unimportant for many patients, including preoperative carotid endarterectomy, preop ECG, preop coronary revascularization, and preop lab work.

"I was always listening for bruits years ago," Dr. Grant said. "I've sort of stopped doing that now. You'll hear it; you won't know what to do with it. We used to take care of those things before surgery. We now know that's not helpful for patients without symptoms."

Steven Cohn, MD, SFHM, director of the medical consultation service at Jackson Memorial Hospital in Miami, reviewed cardiac risk assessment in noncardiac procedures. He cautioned that the Revised Cardiac Risk Assessment was created based on patients with lengths of stay of at least 2 days and shouldn't be used for low-risk or ambulatory procedures because it will overestimate the risk.

Dr. Cohn's philosophy is to not suggest a delay without firm evidence that it is necessary. "I try not to interfere with surgery unless I feel that there is significant risk," he said.

Kurt Pfeifer, MD, professor of internal medicine at the Medical College of Wisconsin, Milwaukee, said general risk factors for preoperative pulmonary complications include functional dependence, prolonged surgery or surgery close to the respiratory tree, older age, and multiple comorbidities. Dr. Pfeifer recommended using lung expansion for high-risk patients, screening for obstructive sleep apnea with the STOP-BANG questionnaire, and identifying potentially difficult airways well in advance of a procedure.

In workshop discussions at the HM18 pre-course, hospitalists considered their contributions to preoperative care and ways they might be able to contribute more effectively. Among their ideas were better communication with anesthesiology – regarded as severely lacking by many hospitalists in the session – as well as designating smaller perioperative teams to foster knowledge and greater trust with surgeons.

Aron Mednick, MD, FHM, director of the comanagement service at Tisch Hospital, NYU Langone Medical Center, New York, said his group talked about an "identify, mitigate, propose, and resolve" method – identifying services or conditions with a high rate of preoperative problems, finding data on how to solve them, and proposing ways to get hospitalists involved in the solution.

"We noted that a lot of people experience resistance with getting hospitalists involved in care early," he said. "So one of the ways to do this is actually to identify problems and start above the surgeon, at the CMO and COO level, and then move down through department chairs and, basically, impose our existence on the care of the patient."

Antibiotic stewardship in sepsis

'Treat only clinically significant infections,' expert says

By Kari Oakes
MDedge News

FROM HM18 / ORLANDO / When is it rational to consider de-escalating, or even stopping, antibiotics for septic patients, and how will patients' future health be affected by antibiotic use during critical illnesses?

According to Jennifer Hanrahan, DO, of Case Western Reserve University, Cleveland, locating the tipping point between optimal care for the individual patient in sepsis, and the importance of antibiotic stewardship is a balancing act. It's a process guided by laboratory findings, by knowledge of local pathogens and patterns of antimicrobial resistance, and also by clinical judgment, she said at the annual meeting of the Society of Hospital Medicine.

By all means, begin antibiotics for patients with sepsis, Dr. Hanrahan, also medical director of infection prevention at MetroHealth Medical Center, Cleveland, told attendees at a pre-course at HM18. "Prompt initiation of antibiotics for sepsis is critical, and appropriate use of antibiotics decreases mortality." However, she noted, de-escalation of antibiotics also decreases mortality.

"What is antibiotic stewardship? Most of us think of this as the microbial stewardship police calling to ask you, 'Why are you using this antibiotic?" she said. "It's really the right antibiotic, for the right diagnosis, for the appropriate duration."

Of course, Dr. Hanrahan said, any medication is associated with potential adverse events, and antibiotics are no different. "Almost one-third of antibiotics given are either unnecessary or inappropriate," she said.

Antimicrobial resistance is a very serious public health threat, Dr. Hanrahan affirmed. "Antibiotic use is the most important modifiable factor related to development of antibiotic resistance. With regard to multidrug resistant [MDR] gram negatives, we are running out of antibiotics" to treat these organisms, she said, noting that "Many antibiotics to treat MDRs are "astronomically expensive – and that's a really big problem."

It's important to remember that, when antibiotics are prescribed, "You're affecting the microbiome not just of that patient, but of those around them," as resistance factors are potentially spread from one individual's microbiome to their friends, family, and other contacts, Dr. Hanrahan said.


Dr. Hanrahan

The later risk of sepsis has also shown to be elevated for individuals who have received high-risk antibiotics such as fluoroquinolones, third- and fourth-generation cephalosporins, beta-lactamase–inhibitor formulations, vancomycin, and carbapenems – many of which are also used to treat sepsis. All of these antibiotics kill anaerobic bacteria, Dr. Hanrahan said, and "when you kill anaerobes you do a lot of bad things to people."

Identifying the pathogens

There are already many frightening players in the antibiotic-resistant landscape. Among them are carbapenem-resistant Enterobacteriaceae, increasingly common in health care settings. Unfortunately, with methicillin-resistant *Staphylococcus aureus* (MRSA), "we've lost the battle," Dr. Hanrahan said.

Acinetobacter is another increasing threat, she said, as is *Candida auris*, which has caused large outbreaks in Europe. Because it's resistant to azole antifungals, once *C. auris* comes to U.S. hospitals, "You're going to have a really big problem," she said. Finally, multidrug resistant and extremely drug resistant *Pseudomonas* species are being encountered with increasing frequency.

And, of course, *Clostridium difficile* infections continue to ravage older populations. "One in 11 people aged 65 or older will die from *C. diff* infections," said Dr. Hanrahan.

For all of these bacteria, she said, "I can't tell you what antibiotics to use because you have to know what the organisms are in your hospital." A good resource for tracking local resistance patterns is the information provided by the Centers for Disease Control and Prevention, including interactive maps showing health care–associated infections, as well as HealthMap ResistanceOpen, which maps antibiotic resistance alerts across the United States. The CDC also offers training on antibiotic stewardship; Dr. Hanrahan said the several hours she spent completing the training were well spent.

After a broad-spectrum antibiotic is initiated for sepsis, Dr. Hanrahan said that the next infectious disease–related steps should focus on identifying pathogens so antimicrobial therapy can be tailored or scaled back appropriately. In many cases, this will mean obtaining blood cultures – ideally, two sets from two separate sites. It's no longer thought necessary to separate the blood draws by 20 minutes, or to try to time the draw during a febrile episode, she said.

What is important is to make sure that you're not treating contamination or colonization – "Treat only clinically significant infections," Dr. Hanrahan said. A common red herring, especially among elderly individuals coming from assisted living or in patients with indwelling urinary catheters, is a positive urine culture in the absence of signs or symptoms of urinary tract infection. Think twice about whether this truly represents a source of infection, she said. "Don't treat asymptomatic bacteriuria."

In order to avoid "chasing contamination," do not obtain the blood culture samples from a venipuncture site. "Contamination is twice as likely when drawing from a venipuncture site," Dr. Hanrahan noted. "When possible you should avoid this."

It's also important to remember that 10% of fever in hospitalized individuals is from a noninfectious source. "Take a careful history, and do a physical exam to help distinguish infections from other causes of fever," said Dr. Hanrahan.

Additional investigations to consider in highly immunocompromised patients might include both mycobacterial and fungal cultures, although these studies are otherwise generally low yield. And, she said, "Don't send catheter-tip cultures – it's pointless, and it really doesn't add much information."

Good clinical judgment still goes a long way toward guiding therapy. "If a patient is stable and it's not clear whether an antibiotic is needed, consider waiting and re-evaluating later," Dr. Hanrahan said.

Generally, duration of treatment should also be clinically based. "Stop antibiotics as soon as possible, and remove catheters as soon as possible," Dr. Hanrahan said, adding that few infections really warrant treatment for a fixed amount of time. These include meningitis, endocarditis, tuberculosis, and many cases of osteomyelitis.

Similarly, when a patient who had been ill now looks well, feels well, and is stable or improving, there's usually no need for repeat blood cultures, Dr. Hanrahan said. Still, a cautious balance is where most clinicians will wind up.

"I learned a long time ago that I have to do the things that let me go home and sleep at night," she concluded.


COURTESY SHM

Few acutely ill hospitalized patients receive VTE prophylaxis

By Doug Brunk
MDedge News

REPORTING FROM THSNA 2018 / SAN DIEGO / Among patients hospitalized for acute medical illnesses, the risk of venous thromboembolism (VTE) remained elevated 30-40 days after discharge, results from a large analysis of national data showed.

Moreover, only 7% of at-risk patients received VTE prophylaxis in both the inpatient and outpatient setting.

"The results of this real-world study imply that there is a significantly unmet medical need for effective VTE prophylaxis in both the inpatient and outpatient continuum of care among patients hospitalized for acute medical illnesses," researchers led by Alpesh Amin, MD, wrote in a poster presented at the biennial summit of the Thrombosis & Hemostasis Societies of North America.

According to Dr. Amin, who chairs the department of medicine at the University of California, Irvine, hospitalized patients with acute medical illnesses face an increased risk for VTE during hospital discharge, mainly within 40 days following hospital admission. However, the treatment patterns of VTE prophylaxis in this patient population have not been well studied in the "real-world" setting. In an effort to improve this area of clinical practice, the researchers used the Marketscan database between Jan. 1, 2012, and June 30, 2015, to identify acutely ill hospitalized patients, such as those with heart failure, respiratory diseases, ischemic stroke, cancer, infectious diseases, and rheumatic diseases. The key outcomes of interest were the proportion of patients receiving inpatient and outpatient VTE prophylaxis and the proportion of patients with VTE events during and after the index hospitalization. They used Kaplan-Meier analysis to examine the risk for VTE events after the index inpatient admission.

Dr. Amin

"There is a significantly unmet medical need for effective VTE prophylaxis."

The mean age of the 17,895 patients was 58 years, 55% were female, and most (77%) were from the Southern area of the United States. Their mean Charlson Comorbidity Index score prior to hospitalization was 2.2. Nearly all hospitals (87%) were urban based, nonteaching (95%), and large, with 68% having at least 300 beds. Nearly three-quarters of patients (72%) were hospitalized for infectious and respiratory diseases, and the mean length of stay was 5 days.

Dr. Amin and his associates found that 59% of hospitalized patients did not receive any VTE prophylaxis, while only 7% received prophylaxis in both the inpatient and outpatient continuum of care. At the same time, cumulative VTE rates within 40 days of index admission were highest among patients hospitalized for infectious diseases and cancer (3.4% each), followed by those with heart failure (3.1%), respiratory diseases (2%), ischemic stroke (1.5%), and rheumatic diseases (1.3%). The cumulative VTE event rate for the overall study population within 40 days from index hospitalization was nearly 3%, with 60% of VTE events having occurred within 40 days.

The study was funded by Portola Pharmaceuticals. Dr. Amin reported having no financial disclosures.

Diagnosing heparin-induced thrombocytopenia

By Doug Brunk
MDedge News

REPORTING FROM THSNA 2018 / SAN DIEGO / Both the 4Ts Score and the HIT Expert Probability (HEP) Score are useful in clinical practice for the diagnosis of heparin-induced thrombocytopenia, but the HEP score may have better operative characteristics in ICU patients, results from a real-world analysis showed.

"The diagnosis of heparin-induced thrombocytopenia (HIT) is challenging," Allyson M. Pishko, MD, one of the study authors, said at the biennial summit of the Thrombosis & Hemostasis Societies of North America. "The 4Ts Score is commonly used, but limitations include its low positive predictive value and significant interobserver variability."

The HEP Score, on the other hand, is based on the opinion of 26 HIT experts, said Dr. Pishko, a hematology/oncology fellow at the University of Pennsylvania, Philadelphia. It contains eight categories with positive or negative points assigned within each category. Results from a single-center retrospective study showed a higher positive predictive value and less inter-rater variability, compared with the 4Ts Score (J Thromb Haemost. 2010 Dec;8[12]:2642-50). One external prospective study showed operating characteristics similar to those of 4Ts scores (Thromb Haemost. 2015;113[3]:633-40).

Dr. Pishko

The aim of the current study was to validate the HEP Score in a real-world setting and to compare the performance of the HEP Score versus the 4Ts Score. The researchers enrolled 292 adults with suspected acute HIT who were hospitalized at the University of Pennsylvania or affiliated community hospitals, and who had HIT laboratory testing ordered.

The HEP Score and the 4Ts Score were calculated by a member of the clinical team and were completed prior to return of the HIT lab test result. The majority of scorers (62%) were hematology fellows, followed by attendings (35%), and residents/students (3%). All patients underwent testing with an HIT enzyme-linked immunosorbent assay (ELISA) and serotonin-release assay (SRA). Patients in whom the optical density of the ELISA was less than 0.4 units were classified as not having HIT. The researchers used the Wilcoxon rank-sum test to compare HEP and 4Ts Scores in patients with and without HIT.

"The 4Ts Score is commonly used, but limitations include its low positive predictive value and significant interobserver variability."

Of the 292 patients, 209 were HIT negative and 83 had their data reviewed by an expert panel. Of these 83 patients, 40 were found to be HIT negative and 43 were HIT positive, and their mean ages were 65 years and 63 years, respectively. Among the cases found to be positive for HIT, 93% had HIT ELISA optical density of 1 or greater and 69.7% were SRA positive. The median HEP Score in patients with and without HIT was 8 versus 5 (*P* less than .0001).

At the prespecified screening cutoff of 2 or more points, the HEP Score was 97.7% sensitive and 21.9% specific, with a positive predictive value of 17.7% and a negative predictive value of 98.2%. A cutoff of 5 or greater provided 90.7% sensitivity and 47.8% specificity with a positive predictive value of 23.1% and a negative predictive value of 96.8%. The mean time to calculate the HEP Score was 4.1 minutes.

The median 4Ts Score in patients with and without HIT was 5 versus 4 (*P* less than .0001), Dr. Pishko reported. A 4Ts Score of 4 or greater had a sensitivity of 97.7% and specificity of 32.9%, with a positive predictive value of 20.1% and a negative predictive value of 98.8%.

The area under the receiver operating characteristic curves for the HEP Score and 4Ts Score were similar (0.81 vs. 0.76; *P* = .121). Subset analysis revealed that compared with the 4Ts Score, the HEP Score had better operating characteristics in ICU patients (AUC, 0.87 vs. 0.79; *P* = .029) and with trainee scorers (AUC, 0.79 vs. 0.73; *P* = .032).

"Our data suggest that either the HEP Score or the 4Ts Score could be used in clinical practice," Dr. Pishko said.

The National Institutes of Health funded the study. Dr. Pishko reported having no financial disclosures.

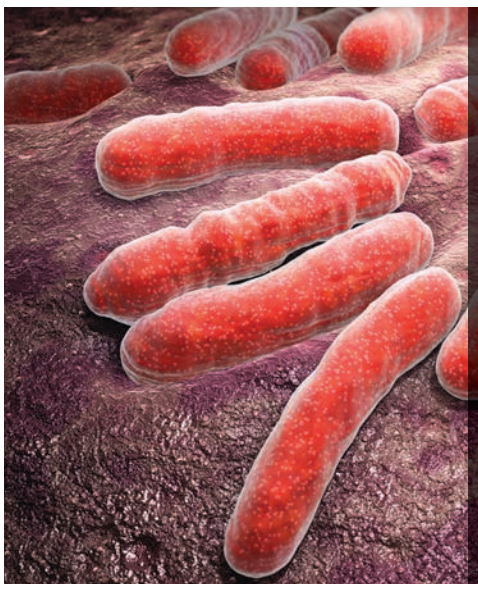
Key Clinical Question

Diagnosing pulmonary tuberculosis in the hospital

An uncommon but serious problem in certain populations

By Syam Mallampalli, MD, MPH, FACP; Satyananta Velidi, MD; Malachi Courtney, MD

Geisinger Medical Center, Danville, Pa.



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Clinical Case

A 40-year-old Indian immigrant presented to the emergency department with hemoptysis. He had had an intermittent productive cough for the past 4 weeks with increasing fatigue and lack of appetite. He also had intermittent fever with drenching night sweats. Chest radiograph and CT scan showed a left upper lobe cavitary lesion with infiltrate. He was admitted to the hospital with concern for pneumonia and to rule out possible active pulmonary tuberculosis.

Background

Active pulmonary tuberculosis (APTB) remains an important but often-missed diagnosis in hospitalized patients in the Western world.[1,2] Because of its relative rarity, the diagnosis of APTB often is delayed in the United States, which can lead hospitalized patients to nosocomial transmission, unnecessary exposures, patient harm,[3] and potentially avoidable cost to the health care system.[4] The diagnosis and management can be challenging involving isolation needs, sputum clearance, treatment strategy, and criteria for discharge to home.

Diagnosis

Any patient with risk factors presenting with signs and/or symptoms of APTB such as productive cough for more than 4 weeks, night sweats, weight loss, low-grade fevers, upper-lobe cavitary lesions, or hemoptysis should be suspected. The diagnostic work-up for APTB should always begin with a thorough medical and social history. A chest radiograph or a CT scan should always be obtained. Risk factors for infection and for progression to active pulmonary TB are listed below.

Risk factors for TB infection:

- Close contacts of a person with APTB.
- Health care workers.
- Immigrants from high-burden countries.
- Homeless people.
- Individuals who have been incarcerated.
- International travelers.
- HIV patients.
- Intravenous drug users.

Risk factors for progression to APTB:

- HIV infection.
- Intravenous drug use.
- Silicosis.
- Younger than 5 years of age.
- Immunosuppressed.

All patients with suspected or confirmed APTB who cannot be safely discharged home (see discharge considerations below) should be kept in negative-pressure airborne isolation rooms. Isolation can be discontinued once APTB has been ruled out or the patient is determined to be noninfectious based on three consecutive negative sputum smears.

Although rapid and inexpensive, acid-fast bacilli (AFB) smear microscopy has poor sensitivity (45%-80%, with culture-confirmed APTB cases) and poor positive predictive value (50%-80%) for TB in settings in which nontuberculous mycobacteria are commonly isolated. This makes an AFB smear nondiagnostic in the early diagnosis of APTB. The burden of mycobacteria seen in the sputum smear correlates with infectivity.

For improved sensitivity of testing, it is strongly recommended that three AFB smears be completed in 8- to 24-hour intervals and positive smears be accompanied by nucleic acid amplification (NAA) testing.[5] If APTB is suspected, but the patient is unable to expectorate, induced sputum samples should be obtained, and, if unable to induce sputum samples, flexible bronchoscopy sampling should be pursued especially for the high-risk populations described above.

The Centers for Disease Control and Prevention recommends that at least one sputum specimen be tested with NAA to expedite the time to diagnosis of APTB. A negative NAA does NOT rule out TB. The turnaround time for this test is about 24-48 hours. NAA has better positive predictive value (greater than 95%) with AFB smear-positive specimens in settings in which nontuberculous mycobacteria are common. The ability to confirm rapidly the presence of *Mycobacterium tuberculosis* is 50%-80% in AFB smear-negative, culture-positive specimens.[6]

In patients with clinical or radiologic suspicion of APTB who are unable to produce sputum or have negative sputum smear microscopy results, bronchoscopy is a safe and reliable method for the diagnosis of pulmonary tuberculosis. For the diagnosis of tuberculosis, bronchoalveolar lavage has a sensitivity and specificity of 60% and 100%, respectively. Adding transbronchial biopsy further increases the sensitivity to 84%, and postbronchoscopy sputum smear microscopy increases the sensitivity to 94%.[6]

In 2005, the CDC released guidelines for using interferon-gamma release assays (IGRA) to test for *M. tuberculosis* infection.[7] Both tuberculin skin testing (TST) and IGRAs assess lymphocytes' response to *M. tuberculosis*. Although these tests can be supportive of a previous tuberculosis infection, they are not diagnostic tests for APTB. Neither an IGRA nor a TST can distinguish latent from active tuberculosis.

Sputum AFB culture remains the preferred method for laboratory confirmation of APTB. Once APTB is confirmed, it is essential for susceptibility testing and genotyping. However, in the absence of a positive culture, APTB can be diagnosed based on signs and symptoms alone in a high-risk patient.

Key Points

- Active pulmonary tuberculosis (APTB) remains an important but often-missed diagnosis in hospitalized patients.
- A patient with suspected APTB should be placed in airborne isolation.
- Three acid-fast bacilli smears should be completed in 8- to 24-hour intervals, and positive smears should be accompanied by nucleic acid amplification testing.
- In the absence of a positive culture, APTB can be diagnosed based on signs and symptoms alone in a high-risk patient.
- The intensive phase of therapy may include pyrazinamide, rifampin, ethambutol, and isoniazid along with pyridoxine.

Treatment

A multidisciplinary, patient-centered approach involving the patient, providers, and public health officials is required to accomplish the following treatment goals: eradicating *Mycobacterium* infection, eliminating the risk of transmission, avoiding the disease, and preventing drug resistance.[8]

Infectious disease consultation is mandatory in all HIV-positive and suspected or confirmed multidrug-resistant cases. Directly observed therapy is an essential component of APTB treatment to ensure compliance in many situations.

Admission and discharge

Admission to a hospital is not required unless a patient meets criteria for admission independent of APTB diagnosis, or proper risk stratification and assessment cannot be completed in a timely manner. A patient with suspected APTB should

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be placed in airborne isolation. All staff should wear N95 disposable masks or respirators while inside the patient's room.[9]

Discharge considerations are listed below:

- Inform the department of health (DOH).
- Establish proper isolation precautions to minimize exposure.
- Ensure ability to stay at home until DOH and physician determines noninfectivity.
- Educate the patient about length of therapy, directly observed therapy, side effects, and importance of compliance.

Additional Reading

- American Thoracic Society and CDC. Diagnostic standards and classification of tuberculosis in adults and children. Am J Respir Crit Care Med. 2000; 161(4):1376-95.
- Nahid P et al. Executive Summary: Official ATS/CDC/IDSA Clinical Practice Guidelines: Treatment of drug-susceptible tuberculosis. Clin Infect Dis. 2016;63(7):853-67.

- Coordinate discharge with the DOH.
- Make sure proper follow-up is scheduled.

Back to the case

Our patient was placed on airborne respiratory isolation immediately upon admission and sputum was sent for AFB. Sputum smear was positive for AFB as well as a positive nucleic acid testing for *Mycobacterium tuberculosis*. HIV antibody testing was negative. Once the sputum AFB was determined to be positive, the department of health was informed. He was started on the intensive phase of therapy with pyrazinamide, rifampin, ethambutol, and isoniazid along with pyridoxine. He tolerated his medications well and had no immediate reactions. His family and close contacts were screened and advised to be tested.

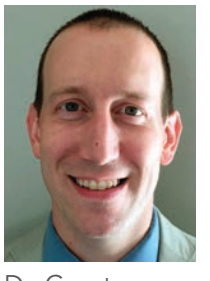
The patient was discharged after proper follow-up with primary care doctor was scheduled. The department of health arranged for directly observed therapy. He received information about the importance of taking all of his medications and staying at home except for medical visits until the DOH had deemed him to be noninfectious.

Bottom line

APTB in the hospital is an uncommon but serious problem in certain populations. It requires a high index of suspicion and a multidisciplinary approach for effective treatment and prevention of transmission.


Dr. Mallampalli


Dr. Velidi


Dr. Courtney

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8. Jensen PA et al. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care settings, 2005. MMWR Recomm Rep. 2005 Dec 30;54(RR-17):1-141.

9. Siegel JD et al. and the Health Care Infection Control Practices Advisory Committee. 2007 Guideline for isolation precautions: Preventing transmission of infectious agents in health care settings. Am J Infect Control. 2007 Dec;35(10 Suppl 2):S65-164.

In the Literature

Clinician reviews of HM-centric research

By Bassima Abdallah, MD, Neal Biddick, MD, Bethany Roy, MD, Gregory Salber, MD, Kevin Winters, MD, Joshua Allen-Dicker, MD, MPH, FHM

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IN THIS ISSUE

1. After initial rivaroxaban, aspirin is noninferior to rivaroxaban for thromboprophylaxis following joint arthroplasty.
2. Pulmonary Embolism Rule-Out Criteria Strategy is noninferior when clinical probability is low.
3. Balanced fluid resuscitation vs. saline does not decrease hospital-free days.
4. Multifaceted pharmacist intervention may reduce postdischarge ED visits and readmissions.
5. PE is rare in patients presenting to the ED with syncope.
6. Patent foramen ovale may be associated with increased risk of perioperative ischemic stroke.
7. Catheter ablation of AF in patients with heart failure decreases mortality and HF admissions.
8. Discharge opioid prescriptions for many surgical hospitalizations may be unnecessary.
9. Prophylactic haloperidol does not improve survival in critically ill patients.
10. Larger vegetation size associated with increased risk of embolism and mortality in infective endocarditis.

By Bassima Abdallah, MD

1 After initial rivaroxaban, aspirin is noninferior to rivaroxaban for thromboprophylaxis following joint arthroplasty.

CLINICAL QUESTION: Is aspirin as effective as rivaroxaban at reducing rates of symptomatic venous thromboembolism (VTE) after hip or knee arthroplasty?
BACKGROUND: While there is a consensus on the need for chemoprophylaxis to reduce the rates of postoperative VTE, there is wide variation in choice of agents recommended. Aspirin, while cheap and widely available, has never been directly compared with a direct oral anticoagulant in randomized, controlled trials.
STUDY DESIGN: Multicenter, double-blind, randomized, controlled noninferiority trial.
SETTING: 15 university-affiliated health centers in Canada from January 2013 through April 2016.
SYNOPSIS: 3,224 patients who received daily rivaroxaban for 5 days following joint arthroplasty were randomized to either receive aspirin 81 mg daily or continue daily rivaroxaban. Duration of therapy was determined by type of surgery (9 days for knee, 17 days for hip). The primary effectiveness outcome was defined as symptomatic pulmonary embolism or proximal deep venous thrombosis diagnosed in the 90-day follow-up period. The primary outcome results met the predetermined criterion for noninferiority with similar rates of symptomatic VTE in the aspirin and rivaroxaban group (0.64% vs. 0.7%; *P* less than .001). There was no significant difference in bleeding rates between the groups. Given that patients with prior VTE, morbid obesity, or cancer were not well represented in this study, these results should not be extrapolated to those populations felt to be at highest risk for VTE.
BOTTOM LINE: For thromboprophylaxis after joint arthroplasty, rivaroxaban followed by aspirin may be noninferior to extended rivaroxaban.
CITATION: Anderson D et al. Aspirin or rivaroxaban for VTE prophylaxis after hip or knee arthroplasty. N Eng J Med. 2018 Feb 22;378(8):699-707.

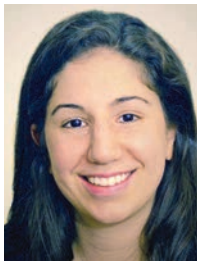
Short Takes

Non–private clinical encounters tied to diagnostic error and delays in delivery of care.

In a cross-sectional survey of 409 emergency physicians attending the American College of Emergency Physicians Scientific Assembly conference, a majority of respondents reported deviating from their standard history and physical exam practices when practicing in a hallway location or when a patient had a companion present during the clinical encounter. Of those physicians who reported changing their practices during non–private clinical encounters, a significant proportion reported that these changes had led to a delay in patient care or diagnostic error.
CITATION: Stoklosa H et al. Do EPs change their clinical behaviour in the hallway or when a companion is present? A cross-sectional survey. Emerg Med J. 2018 Feb 13. doi: 10.1136/emermed-2017-207119.

2 Pulmonary Embolism Rule-Out Criteria Strategy is noninferior when clinical probability is low.

CLINICAL QUESTION: Can low probability pulmonary embolism (PE) be safely excluded using the Pulmonary Embolism Rule-Out Criteria?
BACKGROUND: There is an alarming trend toward overuse of computed tomographic pulmonary angiography (CTPA) for the rule-out of low clinical probability PE. The eight-item Pulmonary Embolism Rule-Out Criteria (PERC) rule was devised to be used in populations of patients with low clinical probability of PE to guide which patients would likely not benefit from CTPA imaging. Recent concerns have been raised that the use of the PERC rule could result in high false-negative rates.
STUDY DESIGN: Crossover cluster–randomized clinical noninferiority trial.
SETTING: 14 EDs in France from August 2015 to September 2016.
SYNOPSIS: 1,916 emergency department patients with low clinical probability of PE were cluster-randomized to usual care or to a PERC strategy where, if the PERC score was zero, PE was ruled out without additional testing. The primary outcome was diagnosis of a symptomatic PE within 3 months that had not been diagnosed initially. Primary outcome results met prespecified noninferiority criteria for the PERC group, compared with the usual-care group (0.1% in the PERC group, 0% in the control group). The PERC group had significantly lower median length of ED stay and lower likelihood of admission.


Dr. Abdallah

Limitations of this study include its younger average patient age (44 years) and its cluster, as opposed to per-patient, randomization design.
BOTTOM LINE: In patients for whom the clinical probability of PE is low, use of the PERC rule is noninferior to a conventional D-dimer and CTPA strategy for ruling out symptomatic PE.
CITATION: Freund Y et al. Effect of the pulmonary embolism rule-out criteria on subsequent thromboembolic events among low-risk emergency department patients. JAMA. 2018;319(6):559-66.

Dr. Abdallah is a hospitalist at Beth Israel Deaconess Medical Center, and instructor in medicine, Harvard Medical School, Boston.

By Neal Biddick, MD

3 Balanced fluid resuscitation vs. saline does not decrease hospital-free days.

CLINICAL QUESTION: Does balanced crystalloid fluid improve outcomes versus saline in noncritically ill patients who are hospitalized?
BACKGROUND: Prior research has raised concerns about a connection between intravenous saline administration and adverse outcomes. However, this work has been limited to patients in the ICU and operative room settings.
STUDY DESIGN: Single-center, unblinded, multiple crossover (clustered randomization) trial.

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SETTING: A tertiary-care, academic medical center, from January 2016 to April 2017.
SYNOPSIS: This study enrolled 13,347 adult patients receiving a minimum of 500 cc of intravenous fluid in the emergency department. Participants were randomized to receive either normal saline or balanced crystalloid fluid (lactated Ringer's solution or Plasma-Lyte A). The study authors found no significant difference between the two groups in the primary outcome of hospital-free days (P = .41), or in several of the secondary outcomes including acute kidney injury stage 2 or higher (P = .14) and in-hospital mortality (P = .36). The balanced crystalloid fluid group did have a significantly lower incidence of a composite secondary outcome of major adverse kidney events (P = .01). However, given the primary and other secondary outcome findings, and concerns that composite outcomes lack patient centeredness, an accompanying editorial urged caution against changing clinical practice based on this finding.


Dr. Biddick

BOTTOM LINE: There was no significant difference in hospital-free days for noncritically ill patients receiving IV fluids in the ED between those treated with saline and balanced crystalloid fluid.
CITATION: Self WH et al. Balanced crystalloids versus saline in noncritically ill adults. N Eng J Med. 2018;378:819-28.

Short Takes

Retrospective case series of fluoroquinolone-induced acute interstitial nephritis (AIN).

A 23-year retrospective review of biopsy-proven cases of acute interstitial nephritis secondary to fluoroquinolones revealed that only 17% of cases presented with the typical triad of fever, rash, and eosinophilia, but that discontinuation of the offending agent resulted in complete or partial recovery in a majority of patients, with a median time to recovery of 20.5 days.
CITATION: Farid S et al. Clinical manifestations and outcomes of fluoroquinolone-related acute interstitial nephritis. Mayo Clin Proc. 2018 Jan;93(1):25-31.

4 Multifaceted pharmacist intervention may reduce postdischarge ED visits and readmissions.

CLINICAL QUESTION: Can a multifaceted intervention by a clinical pharmacist reduce the rate of ED visits and readmission over the subsequent 180 days?
BACKGROUND: The period following an inpatient admission contains many potential risks for patients, among them the risk for adverse drug events. Approximately 45% of readmissions from adverse drug reactions are thought to be avoidable.
STUDY DESIGN: Multicentered, single-blinded, randomized, control trial, from September 2013 to April 2015.
SETTING: Four acute inpatient hospitals in Denmark.
SYNOPSIS: 1,467 adult patients being admitted for an acute hospitalization on a minimum of five medications were randomized to receive usual care, a basic intervention (medication review by a clinical pharmacist), or an extended intervention (medication review, three motivational interviews, and follow-up with the primary care physician, pharmacy and, if appropriate, nursing home by a clinical pharmacist). The primary endpoints were readmission within 30 days or 180 days, ED visits within 180 days, and a composite endpoint of readmission or ED visit within 180 days post discharge. For these endpoints, the basic intervention group had no statistically significant difference from the usual-care group. The extended intervention group had significantly lower rates of readmission within 30 days and 180 days, as well as the primary composite endpoint compared to the usual-care group (P less than .05 for all comparisons). For the extended intervention, the number needed to treat for the main composite endpoint was 12.
BOTTOM LINE: For patients admitted to the hospital, an extended intervention by a clinical pharmacist resulted in a significant reduction in readmissions.
CITATION: Ravn-Nielsen LV et al. Effect of an in-hospital multifaceted clinical pharmacist intervention on the risk of readmission. JAMA Intern Med. 2018;178(3):375-82.

Dr. Biddick is a hospitalist at Beth Israel Deaconess Medical Center, and instructor in medicine, Harvard Medical School, Boston.

By Bethany Roy, MD

5 PE is rare in patients presenting to the ED with syncope.

CLINICAL QUESTION: What is the prevalence of pulmonary embolism (PE) in patients presenting to the ED with syncope?
BACKGROUND: PE is commonly accepted as a "can't miss" diagnosis in the work-up of syncope. However, the actual prevalence of PE in patients presenting with syncope is inconsistently characterized.
STUDY DESIGN: Retrospective, observational study.
SETTING: Canada, Denmark, Italy, and the United States, from January 2010 to September 2016.
SYNOPSIS: Longitudinal administrative databases were used to identify patients with ICD codes for syncope at discharge from the ED or hospital. Those with an ICD code for PE were included to calculate the prevalence of PE in this population (primary outcome).


Dr. Roy

The prevalence of PE in all patients ranged from 0.06% (95% confidence interval, 0.05%-0.06%) to 0.55% (95% CI, 0.50%-0.61%); and in hospitalized patients from 0.15% (95% CI, 0.14%-0.16%) to 2.10% (95% CI, 1.84%-2.39%). This is a much lower than the estimated 17.3% prevalence of PE in patients presenting with syncope estimated by the PESIT study published in the New England Journal of Medicine in 2016. Further definitive research is needed to better characterize prevalence rates.

Limitations of this study include the potential for information bias: The inclusion criteria of patients coded for syncope at discharge likely omits some patients who initially presented with syncope but were coded for a primary diagnosis that caused syncope.
BOTTOM LINE: PE in patients presenting to the ED with syncope may be rare.
CITATION: Costantino G et al. Prevalence of pulmonary embolism in patients with syncope. JAMA. 2018;178(3):356-62.

6 Patent foramen ovale may be associated with increased risk of perioperative ischemic stroke.

CLINICAL QUESTION: Are patients with patent foramen ovale (PFO) at increased risk of perioperative ischemic stroke?
BACKGROUND: Prior research has identified an association between PFO and risk of stroke. However, little is known about the effect of a preoperatively diagnosed PFO on perioperative stroke risk.
STUDY DESIGN: Retrospective cohort study.
SETTING: Three Massachusetts hospitals, from January 2007 to December 2015.
SYNOPSIS: The charts of 150,198 adult patients who underwent noncardiac surgery were reviewed for ICD codes for PFO. The primary outcome was perioperative ischemic stroke within 30 days of surgery, as identified via ICD code and subsequent chart review. After they adjusted for confounding variables, the study authors found that patients with PFO had an increased risk of perioperative ischemic stroke (odds ratio, 2.66; 95% confidence interval, 1.96-3.63; P less than .001) compared with patients without PFO. These findings were replicated in a propensity score–matched cohort to adjust for baseline differences between PFO and non-PFO groups. Patients with PFO also had a significantly increased risk of large-vessel territory ischemia and more severe neurologic deficits.

Given the observational design, this study could not establish a causal relationship between presence of a PFO and perioperative stroke. While the results support the consideration of PFO as a risk factor for perioperative stroke, research into whether this risk can be mitigated is needed.
BOTTOM LINE: Patients with PFO undergoing noncardiac surgery may be at increased risk of perioperative ischemic stroke.
CITATION: Ng PY et al. Association of preoperatively diagnosed patent foramen ovale with perioperative ischemic stroke. JAMA. 2018 Feb 6;319(5):452-62.

Dr. Roy is a hospitalist at Beth Israel Deaconess Medical Center, and instructor in medicine, Harvard Medical School, Boston.

By Gregory Salber MD

7 Catheter ablation of AF in patients with heart failure decreases mortality and HF admissions.

CLINICAL QUESTION: How does ablation of atrial fibrillation (AF) compare with medical therapy for

patients with heart failure with reduced left ventricular ejection fraction (LVEF)?
BACKGROUND: Rhythm control with medical therapy has been shown to not be superior to rate control for patients with both heart failure and AF. Rhythm control by ablation has been associated with positive outcomes in this same population, but its effectiveness, compared with medical therapy for patient-centered outcomes, has not been demonstrated.
STUDY DESIGN: Multicenter, open-label, randomized, controlled superiority trial.
SETTING: 33 hospitals from Europe, Australia, and the United States during 2008-2016.
SYNOPSIS: A total of 363 patients with HF with LVEF less than 35%, New York Heart Association II-IV symptoms, and permanent or paroxysmal AF who had previously failed or declined antiarrhythmic medications were randomly assigned to undergo ablation by pulmonary vein isolation or to medical therapy. The primary outcome – a composite of death or hospitalization for heart failure – was significantly lower in the ablation group, compared with the medical therapy group (28.5% vs. 44.6%; $P = .006$) with a number needed to treat of 8.3. The secondary outcomes of all-cause mortality and heart failure admissions were also significantly lower in the ablation group (13.4% vs. 25%; $P = .01$ and 20.7% vs. 35.9%; $P = .004$ respectively). The burden of AF, as identified by patient implantable devices was significantly lower in the ablation group, suggesting the likely mechanism of ablation benefit. Limitations of this study include its small sample size and lack of physician or patient blinding to treatment assignment.
BOTTOM LINE: Compared with medical therapy, catheter ablation of atrial fibrillation for patients with symptomatic heart failure with LVEF less than 35% was associated with significantly decreased mortality and heart failure admissions.
CITATION: Marrouche N et al. Catheter ablation for atrial fibrillation with heart failure. N Eng J Med. 2018 Feb 1; 378:417-27.

8 Discharge opioid prescriptions for many surgical hospitalizations may be unnecessary.

CLINICAL QUESTION: Do opioid prescriptions after surgical hospitalization correlate with opioid use immediately prior to discharge?
BACKGROUND: Prescription opioids play a significant role in the current opioid epidemic. Opioids used for nonmedical purposes often are obtained from the prescription of friends and family members, and a majority of heroin users report that their first opioid exposure was via a prescription opioid. Prescription of opioids following low-risk surgical procedures has increased over the past decade.


Dr. Salber

STUDY DESIGN: Cross-sectional study.
SETTING: Two Boston-area acute care hospitals from May 2014 to September 2016.
SYNOPSIS: The authors identified 6,548 inpatient surgical hospitalizations lasting longer than 1 day with a discharge to home in which the patient used no opioid medications in the final 24 hours prior to discharge. Of these, 43.7% received an opioid prescription at discharge. The mean prescription morphine milligram equivalents (MME) provided to this group was 343. The authors identified these cases as instances in which overprescription of opiates may have occurred. Surgical services that tended to have more patients still using opioids at the time of discharge had a higher likelihood of potential overprescription. For patients who used opioids during the final 24 hours of their hospitalization and received an opioid prescription at discharge, inpatient MME use and prescription MME were only weakly correlated (R2 = 0.112). The retrospective two-site design of this study may limit its generalizability.
BOTTOM LINE: In postoperative surgical patients, overprescription of opioid medications may occur frequently.
CITATION: Chen EY et al. Correlation between 24-hour predischarge opioid use and amount of opioids prescribed at hospital discharge. JAMA Surg. 2018;153(2):e174859.

Dr. Salber is a hospitalist at Beth Israel Deaconess Medical Center, and instructor in medicine, Harvard Medical School, Boston.

Continued on following page

Short Takes

Trimethoprim associated with increased risk of AKI and hyperkalemia.

In a cohort study of older patients with urinary tract infections, trimethoprim was associated with increased risk of acute kidney injury and hyperkalemia, but not increased risk of death, in comparison to other antibiotics for UTIs. These risks were amplified for patients simultaneously taking renin-angiotensin system blockers or spironolactone.
CITATION: Crellin E et al. Trimethoprim use for urinary tract infection and risk of adverse outcomes in older patients: cohort study. BMJ. 2018;360:k341.

Mortality of in-hospital cardiac arrest is decreasing, but disparities between on- and off-hours persist.

An analysis of 151,071 in-hospital cardiac arrests (IHCA) during 2000-2014 found that patient survival to hospital discharge increased from 13.6% to 22.0%, but return of spontaneous circulation, postresuscitation survival, and overall survival to hospital discharge were all significantly lower for IHCA that occurred during nights or weekends, compared with weekday IHCA. The difference in on- and off-hours postresuscitation survival rates did not significantly change over the 14-year study period.
CITATION: Ofoma UR et al. Trends in survival after in-hospital cardiac arrest during nights and weekends. J Am Coll Cardiol. 2018;71(4):402-11.

Young women with acute myocardial infarction present differently than young men.

Interviews of 2,009 young women and 976 young men hospitalized for acute MI at U.S. hospitals revealed that, while both groups of patients reported chest pain as the predominant symptom, women were more likely to report a greater number of additional, non–chest pain symptoms.
CITATION: Lichtman JH et al. Sex difference in the presentation and perception of symptoms among young patients with myocardial infarction. Circulation. 2018;137(8):781-90.

ESBL-resistant bacteria spread in hospital despite strict contact precautions

By Michele G. Sullivan
MDedge News

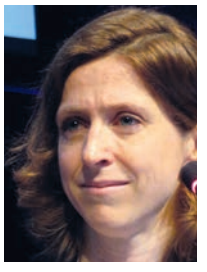
FROM ECCMID 2018 / MADRID / Standard contact precautions for carriers of extended-spectrum, beta-lactamase–resistant *Enterobacteriaceae* (ESBL-E) didn't impact the spread of that organism in non-ICU hospital wards, even when staff employed an active surveillance screening protocol to identify every carrier at admission.

The failure of precautions may have root in two thorny issues, said Friederike Maechler, MD, who presented the data at the European Society of Clinical Microbiology and Infectious Diseases annual congress.

"Adherence to strict contact isolation and hand hygiene is never 100% in a real-life scenario," said Dr. Maechler, of Charite University Hospital, Berlin. Also, she said, contact isolation can only be effective in a ward if all, or at least most, of the ESBL-E carriers are identified. "Even with an extensive surveillance screening program established, many carriers remained unknown."

The 25-month study, dubbed R-Gnosis, was conducted in 20 Western European hospitals in Geneva, Madrid, Berlin, and Utrecht. It compared 12 months of contact precaution with standard precaution infection control strategies in medical and surgical non-ICUs.

The entire study hinged on a strict protocol to identify as many ESBL-E carriers as possible. This was done by screening upon admission to the unit, once per week during the hospital stay, and on discharge. Each patient underwent deep rectal swabs that were cultured on agar and screened for resistance.


Dr. Maechler

The crossover design trial randomized each unit to either contact precautions or standard precautions for 12 months, followed by a 1-month washout period, after which they began the other protocol.

In all, 50,870 patients were entered into the study. By the end, Dr. Maechler had data on 11,367 patients with full screening and follow-up.

Standard precautions did not require a private bedroom, with gloves, gowns, and apron needed for direct contact to body fluids or wounds only, and consistent hand hygiene. Contact precautions required a private bedroom and strict hand hygiene, with gloves, gowns, and aprons used for any patient contact. Study staff monitored compliance with these procedures monthly.

The primary outcome was the ESBL-E acquisition rate per 1,000 patient days. This was defined as a new ESBL-E detection after the patient had a prior negative screen. Dr. Maechler noted that, by epidemiological definition, acquisition does not necessarily imply cross-transmission from other patients.

Adherence to both contact and standard precautions was about 85%, she said, while adherence to hand hygiene was less at around 62%.

Admission ESBL-E screenings revealed that about 12% of the study population was colonized with the strain at admission. The proportion was nearly identical in the contact and standard precaution groups (11.6%, 12.2%).

The incidence density of ward-acquired ESBL-E per 1,000 patient-days at risk was 4.6 in both intervention periods, regardless of the type of precaution. Contact precautions appeared to be slightly less effective for *E. coli* (3.6 per 1,000 patient-days in contact precautions vs. 3.5 in standard), compared with *Klebsiella pneumoniae* (1.8 vs. 2.2).

A multivariate analysis controlled for screening compliance, colonization pressure, and length of stay, study site, and season of year. It showed that strict contact precautions did not reduce the risk of ward-acquired ESBL-E carriage.

Continued from previous page

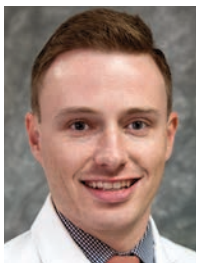
By Kevin Winters, MD

9 Prophylactic haloperidol does not improve survival in critically ill patients.

CLINICAL QUESTION: Does prophylactic use of haloperidol in critically ill patients at high risk of delirium improve survival at 28 days?
BACKGROUND: Delirium occurs frequently in critically ill patients and can lead to increased ICU length of stay, hospital length of stay, duration of mechanical ventilation, and mortality. Prior research into the use of prophylactic antipsychotic administration has yielded inconsistent results.
STUDY DESIGN: Double-blind, randomized, controlled trial.
SETTING: 21 ICUs in the Netherlands, from July 2013 to March 2017.
SYNOPSIS: A total of 1,789 critically ill adults with an anticipated ICU stay of at least 2 days were randomized to receive 1 mg of haloperidol, 2 mg of haloperidol, or a placebo three times daily. All study sites used "best practice" delirium prevention (for example, early mobilization, noise reduction, protocols aiming to prevent oversedation). The primary outcome was defined as the number of days patients survived in the 28 days following inclusion, and secondary outcome measures included number of days survived in 90 days, delirium incidence, number of delirium-free and coma-free days, duration of mechanical ventilation, and length of ICU and hospital stay. The 1-mg haloperidol group was stopped early because of futility. There was no significant difference between the 2-mg haloperidol group and the placebo group for the primary outcome (P = .93), or any of the secondary outcomes.
BOTTOM LINE: In a population of critically ill patients at high risk of delirium, prophylactic haloperidol did not significantly improve 28-day survival, nor did it significantly reduce the incidence of delirium or length of stay.
CITATION: van den Boogaard M et al. Effect of haloperidol on survival among critically ill adults with a high risk of delirium: The REDUCE randomized clinical trial. JAMA. 2018 Feb 20;319(7):680-90.

10 Larger vegetation size associated with increased risk of embolism and mortality in infective endocarditis.

CLINICAL QUESTION: In patients with infective endocarditis, does a vegetation size greater than 10 mm impart a greater embolic risk?
BACKGROUND: A vegetation size greater than 10 mm has historically been used as the cutoff for increased risk of embolization in infective endocarditis, and this cutoff forms a key part of the American Heart Association guidelines for early surgical intervention. However, this cutoff is derived primarily from observational data from small studies.


Dr. Winters

STUDY DESIGN: Meta-analysis of observational studies and randomized clinical trials.
SETTING: An English-language literature search from PubMed and EMBASE performed May 2017.
SYNOPSIS: The authors identified 21 unique studies evaluating the association of vegetation size greater than 10 mm with embolic events in adult patients with infective endocarditis. This accounted for a total of 6,646 unique patients and 5,116 vegetations. Analysis of these data found that patients with a vegetation size greater than 10 mm had significantly increased odds of embolic events (odds ratio, 2.28; P less than .001) and mortality (OR, 1.63; P = .009), compared with those with a vegetation size less than 10 mm.

Limitations of this research include the potential for selection bias in the original studies, and the inability to incorporate information relating to microbiologic results, antibiotic use, and the location of systemic embolization. Interestingly, as vegetations with a size of exactly 10 mm were variably categorized in the original studies, this meta-analysis was unable to reach a conclusion on the risk of embolic events for instances when vegetation size is equal to 10 mm.
BOTTOM LINE: Patients with infective endocarditis and a vegetation size greater than 10 mm may have significantly increased odds of embolic events and mortality, compared with those with vegetation size less than 10 mm.
CITATION: Mohananey D et al. Association of vegetation size with embolic risk in patients with infective endocarditis: A systematic review and meta-analysis. JAMA Intern Med. Apr 1;178(4):502-10.

Dr. Winters is a hospitalist at Beth Israel Deaconess Medical Center, and instructor in medicine, Harvard Medical School, Boston.

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CONTACT:

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Director, UC Health Hospitalist Group; 513-298-7325

Academic Nocturnist Hospitalist

The Division of General Internal Medicine at **Penn State Health Milton S. Hershey Medical Center**, Penn State College of Medicine (Hershey, PA) is seeking a BC/BE Internal Medicine **NOCTURNIST HOSPITALIST** to join our highly regarded team. Successful candidates will hold a faculty appointment to Penn State College of Medicine and will be responsible for the care in patients at Hershey Medical Center. Individuals should have experience in hospital medicine and be comfortable managing patients in a sub-acute care setting.

Our Nocturnists are a part of the Hospital Medicine program and will work in collaboration with advanced practice clinicians and residents. Primary focus will be on overnight hospital admission for patients to the Internal Medicine service. Supervisory responsibilities also exist for bedside procedures, and proficiency in central line placement, paracentesis, arthrocentesis, and lumbar puncture is required. The position also supervises overnight Code Blue and Adult Rapid Response Team calls. This position directly supervises medical residents and provides for teaching opportunity as well.

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Appropriate candidates must possess an MD, DO, or foreign equivalent; be Board Certified in Internal Medicine and have or be able to acquire a license to practice in the Commonwealth of Pennsylvania. Qualified applicants should upload a letter of interest and CV at:
http://tinyurl.com/j29p3fz Ref Job ID#4524

For additional information, please contact:
Brian Mc Gillen, MD — Director, Hospitalist Medicine
c/o Heather Peffley, PHR FASPR — Physician Recruiter
Penn State Health
hpeffley@pennstatehealth.psu.edu

PennState Health
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Penn State Health is committed to affirmative action, equal opportunity and the diversity of its workforce. Equal Opportunity Employer – Minorities/Women/Protected Veterans/Disabled.

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- Day, Evening and Nocturnist positions
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Berkshire Health Systems

Interested candidates are invited to contact:
Liz Mahan, Physician Recruitment Specialist, Berkshire Health Systems
725 North St. • Pittsfield, MA 01201 • (413) 395-7866.
Applications accepted online at **www.berkshirehealthsystems.org**

Johnston Memorial Hospital
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HOSPITALISTS & NOCTURNISTS

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Please Contact:
Tina McLaughlin, CMSR, Johnston Memorial Hospital
Office (276) 258-4580, tina.mclaughlin@balladhealth.com

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For more information, please contact:
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Qualified applicants may submit CVs to Lauren Anastasia, Provider Recruiter at **lanastasia@challiance.org** or via fax at (617) 665-3553. Cambridge Health Alliance Department of Provider Recruitment may be contacted at (617) 665-3555 or 1493 Cambridge Street Cambridge, MA 02139. We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law.

The work schedule that prevents burnout

The schedule is easier to change than the work itself

By John Nelson, MD, MHM

Burnout is influenced by a seemingly infinite combination of variables. An optimal schedule alone isn't the key to preventing it, but maybe a good schedule can reduce your risk you'll suffer from it.

Smart people who have spent years as hospitalists, working multiple different schedules, have formed a variety of conclusions about which work schedules best reduce the risk of burnout. There's no meaningful research to settle the question, so everyone will have to reach their own conclusions, as I've done here.

Scheduling flexibility: Often overlooked

Someone who typically works the same number of consecutive day shifts, each of which is the same duration, might suffer from the monotony and inexorable predictability. Schedules that vary the number of consecutive day shifts, the intensity or length of shifts, and the number of consecutive days off might result in lower rates of burnout. This is especially likely to be the case if each provider has some flexibility to control how her schedule varies over time.

Who really wants the same number of consecutive days worked and days off all the time? While a regularly repeating schedule has benefits, such as ease of coordinating with spouse and child care schedules, meaningful variation that the provider can control may be helpful for many people.

Personal time: Goes on the calendar first

Those who have a regularly repeating work schedule tend to work hard arranging such important things as family vacations on days the schedule dictates. In other words, the first thing that goes on the personal calendar are the weeks of work; they're "X-ed" out and personal events filled into the remaining days.

That's fine for many personal activities, but it means the hospitalist might tend to set a pretty high bar for activities that are worth negotiating alterations to the usual schedule. For example, you might want to see U2 but decide to skip their concert in your town since it falls in the middle of your regularly scheduled week of work. Maybe that's not a big deal (Isn't U2 overplayed and out of date anyway?), but an accumulation of small sacrifices like this might increase resentment of work.

It's possible to organize a hospitalist group schedule in which each provider's personally requested days off, like the U2 concert, go on the work calendar first, and the clinical schedule is built around them. It can get pretty time consuming to manage, but might be a worthwhile investment to reduce burnout risk.

A paradox: Fewer shifts and burnout risk

I'm convinced many hospitalists make the mistake of seeking to maximize their number of days off with the idea that it will be good for happiness, career longevity, burnout, etc. While having more days off provides more time for nonwork activities and rest/recovery from work, it usually means the average workday is busier and more stressful to maintain expected levels of productivity. The net effect for some seems to be increased burnout.

Consider someone who has been working 182 hospitalist shifts and generating a total of 2,114 billed encounters annually (both are the most recent national medians available from surveys). This hospitalist successfully negotiates a reduction to 161 annual shifts. This would probably feel good to anyone at first, but keep in mind that it means the average number of daily encounters to maintain median annual productivity would increase 13% (from 11.6 to 13.1 in this example). That is, each day of work just got 13% busier.

I regularly encounter career hospitalists with more than 10 years of experience who say they still appreciate – or even are addicted to – having lots of days off. But the worked days often are so busy they don't know how long they can keep doing it. It is possible some of them might be happier and less burned out if they work more shifts annually, and the average shift is meaningfully less busy.

The "right" number of shifts depends on a combination of personal and economic factors. Rather than focusing almost exclusively on the number of shifts worked annually, it may be better to think about the total amount of annual work measured in billed encounters, or wRVUs (work relative value units), and how it is titrated out on the calendar.

Other scheduling attributes and burnout: A quick take

I think it's really important to ensure the hospitalist group always has the target number of providers working each day. Many groups have experienced staffing deficits for so long that they've essentially given up on this goal, and staffing levels vary day to day. This means each provider has uncertainty regarding how often he will be scheduled on days with fewer than the targeted numbers of providers working.

Over time this can become a very significant stressor, contributing to burnout. There aren't any simple solutions to staffing shortages, but avoiding short-staffed days should always be a top priority.

All hospitalist groups should ensure their schedule has day-shift providers work a meaningful series of shifts consecutively to support good patient-provider continuity. I think "continuity is king" and influences efficiency, quality of care, and provider burnout. Of course, there is tension between working many consecutive day shifts and still having a reasonable lifestyle; you'll have to make up your own mind about the sweet spot between these to competing needs.

Schedule and number of shifts are only part of the burnout picture. The nature of hospitalist work, including EHR frustrations and distressing conversations regarding observation status, etc., probably has more significant influence on burnout and job satisfaction than does the work schedule itself.

But there is still lots of value in thinking carefully about your group's work schedule and making adjustments where needed. The schedule is a lot easier to change than the nature of the work itself.

"While having more days off provides more time for nonwork activities and rest/recovery from work, it usually means the average workday is busier and more stressful to maintain expected levels of productivity."

Dr. Nelson has had a career in clinical practice as a hospitalist starting in 1988. He is cofounder and past president of SHM, and principal in Nelson Flores Hospital Medicine Consultants. He is co-director for SHM's practice management courses. Contact him at john.nelson@nelsonflores.com.

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