



## → INSIDE

See how one large, urban ED has drastically reduced errors on the medication lists of medically complex patients destined for admission . . . . . 17

An array of simple strategies can prevent constant interruptions from causing provider frustration and errors, which can lead to patient harm . . . . . 20

FEBRUARY 2018

Vol. 30, No. 2; p. 13-24

## ED-based Intervention Connects Frequent Users With Program to Address Underlying Needs

*While the program has been successful at drastically curbing ED use in enrolled patients thus far, the ultimate aim is to transition patients to a primary care provider*

**F**requent ED users often are frustrating for emergency providers, particularly when patients with serious underlying needs are not addressed. Such patients may visit the ED every week or even more frequently, and yet they rarely present with a medical emergency, and there may be little a busy emergency clinician can do to help. In addition to increasing health-care costs, the people on both ends of such encounters may feel dissatisfied or discouraged.

However, a new program at Grady Memorial Hospital in Atlanta seeks to short-circuit this cycle of care so that patients with complex conditions are connected with the help they need without continually sapping emergency medicine resources. Called the Chronic Care Clinic (CCC), the program is just getting started, but early results show promise. Grady is set to expand the program in coming months.

Like many large, urban medical centers, the ED at Grady Hospital sees a large number of frequent users, but their motivations in seeking emergency care often are misjudged, explains **Hany Atallah**, MD, the chief of emergency medicine in the Grady Health System and medical director of the Emergency Care Center. “Many of these patients have chronic medical conditions and are concerned about what is going on with their health, which is why they come in frequently. They often have a feeling there is an emergency and want to make sure nothing bad is happening.”

The CCC was developed with frequent users in mind so that these patients who present with issues that are not commonly considered emergencies can develop a relationship with a primary care provider (PCP) who can better oversee the trajectory of their care. “The literature shows that you can

**RELIAS**  
Formerly AHC Media

**NOW AVAILABLE ONLINE!** VISIT [AHCMedia.com](http://AHCMedia.com) or **CALL** (800) 688-2421

Financial Disclosure: Physician Editor **Robert Bitterman**, Author **Dorothy Brooks**, Editor **Jonathan Springston**, Executive Editor **Shelly Morrow Mark**, and Editorial Group Manager **Terrey L. Hatcher** report no consultant, stockholder, speaker's bureau, research, or other financial relationships with companies having ties to this field of study.



## ED MANAGEMENT®

### ED Management®

ISSN 1044-9167, is published 12 times annually by AHC Media, a Relias Learning company, 111 Corning Road, Suite 250, Cary, NC 27518-9238. Periodicals Postage Paid at Cary, NC, and additional mailing offices.

**POSTMASTER:** Send all address changes to ED Management, Relias Learning, 111 Corning Road, Suite 250, Cary, NC 27518-9238.

### SUBSCRIBER INFORMATION:

Customer Service: (800) 688-2421  
Customer.Service@AHCMedia.com  
AHCMedia.com

### EDITORIAL EMAIL ADDRESS:

jspringston@reliaslearning.com

### SUBSCRIPTION PRICES:

Print: U.S.A., 1 year with free AMA PRA Category 1 Credits™: \$519. Add \$19.99 for shipping & handling.  
Online only: 1 year (Single user) with free AMA PRA Category 1 Credits™: \$469  
Outside U.S., add \$30 per year, total prepaid in U.S. funds

Back issues: \$82. Missing issues will be fulfilled by customer service free of charge when contacted within one month of the missing issue's date. GST Registration Number: R128870672.

**ACCREDITATION:** Relias Learning is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

Relias Learning designates this enduring material for 1.25 AMA PRA Category 1 Credits™.

Physicians should claim only credit commensurate with the extent of their participation in the activity.

Approved by the American College of Emergency Physicians for a maximum of 1.25 hour(s) of ACEP Category I credit.

This activity is intended for emergency physicians and other clinicians. It is in effect for 36 months from the date of the publication.

Opinions expressed are not necessarily those of this publication, the executive editor, or the editorial board. Mention of products or services does not constitute endorsement. Clinical, legal, tax, and other comments are offered for general guidance only; professional counsel should be sought in specific situations.

**AUTHOR:** Dorothy Brooks

**EDITOR:** Jonathan Springston

**EXECUTIVE EDITOR:** Shelly Morrow Mark

**EDITORIAL GROUP MANAGER:** Terrey L. Hatcher

**SENIOR ACCREDITATIONS OFFICER:** Lee Landenberger

Copyright© 2018 by AHC Media, a Relias Learning company. ED Management® is a registered trademark of AHC Media, a Relias Learning company. The trademark ED Management® is used herein under license. All rights reserved. No part of this newsletter may be reproduced in any form or incorporated into any information-retrieval system without the written permission of the copyright owner.

save a lot of money by doing this, and you actually end up providing better care, which is really what we want,” Atallah observes.

To get the CCC started, in February 2017 administrators analyzed hospital data to identify frequent ED users, Atallah notes.

“We wanted to start with success, so we began by enrolling patients who had actually shown a record of having shown up to clinic appointments in the past,” he says. “Maybe they didn’t have perfect attendance to these appointments, but we wanted people who were familiar with the clinic system and had used the clinic before so that we could basically re-introduce that to them.”

The process of identifying appropriate patients for the program has now morphed into an “ER Frequenter Registry,” explains **Kelley Carroll**, MD, the vice president and chief of ambulatory medicine in the Grady Health System. “The initial definition for inclusion in the registry was 12 ED visits in 12 months, and that produced a registry of about 600 patients.”

However, most of these patients were directed to a specialty behavioral health clinic or to substance abuse counseling, and administrators experienced difficulty connecting with another 30% of these patients. “Either they did not show up for their first visit [to the CCC] or we just could not connect with them,” Carroll notes.

A third group of patients either left without seeing anyone or didn’t present with any clinical information to determine whether they needed to be contacted. Consequently, the criteria for enrollment in the CCC have been modified to include patients who have visited the ED six times in six months, Carroll explains.

“Currently enrolled right now — we have 41 patients,” she says.

Patient navigators on site in the ED are charged with intervening with frequent users when they present for care. “[Navigators] will keep an eye on the track board and look for when a patient’s name pops up,” Atallah explains. “We have a little box that identifies the patient as a frequent utilizer of emergency services, so when they see that box checked, it is an easy way for them to look through all the patients we have and quickly identify [the high users].”

When a high-use patient is flagged, a patient navigator will take steps to expedite that patient through the ED process, and then make sure that patient is directed to the CCC. In the early days of the program, these patients were directed to a walk-in clinic that is just a stone’s throw from the ED, Atallah notes. However, Grady is in the process of moving the CCC to a separate space on campus called the Transition of Care Clinic.

“It is still on our main campus, but it is on the outpatient clinic side of the building,” Carroll explains. “The Transition of Care Clinic is seeing post-discharge and post-ED visit patients, and it is also handling quick follow-up for patients who are at high risk for readmissions.”

When the move to the new space is complete, the CCC essentially will operate under the umbrella of the larger Transition of Care Clinic and share some of the clinical staff with other programs housed there, but it will employ its own community health worker, RN, and advanced practice practitioner.

Frequent users who present for care to the ED receive same-day appointments in the CCC to facilitate the transition. The idea is for the

patients to realize that every time they come to the ED they are sent to the CCC, so they might as well just visit the CCC to begin with, Atallah observes.

## Prepare for Social Needs

Thus far, no patterns have emerged in terms of top diagnoses among high-use patients, but administrators have found that social limitations rather than chronic diseases have been the primary driver behind these patients' frequent ED use.

"Most of them need transportation; a good percentage of them — about 30% — require housing; and 16 out of the 41 have needed linkages to family resources," Carroll shares. "Really, [the biggest needs] have been for social interventions more than titration of medicines or management of chronic diseases."

Navigators work with community health workers to link patients with the resources those patients require. "Those are the people on the ground really making it happen for the patient," Carroll says. "We do have a social worker, and we have an RN care resource manager who acts as a sort of pilot ... for the social needs of the patient."

For instance, community health workers might visit patients in their homes to find out what barriers may be keeping them from following their plan of care or preventing them from making it to scheduled clinic appointments, resulting instead in ED visits, Carroll notes. In other cases, the community health workers may walk appropriate patients to financial services to get them signed up for Medicaid.

"These patients have difficulty navigating the medical system, so the easiest thing for them to do

## EXECUTIVE SUMMARY

Grady Memorial Hospital in Atlanta established a Chronic Care Clinic (CCC) to take over the care of high-needs patients who frequent the ED. Navigators intervene with these patients when they present to the ED and connect them to the CCC, which offers an array of services to meet several social and medical needs. The goal of the program is to eventually transition these patients to primary care so their underlying needs can be addressed.

- The program targets patients who have visited the ED six times in six months.
- In the current cohort of 41 patients enrolled in the program, ED visits per quarter have been reduced from 185 to 84, saving 100 visits per quarter for the cohort.
- The program has produced 65% fewer ED visits, 17% fewer inpatient admissions, and 146% more outpatient or ambulatory visits, and the cohort's monthly costs have declined by 50%.
- Thus far, administrators have found that social limitations rather than chronic diseases have been the primary driver behind these patients' frequent ED use.

is walk into the ED. It is hard for them to understand how to pick up the phone and call for a cardiology appointment, figure out how to get Medicaid, or how to get their Medicare part B coverage," Carroll explains. "They don't have self-management skills, so the navigator and the community health worker are teaching them those skills along with the RN."

Pharmacists are part of the CCC team, too, Atallah adds. "These patients have a hard time understanding their health and what needs to happen," he says. "You really have to very much hold their hands through the whole process until they learn to really start doing these things themselves."

One other resource that is at the disposal of the CCC program is Mobile Integrated Health (MIH), a paramedicine program in the Grady Health System that also helps break down barriers to care for high-needs patients who frequent the ED. An MIH team consists of a nurse practitioner and a paramedic who can

visit a patient's home and address any challenges he or she may face.

"Once the CCC establishes someone as a patient, it might send a referral to MIH to conduct a home evaluation, explains **Michael Colman**, MPA, NRP, vice president, EMS Mobile Advanced Practice, Grady Health System. "When a patient is in the doctor's office, it might seem like everything is OK, but when [patients] get home, they might have no food and no heat. They might be living in an abandoned building. So the nurse practitioner and the paramedic can go out to the residence and give the providers some insight [on their patients] they don't have to try and help set up some strategies so that the patient receives better care."

The MIH team may review a patient's prescriptions, and give the patient an opportunity to ask questions in a non-intimidating, non-rushed kind of environment.

"We have more time [than a typical doctor's visit] ... and we can come back the next day," Colman notes.

In the early days of the program, the MIH team would visit patients prior to their first CCC appointment, but team members found it was more effective to see patients afterward because not every patient requires a home visit, observes **Matthew Thornton**, EMT-P, the district supervisor for Grady EMS MIH. “A lot of the patients we go to see have been enrolled [in the CCC], but then miss their appointments, so we get a referral and go out there and see what is wrong,” he says.

Thornton notes that the types of patients he encounters from the CCC run the gamut.

“We have patients in their 70s and 80s with heart failure and COPD who come to the ED all the time, and we have patients in their 20s who have trouble with their diabetes,” he says.

## Careful With Transitions

When patients can manage their required healthcare tasks on their own, CCC staff members take steps to bridge these patients from the CCC to primary care.

“So far, we have had eight patients we have transitioned into primary care, and we have learned a lot from that experience,” Carroll says. “A few of the patients have bounced back [to the CCC] because the primary care [office] didn’t have the same wrap-around services with all these ancillary providers around them, so that is one lesson learned.”

To correct this deficit, Grady is working to build such services around primary care. “We will probably need a navigator and a community health worker to actually stay with the patients or at least check in with them for at least a month after transitioning them to make sure they are sticking

with primary care,” Carroll explains. Despite this issue, the program is working as intended. The cohort of 41 patients enrolled in the program logged 185 ED visits per quarter prior to enrollment in the CCC program.

“Post-enrollment, they now have 84 visits per quarter, so it is saving 100 visits per quarter for that cohort,” Carroll notes. “Looking at utilization, we have 65% fewer ED visits, 17% fewer inpatient admissions, and 146% more outpatient or ambulatory visits, and their monthly costs have declined by 50%.”

“TROUBLESHOOT WITH PATIENTS WITH WHOM YOU ARE LIKELY TO BE SUCCESSFUL. THAT WAS A BIG HELP FOR US.”

Encouraged by the data, administrators plan to expand the program further in 2018.

“We will be able to enroll more patients because we will have more staff as part of the Transition [of] Care Clinic,” Carroll notes. “We will have a behavioral health professional there full time and two full-time PharmDs, so we will be able to see some of the patients who have been deemed inappropriate [for the program thus far] because their primary diagnosis was substance abuse.”

That should be a big help because roughly 50% of the ER Frequenter Registry in 2017 were patients with a primary diagnosis of substance abuse, but the CCC did not have the infrastructure in place to manage those patients. “We did have a

substance abuse counselor in the ED who would try a brief intervention with the patient, and then bridge them [to treatment], but most of those patients did not follow up,” Carroll explains. “We will now have more staff concentrated on that patient population.”

Atallah’s advice to other EDs that face similar challenges in meeting the needs of frequent users is to start small initially and set up the organization for success. “Troubleshoot with patients with whom you are likely to be successful. That was a big help for us,” he says. “Also, you can never plan enough. Understand all the moving parts that you are going to need to make the program work.”

Further, Carroll advises organizations to remember the need to hire intensive social and family experts.

“We have a social worker who seems to magically do a good job of finding places for people to live,” she says. “Pay attention to the social aspects because the reason these people come to the ED frequently is very important.” ■

## SOURCES

- **Hany Atallah**, MD, Chief, Emergency Medicine, Grady Health System; Medical Director, Emergency Care Center, Grady Memorial Hospital, Atlanta. Email: hatalla@emory.edu.
- **Kelley Carroll**, MD, Vice President and Chief of Ambulatory Medicine, Grady Health System, Atlanta. Phone: (404) 616-1000.
- **Michael Colman**, MPA, NRP, Vice President, EMS Mobile Advanced Practice, Grady Health System, Atlanta. Email: mcolman@gmh.edu.
- **Matthew Thornton**, EMT-P, District Supervisor, Grady EMS Mobile Integrated Health, Grady Health System, Atlanta. Email: mthornton@gmh.edu.

# Hospital Leverages Pharmacists, Trained Technicians to Reduce Medication History Errors

*To reduce medication errors, investigators make the case that 'universal precautions' should be developed and applied to electronic medical record-based medication histories*

**M**edication errors are one of the most commonly cited reasons for adverse events and it is easy to see why, particularly in the case of patients with complex conditions who are taking multiple drugs.

“Patients have medications generated at a variety of different encounters, and when people go to see their physicians, generally it is a medical assistant who will enter that information into the electronic medical record [EMR], but at every encounter someone else is actually entering that information,” explains **Rita Shane**, PharmD, FASHP, FCSHP, the chief pharmacy officer at Cedars-Sinai Medical Center in Los Angeles.

Frequently, patients do not recall all the medications they are taking, let alone what dosages they are prescribed, and medical assistants may not be able to understand all the elements of a medication order, so it is not unusual to see incomplete or incorrect entries in the EMR, Shane observes. This presents problems when a patient arrives at the ED, and then is determined to require inpatient care.

“When patients are admitted to the hospital, those [medication] lists are the basis for the inpatient orders as well as the discharge orders, and our study shows that frequently — an upsetting percentage of the time — these lists have errors,” Shane notes. “The study demonstrated [an average of] eight errors for a high-risk patient, and even in quality improvement studies that I have been doing since 2011, that number shows up

all the time. It is either seven or eight errors for high-risk patients.” These errors can lead physicians to order the wrong medications or incorrect dosages, Shane adds.

Recognizing that more time and expertise must be employed to ensure medication lists for these patients are accurate prior to admission from the ED, Cedars-Sinai developed an intervention whereby either pharmacists or trained pharmacy technicians who are supervised by pharmacists would take over the task of compiling accurate medication histories. In a three-arm, randomized trial involving 306 medically complex patients, investigators compared the results of directing pharmacists or pharmacy technicians to compile medication histories with

usual care, in which this task typically was handled by a nurse.

The results were dramatic: Investigators found that mistakes in medical histories as well as drug orders could be reduced by more than 80% if either pharmacists or trained pharmacy technicians compiled the medication histories.<sup>1</sup>

## Start With High-risk Patients

In the study, investigators focused only on patients who were taking 10 or more medications routinely, patients with a history of acute myocardial infarction or congestive heart failure (CHF) on their problem list,

### EXECUTIVE SUMMARY

To reduce the high number of medication errors observed in the medication lists of medically complex patients who are admitted to the hospital from the ED, Cedars-Sinai Medical Center in Los Angeles developed an intervention whereby pharmacists or trained pharmacy technicians review and prepare medication histories rather than rely on usual care for this task.

- In a three-arm, randomized trial involving 306 medically complex patients destined for admission from the ED, investigators found that mistakes in medical histories as well as drug orders could be reduced by more than 80% if either pharmacists or trained pharmacy technicians compiled medication histories compared to usual care.
- The study results have prompted Cedars-Sinai to implement the intervention routinely in the ED, and the targeted population is expanding gradually to include more patients.
- Investigators note other hospitals have demonstrated that rather than nurses spending more than 40 minutes preparing medication histories, it is more cost-effective to use a trained pharmacy technician who is under the supervision of a pharmacist.

patients with transplants, and patients admitted from a skilled nursing facility (SNF). Additionally, patients taking an active blood thinner, insulin, or another drug known to have a narrow therapeutic index were included in the target group.

The strong results prompted the hospital to implement the intervention routinely, but Shane notes that she is enlarging the targeted group gradually.

“Our goal right now is to see if we can actually go beyond the high-risk patients and get to all of the patients that are being admitted from the ED,” she says. “We have been targeting anyone over 65 who is on greater than seven medications that they take routinely, so we have been trying to incrementally increase the population we reach to try to ensure their medication lists are accurate.”

The study demonstrated that both pharmacists and trained pharmacy technicians were able to obtain the medication lists safely and more accurately than usual care. Shane notes that this makes sense given the fact that clinicians are tasked with many other responsibilities in the ED.

“Nurses and physicians are focused on stabilizing the patient. The pharmacists and the pharmacy technicians are focused on the medications. That is our area,” she says. “We say that to be able to take care of patients [requires] a three-legged stool: the physician, the pharmacist, and the nurse. You need all three to make sure that patients receive the care they need.”

Shane stresses that the pharmacy technicians are trained and procured to take on the role of preparing medication histories. The task can involve studying claims data as well as consulting with family members, other providers, and pharmacies that have filled prescriptions for the patient. The pharmacy technicians also

will examine what over-the-counter (OTC) medications a patient takes.

“We really try to get as accurate a list as possible,” she explains. “And we check with the patients to make sure they are indeed taking the medications that the prescription claims reflect.”

It’s a time-consuming task, and Shane notes that other hospitals have demonstrated that rather than asking nurses to spend more than 40 minutes preparing medication histories, it is more cost-effective to use a trained pharmacy technician.

“A number of hospitals have actually added pharmacy technicians for this expressed purpose because the way the EMR works, the errors just get promulgated through the inpatient course,” Shane explains. “Pharmacists do catch a lot of the egregious errors, but there is a potential that these errors could continue if an order and a dose don’t look unusual, and a thorough history is not taken. Then, [the error] can become the basis of a discharge prescription and subsequent orders when the patients go to see their various doctors.”

## Complete Task Before Admission

At Cedars-Sinai, the pharmacy technicians are made aware of patients who require medication histories through a tracking board on the ED’s EMR, Shane notes.

“[Technicians] know who is being admitted, and they will focus on patients who are high risk,” she explains. By looking through the claims information, technicians can discern which patients meet the criteria. “We want to get as many histories as possible,” Shane adds. “If the patient doesn’t speak English, we will get a translator who is certified

to translate in the patient’s native language.” Once a pharmacy tech has consulted with the patient and completed work on the medication history, he or she transcribes any changes to the medication list into the EMR and marks the list as updated and reviewed.

“The goal is to get as many [medication histories] done as possible while the patients remain in the ED because physicians then order off that medication list,” Shane notes. “Physicians will sometimes tell us that they are waiting for us to finish the history before writing their orders.”

While there have been cases in which the medication history has not been completed before the patient is admitted, the pharmacy technician will aim to complete the process within 24 hours of admission, Shane observes. For instance, this could occur when a patient arrives in the ED in the middle of the night, a time when resources are limited.

The intervention has uncovered several significant medication errors embedded in patient EMRs, Shane says. These range from doses of insulin that a patient may have required at one time, but that are no longer correct, to faulty information regarding prescriptions for blood thinners.

“Roughly 39% of medication history errors have the potential to cause moderate to severe harm,” she says. “Blood thinners are notorious for causing problems with dosing, and with CHF and diabetic patients, it is really important to get their medications right.”

## Integrate Process Into Workflow

Hospitals interested in employing this type of intervention must first define their own high-risk population

to determine what resources to put in place, Shane observes. She adds that it is critical to determine where the intervention can be implemented most effectively into the ED workflow.

“Timing is everything. Patients may be going for different imaging tests or different evaluations, so one of the lessons [we] learned is to try to make sure we were not interfering with other things going on with the patient,” Shane explains. “Also, make sure that the other providers know that you are doing this work so that the patient isn’t being asked the same questions by multiple different clinicians.”

Further, if a patient brings in a medication list, make sure that it is either scanned or maintained so that the information is not lost, and that it is directed into the correct EMR, Shane advises. “The logistics and the workflows need to be worked out very collaboratively with the other clinicians who work in the ED,” she adds.

**Joshua Pevnick**, MD, MSHS, the lead author of the study who serves as an assistant professor of medicine in the department of general internal medicine and as associate director of the division of informatics at Cedars-Sinai, notes that while the intervention has worked well at Cedars-Sinai, he advises other organizations to evaluate their goals, resources, and patient population first to see if the intervention is a good fit for their work setting.

“Smaller organizations may not have enough patient volume in the ED, especially of these older and sicker patients, to justify stationing pharmacy personnel in the ED all the time unless [these personnel] are also contributing in other ways,” he explains. “One resource that can help hospitals do this type of initial assessment is the MARQUIS [Multi-Center Medication Reconciliation

Quality Improvement Study] toolkit, which is available for free online from the Society of Hospital Medicine.”<sup>2</sup>

## Maintain Quality Control

Every discipline is likely to welcome pharmacy assistance with the compiling of medication histories, Shane says.

“For busy clinicians, this task is something that adds to their work, and they would rather have someone do it who is most knowledgeable about the medications,” she says. “The physicians have said they are grateful that we do this, and the nurses are as well. I recently surveyed the nurses, and they indicated they would be very happy if we could do all [the medication histories].”

Shane observes that there is a grammar to medication orders that other healthcare workers don’t always understand.

“There is the drug, the dose, the route, the frequency, the duration, and the dosage form,” Shane notes. Also, there are indications for drugs that are directed to be used on an “as-needed” basis. “Knowing what a complete medication order sentence is may not be something that busy clinicians are aware of,” Shane explains. “These days, there are so many unusual dosage forms with sustained release and immediate release drugs, and getting those mixed up can actually cause harm.”

While pharmacy technicians complete training modules to expertly prepare the medication histories, Cedars-Sinai also leverages first-year pharmacy students to perform this task.

“That is one of the first things pharmacy students learn when they get to pharmacy school is how to take a medication history,” Shane notes.

“We try to leverage different individuals to do this, but all the individuals have the training to do it.”

Throughout the study period, investigators used reference standard admission medication histories to assess the quality of the admission medication histories used clinically, Pevnick says. However, he notes that the National Quality Forum recently endorsed a quality measure that assesses admission medication history quality in the same way for a small number of randomly selected patients each month.

“We believe this to be a practical way of ensuring continued success with this and other medication reconciliation interventions,” he says. (See *Measure 2456 under “Find Measures” at: <http://bit.ly/2C5X0hA>*.)

Pevnick adds that Cedars-Sinai plans to study a more refined intervention that investigators hope will be able to streamline the gains documented in their initial study. At the same time, Shane plans to apply the intervention to more patient populations beyond the ED. In fact, given the high rate of medication errors and their associated risks, Shane makes the case that “universal precautions” should be developed and applied to EMR-based medication histories or lists in much the same way that they have been developed to deal with infections from blood-borne pathogens.<sup>3</sup>

“If the information [on the medication histories] is inaccurate, everything is inaccurate,” Shane observes. “This is something we should look at to keep our patients safe, especially when they are in hospitals and are so vulnerable.” ■

## REFERENCES

1. Pevnick JM, Nguyen C, Jackevicius CA, et al. Improving admission medication reconciliation with

pharmacists or pharmacy technicians in the emergency department: A randomised controlled trial. *BMJ Qual Saf* 2017 Oct 6. pii: bmjqs-2017-006761. doi: 10.1136/bmjqs-2017-006761. [Epub ahead of print].

2. Agency for Healthcare Quality and Research. Multi-Center Medication Reconciliation Quality Improvement

Study (MARQUIS) Toolkit. Available at: <http://bit.ly/2lflMkG>. Accessed Dec. 28, 2017.

3. Shane R. Why “universal precautions” are needed for medication lists. *BMJ Qual Saf* 2016;25:731-732.

## SOURCES

- **Joshua Pevnick**, MD, MSHS, Assistant Professor of Medicine,

Department of General Internal Medicine; Associate Director, Division of Informatics, Cedars-Sinai Medical Center, Los Angeles. Email: Joshua.Pevnick@cshs.org.

- **Rita Shane**, PharmD, FASHP, FCSHP, Chief Pharmacy Officer, Cedars-Sinai Medical Center, Los Angeles. Email: Shane@cshs.org.

# Use Simple Strategies to Manage Frequent Interruptions, Minimize Potential for Errors

*Although interruptions occur in many other specialties, emergency physicians are particularly affected by frequent disruptions, many of which are important and necessary, but which lead to errors and frustration*

It's no secret that EDs are busy, fast-paced environments. Clinicians going into this field recognize that pressure and stress are part of the package. However, how they handle this stress, particularly how they manage the frequent disruptions that go along with repeated

interruptions, can make a difference in terms of patient safety as well as a clinician's own well-being.

New research suggests there is ample room for improvement in this area. Through the use of relatively simple strategies, providers could act more proactively to mitigate the

potentially harmful effects that go along with repeated interruptions while performing important health-care tasks over the course of a shift in the ED.<sup>1</sup>

“What we know about task disruptions is that they are highly, highly disruptive, and what we also know about the ED is that task interruptions are very frequent,” explains **Raj Ratwani**, PhD, the scientific director and senior research scientist at the National Center for Human Factors in Healthcare at the MedStar Institute for Innovation in Washington, DC.

To quantify the problem, Ratwani notes studies have shown that an emergency physician might be interrupted anywhere between 10 and 15 times per hour. Those interruptions result in errors that can cause patient harm and the potential for patient harm.

“[The interruptions] also are very disruptive to the cognitive processes of the emergency physician, meaning that they disrupt the way the physician is thinking, working, and reasoning with information,” he explains.

## EXECUTIVE SUMMARY

Research shows that emergency physicians may be interrupted 10-15 times per hour, leading to the potential for errors and patient harm. However, experts note that an array of relatively simple strategies can help clinicians better manage these interruptions to both minimize related mistakes and potentially ease the frustration that results from continuous interruptions.

- Experts note that while interruptions related to computer work are most prevalent, they also can occur in other circumstances, such as when physicians are working on paperwork or walking to see a patient.
- When performing an important task, physicians should feel empowered to delay an interruption until the task is completed in appropriate circumstances, according to investigators.
- Other strategies that can help physicians better manage interruptions include waiting for logical break points before handling an interruption and using environmental cues so that it will be easier to resume work on the original task once an interruption has been handled.
- Frustration with interruptions can be a powerful motivator for clinicians to learn and practice new strategies for better managing the way they deal with such work disruptions.

In addition to causing errors and disrupting thought processes, disruptions are very frustrating to physicians, Ratwani notes.

“They contribute to the problems around physician burnout and physician stress,” he adds.

## Use Delay Tactics

To paint a picture of how these disruptions commonly lead to errors, Ratwani offers the example of a physician who is standing at a workstation and placing a medication order for a patient.

“The physician might get interrupted by a nurse asking whether a patient in a particular room is allowed to eat,” he says. “The physician may direct his or her attention to that nurse to answer the question and then come back to the screen and input incorrect information or skip a step when entering important information on the medication order.”

Alternatively, when a physician is placing a medication order for patient A, a nurse might come by and say that patient B needs a medication order right away. In this instance, the physician may go to place the medication order for patient B without changing the screen, inadvertently ordering a medication for the wrong patient.

“That is a mix-up that occurs using the health information technology [IT] system when physicians get interrupted and their thought processes get disrupted,” Ratwani observes.

Although interruptions related to computer use are the most prevalent, they can occur under many other circumstances as well, such as while a physician is reviewing paperwork or even while he or she is walking

to see a patient in a room, Ratwani explains. The physician may be anticipating what questions to ask that patient or formulating a possible diagnosis in advance of an encounter, he says. However, this thought process can be disrupted by a nurse or a tech who stops the physician to ask about a different patient.

“Where we see fewer interruptions is actually in the patient room itself, so people generally recognize that is protected time between the physician and the patient,” Ratwani adds.

Of course, many interruptions are indeed necessary and important. However, there are strategies clinicians can use to better manage them so that interruptions are less likely to lead to errors. For example, if clinicians recognize they are performing a high-risk task and someone begins to interrupt them, clinicians can move to delay or defer the interruption.

“You can ask the [interrupting person] to wait a minute and then complete your task, or you can ask them to come back at another time,” Ratwani suggests. “At a very base level, that is the first thing that clinicians can do, and they should feel empowered to do that when they recognize that they are doing something that should not be interrupted.”

## Look for Break Points

Further, Ratwani points to three primary strategies available for cases in which clinicians decide that they need to accept and engage in the interruption. In these instances, the goal is to reduce the disruptiveness of the interruption, he observes. Ratwani notes that one way to do this is to set up environmental cues or what is essentially a reminder system so

that clinicians can easily go back to the task they were performing once they have handled the interruption.

For example, say a clinician is in the process of placing a medication order, Ratwani offers. “If you are working on the computer and you leave your mouse right where you were last working — the field where you were just about to put information in, and you then turn to the interrupter and deal with the interruption, when you come back you will then know where you were in the ordering process,” he says. “If you deliberately set that up, it helps you to remember to go back to that position.”

An alternative to using mouse placement as an environmental cue involves placing a sticky note right where one left off in the ordering process when the interruption occurred. For instance, this could be right at the point of entering the dose information for a particular patient.

“That gives you that extra little reminder that this is what you were last doing,” Ratwani notes.

A second strategy that can be helpful in minimizing missteps due to interruptions is what Ratwani calls memory rehearsal. “The basic idea is when you are first getting interrupted, if you repeat to yourself the goal or the task that you are working on, it helps you to recall that memory once the interruption is over,” he explains.

The way this would work is if a clinician is placing a medication order and is interrupted, before moving on to engage in the interruption the clinician would take a moment to repeat what he or she is doing.

“That helps the memory element in your head stay highly activated so that the minute you come back to the task [after dealing with the

interruption], it is easier for you to recall what you were doing,” Ratwani explains.

Finally, a third strategy that can help clinicians better manage interruptions involves continuing to work at the original task until they get to what Ratwani refers to as a break point, a place in the task from which it will be easier to resume the activity after the interruption has been addressed.

“If you are reading a paragraph of text, and you get interrupted and stop reading mid-sentence, that is a difficult place to come back to because you haven’t formalized and finished that complete sentence or that complete task; whereas if you break at the end of the sentence or you break at the end of the paragraph, it is easier for you to come back,” Ratwani observes. “Similarly, if you are working on a task of placing a medication order, instead of stopping while you are typing in the dosage information, if you just give it 10 more seconds and complete that dosage information — or even get to a strong stopping point in the medication task itself — it becomes easier to resume. Actually recognizing where you are stopping your work and being deliberate about where you stop your work is another great strategy.”

## Use Frustration as Motivator

Unfortunately, while such strategies are relatively simple and straightforward, research completed by Ratwani and colleagues suggests that emergency providers are not using the tactics in significant numbers. This, despite the fact that emergency physicians often are exasperated by constant interruptions.

“What we are finding is that there is actually a pretty big appetite [for new solutions] because physicians are getting so frustrated with the number of times they are getting interrupted,” Ratwani notes.

“Number one, they recognize themselves that [interruptions] can be unsafe, and number two, they are really stressful.”

In fact, Ratwani says that several physicians have contacted his group at the Institute for Innovation to ask for pointers on how to better manage interruptions.

RESEARCH COMPLETED BY RATWANI AND COLLEAGUES SUGGESTS THAT EMERGENCY PROVIDERS ARE NOT USING THE TACTICS IN SIGNIFICANT NUMBERS.

“We can do this very quickly. It doesn’t have to involve expensive training, and then it involves the physician putting the strategies into practice,” he offers. “They have to really think about the way they do their work and the way they handle interruptions, and then practice using these strategies.”

Most physicians can acquire and adapt the practices to their own work environments quite readily, Ratwani observes.

“Physicians are incredibly bright, and many of them already have some

of their own strategies in place, so when you get them into the meta-cognitive process of thinking about how they think and how they do their work, they are quite good at formulating strategies,” he says.

“Everyone has their own way of ... tracking which patients they have seen and tracking which patients need further attention, so they can quickly adopt these practices and bring them into their own workflow and their own work process.”

While medical personnel always seem open to considering new approaches when an error has occurred, Ratwani notes that he has found physicians most receptive to new solutions in this area when they see how much the interruptions are affecting their work. “It is when they’ve just recognized that they are leaving work so frustrated and stressed, and they can see that they can’t get anything done effectively because of all the interruptions in their environment,” he explains.

Certainly, IT prompts could help EDs implement some of the strategies that Ratwani recommends. For example, given that computer systems can detect when there is a period of no activity, they could then be programmed to highlight a field where the user was engaged last or construct arrows showing the last three steps the user completed before leaving the computer to handle an interruption.

“There are many cues that could be introduced computationally that would alleviate the memory burden on the physician,” Ratwani explains.

## Consider Unique Challenges

Other high-risk industries such as defense and aviation have recognized

the problems associated with interruptions and have devised ways to minimize them, Ratwani notes. For example, he says sterile cockpits are mandated during takeoffs and landings, eliminating the possibility of any interruptions during these critical periods. However, healthcare is unique in some ways.

“The challenge in emergency medicine is that oftentimes the interruptions are a necessary part of delivering care,” Ratwani laments. “Not all interruptions are bad. Sometimes you need to be interrupted. If you have a patient who is coding or a high-severity patient who has just come in, the physician wants to know and needs to know.”

This is why strategies to manage these interruptions are important, Ratwani observes. “You can’t just shut down the interruptions and make [the ED] a completely sterile environment. That won’t work,” he adds.

Further, while Ratwani’s current research focuses on physicians, he stresses that interruptions affect other types of healthcare personnel as well.

“Other researchers have looked at how often nurses get interrupted and how often other types of clinicians in emergency medicine get interrupted, and interruptions happen across the board,” he says. “Now, it is at varying levels of frequency, of course, and probably at varying levels of severity, depending on the tasks [the clinicians] are taking on.”

For instance, Ratwani notes that his group found that radiologists get interrupted between nine and 10 times per hour, enough to be highly disruptive to their work. “The problem is pervasive across healthcare, [although] emergency medicine certainly seems to be where there are far more frequent disruptions

compared to other clinical environments,” he adds.

## Minimize Need for Interruptions

Knowing that interruptions are highly stressful, investigators are evaluating the physiological response of emergency physicians to their work environment.

“We are looking at their heart rate, heart rate variability, and respiratory rate so that we can try to reduce the level of stress in our physicians,” Ratwani explains.

Further, now that it is clear emergency physicians are not employing the kinds of strategies that could help them manage interruptions as readily as they could, researchers are trying to find ways to instill these strategies into their practice without placing added burdens on physicians or the ED.

“Physicians have enough training they have to go through, so we really don’t want to add another training around interruptions,”

Ratwani notes. “If we can take [this information] and layer it into trainings or simulations that physicians are already doing, I think that would be the best approach.”

A third investigative project is focused on finding ways to minimize the need for interruptions in the first place. Ratwani says that it is a matter of looking at the interruptions problem in a more holistic way to root out inherent shortcomings with the health IT system, processes, or workflows that may be driving the need for interruptions. ■

## REFERENCE

1. Ratwani RM, Fong A, Puthumana JS, Hettinger AZ. Emergency physician use of cognitive strategies to manage interruptions. *Ann Emerg Med* 2017;70:683-687.

## SOURCE

- **Raj Ratwani**, PhD, Scientific Director, Senior Research Scientist, National Center for Human Factors in Healthcare, MedStar Institute for Innovation, Washington, DC. Raj.m.ratwani@medstar.net.

## CME OBJECTIVES

After completing this activity, participants will be able to:

1. Apply new information about various approaches to ED management;
2. Discuss how developments in the regulatory arena apply to the ED setting; and
3. Implement managerial procedures suggested by your peers in the publication.

## COMING IN FUTURE MONTHS

- Using IT solutions to improve communication between EMS and the ED
- Optimizing the care and management of patients who present to the ED with concussion
- Practicing shared decision-making in the emergency setting
- Room for improvement in ED-based screening for HIV



## ED MANAGEMENT

### PHYSICIAN EDITOR

**Robert A. Bitterman, MD, JD, FACEP**  
President  
Bitterman Health Law Consulting Group

### EDITORIAL ADVISORY BOARD

**Nancy Auer, MD, FACEP**  
Vice President for Medical Affairs  
Swedish Health Services, Seattle

**Kay Ball, PhD, RN, CNOR, FAAN**  
Professor of Nursing,  
Otterbein University,  
Westerville, OH

**Larry Bedard, MD, FACEP**  
Senior Partner  
California Emergency Physicians  
President, Bedard and Associates  
Sausalito, CA

**Richard Bukata, MD**  
Medical Director, ED, San Gabriel (CA) Valley Medical  
Center; Clinical Professor of Emergency Medicine, Keck  
School of Medicine, University of Southern California  
Los Angeles

**Diana S. Contino, RN, MBA, FAEN**  
Executive Director, Accountable Care Organization  
Memorial Care Health System  
Fountain Valley, CA

**Caral Edelberg, CPC, CPMA, CAC, CCS-P, CHC**  
President, Edelberg Compliance Associates  
Baton Rouge, LA

**Gregory L. Henry, MD, FACEP**  
Clinical Professor, Department of Emergency Medicine  
University of Michigan Medical School  
Risk Management Consultant  
Emergency Physicians Medical Group  
Chief Executive Officer  
Medical Practice Risk Assessment Inc.  
Ann Arbor, MI

**Marty Karpriel, MPA, FACHE, FHFMA**  
Emergency Services Consultant  
Karpriel Consulting Group Inc.  
Long Beach, CA

**Thom A. Mayer, MD, FACEP**  
Chairman, Department of Emergency Medicine  
Fairfax Hospital, Falls Church, VA

**Larry B. Mellick, MD, MS, FAAP, FACEP**  
Professor of Emergency Medicine  
Professor of Pediatrics  
Department of Emergency Medicine  
Augusta University, Augusta, GA

**Robert B. Takla, MD, FACEP**  
Medical Director and Chair  
Department of Emergency Medicine  
St. John Hospital and Medical Center, Detroit

**Michael J. Williams, MPA/HSA**  
President, The Abaris Group  
Walnut Creek, CA

Interested in reprints or posting an article to your company's site? There are numerous opportunities for you to leverage editorial recognition for the benefit of your brand. Call us at (800) 688-2421 or email us at [Reprints@AHCMedia.com](mailto:Reprints@AHCMedia.com).

Discounts are available for group subscriptions, multiple copies, site-licenses, or electronic distribution. For pricing information, please contact our Group Account Managers at [Groups@AHCMedia.com](mailto:Groups@AHCMedia.com) or (866) 213-0844.

To reproduce any part of AHC newsletters for educational purposes, please contact The Copyright Clearance Center for permission:

Email: [info@copyright.com](mailto:info@copyright.com)  
Website: [www.copyright.com](http://www.copyright.com)  
Phone: (978) 750-8400

## CME INSTRUCTIONS

To earn credit for this activity, please follow these instructions:

1. Read and study the activity, using the provided references for further research.
2. Log on to **AHCMedia.com** and click on [My Account](#). First-time users must register on the site using the eight-digit subscriber number printed on their mailing label, invoice, or renewal notice.
3. Pass the online tests with a score of 100%; you will be allowed to answer the questions as many times as needed to achieve a score of 100%.
4. After successfully completing the test, a credit letter will be emailed to you instantly.
5. Twice yearly after the test, your browser will be directed to an activity evaluation form, which must be completed to receive your credit letter.

## CME QUESTIONS

1. **Kelley Carroll, MD, vice president and chief of ambulatory medicine in the Grady Health System in Atlanta, explains that roughly 50% of the "ER Frequenter Registry" in 2017 were patients with a primary diagnosis of:**
  - a. substance abuse.
  - b. diabetes.
  - c. COPD.
  - d. congestive heart failure.
2. **According to Rita Shane, PharmD, FASHP, FCSHP, the chief pharmacy officer at Cedars-Sinai Medical Center in Los Angeles, roughly what percentage of medication history errors potentially can cause moderate to severe harm?**
  - a. 12%
  - b. 26%
  - c. 39%
  - d. 50%
3. **According to studies cited by Raj Ratwani, PhD, the scientific director and senior research scientist at the National Center for Human Factors in Healthcare at the MedStar Institute for Innovation in Washington, DC, how many interruptions might an emergency physician experience per hour?**
  - a. 5-10
  - b. 10-15
  - c. 15-20
  - d. 20-25



**18**  
pediatric-trauma  
specific CME/CE

## Small Patients. Large Challenges.

Make sure you're prepared.

Written by leading experts in the field, AHC Media's *Pediatric Trauma 2018: Practical Application of the Latest Standards of Care* is your go-to digital resource for the latest on how to decrease risk, stabilize, and improve outcomes for your smallest patients.

**Save \$50 With Promo Code  
PTCPUB**

Visit [AHCMedia.com/PTC2018](http://AHCMedia.com/PTC2018)

Effort 3851