The good news is that there is growing interest in and scholarship on this topic. Based on a review of the literature and my own research, I offer the mnemonic POISED (prepare, orient, information gathering, share, educate, debrief) as a memory aid for developing and reinforcing good computer use habits.

**Prepare** | In busy primary care practices, the time-honored habit of reviewing the patient’s medical record before entering the examination room may be overlooked and several precious minutes of face-to-face time may be spent silently reviewing the medical record with the patient in the examination room. This method is inefficient and can sometimes prove embarrassing when a patient reminds the physician of why he or she is there (e.g., “You told me to schedule a follow-up for my diabetes care.”). Preparation for the visit is key to efficiency and improved patient experience and trust.

**Orient** | One best practice is to spend the first 1 to 2 minutes of the visit engaged in dialogue with the patient without using the computer at all. Once a welcoming atmosphere has been established, partnership statements such as, “I’m going to be using the computer from time to help me keep track of things” will alert the patient of your intent and rationale for using the computer. In a study of medical malpractice and communication, orientation statements proved to be protective while their absence was associated with a history of malpractice.

**Information Gathering** | Recent scholarship suggests that some parts of the encounter should be centered on the physician and others should be centered on the patient or physician-patient relationship. Using the computer during information-gathering segments of the visit is both appropriate and expected by patients. Although this process may seem counterintuitive, if you do not enter information into the computer from time to time, you risk patients questioning how seriously you take their concerns. Timing is everything.

**Share** | The computer is a wonderful source of information and patients appreciate it when they feel like they are partners in the care process. Turning the computer screen so patients can see what you are typing has the double benefit of partnership and serves as a way to check that what is being typed is what was said or meant.

**Educate** | The computer screen is also useful as a teaching aid. With a click of the mouse, information such as a patient’s weight, blood pressure, and blood glucose measurements can be shown as a histogram and become the basis for a conversation either reinforcing good health habits or talking about how to improve them.

**Debrief** | Do not take for granted that instructions to patients are clear and perfectly understood. Examination room computers provide the perfect opportunity to use a “teach back” or a “talk back” format to assess the degree to which recommendations are understood. Being POISED for examination room computer use need not cost additional visit time. Used well, just the opposite is true. Medicine is fundamentally a human enterprise that is still practiced one conversation at a time. The study by Ratanawongsa et al reminds us that our most vulnerable patients may be at even greater risk than others when a disproportionate amount of a physician’s time is spent interacting with the computer screen and not with the patient. It is said that technology is neither good nor bad, but it is not neutral. Our challenge is to find the best ways to incorporate computers in the examination room without losing the heart and soul of medicine: the physician-patient relationship.

**Use of Pulmonary Artery Catheterization in US Patients With Heart Failure, 2001-2012**

The Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE) trial in 2005 demonstrated that the addition of pulmonary artery (PA) catheterization to standard management in heart failure (HF) did not improve patient outcomes but was associated with an unanticipated increase in adverse events. Consequently, current HF guidelines recommend limiting the use of PA catheters to patients with cardiogenic shock or mechanical ventilation (American College of Cardiology–American Heart...
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Abbreviations: AMI, acute myocardial infarction (MI); CABG, coronary artery bypass graft; CAD, coronary artery disease; CCI, chronic coronary insufficiency; CKD, chronic kidney disease; HF, heart failure; PA, pulmonary artery.  
\(^a\) Unless otherwise specified, data are expressed as percentage (SE) of patients. 
\(^b\) Calculated for negative trend. 
\(^c\) Calculated for trends between white vs nonwhite races. 
\(^d\) Calculated for positive trends, unless otherwise stated.
Association [ACC-AHA] class I, level of evidence C) and discourage PA catheter use in routine management of HF (ACC-AHA class III, level of evidence B).2 Given these recommendations, we examined contemporary trends in the use of PA catheterization in patients hospitalized with HF.

Methods | Using survey analysis in the National Inpatient Sample,3 we identified 2 492 284 adult patients (aged >18 years) from January 1, 2001, to December 31, 2012, with a primary diagnosis of HF using previously validated codes 428.x, 402.x1, 404.x1, and 404.x3 from the International Classification of Dis-

Dotted vertical line represents publication of ESCAPE trial; error bars, SEs for national estimates. P values are calculated for trend. Inset graph in part C shows the trend plot with a smaller scale.
creasing use of advanced HF therapies and the preparatory use of PA catheters in recent years. These factors include in- treatment of acute HF.

A finding highlights the discordance between guideline recommendations and current clinical practice regarding management of acute HF.

Several factors may explain the observed increase in the use of PA catheters in recent years. These factors include increasing use of advanced HF therapies and the preparatory hemodynamic evaluations and increasing prevalence of comorbidities such as pulmonary hypertension and chronic kidney disease that may prompt invasive assessment of volume status. Future studies are needed to determine whether a proportion of the increase in the use of PA catheters among patients with HF is attributable to inappropriate overuse.

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Rohan Khera, MD
Nilay Kumar, MD
Harsh Golwala, MD
Saket Girotra, MD, SM
Gregg C. Fonarow, MD

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Author Contributions: Drs Pandey and Khera contributed equally to this work. Drs Pandey and Khera had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Pandey, Khera, Golwala, Fonarow.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Pandey, Khera.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Pandey, Khera, Kumar.

Administrative, technical, or material support: Fonarow.

Study supervision: Fonarow.

Conflict of Interest Disclosures: Dr Fonarow reports receiving research support from the Agency for Healthcare Research and Quality and the National Institutes of Health and serving as a consultant for Amgen, Bayer, Gambro, Novartis, and Medtronic. No other disclosures were reported.


Invited Commentary

Ongoing Use of Pulmonary Artery Catheters Despite Negative Trial Findings

In this issue of *JAMA Internal Medicine*, Pandey et al1 examine national trends in the use of pulmonary artery (PA) catheters for acute episodes of heart failure. The PA catheter, a central venous line thread through the right side of the heart so that its tip resides in the PA, provides multiple central oxygenation, pressure, and volume measures. Following the first report of a case series by Swan et al in 1970,2 the PA catheter was adopted rapidly in intensive care, coronary care, and operating rooms for conditions involving shock or hemodynamic compromise. However, a large observational study by Connors et al3 in 1996 associated the PA catheter with no benefit and possible harm. That study prompted several randomized clinical trials (RCTs), all of which had negative findings,4-7 leading to a dramatic drop in the use of PA catheters. Pandey et al1 used the National Inpatient Sample from 2001 to 2012 and focused only on acute heart failure. They reported dropping rates initially. However, since 2007, use appears to be climbing, although the reasons are unknown. This finding prompts several thoughts.

First, the study itself deserves comment. The key findings are expressed as rates, and rates are as affected by changes in the denominator as in the numerator. Although the numerator, PA catheter use, may be somewhat discrete and accurately counted, the denominator is more challenging. Changes in the epidemiology and management of heart failure and in hospital coding may all affect the annual type and number of cases counted in the denominator. The changes in rates were reasonably similar to the changes in the number of catheters used, suggesting the numbers in the denominator did not change too dramatically. However, the authors also note that the mix of patients in whom a PA catheter was placed changed considerably over time. We do not know whether the case-mix of the denominator also changed or whether physicians were selecting different patients over time.

Second, what is the right rate of PA catheter use? When the negative RCT findings were followed by falling use, one could conclude that all was well: An intervention shown to have no value was fading from practice. However, these new data suggest that, at a minimum, a stubborn and reasonably high rate of PA catheter use persists, despite the lack of evidence of benefit and despite the known costs and potential complications. Two broad schools of thought apply. One defends ongoing practice and argues that many physicians make clever use of the data generated from the catheter to provide high-quality care. This school argues that diagnostic strategies are not the same as therapeutic strategies and that the PA catheter is only as good as the user of the information it provides. Although the RCT findings were negative, the RCTs asked narrow questions and did not exclude the benefit provided by smart physicians providing nuanced care in isolated instances. The opposing school states that diagnostic tests should be subject to scrutiny for efficacy and demands that proponents of the PA catheter outline the interventions that would be enacted as a consequence of information generated from the catheter. Thus, they would ask what those smart decisions are and whether physicians can reproduce them.

Both arguments have merits. First, interventions with no merit should be dropped from practice, especially if associated with harm or cost. Second, the definition of no merit is slippery. Although they are our best instrument for inferring causality, RCTs are crude instruments not well suited to determine small benefits from complex interventions in carefully chosen patients. Finally, although we ought to be utilitarian in our assessment of all tests and interventions, physicians struggle to bring the same scrutiny to elements of their existing armamentarium with which they are comfortable and feel expert as to those not yet approved. Here, physicians’ instincts may be that adherence to traditional care is conservative, although this argument is likely flawed.

What is the way out of this conundrum? From the societal perspective, a reasonable plan might be to ask proponents of the PA catheter to delineate those practices they consider potentially beneficial. This deliberation should consider alternative strategies that might yield the same gains, such as the use of noninvasive monitoring devices. Next, a plan to test these strategies that would satisfactorily rule out any minimally important differences ought to be developed and priced. Ideally, a value of information framework could be applied to consider the current incremental costs associated with PA catheter use and the cost of further evaluation. Under this framework, if the price is acceptable in terms of national funding priorities, then the catheter should be evaluated, letting the chips fall where they may. However, if the evaluation is too expensive, we may be forced to tolerate the existing uncertainty, which would mean at a minimum circumscribing the set of clinical instances when a PA catheter may be beneficial and explicitly outlining the way proponents use data from the catheter to guide care. This information could be used to control indiscriminate use of the PA catheter and, in clinical settings of unknown but potential value, to help decision making by patients, families, and physicians.

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Conflict of Interest Disclosures: None reported.


Recurrent and Mortality in Young Women With Myocardial Infarction or Ischemic Stroke: Long-term Follow-up of the Risk of Arterial Thrombosis in Relation to Oral Contraceptives (RATIO) Study

Rates of death in the acute phase of cardiovascular events have decreased, but disease burden remains high in the increasing number of survivors. This finding is particularly important for those affected at a young age. Nevertheless, little information is available on the long-term outcome of young patients who survived a cardiovascular event, especially women. Single disease cohorts have suggested that the risk of cardiovascular disease is driven by recurrence of the index event, but, to our knowledge, this has never been investigated in a single study with multiple index groups. We determined the long-term mortality and subtype-specific morbidity in young women surviving myocardial infarction (MI) or ischemic stroke (IS) compared with a control group.

Methods | A cohort was formed on the basis of the Risk of Arterial Thrombosis in Relation to Oral Contraceptives (RATIO) study, which included consenting women aged 18 to 50 years who survived a first MI or IS from January 1, 1995, through December 31, 1998. Women with no history of arterial thrombosis were recruited as controls. The study was approved by the ethics committees of the participating hospitals. All patients provided written informed consent. Women were followed up to December 31, 2012, by linkage to the Dutch Registry of death certificates and to the Dutch Hospital Data register (Central Bureau of Statistics) for causes of death and hospital admissions. Data analysis was performed from December 1, 2013, through September 30, 2014. Incidence rates (IRs) and their ratios were calculated for mortality and the first reoccurrence of any acute major cardiovascular event during follow-up. Adjusted hazard ratios (HRs) obtained from Cox proportional hazards regression models were used for comparison with the controls.

Results | A total of 226 women with MI, 160 with IS, and 782 controls (mean age, 42.4, 40.0, and 48.4 years, respectively) were followed up for a median of 18.7 years (interquartile range, 17.5-20.5 years). Mortality rates were 3.7 (95% CI, 2.5-5.4) times higher in patients with MI (IR, 8.8 per 1000 person-years; 95% CI, 6.2-12.3) and 1.8 (95% CI, 1.0-3.5) times higher in patients with IS (IR, 4.4 per 1000 person-years; 95% CI, 2.4-7.6) than in controls (IR, 2.4 per 1000 person-years; 95% CI, 1.7-3.4). This elevated mortality persisted over time (Figure) and was mainly supported by a high rate of deaths from acute vascular events: vascular mortality rate, 3.5 per 1000 person-years (95% CI, 1.9-5.9) in patients with MI, 2.1 per 1000 person-years (95%, 0.8-4.5) in patients with IS, and 0.3 per 1000 person-years (95% CI, 0.1-0.7) in controls.

When counting both fatal and nonfatal cardiovascular events, the IR was highest in patients with IS at 14.1 per 1000 person-years (95% CI, 9.9-19.4), corresponding to an HR of 12.9 (95% CI, 6.7-25.0) compared with controls (Table). The rate was 12.1 per 1000 person-years (95% CI, 8.7-16.2) in patients with MI, with an HR of 9.8 (95% CI, 5.0-19.4) in contrast with controls.

In patients with MI, the rate of cardiac events was 10.1 per 1000 person-years (95% CI, 7.5-13.8) whereas the rate of cerebral events was 1.9 per 1000 person-years (95% CI, 0.8-3.8). In patients with IS, the reverse picture was observed, with a rate of cerebral events of 11.1 per 1000 person-years (95% CI, 7.5-15.9), whereas the risk of cardiac events was 2.7 per 1000 person-years (95% CI, 1.2-5.4).