

## The Top 10 List for a Safe and Effective Sign-out

Clinton D. Kemp, MD; Jonathan M. Bath, MBBS; Jonathan Berger, MD; Aaron Bergsman, MBBS; Trevor Ellison, MD; Katherine Emery, MD; Jacqueline Garonzik-Wang, MD; Helen G. Hui-Chou, MD; Skye C. Mayo, MD, MPH; Oscar K. Serrano, MD; Sachin Shridharani, MD; Kashif Zuberi, MBChB; Pamela A. Lipsett, MD; Julie A. Freischlag, MD

**W**ith the advent of the 80-hour workweek, much attention has been focused on the benefits of shorter work hours regarding resident fatigue and reduced medical errors. Along with this change, however, there has been more reliance on multiple teams of residents who assume the care of inpatients at different times. In this new paradigm, a safe and effective sign-out process is needed to ensure a seamless transition of care from one resident to another. Several studies have been published on the sign-out process among interns in internal medicine, but the literature is sparse with regards to the best way to hand over care of a busy inpatient surgical service. To aid in this process, the Halsted surgical interns performed a review of the current literature on this topic. They also reflected on their personal experiences and developed a 10-point method for safe and effective sign-outs. This process is emphasized for incoming interns and used across the various surgical services at The Johns Hopkins Hospital.

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For generations of American surgeons, the mantra of the enthusiastic resident was: "The only problem with spending every other night on call is that you miss half of the cases." However, patients, the public, and lawmakers have recognized that fatigue among physicians may result in medical errors with serious consequences for patients. The recent arrival of the 80-hour workweek represents a major change in the philosophy of medical care and resident education: in-house call may not be more frequent than every third night, duty periods must not exceed 30 continuous hours, and physicians must spend 10 hours away from the hospital between duty periods.

To accommodate these changes put in place by the Accreditation Council for Graduate Medical Education, residents have come to depend more on their colleagues to assume care of their patients when they are away from the hospital. Despite these changes, each staff member still expects—and each patient deserves—seamless transitions of care when not directly caring for his or her patients. The scheduling challenges of the work-hours regulations combined with the increasing complexities of delivering health care

have introduced new risks.<sup>1</sup> Although residents may be less fatigued, the new challenge becomes ensuring adequate continuity of care throughout the transitions between caretakers. An entirely new vocabulary has emerged to describe our new roles. Words like *cross-cover*, *night-float*, and *sign-out* describe how residency programs have adapted to this new era.

After adopting the work-hours regulations, the next challenge is to develop a systematic, reliable, and efficient system for transmitting information from the primary resident to the resident on call, who will not have the benefit of personal and intimate knowledge of a patient's history at the time of admission. Several authors have written on this subject and have advocated use of electronic medical records to facilitate these transfers of care.<sup>2,3</sup>

Nation-wide surveys on the sign-out process and transitions of care among resident physicians have shown that there is not a standardized process, as sign-out practices vary widely among different institutions, services, and individuals.<sup>4</sup> This is in contrast to traditional nursing practices, as policies and procedures for the sign-out process are standardized at most, if not all, institutions.<sup>5,6</sup> Surveys of residents coming off of a night on call have identified areas of con-

Author Affiliations: The Johns Hopkins University, Baltimore, Maryland.

cern and a desire for a standardized sign-out process, with any active issues and pertinent medical comorbidities clearly outlined.<sup>7,8</sup>

Several authors have commented on the practices of signing out medicinal services at their institutions.<sup>2,9</sup> Despite these important changes to the structure of care in the academic arena, the literature in this area is sparse, and there have been very few articles that specifically deal with the signing out of inpatients in a surgical service.<sup>10,11</sup>

Herein, we have reviewed the literature on transitions of care and the methods that training programs across the country use to streamline the sign-out process. In addition, we describe our experiences and efforts to distill and refine what we feel are the sign-out process' most salient elements.

## METHODS

As part of a quality-improvement project at the end of their intern year, the Halsted surgical interns at The Johns Hopkins Hospital were asked to submit suggestions for the best way to perform a successful sign-out. Anecdotes concerning the sign-out process were compiled from their personal experiences. These responses were compiled into the top 10 most frequent and important responses on how to standardize and improve the sign-out process among interns.

## RESULTS

In 1 anecdotal example of the sign-out process, the primary resident was in a hurry to leave and sign-out was completed over the telephone with the on-call resident. Sign-out entailed simply asking if the on-call resident understood the patient list and what needed to be done that evening. No patient details were discussed. Later, the on-call resident was asked to evaluate a patient who was being treated with metoprolol and was tachycardic, short of breath, and in atrial fibrillation. Unbeknownst to the on-call resident, the patient had a pulmonary embolus diagnosed that same day. The on-call resident did not inform the chief resident that the patient was tachycardic, as the sign-out suggested that the patient had been tachycardic all day. The following morning, after the primary team discovered the patient's worsening tachycardia, they ordered an emergent computed tomographic scan of her chest, which revealed that she had an extension of her pulmonary embolus, which was likely the cause of her symptoms. In this case, face-to-face sign-out with adequate time to explain the pertinent issues and for the on-call intern to ask questions did not occur. Also, the patient list was not up to date with known and active issues for each patient identified. In addition, it was not delineated what constituted a change from expected course or what the chief physician needed to know.

Another example involved a patient who had recently undergone a heart transplantation and was transferred to the surgical floor from the cardiac surgery intensive care unit. On sign-out, the only details given about this patient was that he had been stable throughout the day and his heart rate was being controlled with amiodarone. During the evening, the patient became tachycardic and the resident on call was asked to assess the patient. On reviewing the patient's medical record, the resident interpreted the available data of oliguria, mild

hypotension, and low intake as being consistent with low circulating volume and resulting tachycardia. As a result, the physician ordered a fluid bolus for the patient and alerted the senior physician on duty. The senior physician was aware that the patient had very poor right heart function and advised the intern to discontinue the fluid bolus. This is an example of a near miss due to the covering intern or nurse not knowing the goals of therapy.

From anecdotal evidence of inadequate sign-out as described and the suggestions submitted by this group of surgical interns, a 10-point guideline for sign-out was established:

1. Time. Ensure enough time for adequate sign-out, which for each patient includes a discussion of a brief history of present illness, major comorbidities, important events of the past 24 hours, things that the physician may get called about, tasks for each patient, and general plan of care.
2. Active. Make signing out an active process, ask any necessary questions, and ensure that the physician signing in has complete knowledge about each patient or task.
3. Sick. Sick patients should be emphasized, with the management plan and threshold to transfer to a higher level of care clearly outlined. Residents on call should be encouraged to see sick patients before they get called on any major issues.
4. Senior. Know who is the senior resident on call and contact them before beginning the call night.
5. One list. Use 1 standardized list or form for each service, with emphasis on its confidential nature and proper methods for disposal when finished.
6. Details. List should include surgery date/type, post-operative complications, wound dressing, antibiotics, diet, pain management, important medications, and general plan/pathway.
7. Outstanding tasks. Use an updated, accurate list, with outstanding tasks to be performed and information that the on-call resident needs to gather outlined in bold type.
8. Outstanding laboratories/studies. Sign out all pending laboratory tests, studies, consults, and what the chief physician needs to be told.
9. Admissions. Any expected admissions should be explained to the on-call resident, making pertinent history and exact purpose for admission understood so that the on-call resident can fill out admission orders correctly and in a timely fashion once the patient arrives to the hospital.
10. Morning update. In the morning, update the list and give enough time for prerounds sign-out, emphasizing major events and patients whose course deviated from the expected pathway.

## COMMENT

Beginning with William Stewart Halsted, MD, surgery at Hopkins has had a long and proud tradition, characterized by a devotion to providing exceptional care of the surgical patient. However, with the recent advent of work-hours restrictions, Hopkins surgical residents, much like those in other surgical programs across the country, have had to conform to a new paradigm—caring for patients while abiding by the new guidelines set forth by the Accreditation Council for Graduate Medical Education.

These guidelines are now considered standards by which residency training programs must abide if they are to remain accredited graduate medical education programs.

Despite implementation of the Accreditation Council for Graduate Medical Education guidelines in July 2003, there has not been much research regarding the safest and most effective method for signing out across hospital departments.<sup>2,4,7,10</sup> In surgery, a thorough yet succinct sign-out is essential, as, in most instances, a single resident can care for as many as 60 patients. Few studies to date have specifically focused on surgical sign-out.<sup>10-13</sup>

At our institution, we have developed a simple 10-point list of items regarding sign-out, which we emphasize to incoming interns. More-senior residents are expected to take a mentoring role and to stress the importance of sign-outs to the incoming intern class. At Hopkins, these points are introduced at intern orientation and a mock sign-out is enacted in the presence of all interns. This gives interns an opportunity to witness an experienced, succinct, and effective sign-out while giving them a chance to ask questions in an open forum. These points continue to be emphasized throughout the year as the new class begins their clinical responsibilities.

We believe that, akin to the nursing model,<sup>6</sup> sign-out should be an active and dynamic conversation, rather than a unilateral description of patient details and tasks to be performed at night. Both parties should allow ample time to ask questions about each patient, emphasizing those who may require special attention and providing a step-by-step algorithm that outlines the pathway for care if a situation arises.

There is convincing evidence that computerized sign-outs make patient transfers safer and much more effective.<sup>2,8,10,11</sup> A standard Web-based patient list in all surgical services across the hospital makes it simple to give and receive sign-out in a manner in which both physicians feel comfortable about specific details of each patient and an outline for a plan of care regardless of the service or particular operation that a patient has undergone.

An important aspect that we emphasize at our institution is continuity of care by the primary service. To this end, if a patient is to be admitted after the primary team has signed out, it is expected that the patient's reason for admission and other important information will be relayed to the on-call resident at sign-out so that any special orders that need to be entered or studies that need to be performed can be done expeditiously. This keeps the on-call resident from having to browse an unfamiliar medical record to find critical information and ensures that patients are appropriately taken care of in a timely manner.

And finally, as it has been previously shown,<sup>2</sup> giving ample time for signing in the morning after cross-cover is of utmost importance, especially for services in which laboratory data are critical for making clinical decisions before heading to the operating room. Again, the sign-in should be a dynamic conversation in which both parties are actively engaged in information about the patients for whom they are caring.

## CONCLUSIONS

We have provided a 10-point list of items regarding sign-out, which we feel are essential for the effective and safe

transfer of patient care: (1) ensure enough time, (2) make sign-out an active process, (3) emphasize sick patients, (4) know who is the senior on-call physician, (5) have 1 standardized list, (6) include important details in the list, (7) perform all outstanding tasks, (8) follow-up on all outstanding laboratory tests/studies, (9) anticipate and prepare for all known admissions, and (10) leave time for morning update. Despite the challenges that the new work-hours restrictions have imposed on patient care, we are confident that our generation, with the aid of information systems technology, will adjust and evolve into surgeons who provide exceptional care that does not require us to be in the hospital every other night.

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Correspondence: Julie A. Freischlag, MD, Johns Hopkins Medical Institutions, 720 Rutland Ave, 759 Ross Bldg, Baltimore, MD 21205 (jfreisc1@jhmi.edu).

Author Contributions: *Study concept and design:* Kemp, Mayo, Serrano, Shridharani, and Freischlag. *Acquisition of data:* Bath, Bergsman, Ellison, Emery, Garonzik-Wang, Hui-Chou, Serrano, Shridharani, and Zuberi. *Analysis and interpretation of data:* Berger, Garonzik-Wang, Mayo, Shridharani, Lipsett, and Freischlag. *Drafting of the manuscript:* Kemp, Bath, Berger, Bergsman, Emery, Garonzik-Wang, Hui-Chou, Mayo, Serrano, Shridharani, and Zuberi. *Critical revision of the manuscript for important intellectual content:* Kemp, Ellison, Garonzik-Wang, Mayo, Shridharani, Lipsett, and Freischlag. *Administrative, technical, and material support:* Kemp, Bath, Bergsman, Garonzik-Wang, Hui-Chou, Serrano, and Shridharani. *Study supervision:* Kemp, Mayo, Lipsett, and Freischlag. *Financial Disclosure:* None reported.

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