



## **CPI or HPI? Chronology of Present Illness May Help Avoid Diagnostic Pitfalls**

By Susan Carr

*“A chronology is a useful tool but a miserable read.”<sup>1(np)</sup>*

- Kenneth D. Durr, PhD

In “A Beginning, a Middle, and an End: The Difference Between Chronology and History,”<sup>1</sup> Historian Ken Durr explains that writing history involves more than simply recording facts. History writers select which events and details to emphasize and craft storylines to engage the reader and deliver a message. In that sense, writers of history interpret and package the truth to make a point. Durr emphasizes the need to keep the reader engaged; if the story is a “miserable read,” the writer will lose his or her chance to inform.

Physicians are historians of a sort. They “take” the patient’s history (by one estimate, between 100,000 and 200,000 times in a career),<sup>2</sup> exploring the reasons why the patient seeks consultation and uncovering other details to supply context. Traditionally, physicians are trained to treat patient histories (the History of Present Illness, or HPI) as narrative storytelling culminating in diagnosis.<sup>3</sup>

Clinicians and educators at the Stanford University School of Medicine use an alternative approach to taking the patient’s history, which replaces narrative complexity with chronological clarity that is not invested in a storyline or diagnosis. Chronology may not offer a great “read,” but it offers advantages including protection against some pitfalls in the diagnostic process.

### **Chronology as an Organizing Principle**

Kelley Skeff, MD, PhD, George DeForest Barnett Professor at Stanford University School of Medicine, developed the alternate framework for patient history-taking, the Chronology of Present Illness, or CPI.<sup>4</sup> CPI pre-empts wordiness and narrative creativity with a complete list of events – symptoms, treatments, responses, and activities – recorded in the order in which they occurred and written in an efficient format. Dates are listed on the left and details of the history are recorded to the right, often (but not necessarily) displayed as a bulleted list.

CPI is designed to save time and capture a complete history. The process also separates history-taking from analysis, clearing the way mentally for clinical reasoning and diagnosis.

Skeff began using and teaching CPI more than 30 years ago, before awareness of diagnostic error grew into the current-day movement. Skeff and others now see that CPI offers numerous advantages in the

diagnostic process. Insufficient data collection, premature closure, and other cognitive biases are among the pitfalls that CPI can help clinicians avoid. It also helps communication among care team members, including patients.<sup>3</sup>

Skeff described CPI in a keynote address titled “The Power of the Patient Narrative” at the [Diagnostic Error in Medicine](#) conference held in New Orleans in November 2018.

### **Results of a Pilot Study**

Although the process is efficient overall, in a 2-week pilot study of CPI,<sup>3</sup> residents at Stanford University found that generating a patient history in the new format was more time-consuming than HPI, at least at first. CPI was new for the participants in the study, which likely affected their speed, but some of the extra time was incurred in pre-work, preparing for the patient interview. Physicians may begin to draft the CPI prior to the interview by reviewing the patient’s chart. The patient interview may also take longer with CPI because it demands more detail. Laura Mazer, MD (a colleague of Dr. Skeff at Stanford and involved in the study) reports, “Not always,...but with a complicated patient, it [CPI] will take more time because it's forcing you to do the job right.”<sup>5(np)</sup>

The pilot study included 22 internal medicine residents who were rotating on the night shift and the residents to whom they handed off in the morning. Researchers gathered the residents’ responses to a questionnaire pre and post intervention as well as open-ended comments after a two-week rotation. Both groups of residents felt CPI offered improved clarity in the note itself and more concise, effective verbal communication about patients at the morning hand-off. Some commented that CPI prompted them to be better prepared for patient interviews and helped them organize their interactions with patients. Others reported that patients “felt that a CPI-oriented interview made it easier for them to tell their story.”<sup>3(p186)</sup>

The researchers observe that the CPI format seems better suited to electronic records than the narrative format of HPI. With CPI, many of the problems caused by copying and pasting large amounts of text electronically are avoided. There is less copy to begin with and, if errors and extraneous information do appear in the CPI, they may be more likely to be discovered and addressed, less likely to be carried forward as “chart lore.”<sup>3(p187)</sup> It is easier to catch errors and correct notes in real time when the history is written in list form than in prose.<sup>4</sup>

In a letter-to-the-editor titled “The Illness of Present Histories,” two physicians (including Jeffrey Chi, MD, who was involved in the pilot study at Stanford) say the narrative approach of HPI is a vestige of an earlier time:

*The idyllic scenario of a student handcrafting a thorough history has been replaced by a digital scavenger hunt.*<sup>6(p434)</sup>

In settings where time pressures are intense and scanning information quickly is a necessary skill, narrative prose seems “outdated and impractical.”<sup>6(p434)</sup>

### **Methods for Teaching History-Taking**

In 2015, researchers performed a systematic review<sup>2</sup> of methods being used to teach history-taking in undergraduate medical education. Across 23 published studies, they found wide variation in educational

techniques, including traditional lectures, role-playing workshops, Web-based training, and a simulation program using Lego blocks. They did not find that one approach was clearly superior to another. The researchers report that lack of a common model and definition of history-taking makes comparative study difficult. Even if there were a consistent, accepted definition, history-taking varies by specialty, context, and circumstances:

*... a “good” medical interview in an emergency ward would differ distinctly from a “good” first interview in a psychiatric medical practice.* <sup>2(p2)</sup>

CPI, which was not included in the study, could possibly supply a common framework for use in different settings, at least as a starting point.

### **Taking History Without Predisposition**

Researchers have observed that students’ communication skills deteriorate during medical school, with the steepest decline occurring in interviewing skills. <sup>3,7</sup> As trainees gain more medical knowledge, become more confident in their clinical reasoning, and feel increased production pressure, they may be inclined to jump to conclusions more quickly. Conversely, renewed training can help students and others refocus their attention to detail and avoid premature closure. <sup>2,7</sup>

Skeff and his colleagues point out that using a chronological timeline:

*...allows physicians to concentrate on symptom evolution instead of struggling with how to organize the data, or deciding which details to include in the initial history.* <sup>3(p187)</sup>

Treating history-taking as a discrete activity and not trying to multitask lessens the cognitive load and allows more space for reflection and building a differential diagnosis. <sup>3,4</sup> If the narrative is written with a presumed diagnosis in mind, details may be omitted that don’t seem to be relevant because they don’t conform to the current thinking. <sup>8</sup>

### **Storytelling as Therapy**

The patient interview and HPI are crucial information gathering and processing activities, with profound effects on the process of diagnosis. They also can embody patient-centeredness and anchor the patient-physician relationship. <sup>8</sup> In addition, the prose form of HPI is a familiar vehicle for telling stories and making meaning out of experience.

More than 20 years ago, Herbert M. Adler, MD, a psychiatrist at Jefferson Medical College, studied the implications of the process of HPI as a treatment, as therapeutic for the patient. In Adler’s view, in the course of the interview, the physician helps the patient tell his or her story, “transforming the chaos of experience into a coherent narrative,” <sup>9(p28)</sup> helping patients make sense of their illness.

The bullet points of CPI may initially seem cold and less evocative than prose, but they offer an efficient way for patients and physicians to develop an important story. That process may be better suited to current practice than HPI and less prone to diagnostic pitfalls.

### **References**

1. Durr K. A beginning, a middle, and an end: the difference between chronology and history. History Associates website. <https://www.historyassociates.com/resources/blog/a-beginning-a-middle-and-an-end-the-difference-between-chronology-and-history/>. Published June 24, 2015. Accessed February 15, 2019.
  2. Keifenheim KE, Teufel M, Ip J, et al. Teaching history taking to medical students: a systematic review. *BMC Med Educ*. 2015;15(159):1-12.
  3. Mazer LM, Storage T, Berekyei S, Chi J, Skeff K. A pilot study of the chronology of present illness: restructuring the HPI to improve physician cognition and communication. *J Gen Intern Med*. 2017;32(2):182-188.
  4. Skeff KM. Reassessing the HPI: the chronology of present illness (CPI). *J Gen Intern Med*. 2013;29(1):13-15.
  5. Durkin M. Take a chronology instead of a history. *ACP Hospitalist*. <https://acphospitalist.org/archives/2017/04/success.htm>. Published April 2017. Accessed February 15, 2019.
  6. Kumar AD, Chi J. The illness of present histories [letter]. *Academic medicine*. 2017;92(4):434-435.
  7. Fortin AH, Haeseler FD, Angoff N, et al. Teaching pre-clinical medical students an integrated approach to medical interviewing: half-day workshops using actors. *J Gen Intern Med*. 2002;17(9):704-708.
  8. Skeff K, Mazer LM, Merrell SB. The Chronology of Present Illness as a Tool to Teach Patient-Physician Communication and Reduce Diagnostic Errors. [http://med.stanford.edu/academy/programs/grants/2015-2016-innovation-grants-recipients/\\_jcr\\_content/main/panel\\_builder/panel\\_0/accordion/accordion\\_content15/download/file.re.s/Mazer\\_GrantAppSkeff\\_FINAL.pdf](http://med.stanford.edu/academy/programs/grants/2015-2016-innovation-grants-recipients/_jcr_content/main/panel_builder/panel_0/accordion/accordion_content15/download/file.re.s/Mazer_GrantAppSkeff_FINAL.pdf). nd. Accessed February 15, 2019.
  9. Adler HM. The history of the present illness as treatment: Who's listening, and why does it matter? *Journal of the American Board of Family Practice*. 1997;10(1):28-35.
- 

### **The Coalition to Improve Diagnosis Welcomes Six New Member Organizations**

Six leading healthcare organizations have pledged to take action to improve diagnostic quality and safety by joining the [Coalition to Improve Diagnosis](#), which already includes many of the most prominent organizations in healthcare and patient advocacy. The new member organizations represent distinct healthcare sectors, including laboratory testing, hospitals, health systems, accreditation, and patient safety: the American Society for Clinical Laboratory Science (ASCLS), Ballad Health, Baystate Health, The Joint Commission, Northwell Health, and the Washington Patient Safety Coalition (WPSC).

These latest additions to the Coalition's membership come on the heels of the September 2018 launch of [ACT for Better Diagnosis™](#). Funded by the Gordon and Betty Moore Foundation and the Mont Fund,

*ACT for Better Diagnosis* is an initiative created by the Society to Improve Diagnosis in Medicine (SIDM) and the Coalition to Improve Diagnosis to improve the diagnostic process by calling on organizations to identify and spread practical steps to better ensure diagnoses are **Accurate, Communicated, and Timely.**

[Every nine minutes](#), someone in a U.S. hospital dies due to a medical diagnosis that was wrong or delayed. Researchers estimate that [up to 80,000 deaths a year](#) in U.S. hospitals can be attributed to inaccurate or delayed diagnoses.

“For too long, improving diagnostic quality and safety has not been on the radar of health organizations,” said Paul L. Epner, chief executive officer and co-founder of SIDM. “But that is changing, and it’s exciting to now see that a groundswell is building and taking hold across all sectors of health care. These healthcare leaders are recognizing that improving the diagnostic process saves lives, reduces harm, and will save costs to the system.”

Convened and led by SIDM, the Coalition to Improve Diagnosis is the only collaboration of diverse healthcare organizations singularly focused on improving the diagnostic process. Together, they work to find solutions that enhance diagnostic quality and safety, reduce harm, and ultimately ensure better health outcomes for patients.

The following six organizations have committed to *ACT for Better Diagnosis* by joining the Coalition and [taking action](#) to improve the diagnostic process:

**[American Society for Clinical Laboratory Science:](#)** The ASCLS has developed programs and products focused on educating patients and healthcare professionals to prevent wrong or delayed medical diagnoses associated with laboratory testing.

**[Ballad Health:](#)** Ballad Health is identifying evidence-based criteria for the appropriate testing of hospital-acquired infections, establishing appropriate use of CT and MRI imaging to improve stroke diagnoses, and creating an approach to accurately and quickly identify patients with sepsis.

**[Baystate Health:](#)** Baystate Health has made diagnostic excellence a major priority of their comprehensive patient safety program. It is committed to identifying opportunities to improve the diagnostic process and to implement solutions that will reduce harm from misdiagnosis. In order to achieve that goal, Baystate has organized interdisciplinary teams to study and act in many areas including clinical reasoning education, incident identification and review, electronic clinical decision support, quality improvement activities, and clinical pathway development.

**[The Joint Commission:](#)** As the nation’s largest healthcare accreditor, The Joint Commission provides best practices and rigorous standards to help organizations improve patient safety and quality of care. The Joint Commission is exploring current best practices to ensure appropriate follow-up of diagnostic tests and consults ordered as part of the diagnostic process, which is the focus of National Patient Safety Goal 02.03.01, to “report critical results of tests and diagnostic procedures on a timely basis.”

**[Northwell Health:](#)** Northwell Health developed and deployed trials to reduce diagnostic errors in emergency departments and ambulatory and inpatient clinical settings by focusing on the roles of the patient, family, and caregiver with a scripted “Teach-Back” intervention.

**[Washington Patient Safety Coalition:](#)** The WPSC voted in 2018 to elevate diagnostic improvement as one of its major programmatic goals for 2018 – 2019. To that end, they have organized a workgroup of

stakeholders dedicated to this goal and are developing podcasts, blogs, [a webinar series](#), and other resources on the topic. It will also be one of the key themes at their upcoming annual regional meeting, the [Northwest Patient Safety Conference](#) in May 2019, where Mark Graber and Sue Sheridan of SIDM will be the closing speakers.

As recently profiled in [Modern Healthcare](#), the Coalition to Improve Diagnosis now includes more than 50 organizations representing clinicians, patients, health systems, researchers, and testing professionals. Collectively they acknowledge that improvement will require sustained work over several years with all stakeholders involved.

If your organization is interested in joining the Coalition to Improve Diagnosis and taking action towards improved diagnosis, please contact [coalition@improvediagnosis.org](mailto:coalition@improvediagnosis.org) or visit [DxCoalition.org](#). More information on *ACT for Better Diagnosis* is available at [www.BetterDiagnosis.org](http://www.BetterDiagnosis.org).

---

## **Diagnostic Quality and Public Policy**

### **Fee Schedule Changes Aim to Allow Physicians More Time with Patients**

The SIDM Policy Committee, a joint effort of the Society to Improve Diagnosis in Medicine and the [Coalition to Improve Diagnosis](#), monitors the legislative and regulatory landscape for developments likely to impact diagnostic quality and safety and opportunities to move the diagnostic quality conversation forward. The committee made great strides in 2018 by reaching out to and educating policymakers about the need for greater federal investment in diagnostic quality and safety research, resulting in roughly \$2 million in new funding to AHRQ to support grants to address diagnostic errors. On another front, the Policy Committee reports that several important new developments in the Medicare Physician Fee Schedule (PFS) have taken effect this year. PFS is a complete listing of payments and policies that Medicare uses to reimburse physicians and other providers working on a fee-for-service basis and is updated annually. The 2019 update took effect in January. It includes a number of long-sought changes in Medicare payment policy that the Centers for Medicaid and Medicare Services (CMS) says are intended to reflect modern practice and unburden physicians from paperwork, allowing them to spend more face-to-face time with their patients. Ideally, these provisions will work in support of a more safe and efficient diagnostic process.

### **Modernizing Medicare Payment Policy: Virtual Visits**

Medicare payment policy generally states that, with a few exceptions, patient-provider interactions qualify for reimbursement only if they are face-to-face. Telephone “check-ins,” for example, by a patient who wants to know if a new symptom warrants an office visit, or by a clinician checking up on a patient’s response to a care plan, have not been reimbursable.

As of January 1, 2019, Medicare will reimburse physicians and other clinicians under two new billing codes that recognize “technology-enabled” physician-patient communications. The first establishes payment for a 5-to-10 minute “virtual check-in” between a provider and a patient using “communications-technology-based service” (e.g., telephone, video-chat). The second new code allows

payment for asynchronous professional evaluation and 24-hour follow-up of video and/or images submitted or uploaded by a patient (“store-and-forward”).

With these new codes for “virtual” physician-patient communication, CMS aims both to align payment policy with current trends in medical practice and to improve efficiency. There should be less incentive for practices to require patients to show up for what may be unnecessary office visits for problems and concerns that could be handled through a call or other “technology-enabled” communication.

It bears noting that CMS also cautions that payment for “virtual” communication has significant potential for abuse, particularly since the agency does not require additional clinical documentation for the new codes. The agency will monitor the use of the new codes very carefully to learn how they are used and their impact on patient care.

### **Interprofessional Consultation**

The 2019 PFS also implements a long-sought change in payment policy for clinical consultations. Consistent with a recommendation in the National Academy of Medicine’s report, [\*Improving Diagnosis in Health Care\*](#), CMS has adopted new codes to reimburse clinicians for time spent referring and responding to requests for medical consultation. Until now, the clinician’s time and effort to request or provide clinical consultations for a patient were considered bundled into the payment for that patient’s office visit and not reimbursable as a distinct service.

The practical effect of that policy has been that referring physicians typically send patients to separate visits with consulting specialists. That results in significant added cost and inconvenience to patients and the system in cases where a simple phone or internet-based interaction between the treating clinician and the consultant would have been sufficient. And there was no guarantee that patients would actually follow up with specialists. The new codes allow payment for consultations through telephone, internet, or electronic medical records (EMR) directly between the treating clinician and a consulting clinician “with specific specialty expertise to assist with the diagnosis and/or management of the patient’s problem without the need for the patient’s face-to face contact.”

Beneficiaries are subject to regular cost-sharing provisions (copayment and deductibles) for these services so their consent for the virtual consult must be documented in the medical record.

### **Clinical Documentation Requirements**

Physicians and other practitioners have been complaining for years that the work required to fulfill all the documentation requirements in electronic medical record templates siphons time away from the patient encounter and often results in obscuring the information most important to establishing a diagnosis. One of the biggest changes in the 2019 PFS and part of CMS’s broader “Patients Over Paperwork” initiative seeks to tackle this problem by simplifying clinical documentation requirements that were established before the widespread adoption of electronic medical records. This is one step in a longer-range initiative by CMS and the Office of the National Coordinator for HIT to address the burden associated with electronic records.

One major source of frustration for physicians — and a potential safety issue for patients — has been a requirement that for each patient visit, clinicians document in the medical record a patient’s chief complaint (CC), history of present illness, past family social history, and review of systems. In an EMR

environment, this requirement has resulted in a tendency to “cut and paste” information already in the record into the current visit documentation, leading to vastly long and impenetrable clinical notes, or “note bloat.” Starting in 2019, for established patient office or outpatient visits, when relevant information about the required elements is already contained in the medical record, clinicians do not need to “redocument” that information at each visit. Rather, they can focus their visit documentation just on what has changed since the last visit, or on pertinent items that have not changed, so long as there is evidence that the clinician reviewed the previous information and updated it as needed.

In addition, for new and established patients, any part of the CC or history can be documented in the medical record by ancillary staff or even the patient, freeing the physician to focus attention on the patient. Clinicians still must review prior data, update as necessary, and indicate in the medical record that they have done so. (State laws regarding scope of practice will determine which ancillary staff are able to enter the initial documentation for approval by the billing clinician.)

CMS intends these changes to allow practitioners greater flexibility to exercise clinical judgment in documentation, “so they can focus on what is clinically relevant and medically necessary for the beneficiary.”

Finally, CMS proposed significant changes to the underlying structure of documentation and payment rates for Evaluation and Management codes but did not finalize those changes. While also intended to reduce provider burden, the proposed changes proved to be so controversial that CMS is delaying further action until 2021, giving stakeholders more time to influence policymaking. The Policy Committee and SIDM are engaging with CMS to ensure that any further proposed changes to clinical documentation support improvement in diagnostic quality and safety.

Questions about these and other policy developments? Please contact [leslie.tucker@improvediagnosis.org](mailto:leslie.tucker@improvediagnosis.org).