

Care Team Identification in the Electronic Health Record: A Critical First Step for Patient-Centered Communication

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Patient-centered communication is essential to coordinate care and safely progress patients from admission through discharge. Hospitals struggle with improving the complex and increasingly electronic conversation patterns among care team members, patients, and caregivers to achieve effective patient-centered communication across settings. Accurate and reliable identification of all care team members is a precursor to effective patient-centered communication and ideally should be facilitated by the electronic

health record. However, the process of identifying care team members is challenging, and team lists in the electronic health record are typically neither accurate nor reliable. Based on the literature and on experience from 2 initiatives at our institution, we outline strategies to improve care team identification in the electronic health record and discuss potential implications for patient-centered communication. *Journal of Hospital Medicine* 2016;11:381–385. © 2016 Society of Hospital Medicine

Patient-centered communication is a strategy that is used to promote shared understanding of the plan of care among providers and patients.^{1–3} Caring for hospitalized patients is a collaborative effort that requires seamless patient-centered communication among a rapidly changing care team to safely progress a patient from admission through discharge. Yet, hospitals continue to struggle with improving the complex and increasingly electronic conversation patterns among care team members and patients to achieve effective patient-centered communication.^{4,5} When members of the care team operate in this environment, patients often receive conflicting information regarding their plan of care, medications, and test results. Ineffective communication can lead to a suboptimal patient experience, additional costs, medical errors, and preventable adverse events.^{6–10}

A critical first step to improving patient-centered communication is identifying the care team.^{11,12} Accurate and reliable identification of all care team members is a pressing information need; it is fundamental to efficiently conveying information about the plan of care to those who know the patient the best, must make timely decisions, or will assume care once the patient leaves the hospital.¹³ Furthermore, it has implications for engaging patients more meaningfully in their care.^{14–17} Ideally, the process of identifying an individual caring for the patient in a specific role is quickly and reliably determined from the electronic health record, the single

“source of truth” where any provider can quickly identify other team members. This source of truth can be updated manually when individual members assign and remove themselves from the care team, or automatically when accessing the patient’s record, writing a note, placing an order, or adding a patient to a coverage list. When providers correctly identify other team members in this way, hospital paging directories and secure messaging tools that link to the electronic health record become more effective at supporting care team communication.¹⁸

In general, the process of identifying care teams is difficult,¹⁹ and maintaining role assignments in the electronic health record is equally challenging. Vawdrey et al. previously reported that care team lists are inaccurate and cannot be used to reliably identify other members at any given moment.¹⁸ The inability to identify team members often leads to incorrectly routed pages, e-mail messages, and phone calls.²⁰ Consequently, the potential to reliably manage the care team and improve electronic communication remains untapped, rendering team collaboration and care coordination less effective.^{18,21,22}

In recent years, the trend toward restructuring inpatient teams—geographical localization, structured communication interventions, teamwork training, and interdisciplinary rounds—would seem to diminish the need for electronic care team identification, as those efforts have already made a positive impact with regard to interprofessional communication and collaboration, team satisfaction, and adverse events.^{23–26} Nonetheless, interdisciplinary teamwork, though critically important for patient-centered communication, does not completely obviate the need for accurate and reliable care team identification.²⁶ Although care teams are statically located on units, the plan of care is dynamic; it evolves when the patient’s status changes, when new information becomes available,

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TABLE 1. Key Facets of Electronic Health Record Care Team Identification Initiative, Successes, and Challenges

| Key Facets | Successes | Challenges |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linked electronic role assignment to administrative processes and clinical workflows | Leveraged existing processes to identify attending provider by routinely reviewing online schedules Linked role assignment to electronic medication administration system sign-in process for nurses at the start of their shift | Difficult to generate buy-in from administrators and specific clinician groups to incorporate routine use of role assignment functionality into existing and/or new workflows No institutional policy mandating role assignments for members of extended care team |
| Incorporated default functionality to specify length of role assignment (eg, stop date) | Used by trainees (residents, fellows) to automate team list role assignments for a prespecified period of time according to online schedules | Underutilized by subspecialty consultants, many of who were unaware or did not fully appreciate the added value of this functionality Research assistants regularly verified that default role assignments were accurately maintained for trainees |
| Linked role assignment to patient-specific group e-mail and messaging tools | Clinicians acknowledged clear efficiency benefits (eg, automated patient identification within messages, correct routing of e-mails) Used by specific members of the care team tasked with facilitating coordination of care (eg, nurse practitioner trained as discharge advocate for research study) | Difficult to promote use of patient-specific messaging, particularly for non-unit-based providers (eg, consultants, primary care physicians) Required access to an application not typically used for clinical messaging Difficult to change culture of network e-mail use for clinical messaging |
| Advertised new functionality and demonstrated potential efficiencies for care team communication | Unit-based clinicians (hospitalists, nurses, housestaff) typically understood benefits when demonstrated and were easier to engage Some non-unit-based provider groups (eg, social workers, nutritionists, subspecialty fellows) considered the initiative worthwhile, and were open to learning about new functionality to improve communication | Some non-unit-based clinicians (eg, consulting attendings, primary care physicians) did not see benefits and/or were difficult to engage Clinicians had several options for managing team lists prior to implementation of new electronic health record Institutional effort toward implementing new electronic health record detracted from efforts at demonstrating enhanced functionality of existing applications |

and when key longitudinal providers (eg, primary care physician, subspecialty consultant) make recommendations. Thus, information conveyed as a team on rounds quickly becomes out of date, requiring additional forms of communication. Furthermore, due to frequent ad hoc coverage among team members, the identity of providers covering the patient at any given moment is often not clear.²⁷ This is particularly problematic for non-unit-based providers who try to communicate with unit-based care team members. These providers, in particular, have valuable knowledge and insight that can aid the primary team in decision making.^{28,29} However, they typically do not participate in rounds, often waste time identifying responsible providers,²⁰ and may communicate their recommendations directly with the patient without discussing with the primary team. These factors in part explain why geographic localization has shown limited improvement in shared understanding of the plan of care.²³

From the perspective of patients and caregivers, identification of the providers entering and leaving their room is also challenging; only 11% to 51% of patients identify their providers correctly.³⁰ This adds to confusion regarding who is responsible for which aspects of the patient's care and can negatively affect the perception of the quality of care received.³¹ Use of whiteboards has been shown to improve the proportion of patients who could identify key providers,³² but these are not reliably updated and generally cannot accommodate all team members. When face cards are used, patients and caregivers report that they are more likely to identify their providers correctly.^{14,33,34} However, potential confusion may ensue when another provider assumes care of the patient in the same role.

Finally, use of technology to display team members at the bedside is typically a feature that patients like and can improve identification of care team members.¹⁴⁻¹⁶ Yet, patient engagement technologies are not readily available in the hospital setting,³⁵ and ideally should be linked to the electronic health record, which again must be reliably updated.^{11,12,15,16}

If care team identification is so critical for delivering effective patient-centered communication, why is maintaining role assignment problematic? At the individual level, reasons include discontinuity of the care team due to changing clinical rotations and intrateam coverage, shift-based schedules, and lack of awareness and underutilization of functionality. Additionally, clinicians may have different ways to maintain lists of patients. At the institutional level, functionality to enforce role assignment when accessing patient records may be disabled (to avoid perceived burdens on clinical staff or nonclinical personnel who require access for administrative functions). Finally, electronic health record vendors currently have no incentive to adopt functionality that supports more effective care coordination across settings.²²

However, more than technical solutions and policy changes are required; care team identification in the electronic health record requires a change in institutional culture. Maintaining an accurate relationship to each patient requires work without tangible benefits—the benefits accrue only when everyone else identifies their role on the team—a “tragedy of the commons.” This can be illustrated by our own experience. We conducted a quality improvement initiative (Table 1) as a part of 2 concurrent research initiatives that serve to promote patient-centered communication:¹² PCORI

TABLE 2. Goals and Strategies Hospitalists Can Employ to Improve Care Team Identification in the Electronic Health Record

| Goal | Strategies to Achieve Goal |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify and/or establish reliable processes that administrative staff can use to ensure accurate care team role assignments | Identify databases that serve as the "source of truth" for provider schedules and routinely access those databases Access resident scheduling application (eg, Amion) that is routinely updated by training program staff Work with clinical and administrative staff to maintain care team role assignments Engage affiliated ambulatory practices to ensure patient's primary care physician is updated in the electronic health record Engage admissions office to improve reliability of attending assignments based on online clinical schedules when patients are admitted |
| Integrate role assignment into established workflows for specific provider groups when administrative processes not feasible | Link routine care processes to care team role assignment Train nurses, interns, physician assistants to assign role on care team when assuming care of patient at shift change Train residents, fellows to use default functionality to automatically assign their role on care team at the beginning of a clinical rotation |
| Demonstrate value of maintaining role assignments in the electronic health record to the unit-based care team | Emphasize how accurate and reliable care team role assignment can facilitate correct routing of information (eg, test results, discharge summaries) Helps to maintain patient coverage lists (eg, fellows, consultants, social workers) Facilitates patient-specific communication (eg, via group email and messaging tools linked to the electronic health record's care team functionality) |
| Align with concurrent institutional initiatives that enforce or incentivize care team role assignment | Mandate role assignment when writing a note, placing an order, or adding a patient to a coverage list in the electronic health record Provide patients and caregivers the ability to identify the care team via patient portal—creates social pressure for those providers who do not identify themselves on the care team Incentivize providers to maintain role assignments during patient's hospitalization in order to receive notifications if patients are readmitted |
| Automate role assignments for all members of the care team whenever possible | Work with clinical informatics/information system staff to determine feasibility of linking online scheduling systems or log-in process to other systems routinely accessed by specific providers to automatically assign/unassign specific providers at the beginning/end of a shift (eg, nurses automatically assigned to care team when they access the electronic medication administration record system at beginning of shift) Explore availability of default functionality to assign and unassign providers to and from the care team in a specific role by team, service, or unit-based patient lists Require a stop time/date for role assignments or set a default if none entered |

(Patient-Centered Outcomes Research Institute Transitions), the goal of which is to improve care transitions within the Partners' Pioneer Accountable Care Organization; and the PROSPECT (Promoting Respect and Ongoing Safety Through Patient-Centeredness, Engagement, Communication, and Technology) project, an initiative funded by the Gordon and Betty Moore Foundation to eliminate preventable harms in the acute care environment.²⁹ Our goal was to electronically manage the care team with a high degree of fidelity. We enhanced a home-grown application, which was developed to improve management of team lists for inpatient providers, accessible from our electronic health record, to facilitate role assignment. Specifically, we leveraged existing care processes (eg, nursing log-on to the electronic medication administration system) to automatically assign certain providers to the care team at change of shift, added functionality to make it easy to assign a provider to all patients on a list for a defined period of time, and encouraged providers to assign their role by demonstrating benefits including quick access to patient-specific group e-mail and secure messaging tools (Table 1, Key Facets). The initiative was well-received by most disciplines, but uptake was suboptimal. Our research assistants routinely assigned residents and others to the care team because our proactive attempts at advertising and reinforcing use of the application

failed to reach a critical mass. Most did not see immediate benefits because it was an added step to their busy day, had other methods of managing team lists, and only saw benefit if everyone else participated. Key facets of our care team identification initiative, successes, and challenges are outlined in Table 1.

There were a few glimmers of hope, however. On several PROSPECT units, we displayed team members on a tablet-based patient portal so that patients would recognize their providers.^{11,17,36} Similar to recent work by O'Leary et al.,¹⁴ patients on PROSPECT units were able to correctly identify several care team members, but regularly asked why other providers (eg, consulting fellow) were not listed. Those providers asked the same question, and some eventually learned to assign their role via the application. As part of PROSPECT, we visited other institutions and learned of an effort to display team members on high-definition televisions in the patient's room. Several providers, wondering why they were not listed, learned to assign their role and their picture then appeared. Social pressure was the driving force.

Coincidentally, we recently implemented a new electronic health record at our institution. Anecdotally, although no formal policy was established, many providers (eg, attendings, first responders, nurses, care coordinators, and other unit-based providers) appear to

be assigning their roles. Other providers (eg, dieticians, physical therapists, residents) also assign their role, but often fail to end role assignments upon completing their rotation or when the patient transfers to another service. Finally, even when actively involved, most subspecialists still do not designate their role. Despite these gaps and inconsistencies, we have made progress toward improving care team identification. The reasons for this progress are straightforward; during required training for the new electronic health record, all inpatient providers were taught to assign their role on the “treatment team” when assuming care of patients and now have 1 option for managing team lists. However, most providers were not trained to end their role assignments, and many have learned that role assignment is not required to access the patient’s record; functionality to enforce this was disabled. Based on lessons learned from our experience,¹² we offer several strategies that hospitalists can employ to improve care team identification in the electronic health record (Table 2).

In the future, care team identification in the electronic health record can be automated by integrating directly with electronic workflows, online scheduling applications, and provider directories. Hospitals could then leverage care team lists to facilitate patient-centered communication via secure web-based and mobile messaging applications configured to simultaneously update all team members (eg, group messaging apps, microblogs).^{11,37,38} By synchronizing with the electronic health record, role assignments can be automatically updated via these applications, further increasing fidelity of care team identification.¹² Finally, as hospitals implement acute care patient portals, team lists can be leveraged to display all care team members correctly so that patients and caregivers can communicate more easily with providers.¹⁷ The potential ramifications for patient-centered communication are tremendous.

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References

- Brown SJ. Patient-centered communication. *Annu Rev Nurs Res*. 1999;17:85–104.
- Arora NK, Street RL, Jr, Epstein RM, Butow PN. Facilitating patient-centered cancer communication: a road map. *Patient Educ Couns*. 2009;77:319–321.
- Epstein R, Street RJ. Patient-Centered Communication in Cancer Care: Promoting Healing and Reducing Suffering. NIH Publication No. 07–6225. Bethesda, MD: National Cancer Institute; 2007.
- Coiera E. When conversation is better than computation. *J Am Med Inform Assoc*. 2000;7:277–286.
- Coiera E. Communication systems in healthcare. *Clin Biochem Rev*. 2006;27:89–98.
- Leape LL, Brennan TA, Laird N, et al. The nature of adverse events in hospitalized patients. results of the Harvard Medical Practice Study II. *N Engl J Med*. 1991;324:377–384.
- Donchin Y, Gopher D, Olin M, et al. A look into the nature and causes of human errors in the intensive care unit. *Crit Care Med*. 1995;23:294–300.
- Sutcliffe KM, Lewton E, Rosenthal MM. Communication failures: an insidious contributor to medical mishaps. *Acad Med*. 2004;79:186–194.
- Alvarez G, Coiera E. Interdisciplinary communication: an uncharted source of medical error? *J Crit Care*. 2006;21:236–242; discussion 242.
- Agarwal R, Sands DZ, Schneider JD. Quantifying the economic impact of communication inefficiencies in U.S. hospitals. *J Healthc Manag*. 2010;55:265–281; discussion 281–282.
- Dalal A, Dykes P, Schnipper J, Bates D. Transforming the acute care environment: a web-based patient-centered toolkit [abstract]. *J Hosp Med*. 2014;9(suppl 2):694.
- Dalal AK, Gershnik E, Magny-Normilus C, et al. Creating a culture of patient-centered care team communication at a large academic medical center [Abstract]. *J Hosp Med*. 2015;10 (suppl 2). Available at: <http://www.shmabstracts.com/abstract/creating-a-culture-of-patient-centered-care-team-communication-at-a-large-academic-medical-center>. Accessed April 24, 2015.
- McKnight L, Stetson PD, Bakken S, Curran C, Cimino JJ. Perceived information needs and communication difficulties of inpatient physicians and nurses. *Proc AMIA Symp*. 2001:453–457.
- O’Leary KJ, Lohman ME, Culver E, Killarney A, Randy Smith G Jr, Liebovitz DM. The effect of tablet computers with a mobile patient portal application on hospitalized patients’ knowledge and activation [published online June 15, 2015]. *J Am Med Inform Assoc*. doi: 10.1093/jamia/ocv058.
- Caligtan CA, Carroll DL, Hurley AC, Gersh-Zaremski R, Dykes PC. Bedside information technology to support patient-centered care. *Int J Med Inform*. 2012;81(7):442–451.
- Dykes PC, Carroll DL, Hurley AC, et al. Building and testing a patient-centric electronic bedside communication center. *J Gerontol Nurs*. 2013;39:15–19.
- Dalal AK, Dykes PC, Collins S, et al. A web-based, patient-centered toolkit to engage patients and caregivers in the acute care setting: a preliminary evaluation [published online August 2, 2015]. *J Am Med Inform Assoc*. doi: 10.1093/jamia/ocv093.
- Vawdrey D, Wilcox L, Collins S, et al. Awareness of the care team in electronic health records. *Appl Clin Inform*. 2011;2:395–405.
- O’Leary KJ, Ritter CD, Wheeler H, Szekendi MK, Brinton TS, Williams MV. Teamwork on inpatient medical units: assessing attitudes and barriers. *Qual Saf Health Care*. 2010;19:117–121.
- Wong BM, Quan S, Cheung CM, et al. Frequency and clinical importance of pages sent to the wrong physician. *Arch Intern Med*. 2009;169:1072–1073.
- O’Malley AS, Cunningham PJ. Patient experiences with coordination of care: the benefit of continuity and primary care physician as referral source. *J Gen Intern Med*. 2009;24:170–177.
- O’Malley AS, Grossman JM, Cohen GR, Kemper NM, Pham HH. Are electronic medical records helpful for care coordination? Experiences of physician practices. *J Gen Intern Med*. 2010;25:177–185.
- O’Leary KJ, Wayne DB, Landler MP, et al. Impact of localizing physicians to hospital units on nurse-physician communication and agreement on the plan of care. *J Gen Intern Med*. 2009;24:1223–1227.
- O’Leary KJ, Haviley C, Slade ME, Shah HM, Lee J, Williams MV. Improving teamwork: impact of structured interdisciplinary rounds on a hospitalist unit. *J Hosp Med*. 2011;6:88–93.
- O’Leary KJ, Buck R, Fligel HM, et al. Structured interdisciplinary rounds in a medical teaching unit: improving patient safety. *Arch Intern Med*. 2011;171:678–684.
- O’Leary KJ, Sehgal NL, Terrell G, Williams MV; High Performance Teams and the Hospital of the Future Project Team. Interdisciplinary teamwork in hospitals: a review and practical recommendations for improvement. *J Hosp Med*. 2012;7:48–54.
- Martin K, Frank M, Fletcher KE. Intra-team coverage is common, intrateam handoffs are not. *J Hosp Med*. 2014;9:734–736.
- Tang N. A primary care physician’s ideal transitions of care? Where’s the evidence? *J Hosp Med*. 2013;8:472–477.
- Lindquist LA, Yamahiro A, Garrett A, Zei C, Feinglass JM. Primary care physician communication at hospital discharge reduces medication discrepancies. *J Hosp Med*. 2013;8:672–677.
- Arora VM, Press VG. Let’s “face” it: time to introduce yourself to patients. *J Hosp Med*. 2014;9:199–200.
- Beaudin CL, Lammers JC, Pedroja AT. Patient perceptions of coordinated care: the importance of organized communication in hospitals. *J Healthc Qual*. 1999;21:18–23.
- Tan M, Hooper Evans K, Braddock CH III, Shieh L. Patient whiteboards to improve patient-centered care in the hospital. *Postgrad Med J*. 2013;89:604–609.
- Unaka NI, White CM, Sucharew HJ, Yau C, Clark SL, Brady PW. Effect of a face sheet tool on medical team provider identification and family satisfaction. *J Hosp Med*. 2014;9:186–188.
- Simons Y, Caprio T, Furiasse N, Kriss M, Williams MV, O’Leary KJ. The impact of facecards on patients’ knowledge, satisfaction, trust, and agreement with hospital physicians: a pilot study. *J Hosp Med*. 2014;9:137–141.
- Prey JE, Woollen J, Wilcox L, et al. Patient engagement in the inpatient setting: a systematic review. *J Am Med Inform Assoc*. 2014;21:742–750.

36. PROSPECT: Promoting Respect and Ongoing Safety Through Patient-centeredness, Engagement, Communication, and Technology. Available at: <http://www.partners.org/cird/PROSPECT/Index.htm>. Accessed May 3, 2015.
37. Przybylo JA, Wang A, Loftus P, Evans KH, Chu I, Shieh L. Smarter hospital communication: secure smartphone text messaging improves provider satisfaction and perception of efficacy, workflow. *J Hosp Med.* 2014;9:573–578.
38. Dalal A, Dykes P, McNally K, et al. Engaging patients, providers, and institutional stakeholders in developing a patient-centered microblog. Paper presented at: Proceeding of the American Medical Informatics Association Annual Fall Symposium; November 16–19, 2014; Washington, DC.