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Pulling together and pulling apart: influences of convergence and divergence on distributed healthcare teams

L. Lingard¹, C. Sue-Chue-Lam², G. R. Tait³, J. Bates⁴, J. Shadd⁵, and V. Schulz^{6,7} For the Heart Failure/Palliative Care Teamwork Research Group

¹Centre for Education Research and Innovation, Department of Medicine, Schulich School of Medicine and Dentistry, Western University, Room 112, Health Sciences Addition, London, ON N6A 5C1, Canada

²Schulich School of Medicine and Dentistry, Western University, London, ON, Canada

³Department of Psychiatry and Division of Medical Education, Dalhousie University, Halifax, NS, Canada

⁴Department of Family Practice, Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada

⁵Division of Palliative Care, Department of Family Medicine, DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada

⁶Department of Anesthesia and Perioperative Medicine, London Health Sciences Centre, London, ON, Canada

⁷Western University, London, ON, Canada

Abstract

Effective healthcare requires both competent individuals and competent teams. With this recognition, health professions education is grappling with how to factor team competence into training and assessment strategies. These efforts are impeded, however, by the absence of a sophisticated understanding of the *the relationship between* competent individuals and competent teams. Using data from a constructivist grounded theory study of team-based healthcare for patients with advanced heart failure, this paper explores the relationship between individual team members' perceived goals, understandings, values and routines and the collective competence of the team. Individual interviews with index patients and their healthcare team members formed Team Sampling Units (TSUs). Thirty-seven TSUs consisting of 183 interviews were iteratively analysed for patterns of convergence and divergence in an inductive process informed by complex adaptive systems theory. Convergence and divergence were identifiable on all teams, regularly co-occurred on the same team, and involved recurring themes. Convergence and divergence had nonlinear relationships to the team's collective functioning. Convergence could foster either shared action or collective paralysis; divergence could foster problematic incoherence or productive disruption. These findings advance our understanding of the complex relationship

Correspondence to: L. Lingard.

between the individual and the collective on a healthcare team, and they challenge conventional narratives of healthcare teamwork which derive largely from acute care settings and emphasize the importance of common goals and shared mental models. Complex adaptive systems theory helps us to understand the implications of these insights for healthcare teams' delivery of care for the complex, chronically ill.

Keywords

Teamwork; Collaboration; Competence; Complex chronic care; Grounded theory; Qualitative research

Introduction

In a few short years teamwork has become a central concern in health policy, practice and education, due both to its centrality in the patient safety movement and to its relevance to the twenty-first century challenge of caring for patients with complex chronic disease. This recognition of the importance of teamwork is a critical shift in how we think. With this shift has come growing attention to the need to train healthcare professionals to function effectively as part of a team—to train them not only for individual competence, but also for collective competence.

Collective competence is a distributed capacity of a system which is not easily reducible to an individual. First articulated by Boreham (2004) in the context of higher education and elaborated by Lingard (2012) for the context of health professions education, the concept of collective competence theorizes that competence is jointly accomplished through the interdependent and emergent relationships among individuals and the system. Collective competence is offered as both a contrast and a complement to the traditional view of competence as a quality that individuals acquire and possess. Challenging the traditional notion that individuals achieve a state of competence that transcends context, collective competence posits that competence is a dynamic, evolving process, that it is influenced by its temporal and spatial contexts, that it is embodied in tacit knowledge rather than enacted through prescriptive knowledge, and that it emerges unpredictably as the system selforganizes to adapt to recurring disturbances.

Current approaches to training for teamwork draw on a body of knowledge which derives primarily from the study of teams in acute care contexts such as the critical care unit (Pronovost et al. 2003; Paradis et al. 2016), the operating room (Lingard et al. 2005; Gillespie et al. 2013) and the inpatient medicine ward (Rice et al. 2010; Henkin et al. 2016). However, acute care teams have characteristics not representative of the wider array of teams providing healthcare outside of inpatient hospital settings. Acute care teams are made up of individuals who share an organizational culture, and therefore have some degree of personal contact, shared history and mutual accountability. Another characteristic of acute care team research is its tendency to characterize patients as a background presence, acted upon by the team but not part of it. The dominant conceptualization of teamwork from the body of acute care teamwork research is that good teams pull together: they are characterized by coordination and information sharing, agreement on clear goals and responsibilities, mutual

trust, and transparent, closed loop communication (Stewart et al. 2003; Weller et al. 2014). This conceptualization has motivated successful initiatives to improve teams' collaborative abilities (Weller et al. 2016; Saliski et al. 2008; Haynes et al. 2009). However, it has also been critiqued as an oversimplification for its inattention to issues of culture, power and systems complexity (Bleakley 2013; Kitto and Grant 2014; Paradis and Whitehead 2015). This dominant conceptualization of teamwork relies on linear reasoning: if a team is collectively competent, then its individual members will pull in the same direction; and if individual members are not pulling in the same direction, then the team will not be collectively competent. However, we do not know the extent to which such linear assumptions hold outside the acute care setting. What we do know is that teams in many healthcare settings are characterized by cross-purposes, competing values, mutual invisibility and incompatible routines—and yet, these teams often manage to collectively provide effective care (Lingard et al. 2012). This paper seeks to advance our understanding of how this works in complex, distributed healthcare teams.

Using data from a qualitative study of heart failure (HF) care teams, this study explores the relationship between individual team members' goals, understandings, values, routines, actions and the collective competence of the team. HF care represents an iconic instance of one of contemporary healthcare's most intractable problems: how to coordinate care for the complex chronically ill, among the patient, their caregivers, and a variety of health professionals, distributed across specialties, professions and institutions.

Methods

This paper draws from a multi-centre, qualitative study exploring the practices of HF care teams at five study sites in three Canadian provinces. In particular, the study was motivated by an interest in how these teams currently delivered heart failure care and how they perceived and experienced the emerging mandate to integrate palliative care into HF care practices. The study was approved by Research Ethics Boards at all sites. Data were collected from 2012 to 2015.

Complex adaptive system (CAS) theory informed our appreciation of the multi-factorial, negotiated nature of teamwork. CAS is a theoretical lens only recently, and rarely, brought to bear on questions of healthcare teamwork (Kannampallil et al. 2011), but it is acknowledged as being well suited to the domain (Suter et al. 2013). CAS is appropriate for examining complex problems, the parts of which are not fully knowable, interact unpredictably, and produce unintended outcomes (Zimmerman et al. 2008). Heart failure care, and health care more broadly, is such a problem, although historically it has been approached mechanistically, as if it were merely complicated, with parts knowable and stable. A CAS is an open system composed of multiple agents, including people, policies, equipment, technology, institutions and their values and practices. Because a CAS is greater than the sum of its parts, its individual components need to be understood as entangled and dynamically interacting (Capra 1996; Stacey 2006). For instance, the "roles" of members of the team are not simply reducible to division of labor or specialization: interactions within and between roles exist. Furthermore, roles are shaped by professional regulations, organizational routines and interpersonal relations, and, therefore, give rise to unforeseeable

events. Finally, complex adaptive systems are nonlinear: they self-organize in emergent ways in response to small disturbances, which can produce large and unpredictable consequences. CAS theory informed our research design, which used an innovative team sampling approach to capture the multiple parts of the HF care team, to trace the dynamic interactions among these parts, and to provide insight into the nature and influence of disturbances in this open system. CAS also influenced our analytical approach: we emphasized relationships among the parts of the HF care team over the parts (individuals) themselves.

Patients with advanced HF, defined as New York Heart Association (NYHA) III or IV, were recruited for semi-structured interviews. These patients experience shortness of breath, fatigue, and heart palpitations even with everyday physical exertion, perhaps even at rest. Recruitment centered primarily on patients in clinics in community or tertiary hospitals designated specifically for patients with heart failure. We used a combination of convenience and purposive sampling to recruit patients of different ages, and genders, from both urban and suburban communities, and with a range of clinical (e.g., comorbid conditions) and social (e.g., family supports, financial needs) complexity. Index patients were interviewed by a trained research assistant with no role in their healthcare (Appendix A in Electronic supplementary material). Most interviews took place in patient homes, and some patients and caregivers were interviewed together at their request. Patients were asked to tell the story of their heart failure, to describe their current life and care routine, their needs and goals, and their concerns or hopes for the future. They were also asked to identify the members of their care team—loosely defined as the individuals who provide them with recurring, supportive, HF-related care—and to describe the role of each member and their perception of how they interact on the team.

Identified care team members were invited to participate in semi-structured interviews (Appendices B and C in Electronic supplementary material). Most of these interviews focused exclusively on their understanding of, and role in, the care of the index patient who had identified them as a team member. Because some nurses and cardiologists from the HF clinic were identified by multiple index patients, these interviews could consider their role in the care team of multiple index patients. Healthcare professionals were also asked to reflect more generally, using the index patient as an example, on interactions among members of the HF care team.

The interviews of an index patient and their identified team members were clustered to form Team Sampling Units (TSUs) (Fig. 1: Sample TSUs)—defined as a patient-identified health care team consisting of the patient plus at least two other members (Lingard et al. 2012). In this conceptualization, the patient is seen as a core member of the care team, not just an object of its activity (LaDonna et al. 2016). To ensure confidentiality, each participant was given a pseudonym; to allow for team level analysis, transcripts were assigned a code identifying the TSU to which they belonged.

The total data set for the larger study consisted of 50 patient-centred TSUs. The work reported in this paper derives from 37 of those TSUs, made up of 185 interview transcripts. The analysis for this paper commenced with a subset of 18 TSUs which had been rendered into 'narrative team profiles' by CS in two summer research internships. (Because data

collection was staggered across the five sites, no narrative profiles were produced at this stage of the project for TSUs in Site 5, not yet collected.) These profiles were produced to help the analysis to negotiate both individual perspectives in a single transcript and collective patterns across a TSU. Narrative profiles were created by reading a set of TSU transcripts to answer the following five analytical questions: What do team members see as the patient's main problems? What do team members see as the patient's main needs? In what ways does the patient have agency as a team member? How smoothly is care coordinated among team members? What is the plan for when the heart failure worsens? A coding group (LL, CS, GT, JB, VS, JS) analyzed these narrative team profiles to identify recurring patterns among team members' perceptions and experiences in relation to these five questions.

Early in this analysis we noticed that teams were sometimes 'pulling together' and sometimes 'pulling apart'; that is, TSU members' answers to questions about patient concerns and needs, team coordination and future care plans sometimes overlapped and sometimes did not. We began to systematically and iteratively explore these patterns, coming to call them 'convergence' and 'divergence'. These terms are resonant with CAS theory (Lansing 2003), but they characterize themes we identified inductively, not deductively. We defined convergence as instances when two or more team members reported a shared understanding or action in relation to these five key questions. We defined divergence as instances when two or more team members reported different understanding or action in relation to the questions. In an iterative process that began with a few narrative team profiles and gradually adding more to the analysis, CS used these definitions to systematically identify instances of convergence and divergence in all narrative profiles, reviewing them with the coding group in regular meetings. As instances were identified and confirmed in the narrative profile analysis, CS returned to the primary transcripts in each TSU, to elaborate our understanding of the instance and resolve any questions about its nature. At this point, other TSUs outside the narrative profile group were purposefully sampled to elaborate and refine our insights into these patterns. Ongoing iteration, from individual transcripts to TSUlevel comparisons, was a central feature of our analytical approach. Thematic analysis was conducted (LL, CS) on all identified instances of convergence and divergence, in order to identify recurring issues regarding which team members converged and diverged.

As our catalogue of instances of convergence and divergence grew, we tried to ascertain how these relationships actually constituted the complex system of "HF team" as it responded to emerging circumstances. Did convergence constitute collective competence? Did divergence constitute collective incompetence? Our goal was not to infer causality. Rather, following CAS theory, we wanted to explore the HF *team* as a set of emerging relationships among converging and diverging individual knowledges/attitudes/goals, rather than approaching it as an a priori, coherent unit. At this point in the analysis, we also purposively selected additional TSUs outside those already included in the analysis, largely seeking discrepant instances that would challenge and elaborate our emerging sense of how convergent and divergent patterns constituted the collective. As new TSUs were added, instances of convergence or divergence were reviewed in regular group coding meetings. In total, nineteen additional TSUs were added to the analysis process to reach theoretical sufficiency (Dey 1999) around patterns of convergence and divergence, for a total of 37 TSUs (185

interviews) analyzed for the work reported in this paper (Table 1: Data Included in Analysis).

Results

Four main findings were identified. The first three will be illustrated briefly using representative examples from the TSUs: convergence and divergence occurred in HF teams; they often co-occurred on the same team; and the same recurring themes were associated with both convergence and divergence. The final finding, that convergence and divergence variably influenced team competence, will be considered in more detail.

Both convergence and divergence were identifiable on the HF care teams in the dataset. Convergence and divergence occurred both in relation to specific issues in the care of the index patient such as the need for increased homecare support, as well as in relation to more abstract issues. Tables 2 and 3 represent examples of convergence and divergence.

Teams were rarely wholly convergent or divergent. Rather, in most of the 37 analyzed teams, multiple points of convergence and divergence co-occurred. Ethan's team (Table 4) illustrates how convergence and divergence co-occurred on a single team.

The same recurring issues provoked both convergence and divergence in our dataset. Reflecting our study focus, the most prominent issues were Approach to Death and Dying, and Patient Needs/Experiences/Preferences. As an example of the latter, Table 5 illustrates divergence of perspectives around health maintenance, but an ultimate convergence of actions around patient preferences on Albert's TSU.

Our final finding was that convergence and divergence have various influences on the team's collective competence. In some cases, such as the convergence of Albert's TSU (Table 5) regarding his desire for life quality over life extension, convergence appeared to foster collective competence. Albert's wife and family physician diverged from Albert in their perspectives about how he should look after himself. However, they converged in their actions, working within his preferences. This had interesting effects; for instance, rather than being frustrated by Albert's noncompliance, his family physician simply did what he could to help when Albert invariably 'tipped over' and came to the office for urgent assistance. In fact, not only did the family physician not appear to resent their divergent perspectives, he expressed a strong respect for Albert's values which influenced his convergent actions. However, convergence was not universally beneficial. In some cases, convergence seemed reflective of a collective sense of paralysis rather than a shared plan. Irene's TSU offers an illustration of this (Table 6).

Divergence, too, could have either a productive or unproductive influence on collective competence on these HF care teams. For instance, in Vladimir's TSU (Table 7), the divergence appeared to dilute the team's collective competence.

Vladimir's team lacked a shared recognition of the value of diuretics as part of his ongoing care plan, a divergence that weakened their ability to work collectively. Interestingly, the divergence was explicitly recognized by multiple team members and discussed in their

interviews: the cardiologist and the palliative care physician both realized that Vladimir's family was resisting their decision to maintain Vladimir's diuretic, and the palliative care physician further recognized that the homecare nurses believed the effectiveness of the diuretic precluded the need for ongoing palliative care in the home. While these team members recognized the divergence, however, they did not appear to have a plan to negotiate it. It is likely, therefore, that Vladimir and his family would continue to pull in a different direction than his physicians, with implications for his quality of life in the final weeks of his life.

Divergence could also influence collective competence positively, as Bob's TSU illustrates (Table 8).

In Bob's TSU, the divergence of opinion among the social worker, physiotherapist and HF nurse was a productive one, in that it positively influenced the course of care for Bob. Had all team members converged on the perception that Bob had no palliative care needs, the conversation about end of life options would not have happened; as it turned out, it came at an important time in Bob's care trajectory, as he experienced a precipitous decline shortly after the study interview.

Discussion

This analysis provides insight into the relationship between the individual and the collective on healthcare teams. We found two broad patterns of relationship: a convergent pattern, in which individuals shared knowledge, goals, understandings, values, or perceptions, and a divergent pattern in which some of these features were not shared across individuals on a team. Teams in our dataset were rarely wholly convergent or divergent; more often, convergence and divergence co-existed in the same team. Most interestingly, these patterns of relationship among individuals exhibited various influences on the team's collective competence. That is to say, while convergence sometimes appeared to support the team's collective ability, other times it did not. Similarly, divergence sometimes appeared to undermine the team's collective work, but other times it appeared to create a productive disruption.

These findings offer an interesting departure from the traditional narrative of healthcare teamwork as predicated on mutual assumptions and coordinated actions. Based on this conceptualization, our training for teamwork aims to "decrease tension between individual and team performance" (Loeb 2016), emphasizing clear role descriptions, explicit scopes of practice, shared motivations and stable domains of skill and knowledge. In critical care, for example, team members' "divergent knowledge bases, cultures, languages, expertise, and opinions" (Saliski et al. 2008) are approached as a problem to be solved, particularly when they appear to create a lack of understanding in residents or nurses regarding the patient goals for the day. Such teamwork interventions reflect a conceptualization of the team as a complicated system: one which can be improved in predictable, linear ways through initiatives such as standardized checklists and required communication routines.

We do not intend to argue that this conceptualization of teamwork is wrong. Rather, we argue that it is limited: limited by its acute care origins and by its assumption of linearity. From a CAS theory perspective, the patterns of convergence and divergence we have described can be understood as forms of self-organization, patterns that arise from individuals negotiating in particular, contingent situations (Zimmerman et al. 2008). In the following discussion, we use our results to elaborate and extend the dominant, linear conceptualization of teamwork, with particular attention to the distributed nature of HF teams, the phenomenon of productive divergence, and the influence of patient-as-teammember.

Distributed teamwork

The majority of healthcare trainees will work not on acute care teams, but on distributed teams in which members from various organizations may neither know one another nor have opportunities to discuss shared patients. We cannot train healthcare professionals for collective competence in these settings using only models derived from acute care settings: new approaches are required that account for the distinctive complexities of distributed teamwork.

HF teamwork offers a rich example of the unique complexities of non-acute care teams, in which health professional team members are distributed across organizations and regions, and their interactions are stretched across time and space, in the context of a disease that is continuously and unpredictably evolving. In this context, what one team member sees and understands is, necessarily, different from what another sees and understands, and this is true for health professionals as well as for caregivers and patients. Because such distributed teams are multi-faceted and emergent—patients have multiple, sometimes conflicting needs and goals, and their care providers may have varied perspectives and practices—they can be both convergent and divergent along different issues and at different points in the collaborative activity.

This highlights the enormity of the challenge of 'mutual knowledge' and 'shared assumptions' on distributed teams. Unlike acute care teams, in which members have opportunities to communicate—either through scheduled events such as morning rounds or spontaneous conversations in passing, distributed teams have few structured opportunities for team discussion. Referral letters are common, but referral conversations are not: our participants described having to step well outside their usual communication routines to personally discuss a shared patient with another team member. One implication is that, if convergence is a goal, then communication routines need alteration in order to support the explicit identification and resolution of divergent perspectives and goals.

Productive divergence

But perhaps convergence should not always be the goal. Our results suggest that divergence is an inherent feature of the complex adaptive system of a distributed healthcare team. When individuals on the team possess different knowledge and assumptions based on their position in a HF patient's time/space care trajectory, these differences may be valuable. To expect or

demand convergence may dilute important differences in knowledge or perception on the team.

Furthermore, divergence may be a productive response to system level paradoxes. Productive divergence makes particularly good sense from a CAS perspective, which treats dissent and paradox as two key influences in how a complex adaptive system responds to environmental demands. Take Vladimir's situation as an example. The goal of both his diuretics and his palliative homecare is to improve his quality of life in his final days. However, a paradox is created when Vladimir responds so well to the diuretics that his homecare nurses question his eligibility for the scarce resource of palliative homecare. The paradox in itself is not the problem; it is an inherent feature of a complex system (Stacey 2003). The problem lies in our conventional approach to paradox: usually, we attempt to reduce dissenting beliefs and harmonize opinion. The quest to integrate palliative care into heart failure care exemplifies this approach, with guidelines and organizational integration efforts to produce shared beliefs among all providers caring for patients with advanced HF. Such efforts do not reduce the paradox; ironically, it may intensify with linear efforts to encourage homogeneity of beliefs and practices (Stacey 2003; Kernick 2002). The paradox that 'every HF patient deserves palliative care, but we cannot resource palliative care for every HF patient' is irresolvable; it is a paradox built into the socio-material reality of care for these patients (McDougall 2015), and assumptions otherwise create frustration for both patients and their healthcare providers.

Other domains have recognized that divergence can be productive under certain circumstances. Business studies of work groups report that diversity among team members can foster innovation but only when a shared view of the task exists to 'manage the centrifugal forces of diversity' (West 2002). In Albert's case, the convergent prioritizing of patient preferences constitutes such a shared view. How such convergence develops out of divergence is a key question, but not one that Albert's TSU explicitly answers. Studies of organizational behavior in education and business suggest that opposing views can be productive when they are recognized and negotiated forthrightly (Tjosvold and McNeely 1988; Alper et al. 1998). Similarly, recent critiques of patient safety efforts highlight the importance of "heedful relations" among individuals to achieve effective team performance (Sutcliffe et al. 2016). Due to our study design, we cannot consistently know whether divergent views on our TSUs were recognized among some or all team members, nor can we speak to whether or how they were negotiated, unless a participant reported this in their interview. What we can say, though, is that divergence exists and it appears to shape teamwork in nonlinear ways, sometimes apparently problematic, sometimes productive. And recognition alone does not appear sufficient to translate divergence into productive teamwork: in Vladimir's case, TSU members reported awareness of divergence but did not indicate it had been negotiated in any substantive way.

The patient-as-team-member

A recognition of productive divergence also requires us to question the assumption of convergence as an unequivocal good. Such questioning is valuable because it draws our attention to issues of power and their role in team functioning, which have been under-

explored in teamwork research and education (Janss et al. 2012; Paradis and Whitehead 2015). Our team sampling method allows us to attend to power relations not only among healthcare professionals but also among patients and other healthcare team members. By taking patients as a starting point in our team sampling procedures, we position them as part of their team, giving them a voice they have not traditionally had in teamwork research. Because of this, the definition of 'team' in our work necessarily reflects the patient's perspective, which may explain why, in the patterns we have described, the patient is almost always one of the 'nodes' in convergence or divergence patterns. Their positioning within these patterns, however, was neither consistent nor predictable. Sometimes patients were part of a team-wide convergence: for instance, Irene shared her team's assessment that her needs were being poorly met, and their apathetic sense that her care was not likely to improve. Sometimes the patient was convergent with some team members and divergent with others: for instance, Ethan, his supportive care physician and his wife all perceived his primary need to be assistance with his profound sadness, while his cardiologist disagreed. And sometimes patients were the point of divergence from other team members who shared a perspective: for example, Albert's priority to enjoy his life diverged from his family physician and his wife's priority for compliant self-care. Only rarely did we see the patient's perspective explicitly hold sway in situations of divergence, such as in Albert's TSU, when the team's divergence of perception resolves into convergence of action centered on Albert's goal to enjoy his life.

Patients' multiple positions in TSU convergence and divergence patterns reinforces current challenges to the discourse of patient compliance or adherence which suggests that patients should converge around their healthcare providers' plans for them (Bissell et al. 2004). Our results don't show teams 'centered on' patients, nor do they straightforwardly show patients complying with the perspectives of other team members: instead, they show patients engaged in their teams, sometimes in patterns of convergence and sometimes in patterns of divergence. We would argue that it is a useful reconceptualization of power on the team to conceive of patients as participating in, and negotiating with, emergent patterns of convergence and divergence, rather than being assumed to be the object or victim of other team members' agreements or disagreements. We echo other teamwork researchers in calling for the application of a broader range of theories in the study of how team members collaborate (Suter et al. 2013), particularly those that challenge mechanistic and paternalistic models of teamwork.

More research is needed to fully understand the implications of the convergence and divergence patterns we have described. When should productive divergence be fostered as a way of strengthening the team's collective work or avoiding narrow conceptualizations of the care plan? When is divergence simply divisive and when does it support dynamic thinking? What system factors make convergence productive or paralytic? Our data provide glimpses of distinctions between convergent/divergent *perspectives* and convergent/divergent *actions* on distributed teams, but it remains to more fully explore, what is nature of these distinctions? These questions require answering, if we are to understand how both pulling together and pulling apart function in the collective of a diverse, distributed healthcare team.

Limitations

The use of semi-structured interviews in this study allowed each participant to discuss what was most important from their perspective, ensuring richness and diversity of TSU data. However, it also created difficulties in analyzing for convergence and divergence at the level of a TSU, as participants were not necessarily asked all the same detailed probes and, even when they were, their open-ended answers took various forms. We have therefore been careful in our interpretations to retain complexity and ambiguity.

Interview data reflect perceptions, not direct actions. We contend that perceptions are critical to the functioning of teams, particularly when team members are distributed and their perceptions may be all they have to go on regarding others' actions or beliefs on the team. However, we acknowledge that a study of perceptions cannot support causal inferences. Future work is needed to extend our description of the nonlinear relationships between convergence and divergence and team functioning into evidence regarding the direct impacts of these patterns in real time. Similarly, our data represent a point-in-time snapshot of team perceptions, which offers preliminary insight into patterns of convergence and divergence but cannot do justice to the question of how they are recognized and negotiated over time. Understanding how divergence and convergence become recognized and negotiated when team members rarely interact is an important direction for future research, as invisible or unknown divergence may be more likely to be unproductive than known divergence that is negotiated.

Conclusion

Distributed healthcare teams are complex adaptive systems in which the relationships among the individual parts is one of convergence *and* divergence. Convergence is not always related in a linear way to collective competence, nor does divergence appear to consistently predict collective incompetence. In fact, divergence may play an important role that teamwork research has not yet fully appreciated, particularly in the context of distributed teams. If pulling together and pulling apart are neither good nor bad but rather inherent, evolving features of distributed teamwork, then we need a language to introduce and acknowledge these features in practice and to understand their role in training for collective competence.

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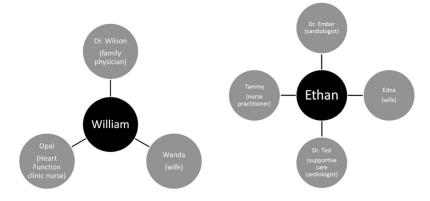


Fig. 1. Two Sample TSUs

Table 1

Data included in analysis, by Patient, Site and TSU size

Index patient	Site	# Interviews in TSU
Ida	Site 1	8
Albert	Site 1	3
Farida	Site 1	7
Bernard	Site 1	3
Sylvan	Site 1	6
Carl	Site 1	6
Leon	Site 1	4
Uther	Site 1	3
Oscar	Site 1	8
Reema	Site 1	5
Brad	Site 2	4
Howard	Site 2	3
Edward	Site 2	4
Seigfried	Site 2	4
Irene	Site 2	4
David	Site 2	3
Kevin	Site 2	3
Martin	Site 3	4
Ophelia	Site 3	3
Norman	Site 3	4
Thomas	Site 3	3
Vladimir	Site 3	5
William	Site 3	4
James	Site 3	6
Terry	Site 4	9
Victor	Site 4	7
Wendy	Site 4	6
Yale	Site 4	7
Aden	Site 4	4
Bob	Site 4	9
Carina	Site 4	6
Zoe	Site 4	5
Ethan	Site 4	5
Frank	Site 4	6
Adam	Site 5	3
Brent	Site 5	5
Carmen	Site 5	4
Patients n = 37		TSU interviews n = 183

Italics indicates TSU is part of 18 narrative profiles group

Table 2

Convergence on Ophelia's TSU

Ophelia was a 42-year old patient whose team converged around an expectation that she still "had time". Ophelia herself hoped that "if I continue going the way I am, I have a few more good years" (p. 12). Her mother similarly expected Ophelia to do well in the future, although Ophelia perceived that this reflected her mother's inability "to come to terms with how sick I am" (p. 15). The heart function clinic nurse explained that they were "still actively treating" Ophelia (p5) and, although they had had "advance planning conversations with her", they hadn't yet formally consulted palliative care. She shared that the clinic was surprised to learn of Ophelia's death because "we never thought that we were at the end... [that she had] only weeks to live" (p. 4)

Table 3

Divergence on Martin's TSU

Martin was a XX-year old patient whose team diverged in how capable they believed Martin was of self-management. Martin reported that he was highly capable of managing his illness, offering the example of keeping his dialysis equipment clean. By contrast, his daughter believed Martin did not "grasp the seriousness" of his care (p. 13), while his nurse reported that Martin actually had "a little bit more insight" into his illness compared to other patients (p. 3)

Table 4

Co-occurrence of divergence and convergence on Ethan's TSU

Ethan had been diagnosed 3 years previously and he was in NYHC Stage III heart failure at the time of his interview. His TSU included his wife, the heart function clinic nurse practitioner, and two cardiologists, one of whom specialized in supportive care. As an example of convergence, Ethan understood that the root of his heart condition was amyloid disease, and his wife, cardiologist, and heart function clinic nurse agreed on this fact. Furthermore, the entire team shared an understanding that Ethan was deeply unhappy with his loss of function, especially having led a "very active lifestyle" prior to contracting his heart condition. On the other hand, the team diverged on the importance of meeting Ethan's psychosocial needs. Ethan identified his "mental issues" as one of his main problems. His cardiologist, however, questioned the value of "sitting down with a counselor once a week and talking about how depressing it is that you're dying". Meanwhile, his supportive care cardiologist described his belief in the importance of a "two-pronged", approach to patient care for Ethan, where pharmacological and non-pharmacological approaches complement each other. Ethan's wife expressed concern that his "moods" were not being addressed "at all"

Table 5

Convergence and divergence around patient preferences on Albert's TSU

Albert was a 52 year old man who had NYHA stage IV heart failure and passed away a few months after he was interviewed. Albert's TSU included his wife and his family physician, who converged with Albert around an approach to living with illness that privileged quality of life over quantity of life. Albert shared that he hoped not to be "lying in a hospital bed" wishing he had done more, and he admitted that he regularly does "what [he] shouldn't" in terms of his diet and activities (18) as a consequence of not wanting to have regrets about how he lived his life. His wife agreed that "he doesn't pay much attention" (3) to instructions about diet and meds; she had taken on the role of receiving medical instructions for him but didn't press him to comply when he wished otherwise. Similarly, his family physician acknowledged candidly that Albert did not always act in the best interests of his health: "for a while he would be very compliant, but eventually life got in the way of lifestyle so he would just drift back to non-compliance" (p6). The family physician accepted that this was Albert's way: he "went with his life" when life extension interfered with lifestyle. This acceptance appeared to inform the family physician's actions to do what he could for Albert on the patient's terms, rather than resenting his preference for life quality over life extension

Table 6

Convergence as paralysis on Irene's TSU

Irene's TSU included her roommate, her family physician and her cardiologist. Irene was a patient with multiple problems: in addition to advanced heart failure, she suffered from arthritis that limited her mobility, cognitive impairment, edema, and an open wound requiring redressing multiple times daily. All team members converged on the understanding that Irene's needs were both complex and insufficiently addressed. The interviews detailed a long list of needs that Irene, her caregiver and her family physician all recognized, including "more supports in the home" (family physician, p1), a way to gather Irene's vitals regularly without a clinic visit, more input from cardiology into Irene's HF care plan, a solution to her edema, and a way to reduce her caregiver's burden. Also convergent in the interviews, however, was a strong sense of apathy: Irene's needs were so complex that she, her caregiver and her family physician seemed to be at a loss for how to best proceed. Her family physician reported that Irene was "tipping constantly" but it was not clear "what she's tipping from" (p6); she wished the cardiologist would still see Irene and didn't understand why he had stopped. The cardiologist also wasn't clear why Irene's visits were discontinued; he expressed a willingness to see her, but said nothing had been booked. Irene and her caregiver didn't know how to get more support in the home; they had asked in the past but "right off the bat the answer [was] always 'No'" so they've stopped asking (p12). Her caregiver "tried to talk to [Irene] about looking for another family doctor" but Irene refused to change. Irene perceived that her family physician was "willing to listen" but at the same time she said that her visits tell her "nothing new" (Irene p. 9) about her condition. The family physician saw Irene's inability to come to clinic as a key barrier but described no plan to overcome it. Irene's caregiver put into words a sense that pervaded all three transcripts: "I don't know that there's anything more that

Table 7

Divergence as dilution on Vladimir's TSU

Vladimir was a 76 year old man with NYHA stage IV heart failure who, at the time of his interview, had been recently discharged from hospital with in-home nursing support from the regional palliative care program. His TSU included his wife, his son, his palliative care physician and his cardiologist. Members of Vladimir's team diverged regarding the role of diuretic medications in his care. According to his palliative care physician, Vladimir had "surprised everyone" by "doing extremely well" since his discharge (p1). This led to the homecare nurses perceiving that he was doing "too well" because his diuretics were keeping his congestive heart failure well controlled. As a consequence, they questioned whether he was a legitimate candidate for continued in-home nursing support. Vladimir's son thought that his father should stop taking the diuretic; he wondered if "maybe there's something naturally that, instead of the medications that he's on ... that could help" (p19). The palliative care physician reported that she recognized that "for some reason [the family] were resistant to giving him the Metolazone, but his weight [was] going up. So [she] was nearly panicking about that" (p2). Vladimir's cardiologist acknowledged the lack of buy-in regarding diuretics from Vladimir's family, and he perceived that "his kids are very attentive and so they don't honestly feel he needs to come to clinic and that's one of the challenges in dealing with them. They're looking for some special answer and they've been thinking also of stopping the medications" (p1)

Table 8

Divergence as productive disruption on Bob's TUS

In Bob's TSU, three of his care providers diverged on whether he had palliative needs. His social worker declared frankly that Bob did not have such needs, and his physiotherapist also assessed Bob as "good and stable", without needs requiring palliative care. However, his heart failure nurse believed that Bob met the "50% functional capacity" criterion to receive palliative care in the home. She initiated a conversation with him about end of life options, in spite of recognizing that others on the team perceived Bob as not being at a point in the disease trajectory where this conversation was required