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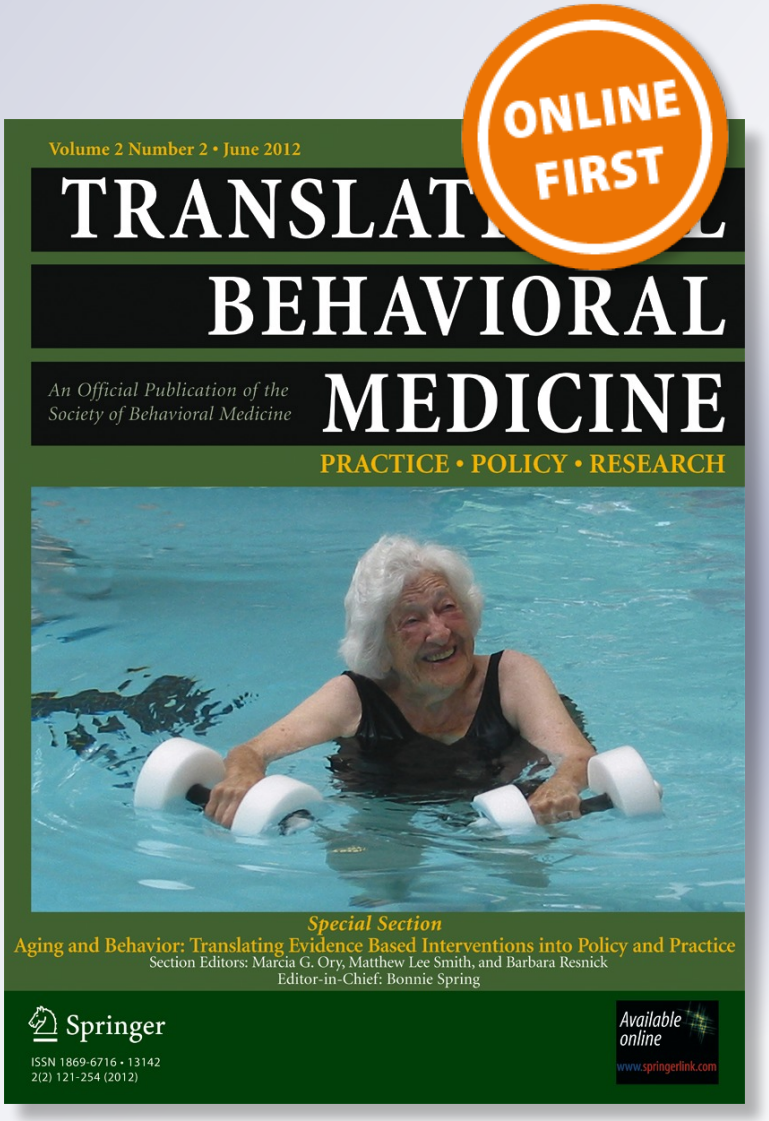

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PRACTICE TOOLS TEAM SCIENCE

Charting a course for collaboration: a multiteam perspective

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ABSTRACT

The translation of medical research from bench-to-bedside often requires integrated input from multiple expert teams. These collectives can best be understood through the lens of multiteam systems theory. Team charters are a practical tool thought to facilitate team performance through the creation of explicit shared norms for behavior. We extend the current literature on team charters to the multiteam context and make three practical recommendations for multiteam charter content that could facilitate effective communication and leadership processes between teams.

KEYWORDS

Team charter, Multiteam charter, Multiteam systems, Shared leadership, Communication, Behavioral norms

Implications

Practice: For maximal coordination and collaboration between-teams, managers of MTSs should create a multiteam charter that specifies between-team norms for communication and leadership processes.

Policy: Those who provide resources to MTSs such as funding agencies and policy makers should take a MTS perspective and make the development of a multiteam charter a priority for collectives of researchers and/or practitioners that fit a MTS structure.

Research: In order to further build upon the existing evidence base of this practical tool, future research should continue to evaluate the efficacy of the propositions laid out for multiteam charters.

Breakthroughs in basic medical research are translated from "bench-to-bedside" by complex systems of expert teams. Take, for example, the Memorial Sloan–Kettering Cancer Care Center [1], an organization that is comprised of *multiple* interdependent teams. In this center, research teams work on topics ranging from the basic cellular level to the actual implementation of clinical drugs. These research teams work interdependently with physician teams in the cancer care unit to apply empirical findings to improve patient care and to refine their future research based on clinical observations. In other words, the multiple teams in this system rely on one another as they work toward a shared superordinate goal–translate scientific knowledge to provide the best patient care and treatment possible.

In the organizational sciences, multiple teams working together toward a common purpose are known as "multiteam systems" (MTSs) [2]. By integrating the work of specialized "component" teams, MTSs offer the promise of comprehensive solutions to complex problems; the types of problems not addressable by single teams who are focused on more narrow content areas. For example, the Sloan–Kettering Cancer Care Center enables the translation of medical research into practice by closely linking researchers with primary care providers.

However, because of their inherent complexities, MTSs present immense challenges to effective collaboration. Not only do teams in MTSs work toward shared common goals, each team pursues their own component team-level goal(s), which, at times, may not align entirely. Having to simultaneously work toward team-level goals along with MTS-level goals creates a demanding work environment and presents a set of challenges over and above the standard stressors associated with healthcare. For example, in the Sloan–Kettering Cancer Care Center the research team's most proximal goals involve generating valid empirical research. Generation of high-quality research often requires extended periods of time and resources. On the other hand, the treatment team's proximal goals center on providing immediate patient care. The success of the system as a whole, however, requires teams to divide attention among both team- and system-level goals. In particular, more effective methods of treating patients might be developed and implemented more rapidly if the treatment teams and research teams collaborate across team boundaries.

Decades of research out of the social and behavioral sciences have examined these kinds of challenges experienced by teams and have identi-

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fied the factors associated with effective teamwork [3–6]. From this, many interventions grounded in empirical research are available for those who are interested in facilitating teamwork. However, as described above, the systems that address large-scale challenges in behavioral medicine–for example, examining the implementation and efficacy of community based interventions, are not always single teams [7, 8]. Facilitating large-scale collaboration in the area of behavioral medicine is, very often, a multiteam challenge. What is required for success in these kinds of MTSs is coordination both *within* and *between* teams. That is, although interventions designed to create a system of strong, cohesive component teams may maximize performance at the team level, when ultimate system-level goals require synchronization between teams, more is needed. Focusing only on component teams, without addressing between-team coordination, may not produce desired outcomes. Therefore, MTS interventions must also address interdependencies between teams if performance across these kinds of complex systems is to be maximized.

One practical intervention shown to facilitate team performance is to have members collaboratively develop "team charters." Team charters are written plans for task accomplishment and teamwork [9]. Research suggests that high-quality plans developed during early phases of team performance are critical for future success [10, 11]. Team charters, if designed appropriately, facilitate planning and serve as guidelines for teamwork processes (i.e., behavioral interactions). Such guidelines are thought to reduce cognitive strain and minimize the occurrence or severity of later conflicts [9].

To extend this beneficial intervention to the MTS context, in this article, we propose the use of "multiteam charters" that target two critical teamwork processes with a substantial evidence base in the teams literature–communication and leadership [12–16]. We offer recommendations for designing multiteam charters that target between-team communication and leadership processes. Our goal is to provide a concrete set of recommendations to guide those who facilitate MTS performance–from those who manage MTSs to those who provide resources to MTSs (e.g., funding agencies, policy makers).

PLANNING AHEAD WITH TEAM CHARTERS

Most succinctly, a team charter is a tangible plan for behavioral interactions [9]. Research has demonstrated that high-quality team charters–those that clearly specify members' roles and future interaction processes–are predictive of better performance [9]. Team norms are shared beliefs regarding appropriate behavioral patterns for team interactions [17–19]. These play a critical role in the coordination of collective actions through a process of social control [20–24]. One particularly crucial type of norm is the preventive norm. Preventive team norms are developed through members' deliberate discussion and reflection of their prior work experiences [13]. These norms provide initial guidelines for interactions and are thought to play a role in preventing future conflicts and communication breakdowns. Because of their importance, researchers [9, 17] have advocated for setting *formal* preventive norms at the beginning of team formation. The creation of a team charter is an effective means for articulating explicit preventive norms. In short, team charters provide an opportunity to develop specific norms and act as an artifact to mediate discussion on adding to or adapting norms as the team evolves.

From the teams literature, there exists guidance for both the content of team charters as well as the processes foundational to effective team performance. First, as for content, team charters should include information about the specific goals of the collaboration, the task strategies members will use to achieve these goals, the timetable for goal achievement, and the strategies they will use to track progress toward their goals [9, 25]. Second, as for the processes, research identifying the behavioral antecedents (i.e., teamwork processes) of team effectiveness [5, 11] provides the critical content for inclusion in team charters. In particular, two team processes with substantial evidence supporting their importance to team functioning are communication and leadership. Communication is the foundation of team coordination, and effective communication is predictive of trust, shared knowledge structures, and team effectiveness [26, 27]. Leadership is a fundamental force that drives coordination [11, 28, 29] and serves to focus members' attention toward goals, provide strategies for goal achievement, and coordinate collective actions [15, 30]. Thus, initial team charters designed to elicit preventive norms for leadership and communication may facilitate positive team outcomes.

In order to extend team charters to the MTS context, consideration must be given to the interdependencies that exist *between* teams. For example, in the Sloan–Kettering Cancer Care Center, the treatment team cannot identify the best possible treatment plan for a patient without information and input from the diagnostic team who determines the severity and type of cancer in the patient. Research has shown that, in MTSs, it is entirely possible for component teams to be successful on their own, while the system as a whole fails to reach its objective [31]. Because of this, overall MTS outcomes require coordination and collaboration both within the component teams and across (i.e., between) the team boundaries [29, 31–34].

We next describe how team charters might be extended to the MTS context. We argue that multiteam charters should incorporate suggestions provided by prior researchers [9, 25] and, in addition, focus on the development of norms for between-team coordination. Specifically, we argue that multiteam charters should be designed to elicit effective

patterns of between-team communication and leadership. In the following, we consider the between-team leadership and communication needs of MTSs and provide three general recommendations for the content of multiteam charters, which might help address those needs. Table 1 provides an example of a possible multiteam charter, which we developed with these recommendations in mind. Although this particular multiteam charter example has not been tested empirically, it is an extension of previously established team charter guidelines [9, 25]. We provide this as a stepping off point for examining the effectiveness of applying team charters to the MTS context.

Recommendation 1: specify between-team communication patterns

Establishing appropriate communication norms early in a team's development can help group members capitalize on future interactions. As such, researchers have emphasized the importance of articulating communication norms when generating team charters [9, 25]. However, as technology continues to advance, the number and types of tools groups can use to communicate with one another has increased. Group members may not always know how to use these tools to their advantage. We argue that multiteam charters should include explicit norms for *between-team* communication that specifies which technologies should be used for various types of messages.

A recent study of geographically distributed scientific MTSs demonstrated the importance to MTS outcomes of specifying communication norms in multiteam charters [33]. The MTSs in this study were tasked with integrating knowledge from different areas of expertise to generate innovative solutions to complex problems. Members communicated with one another throughout the project using several communication modes (e.g., face-to-face, email, phone, video conferencing). Prior to collaboration, each of the MTSs in this study developed self-set norms for communication. Results indicated that more effective MTSs were those that made communication norms more explicit in their initial multiteam charters–by specifying the mode of communication that would be used for within-team versus between-team messages and for specific types of messages and by specifying synchronized communication patterns. From this, we argue that communication norms in multiteam charters should clarify how the MTS plans to: (a) match the mode of communication (e.g., face-to-face, email, video conferencing) to the content of the message (e.g., individualized feedback, general progress updates); (b) match the mode of communication to the recipient of the message (e.g., a fellow team member, a member of another team); and (c) schedule and capitalize on regular between-team meetings. We next detail how why and how these norms should be made explicit.

Communication media vary in the degree to which they convey rich information. Empirical evidence suggests the importance of matching the content of a message to the mode of communication. Research has shown that managers are considered more effective when they are sensitive to the match between the type of message they are conveying and the richness of the communication tool [35]. For example, sending a message of negative individual feedback may require a more rich communication mode (e.g., face-to-face, video conferencing) than would a more generic message such as a general group progress update. Teams are also less effective when they try to accomplish certain tasks through the wrong mediums [12]. For example, consensus decisions are more easily achieved through the use of face-to-face communication rather than virtual mediums [36–41]. Given this, we propose:

Recommendation 1.1. Multiteam charters should include guidelines regarding how different types of messages are to be transferred using the media most appropriate for facilitating performance.

Secondly, communication modes might need to be matched to the *recipient* of a message. For example, it may be feasible for members within a team to communicate with one another in person or through more casual virtual communication tools (e.g., text messaging). Communication with members of other component teams may be more easily accomplished using virtual collaboration tools such as video conferencing or email. MTS members may tend to interact more frequently with members of their component teams than they do with members of other component teams. However, the interactions between teams that facilitate system-level coordination are critical to MTS performance [29, 31]. Therefore, specification of norms for between-team communication could prevent later confusion and better enable alignment of component team goals. Given this, we propose:

Recommendation 1.2. Multiteam charters should facilitate discussion of guidelines for how to communicate across the entire MTS.

Finally, in complex MTSs, large group meetings involving multiple teams may be challenging to schedule and coordinate. As such, these critical meetings may occur infrequently. However, these rare opportunities offer the chance for component teams to align their efforts and identify ways that they can collectively achieve system-level outcomes. For example, Maznevski and Chudoba [42] found that more effective teams hold regularly scheduled face-to-face coordination meetings that are packed with intense agendas focused on decision making and planning for

Table 1 | Example of a multiteam charter

1. Multiteam charter				
Project title: _____				
2. Goals	**Team 1 (e.g., treatment team)**	**Team 2 (e.g., diagnostic team)**	**Team 3 (e.g., nursing team)**	**Multiteam Goals**
	Goal 1:	Goal 1:	Goal 1:	Goal 1:
	(e.g., develop treatment plan)	(e.g., diagnose type and severity of cancer)	(e.g., administer treatment)	(e.g., integrate inputs to develop optimal patient care plan)
	Goal 2:	Goal 2:	Goal 2.	Goal 2:
3. Task strategies	**Team 1**	**Team 2**	**Team 3**	**Multiteam System**
	Goal 1:	Goal 1:	Goal 1:	Goal 1:
	(e.g., get information from diagnostic team)			
	Goal 2:	Goal 2:	Goal 2:	Goal 2:
4. Timeline for goal achievement	**Team 1**	**Team 2**	**Team 3**	**Multiteam system**
	Goal 1:	Goal 1:	Goal 1:	Goal 1:
	Discuss diagnostics by 3 pm, complete plan due by Friday			
	Goal 2:	Goal 2:	Goal 2:	Goal 2:
5. Strategies for Tracking Goal Progress	**Team 1**	**Team 2**	**Team 3**	**Multiteam system**
	Goal 1:	Goal 1:	Goal 1:	Goal 1:
	Goal 2:	Goal 2:	Goal 2:	Goal 2:
6. Individual Roles	**Area of expertise**	**Role within team (e.g., distribute meeting notes, collate diagnostic information)**	**Between-team communication facilitator from each team**	**Boundary-spanning leader(s) from each team**
Team 1 (e.g., treatment team):				
Member 1: Susan	(e.g., primary care)	(e.g., Primary physician)	X	X
Member 2: John				
Member 3: Mary			X	
Team 2 (e.g., diagnostic team):				
Member 1: Sam				X
Member 2:			X	X
Member 3:				
Team 3 (e.g., nursing team):				
Member 1:			X	
Member 2:				X
Member 3:				

7. Between-team communication norms: how will you match your communication method to the content of communication, the recipient of your communication and the frequency of your interactions?		
Content of communication	**Communication medium**	**Frequency**
e.g., Individual feedback to team members	e.g., Face-to-face	e.g., As needed
e.g., coordinating a group meeting with entire system	e.g., email	e.g., every 2 weeks
e.g., team leader meeting	e.g., video conferencing	e.g., every week

Proposed structure of team charter adapted from Wilkinson and Moran [25] and Mathieu and Rapp [9]. Extensions to the MTS context are included throughout

future actions. These regular meetings are followed by periods of less intense interactions, such as follow-up on decisions or scheduling additional meetings, accomplished through virtual communication tools (e.g., email). Conversely, these researchers found that less effective teams do not display such regular temporal patterns and tend to waste time during critical face-to-face group meetings on more "day-to-day" logistic tasks leaving the teams with no clear strategy or plan of action. In a MTS context, where between-team face-to-face meetings may be even more difficult to arrange, establishing clear guidelines for the timing and content of these group meetings may help maximize these opportunities. We argue that multiteam charters can be used to help establish these guidelines. In particular, we propose:

Recommendation 1.3. Multiteam charters should include specific plans for regular between-team interactions and guidelines for how MTSs will capitalize on these interactions.

In sum, we suggest that multiteam charters should be designed such that they elicit clear norms for between-team communication. Specifically, we recommend that multiteam charters include norms for matching communication mode to the content and recipient of messages. Finally, multiteam charters should facilitate plans for regularly scheduled between-team meetings packed with intensive planning-based and decision-making agendas.

Recommendation 2: distribute the leadership role among teams

In teams and MTSs, leadership serves to facilitate group-level outcomes by addressing various team and/or MTS needs. This outlook on leadership is based on functional leadership theory, which assumes that it is the role of leadership "to do, or get done, whatever is not being adequately handled for group needs" [43]. Specifically, the "role" of team or MTS leadership is that of a "functional problem solver" responsible for enacting behaviors that aid the team in goal accomplishment [15, 28]. In other words, the functional leadership role is a set of behavioral responses designed to facilitate team or MTS functioning.

One formal team or MTS leader (e.g., a manager) might accomplish all of the necessary leadership behaviors within a system. However, researchers have been careful to note that the functional leadership role (i.e., the set of leadership behaviors) does not have to be the sole responsibility of one formal leader [28, 44, 45]. Although there may be a formally appointed leader, leadership functions are often shared among multiple (or all) members of a group, simultaneously, or rotated over time [28, 46]. Moreover, this "shared" or "collective" view of leadership contends that the leadership role can be distributed in some manner among multiple people in a group [46, 47].

For example, in a recent study of emergency medical teams, Klein and colleagues [48] found that the leadership role in such teams is dynamically shared among multiple members. Although there is a formal team leader in these medical teams (e.g., the attending physician), he or she will often delegate "leader behaviors" that serve some functional team need, to other team members (e.g., the resident) as task requirements shift. In this situation, leadership is like a baton that is passed among various members. Other recent empirical work [46] has demonstrated the benefits of simultaneously sharing leadership among all members of a team for certain tasks. Such shared leadership structures are thought to encourage more participation in decision making, thus enabling better integration of multiple perspectives. In scientific MTSs, leadership as a distributed phenomenon may be especially appropriate. Given that the individual most qualified for decision making can vary as task requirements shift [47], sharing in leadership behaviors may be necessary in MTSs comprised of experts from various fields. Given this, we propose:

Recommendation 2.1. Multiteam charters should make it clear that the leadership can be distributed among different team members.

Although we expect some degree of leadership distribution in MTSs to facilitate effective system-level outcomes, as the size of a group increases—from single to multiple teams—sharing leadership among all members of the entire system may not be feasible nor efficient. In fact, in the study of globally distributed scientific MTSs mentioned above, more effective MTSs were those that showed a pattern of sharing in leadership *between-teams*. In these MTSs, members of the different component teams relied on one another for leadership and were thus better able to align their multiteam efforts. Furthermore, when developing their initial multiteam charters, these effective MTSs identified specific people (from each component team) who would share in MTS leadership functions. This suggests that in the scientific MTS context, effective "leadership" may be a collective effort, which links experts from multiple component teams. Therefore, we argue that establishment of initial norms for between-team leadership may help create effective leadership structures that facilitate system-level coordination and performance. Given this, we propose:

Recommendation 2.2. Multiteam charters should help establish norms for sharing leadership between teams.

In sum, multiteam charters need to account for flexibility in the distribution of leadership within and across teams. Multiteam charters should foster a distributed leadership structure (e.g., one that involves sharing leadership between component teams). By clearly articulating the adaptive importance of shared leadership, this will better facilitate MTS coordination and performance.

Recommendation 3: specify boundary spanners from each component team

One critical function of leadership in teams is managing the external boundary of the team and ensuring that the team functions appropriately in the environment within which it is nested [15, 49]. Put more simply, the team leadership role involves seeking information and resources from outside sources and helping the team coordinate with other entities. In a MTS, leadership facilitates the management of the external boundary of the system as a whole and, in addition, facilitates information sharing and coordination among component teams. Moreover, effective MTS leadership involves spanning the boundaries of multiple teams.

As mentioned above, leadership in MTSs may need to be distributed among multiple members. However, requiring every member of the system to engage in all leadership functions is unrealistic and inefficient. This may be particularly true for leadership functions that cross team boundaries such as seeking and passing information among component teams or coordinating the collective actions of multiple teams. We argue that the management of component team boundaries is one leadership function that should not be simultaneously shared by all MTS members. Rather, we recommend that this leadership function be distributed systematically among one (or a few) members of each component team in the system.

This recommendation aligns with Burt's [50, 51] work on brokerage in communication networks. Brokers are those individuals who link disconnected subgroups. Burt [50] found that system-level coordination is achieved more efficiently when certain key individuals connect different subgroups as opposed to when all individuals are directly connected to one another. Complex MTSs may be more efficiently coordinated if certain individuals act as ambassadors by connecting their team to others within the system. Leaving this role unspecified may leave teams uninformed about what is occurring outside of their internal team boundary and unable to align their efforts with those of other teams [52, 53].

Recent theoretical work on leadership of disconnected subgroups also supports the notion that leadership functions such as seeking and passing information among teams and coordinating component actions should be distributed among representatives of each component team. Specifically, Hogg and colleagues [54] argue that the leadership structure that most facilitates system-level performance is a boundary-spanning leadership "coalition" composed of members from each of the component subgroups. In other words, Hogg's theory of subgroup leadership implies that systems composed of multiple teams might function more effectively if certain people from each team are designated "boundary spanners" who help component teams share information and coordinate collective actions.

Multiteam charters could be used to help members identify which individuals from each team will serve this boundary-spanning leadership function. Identifying these individuals early on may help facilitate shared leadership and information sharing between teams while still maintaining a coherent leadership structure. In support of this notion, in the globally distributed scientific MTS study mentioned above, MTSs tended to be more effective when their initial multiteam charters clearly specified individuals from each team who would act as team representatives by seeking or passing information and by ensuring the actions of the component teams were aligned toward system-level goals. Given this, we propose:

Recommendation 3.1. Multiteam charters should help members identify individuals who can enable information sharing between teams and increase communication network efficiency by serving as "spokespersons" or "information gatherers."

Recommendation 3.2. Multiteam charters should help members identify individuals from each component team who will facilitate between-team coordination.

Moreover, we argue that multiteam charters can be used to develop preventive norms for distributing the boundary-spanning function of leadership among each component team. Such norms may enable an effective structure of leadership to emerge –one that facilitates between-team communication and collaboration. In other words, we argue that multiteam charters can help identify a member from each team that will take part in system-level leadership by helping the team pass information across team boundaries and coordinate multiteam actions. These individuals could be formal leaders (e.g., managers) and/or component team members enacting a leadership function.

CONCLUSION

In this paper, we have provided guidance, in alignment with research on multiteam systems [29, 31, 33, 34], to propose that multiteam charters be designed to include specific norms for leadership and communication processes between teams. We illustrated how multiteam charters could help guide members toward the development of leadership structures and communication networks that are both efficient and align all teams in the MTS. We provided guidance on the need to (1) identify between-team communication norms, (2) share in leadership among members from different component

teams, and more specifically, (3) to identify members from different component teams to gather information and enable communication across boundaries to facilitate achievement of system-level goals. The aforementioned recommendations are meant as extensions of previous research findings to inform development of multiteam charters. We expect that multiteam charters that follow these guidelines will be more beneficial to MTS processes and overall effectiveness than will multiteam charters that do not follow these guidelines. Future research should evaluate the degree to which these suggestions help improve system-level outcomes.

In conclusion, complex issues in the field of behavioral medicine require the expertise and input of multiple teams. To contribute to the translation of science to practice, we have argued that these teams are better understood through the lens of MTSs. The effectiveness of these systems is dependent upon coordination and collaboration between teams. As such, practical tools for MTS functioning, such as multiteam charters, should be designed to facilitate this between-team coordination. Such multiteam charters could serve as an initial step toward effective system-level interactions.

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1. Memorial Sloan–Kettering Cancer Care Center Website. http://www.mskcc.org/. Accessed 18 July 2012.
2. Mathieu JE, Marks MA, Zaccaro SJ. Multiteam systems. In: Anderson N, Ones DS, Sinangil HK, Viswesvaran C, eds. *Handbook of Industrial, Work, and Organizational Psychology*, vol. 2. London: Sage; 2001.
3. Gladstein DL. Groups in context: a model of task group effectiveness. *Adm Sci Q*. 1984; 29:499-517.
4. Hackman JR. The design of work teams. In: Lorsch J, ed. *Handbook of Organizational Behavior*. New York: Prentice Hall; 1987:315-342.
5. Kozlowski SWJ, Bell BS. Work groups and teams in organizations. In: Borman WC, Ilgen, Klimoski RJ, eds. *Handbook of Psychology: Industrial and Organizational Psychology*. London: Wiley; 2003:333-375.
6. Tannenbaum SI, Beard RL, Salas E. Team building and its influence on team effectiveness: an examination of conceptual and empirical developments. In: Kelley K, ed. *Issues, Theory, and Research in Industrial/Organizational Psychology*. Amsterdam: Elsevier; 1992:117-153.
7. Fiore S. Interdisciplinarity as teamwork: how the science of teams can inform team science. *Small Group Res*. 2008; 39:251-277.
8. DeChurch LA, Zaccaro SJ. Perspectives: teams won't solve this problem. *Human Factors*. 2010; 52:329–334.
9. Mathieu JE, Rapp TL. Laying the foundation for successful team performance trajectories: the roles of team charters and performance strategies. *J Appl Psychol*. 2009; 94:90-103.
10. Lepine JA, Piccolo RF, Jackson CL, Mathieu JE, Saul JR. A meta analysis of teamwork processes: tests of a multidimensional model and relationships with team effectiveness criteria. *Pers Psychol*. 2008; 61:273-307.
11. Marks MA, Mathieu JE, Zaccaro SJ. A temporally based framework and taxonomy of team processes. *Acad Manag Rev*. 2001; 26:356-376.
12. DeSantis G, Monge P. Communication processes for virtual organisations. *Journal of Computer Mediated Communication*. 1998; 3:1–24.
13. Ghosh T, Yates J, Orlikowski W. Using communication norms for coordination: evidence from a distributed team. *Proc. ICIS*. 2004; 115–127.
14. Kozlowski SWJ, Gully SM, Salas E, Cannon-Bowers JA. Team leadership and development: theory, principles, and guidelines for training leaders and teams. In: Beyerlein M, Johnson D, Beyerlein S, eds. *Advances in Interdisciplinary Studies of Work Teams: Team Leadership*, vol. 3. New York: Elsevier; 1996:251-289.
15. Zaccaro SJ, Rittman AL, Marks MA. Team leadership. *Leadersh Q*. 2001; 12:451-483.
16. Zenger TR, Lawrence BS. Organizational demography: the differential effects of age and tenure distributions on technical communication. *Acad Manag J*. 1989; 32:353-376.
17. Feldman DC. The development and enforcement of group norms. *Acad Manag Rev*. 1984; 9:47-53.
18. Hare AP. *Handbook of Small Group Research*. New York: The Free Press; 1976.
19. Taggar S, Ellis R. The role of leaders in shaping formal teams. *Leadersh Q*. 2007; 18:105-120.
20. Barker JR. Tightening the iron cage: concertive control in self-managing teams. *Adm Sci Q*. 1993; 38:408-437.
21. Bettenhausen KJ, Murnighan JK. Emergence of norms in competitive decision-making groups. *Admin Sci Q*. 1985; 30:350-372.
22. Steiner I. *Group Process and Productivity*. New York: Academic; 1972.
23. Ullman-Margalit E. *The Emergence of Norms*. Oxford: Clarendon; 1977.
24. Vroom VH. Industrial social psychology. In Lindzey G, Aronson E. eds. *The Handbook of Social Psychology*. 2nd ed., Vol. 5. Boston, MA: Addison-Wesley; 1969.
25. Wilkinson NL, Moran JW. Team charter. *TQM Mag*. 1998; 10:355-361.
26. DeChurch LA, Mesmer-Magnus JR. The cognitive underpinnings of effective teamwork: a meta-analysis. *J Appl Psychol*. 2010; 95:32-53.
27. Jarvenpaa SL, Shaw TR, Staples DS. Toward contextualized theories of trust: the role of trust in global virtual teams. *Inf Syst Res*. 2004; 15:250-267.
28. Zaccaro SJ, DeChurch LA. Leadership forms and functions in multiteam systems. In: Zaccaro SJ, Marks MA, DeChurch LA, eds. *Multiteam Systems: An Organizational Form for Dynamic and Complex Environments*. New York: Routledge; 2011.
29. DeChurch LA, Marks MA. Leadership in multiteam systems. *J Appl Psychol*. 2006; 2:311-329.
30. Fleishman EA, Mumford MD, Zaccaro SJ, Levin KY, Korotkin AL, Hein MB. Taxonomic efforts in the description of leader behavior: a synthesis and functional interpretation. *Leadersh Q*. 1991; 2:245-287.
31. Marks MA, DeChurch LA, Mathieu JE, Panzer FJ, Alonso A. Teamwork in multiteam systems. *J Appl Psychol*. 2005; 90:964-971.
32. Cobb MG. The impact of environmental complexity and team training on team processes and performance in multi-team environments. *Dissertation Abstracts International*. 1999.
33. DeChurch LA, Carter DR, Zaccaro SJ. Leadership for scientific innovation. Paper presented at the 3rd Annual International Science of Team Science Conference, May 2012, Chicago, IL.
34. DeChurch LA, Zaccaro SJ, Carter DR, Asencio R, Seely P, Wax, A, Chen, T, & McCausland, T. Development of coordination norms in globally distributed multiteam systems. In: Carter DR, DeChurch LA (Co-Chairs) *The Power of Collaboration: Investigations of Multiteam Systems*. Symposium at the 27th Annual Society for Industrial and Organizational Psychology Conference; April, 2012, San Diego, CA.
35. Daft RL, Lengel RH, Trevino LK. Message equivocality, media selection, and manager performance: implications for information systems. *MIS Q*. 1987; 11:355-366.
36. Barefoot JC, Strickland LH. Conflict and dominance in television-mediated interaction. *Hum Relat*. 1982; 35:559-566.
37. Gallupe RB, DeSanctis G, Dickson GW. Computer-based support for group problem finding: an experimental investigation. *MIS Q*. 1988; 12:277-298.
38. Hiltz SR, Johnson K, Turoff M. Experiments in group decision-making: communication process and outcome in face-to-face versus computerized conferences. *Hum Commun Res*. 1986; 13:225-252.
39. Valacich JS, Schwenk C. Devil's advocacy and dialectical inquiry effects on face-to-face and computer-mediated group decision making. *Organ Behav Hum Decis Process*. 1995; 63:158-173.
40. Watson RT, DeSanctis G, Poole MS. Using a GDSS to facilitate group consensus: some intended and unintended consequences. *MIS Q*. 1988; 12:463-477.
41. Weisband SP. Assessing divergent and convergent processes in face-to-face and computer-mediated groups. Working paper, University of Arizona; 1995.
42. Maznevski ML, Chudoba KM. Bridging space over time: global virtual team dynamics and effectiveness. *Organ Sci*. 2000; 11:473-492.
43. McGrath JE. *Leadership Behavior: Some Requirements for Leadership Training*. Washington, DC: US Civil Service Commission, Office of Career Development; 1962.

44. Hackman JR, Walton RE. Leading groups in organizations. In: Goodman PS, Associates, eds. *Designing Effective Work Groups*. San Francisco, CA: Jossey-Bass; 1986:72-119.
45. Morgeson FP, DeRue DS, Karam EP. Leadership in teams: a functional approach to understanding leadership structures and processes. *J Manag*. 2009; 36:5-39.
46. Carson JB, Tesluk PE, Marrone JA. Shared leadership in teams: an investigation of antecedent conditions and performance. *Acad Manag J*. 2007; 50:1217-1234.
47. Pearce CL, Conger JA, eds. *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks, CA: Sage; 2003.
48. Klein KJ, Ziegert JC, Knight AP, Xiao Y. Dynamic delegation: shared, hierarchical, and deindividualized leadership in extreme action teams. *Adm Sci Q*. 2006; 51:590-621.
49. Oh H, Chung MH, Labianca G. Group social capital and group effectiveness: the role of informal socializing ties. *Acad Manag J*. 2004; 47:860-875.
50. Burt RS. *Structural holes: the social structure of competition*. Cambridge, MA: Harvard University Press; 1992.
51. Burt RS. *Brokerage and Closure: An Introduction to Social Capital*. New York: Oxford University Press; 2005.
52. Aldrich H, Herker D. Boundary spanning roles and organization structure. *Acad Manag Rev*. 1977; 2:217-230.
53. Cross R, Prusak L. The people who make organizations go—or stop. *Harvard Business Review*. 2002; June: 104–112.
54. Hogg MA, Van Kippenberg D, Rast DE. Intergroup leadership in organizations: leading across groups and organizational boundaries. *Acad Manag Rev*. 2012; 37:232-255.