What Do We Know about Health Care Team Effectiveness? A Review of the Literature

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This review of health care team effectiveness literature from 1985 to 2004 distinguishes among intervention studies that compare team with usual (nonteam) care; intervention studies that examine the impact of team redesign on team effectiveness; and field studies that explore relationships between team context, structure, processes, and outcomes. The authors use an Integrated Team Effectiveness Model (ITEM) to summarize research findings and to identify gaps in the literature. Their analysis suggests that the type and diversity of clinical expertise involved in team decision making largely accounts for improvements in patient care and organizational effectiveness. Collaboration, conflict resolution, participation, and cohesion are most likely to influence staff satisfaction and perceived team effectiveness. The studies examined here underscore the importance of considering the contexts in which teams are embedded. The ITEM provides a useful framework for conceptualizing relationships between multiple dimensions of team context, structure, processes, and outcomes.

Keywords: *health care team; teamwork; effectiveness; performance; outcomes*

Initially implemented at the beginning of the 20th century to coordinate work, teams are now an integral feature of health care delivery in acute, long-term, and primary care settings (Curley, McEachern, and Speroff 1998; Weisman et al. 1993; Heinemann 2002). As the use of teams has increased, researchers have begun to examine their value in the management and delivery of care (Kalra et al. 2000). The bulk of the literature on health care teams has

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focused on team functioning; however, there has been a recent shift toward examining their effectiveness in improving patient outcomes (Becker et al. 1987; Kerski et al. 1987; Patterson et al. 1994; Weisman et al. 1993). To date, this body of literature has failed to demonstrate conclusively that the use of teams will enhance patient or organizational outcomes; in addition, a number of conceptual and methodological challenges have been identified (Opie 1997; Schmitt, Farrell, and Heinemann 1988; Schofield and Amodeo 1999).

Despite these challenges, the use of teams in health care delivery continues to grow as the added pressures of restructuring, reorganization, cost containment, and the increasing complexity of health care knowledge and work have reinforced the need for them (Heinemann 2002; Shortell and Kaluzny 2000). It is therefore imperative to understand *if*, *how*, and *under what conditions* health care teams affect clinical and organizational effectiveness and how to address the conceptual and methodological obstacles that have limited the ability of health care team research to provide the kinds of answers health care managers need.

NEW CONTRIBUTION

This article (1) synthesizes how *teams* and *effectiveness* are conceptualized in the health care team effectiveness literature; (2) presents an Integrated (Health Care) Team Effectiveness Model based on health care and organizational studies literature; (3) uses this model to synthesize research findings about the relationship between the use of health care teams and organizational and patient outcomes; and (4) appraises the existing research and provides recommendations for the enhancement of the conceptualization, design, and measurement of future health care team effectiveness research.

In addition to offering the first comprehensive review of the empirical literature on health care team effectiveness that spans health care settings (e.g., acute, chronic, home) and patient populations (e.g., operating room, mental health, geriatric), this review goes beyond repeating the oft-cited critiques of the inadequate conceptualization of the team and the methodological difficulties of studying team effectiveness. Unlike previous reviews of empirical studies, we are able to identify potentially significant relationships between health care teams' designs, functions, and outcomes (cf. Schmitt, Farrell, and Heinemann 1988; Schofield and Amodeo 1999). Rather than proposing a single model for the study of all types of health care teams, we suggest that researchers need to develop models of effectiveness tailored to the types of

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teams, patient populations, care delivery settings, and work processes being studied. While no single model of team effectiveness can guide all research, the integrated model we provide offers a useful overarching framework for conceptualizing the complex relationships between multiple dimensions of team context, structure, processes, and outcomes in health care settings.

CONCEPTUALIZING THE TEAM AND TEAM OUTCOMES

DEFINING AND MEASURING TEAMS

The majority of researchers who have published conceptual and theoretical articles and reviews advocate the need to bring clarity and consistency to the definition of the team (Opie 1997; Schmitt, Farrell, and Heinemann 1988; Schofield and Amodeo 1999; Vlieland and Hazes 1997). While often presumed to be a given, a team is a multidimensional construct, and team structures and processes can vary widely according to membership, scope of work, tasks, and interactions. For the purposes of our review and analysis, we drew on Cohen and Bailey's (1997) definition of a team as "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems (for example, business unit or corporation), and who manage their relationships across organizational boundaries" (p. 241).

Four reviews of the health care team effectiveness literature helped to refine further our understanding of different health care team types (Doran 2005; Opie 1997; Schofield and Amodeo 1999; Schmitt, Farrell, and Heinemann 1988). Opie's (1997) conceptual review of the sociological and social work literature on the conceptualization of interprofessional care delivery teams found that the classification of teams as multidisciplinary, interdisciplinary, and transdisciplinary reflects the extent of team integration; that is, the extent to which members share a theoretical base and common language. However, this classificatory system has not been used consistently—most studies did not define these terms, did not report the number or types of disciplines represented on teams, and did not measure the levels of task interdependence or integration.

DEFINING AND MEASURING OUTCOMES

Interpretive difficulties arise when one examines how team outcomes are conceptualized and measured. Like the construct team, *outcome* is also

multidimensional and poorly conceptualized, making comparisons across studies very difficult. The authors of the two empirical reviews we considered found that team studies usually examined processes or outcomes but not the linkages between (Schmitt, Farrell, and Heinemann 1988; Schofield and Amodeo 1999). As a result, they were unable to draw any conclusions about whether teams are effective; what types of teams are effective; and, *if* they are effective, effective *at what* and *under which conditions*. Schofield and Amodeo (1999), however, developed a tripartite classification of outcomes that distinguishes between patient care (e.g., quality of care, patient satisfaction), personnel (e.g., training, job satisfaction), or management (e.g., cost-effectiveness), a significant improvement in the conceptualization of the multidimensionality of effectiveness.

Another related issue identified in a recent review of teamwork and nursing (Doran 2005) is the use of instrumentation employed to measure outcomes in team research (e.g., coordination, effectiveness). The majority of instruments used to measure teamwork have been neither well validated nor evaluated in health care settings, underscoring the need for more complex research designs that specify a comprehensive range of team and outcome variables, controlling for non-team-related factors that might influence outcomes.

INTEGRATED (HEALTH CARE) TEAM EFFECTIVENESS MODEL

Health care researchers have much to learn from the organizational studies literature about designing team effectiveness research and about conceptualizing and operationalizing the multiple dimensions of teams and team effectiveness. This literature tends to provide clearer and more consistent definitions of the construct team than those in the health care literature (Cohen and Bailey 1997; Guzzo and Dickson 1996; Hackman 1987; Hackman 1990; Katzenbach and Smith 1993; Sundstrom, DeMeuse, and Futrell 1990). It typically describes the characteristics of differing types of teams in greater detail, defining and classifying them according to attributes such as task type, team duration, purpose, interdependence, and autonomy (Cohen and Bailey 1997; Devine 2002; Guzzo and Dickson 1996; Hackman 1987; Hackman 1990; Sundstrom, DeMeuse, and Futrell 1990; Sundstrom et al. 2000). The heuristic Integrated (Health Care) Team Effectiveness Model (ITEM) we present in this section of our article (see Figure 1) melds the work of health care researchers Fried et al. (1988) and Schweikhart and Smith-Daniels (1996) with that of organizational studies researchers Cohen and Bailey (1997). We used Cohen and Bailey's team typology and team effectiveness model as a starting point for conceptualizing health care team effectiveness.

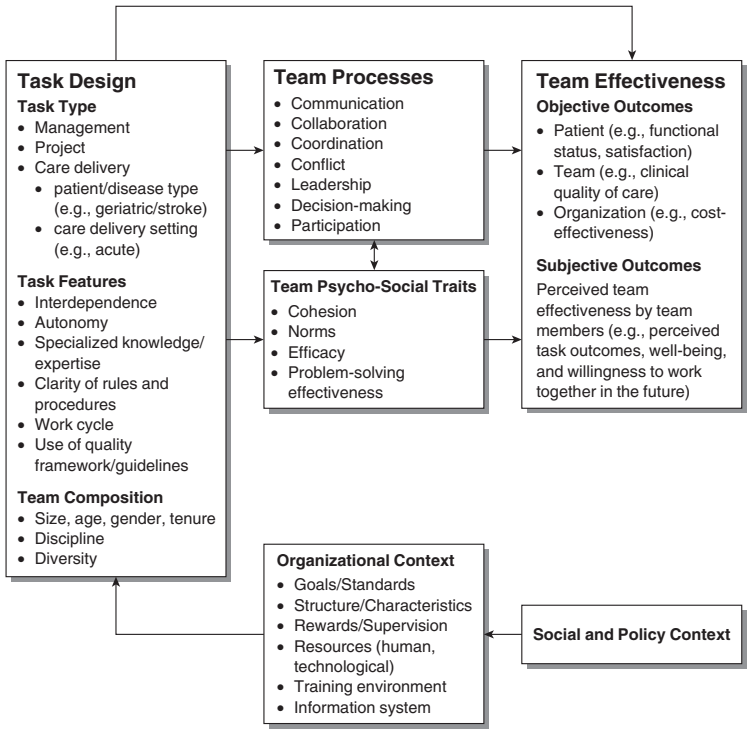

FIGURE 1 Integrated (Health Care) Team Effectiveness Model (ITEM)
Note: Adapted from cohen and Bailey (1997); Fried, Leatt, Deber, and Wilson (1988); and Shweikhart and Smith-Daniels (1996).

Cohen and Bailey's (1997) model of team effectiveness depicts the complex interactions between task design, team processes, team psychosocial traits, and team outcomes. In this model, task design includes the type of team (e.g., project, management, work team), task features (e.g., interdependence, autonomy), team composition (e.g., size, tenure, diversity), and organizational context (e.g., rewards and supervision). Task design factors, while influenced by external environments, can be manipulated by managers to improve team effectiveness. The authors distinguish between team processes, such as communication and conflict, and embedded team psychosocial traits, such as norms and shared mental modes. Both processes and traits are group-level phenomena that are influenced by task design and that can

directly influence team outcomes; in addition, processes and traits interact with each other. Task design can influence outcomes directly or indirectly through its impact on team processes and traits. Finally, building on dimensions of effectiveness identified by Hackman (1987); Guzzo and Dickinson (1996); and Sundstrom, De Meuse, and Futrell (1990), Cohen and Bailey's (1997) model distinguishes between three types of team outcomes: performance, behavioral, and attitudinal.

We modified Cohen and Bailey's team types to encompass the three types of teams most commonly found in health care: (1) project (e.g., quality improvement [QI] teams), (2) management, and (3) care delivery (equivalent to Cohen and Bailey's [1997] work teams). Drawing on the health care literature, we further divided care delivery teams into two subcategories: (1) patient population (e.g., geriatric) or disease type (e.g., stroke) and (2) care delivery setting (e.g., acute, primary, home). Furthermore, we added specialized knowledge, work cycle, and use of a quality framework to task features, and we added disciplinary composition to the team composition section.

Building on Cohen and Bailey's (1997) distinctions between objective outcomes such as performance and behavioral, and subjective outcomes as attitudinal, the ITEM tailors these outcome types to health care. Objective outcomes include measurable improvements in patient outcomes (e.g., functional status, satisfaction), organizational outcomes (e.g., efficiency, costs), staff behavior (e.g., absenteeism, prescribing patterns), and patient behavior (e.g., adherence to medical advice). Subjective outcomes are attitudinal aspects of team effectiveness (e.g., team members' perceptions of their teams' effectiveness). The incorporation of multiple outcome dimensions from organizational studies is a significant improvement over conceptualizations found in the health care literature, which have often failed to distinguish between objective measures of performance and perceived team effectiveness.

The ITEM is not intended to be a definitive model of health care team effectiveness but to provide a broad map of the dimensions of teams, processes, and outcomes that might be relevant in health care settings. Multiple models of team effectiveness might be necessary, depending on team type, task type, work processes, and the types of outcomes they pursue (Devine 2002; Sundstrom et al. 2000).

METHOD

We undertook a literature review dating back to 1985 to obtain a comprehensive understanding of the current state of published research in the field of health care team effectiveness. Our search for publications was conducted via the Medline, PsycInfo, and Sociofile bibliographic databases, using the

following search terms: (1) *multidisciplinary* or *interdisciplinary*; (2) *effect*, *function*, or *performance*; (3) *health*, *health care*, or *hospital*; (4) *medical*, *psychiatric*, *mental health*, or *geriatric*; (5) *team* or *teamwork*; and (f) *team effectiveness*. References to keywords were also reviewed and used to augment the results of the primary search.

Initial searches retrieved 1,975 citations. We included studies that were conducted in health care settings, that used measures of team effectiveness, and that treated the team rather than the team member or the organization as the unit of analysis. Articles were excluded if they examined team effectiveness in laboratory settings, were anecdotal, were not published in English, or were doctoral dissertations. Studies were also excluded if they did not make comparisons with a control group or over time, if they focused on team processes without linking to effectiveness, or if they did not examine team effectiveness across multiple settings. As a result, a number of high-quality single-case narrative studies and studies on team functioning were excluded from this review (e.g., Alexander, Jinnett, D'Aunno, and Ullman 1996; Cott 1998; Fiorelli 1988; Lichtenstein et al. 1997; Malone and MacPherson 2004; McLelland and Sands 1993; West and Poulton 1999).

Based on these criteria, we identified a total of 34 empirical studies and selected 33 as representing the current state of knowledge in the field. Most studies examined care delivery teams (n = 29), while a smaller number examined project teams (n = 4). One article (West and Anderson 1996) on the effectiveness of top management teams was excluded because of the differences between management teams and care delivery and project teams, and the lack of similar studies with which to make comparisons.

RESULTS

HOW HEALTH CARE TEAMS ARE STUDIED

We found three approaches to the study of team effectiveness in the health care domain. In the first, investigators used experimental and quasi-experimental designs to compare the effectiveness of health care work units delivering care sequentially ("usual care") with interventions to deliver care through multidisciplinary teams. Using rigorous research designs, these studies sought to understand whether team care had any impact on objective team performance outcomes, such as care quality and efficiency. However, they could not explain how teams influenced outcomes or how to create high-performing teams. In the second approach, investigators used experimental and quasi-experimental designs that compared the effectiveness of existing work teams with redesigned work teams. Work team redesign

included managerial interventions such as the introduction of quality improvement processes, self-management, and interdisciplinary rounds. The interventions were either at the organizational or system levels. In the third approach, investigators used field study designs to examine the complex relationships between context, task design, processes, and outcomes in both care delivery and project teams. These studies were often based on team effectiveness models, such as those proposed by Hackman (1990) or Cohen and Bailey (1997).

We reviewed 12 intervention studies comparing team care with usual (nonteam) care (see Table 1), 9 intervention studies examining the impact of task redesign on care delivery team effectiveness (see Table 2); and 12 multisite field studies of project and care delivery team effectiveness (see Table 3). An average of 52 teams was examined per multisite study, ranging from a minimum of 15 to a maximum of 102. Tables 1 and 2 provide an overview of team types according to care delivery setting and patient population/disease type, study methodology, nature of interventions, and the team effectiveness variables measured in intervention studies. All intervention studies we reviewed examined the effectiveness of care delivery (rather than project) teams and used objective measures of patient and/or organizational outcomes; only 4 of 22 studies also examined subjective outcomes such as staff satisfaction or perceived team effectiveness. Most intervention studies were conducted in a single site using a quasi-experimental design. Where studies were multisite, interventions were more likely to include the use of a standardized care delivery model in which an interdisciplinary team is but one component within a system of care. Studies varied widely in the extent to which they described teams, goals, composition, and activities (e.g., frequency of meeting, task interdependence) and the organizational context in which interventions were implemented. Field studies are summarized in Table 3 according to team type (project or care delivery), care delivery setting and patient population/disease type, study methodology, extent to which a theoretical model was tested, and team effectiveness variables measured. Of the 12 field studies we reviewed, 8 examined care delivery teams and 4 examined project teams.

WHAT TEAM STUDIES TELL US ABOUT HEALTH CARE TEAM' EFFECTIVENESS

Team Versus Nonteam Intervention Studies

There is some evidence that team care can lead to better clinical outcomes and patient satisfaction across health care settings than can poorly or uncoordinated sequential care. A single-site, randomized controlled trial (RCT)

(text continues on page 282)

TABLE 1 Intervention Studies Comparing the Effectiveness of Team Care with Usual (nonteam) Care

		Study Design		
Author	*Care Delivery Setting (disease/population)*	*Methodology (no. of sites)*	*Intervention*	*Team Effectiveness Variables (objective)*
Zimmer et al. (1985)	Primary care-based home care (geriatric population)	Single-site RCT 167 patients were randomized to intervention and control with follow-up at 6 months	Multidisciplinary home health care team provided physician home calls and 24-hour emergency telephone consultation; team held weekly conferences	Patient functional status Health care utilization (in-home and out of home) Treatment costs Patient/caregiver satisfaction
Becker et al. (1987)	Inpatient (geriatric population on surgical, medical, and psychiatric wards)	Single-site RCT 185 patients were randomized to intervention and control with postdischarge follow-up over 13 months of study	Multidisciplinary Geriatric Consultation Team (GCT) developed a treatment plan, discussed treatment recommendations with ward staff and followed up regularly with patients	Hospital-acquired complications
Kerski et al. (1987)	Outpatient (geriatric population)	Single-site case controlled trial 26 matched pairs were randomized to intervention and control with follow-up at 6 and 12 months	Geriatric clinic with multidisciplinary team providing outpatient follow-up and treatment	Functional status Health care utilization (hospital and community) Patient satisfaction Mortality

(continued)

TABLE 1 (continued)

Author	Care Delivery Setting (disease/population)	Study Design: Methodology (no. of sites)	Study Design: Intervention	Team Effectiveness Variables (objective)
Hughes et al. (1990)	Hospital-based home care (geriatric)	Single-site RCT 233 patients randomized to intervention and control with follow-up at 1 and 6 months	Multidisciplinary team providing postdischarge follow-up within the Hospital-Based Home Care (HBHC) program in the VA system	Functional status Patient/caregiver satisfaction and morale Health care utilization (hospital, community, and residential) Cost of care
Hughes et al. (2000)	Primary care-based home care (geriatric)	Multisite RCT (16) 1,966 patients were randomized to intervention or control with follow-up at 1, 6, and 12 months	Multidisciplinary team providing home care within the Team-Managed/Primary Care-Based Home Care program (TM/PCHC) in the VA system	Functional status HR-QoL Patient satisfaction Hospital readmissions Cost of care
Cohen et al. (2002)	Inpatient and outpatient (geriatric)	Multisite RCT (11) 1,388 patients randomized to intervention or control with follow-up at 6 and 12 months	Multidisciplinary geriatric teams providing geriatric assessment and management according to VA standard guidelines; team met twice weekly	HR-QoL Mortality Functional status Health care utilization Cost of care

Ball, Kirkby, and Williams (2003)	Inpatient (critical care)	Single-site nonrandomized retrospective pre- and/or posttrial 480 patients assigned to intervention or control with postdischarge follow-up pre- and postintervention	Unidisciplinary hospital-based critical care outreach team assesses patients discharged from critical care once per day until patients no longer display warning signs	Survival to hospital discharge Readmission to critical care
Costantini et al. (2003)	Home care (palliative)	Single-site retrospective case/control Each of 189 patients who received intervention were matched with 2 who did not (378 control)	Multidisciplinary palliative home care team	Hospital utilization in last 180 days of life, before and after intervention
Hedrick et al. (2003)	Primary care (mental health)	Single-site RCT 354 patients randomized to intervention and control with follow-up at 3 and 9 months	Multidisciplinary collaborative care team met weekly to develop and review treatment plans using VA standard guidelines	Patient satisfaction Prescribing of antidepressants Enrollment of patients in cognitive behavioral therapy Improvement in depression symptomatology

(continued)

TABLE 1 (continued)

Author	Care Delivery Setting (disease/population)	Study Design: Methodology (no. of sites)	Study Design: Intervention	Team Effectiveness Variables (objective)
Liu et al. (2003)	Primary care (mental health)	Single-site RCT 354 patients randomized to intervention and control with follow-up at 3 and 9 months	Multidisciplinary collaborative care team met weekly to develop and review treatment plans using standardized guidelines and the Chronic Care Model	Cost of treatment Number of depression-free days Prescribing of antidepressants Enrollment of patients in cognitive behavioral therapy
Bellomo et al. (2004)	In-patient (critical care)	Single-site prospective pre- and/or posttrial 21,090 patients participated in "pre" period and 20,921 in intervention period	Multidisciplinary medical emergency team available 24-7 and could be activated by any hospital staff for postoperative patients	Number of adverse events Mortality after surgery Length of stay Intensive care unit admissions
Caplan et al. (2004)	Hospital-based outreach (geriatrics)	Single-site RCT 739 patients randomized to intervention and control and followed up over 18 months	Multidisciplinary Comprehensive Geriatric Assessment (CGA) outreach team reviewed care plan that was developed by nurse at weekly team meeting	Hospital admissions Physical and mental functional status Mortality Nursing home admission

Note: RCT = randomized controlled trial; VA = Veterans Administration; HR-QoL = health-related quality of life.

TABLE 2 Intervention Studies Examining the Impact of Task Redesign on Care Delivery Team Effectiveness

		Study Design			Team Effectiveness Variables	
Author	*Care Delivery Setting (disease/population)*	*Methodology (no. of sites)*	*No. of Teams*	*Intervention*	*Objective*	*Subjective*
Weisman et al. (1993)	In-patient acute care (pediatric, operating room, critical care, medical/surgical)	Single-site quasi-experimental	8 intervention 8 control	Self-management	Nurse retention	Nursing work satisfaction with coordination of care and effective team performance
Cassard et al. (1994)	In-patient acute care (medical/surgical)	Single-site quasi-experimental	4 intervention 4 control	Self-management	Perceived patient postdischarge outcomes: Perceived health status Functional status Needs for care Unmet needs for care Unplanned health care visits Unplanned hospital readmissions	
Ling (1996)	Home care (various)	Multisite quasi-experimental (2)	1 intervention 1 control	Self-management	Hospitalization rates	Staff satisfaction with work quality and work environment

(continued)

TABLE 2 (continued)

		Study Design			Team Effectiveness Variables	
Author	*Care Delivery Setting (disease/population)*	*Methodology (no. of sites)*	*No. of Teams*	*Intervention*	*Objective*	*Subjective*
Curley, McEachern, and Speroff (1998)	In-patient (various)	Single-site RCT	3 intervention 3 control	Interdisciplinary daily rounds	Length of stay Total hospital charges Use of ancillary services Compliance with recommendations	Provider satisfaction
Goldberg et al. (1998)	Primary care (depression and hypertension)	Multi-site RCT (4)	4 intervention 4 control	CQI and academic detailing	Compliance with guidelines Hypertensive and antidepressant drug prescribing Depressive symptomatology	
Gibson (2001)	Inpatient and outpatient (emergency and obstetrics)	Multisite quasi-experimental (3)	51 intervention 20 control	Goal setting Training	Patient-rated quality of nursing Team care	
Irvine-Doran et al. (2002)	In-patient (various)	Multisite quasi-experimental (4)	10 early intervention 15 late intervention	CQI	Success of change in relation to patient outcome indicators as rated by two independent raters	

Dutton et al. (2003)	Trauma center (critically ill)	Single-site retrospective pre- and/or posttrial 13,362 patients admitted to hospital 1 year < intervention and 3 years after	3 teams	Multidisciplinary discharge rounds Team develops plan at the patient's bedside	Patient flow Patient volume Length of stay Ability to accept admissions	
Chin et al. (2004)	Primary care (diabetes)	Multisite pre- and/or posttrial (19)	19 teams	Quality Improvement (QI) Collaborative and Chronic Care Model	HbA1C value and the number of: Eye examination referrals Diet interventions Dental referrals Foot examinations Lipid assessments Urine microalbumin assessments HbA1C measurements	Perceived effectiveness of: The QI collaborative QI models Team functioning

Note: RCT = randomized controlled trial; CQI = continuous quality improvement.

TABLE 3 Field Studies of Project and Care Delivery Team Effectiveness

	Study Design			*Team Effectiveness Variables*	
Author	*Team Type (disease/population)*	*Methodology (no. of sites)*	*No. of Teams/Units*	*Objective*	*Subjective*
Project teams					
Pinto and Pinto (1990)	Hospital-based new program development teams (various)	Multisite survey (72)	72		Perceived project implementation success: task outcomes and psychosocial outcomes
Pinto, Pinto, and Prescott (1993)	Hospital-based new program development teams (various)	Multisite survey (62)	62		Perceived project implementation success: task outcomes and psychosocial outcomes
Lemieux-Charles et al. (2002)	Hospital-based acute-care CQI teams (various)	Multisite survey (11)	97	Team effectiveness as rated by an external evaluator: team-achieved goals	Perceived team effectiveness: performance met expectations, members were satisfied and felt positive about experience Willingness to work on team in future

Shortell et al. (2004)	Multidisciplinary primary care CQI teams (heart disease, diabetes, asthma, and depression)	Multisite survey of team members participating in a quality improvement collaborative program using a Chronic Care Model (40)	40	Number and depth of quality improvement changes made	Perceived team effectiveness: overall effectiveness, perceived participation and goal agreement, team skill, organizational support
Care delivery teams					
Vinokur-Kaplan (1995)	Multidisciplinary hospital-based psychiatric teams (mental health)	Multisite survey (3)	15	Team effectiveness as rated by an external evaluator: standards met	Perceived team effectiveness: standards met, cohesion, well-being, and overall effectiveness
Poulton and West (1999)	Multidisciplinary primary-care teams (various)	Multisite survey (unspecified)	68		Perceived teamwork, organizational efficiency, health care practices, patient-centered care, and overall effectiveness
Edmondson, Bohmer, and Pisano (2001)	Multidisciplinary operating room teams (cardiac surgery)	Multisite observational study using interviews and patient records (16)	16	Time to adopt new cardiac procedure (minimally invasive cardiac surgery)	

(continued)

TABLE 3 (continued)

Author	Study Design: Team Type (disease/population)	Study Design: Methodology (no. of sites)	Study Design: No. of Teams/Units	Team Effectiveness Variables: Objective	Team Effectiveness Variables: Subjective
Care delivery teams					
Bower et al. (2003)	Multidisciplinary primary-care teams (angina, asthma, and diabetes)	Multisite field study using questionnaires and medical note audit (42)	42	Quality of chronic disease management; patient assessment of care	Perceived team effectiveness: professional practice, team working, patient-centered care, overall effectiveness and team innovation
Haward et al. (2003)	Multidisciplinary primary-care breast cancer teams (breast cancer)	Multisite survey (unspecified)	61 (481 team members)	Timeliness of diagnosis; provision of recommended treatment; innovativeness of treatment	Perceived team effectiveness: accessibility, diagnosis, patient choice, psychosocial support, treatment, communication, auditing and resource use; team member well-being

Wheelan, Burchill, and Tilin (2003)	Multidisciplinary intensive care teams (critical care)	Multisite observational study using questionnaire and patient medical records (9)	17 units (349 team members)	Predicted and actual mortality rates	Perceived level of group development (perceived team functioning); perceived team productivity
Temkin-Greener et al. (2004)	Multidisciplinary long-term care teams (geriatric)	Multisite survey of team members participating in a comprehensive strategy of care for the elderly (26)	26 programs (1,220 team members)		Perceived team effectiveness: technical quality and ability to meet patient needs
Lichtenstein et al. (2004)	Multidisciplinary teams (psychiatric)	Multisite of longitudinal survey (1994 and 1999) quality enhancement in VA hospitals (29)	102 inpatient and outpatient units (860 team members)		Perceived team effectiveness: job satisfaction with autonomy and with relationships with coworkers; intent to quit

Note: CQI = continuous quality improvement.

approach is the predominant paradigm for comparing team care with usual (nonteam) care (see Table 1). RCTs most often compare the performance outcomes associated with the introduction of a hospital, community, or home-based multidisciplinary team with usual care, which tends to be sequential, discipline based, and delivered in a hospital. The care delivery intervention team involves, in effect, a redesign of the delivery of care, including changes in task type, features, and composition; the RCT, meanwhile, is a means of studying the effect of changes in task design on objective staff, patient, and organizational outcomes (see Figure 1).

Most team versus nonteam intervention studies examined care delivery teams working in acute or home care settings with a geriatric patient population. Studies that examined geriatric teams in the Veterans Administration (VA) system reported higher functional status, better mental health, decreased dependence, and decreased mortality in intervention teams than in the control group (Caplan et al. 2004; Cohen et al. 2002; Hughes et al. 1990; Hughes et al. 2000), while studies in other settings reported no differences (Becker et al. 1987; Kerski et al. 1987; Zimmer, Groth-Juncker, and McCusker 1985). This difference might be related to the use of standardized VA care guidelines and the fact that VA teams were embedded in a more comprehensive strategy for improving care. Patient satisfaction and health-related quality of life (HR-QoL) were higher for the intervention groups across all studies that examined this outcome (Cohen et al. 2002; Hughes et al. 1990; Hughes et al. 2000; Zimmer, Groth-Juncker, and McCusker 1985). Studies that reported no improvements in functional status or patient satisfaction used small samples and narrowly defined outcomes (Becker et al. 1987; Kerski et al. 1987).

Organizational outcomes across geriatric studies were mixed. Several studies reported no difference in service utilization as a result of care delivery team interventions (Becker et al. 1987; Kerski et al. 1987). When costs were examined, Cohen et al. (2002) in a longitudinal study found few significant differences in either cost or patient outcomes at 12 months. However, Hughes et al. (1990) found that the costs of providing multidisciplinary team care using a hospital-based home care (HBHC) model in the home at 6 months postdischarge were offset by savings in public and private health care services utilization. A later study found that the high cost of an intervention outweighed any gains in decreased service utilization (Hughes et al. 2000). These researchers examined a team-managed/home-based primary care (TM/HBPC) model that included a multidisciplinary home care team with a primary care manager, 24-hour contact for patients, prior approval of hospital readmissions, and TM/HBPC participation in discharge planning. This study was the first of its kind to measure caregiver burden, using both objective and subjective measures, as a dimension of the

cost of care. It was also exemplary for its use of a comprehensive model of team home care and a comprehensive set of outcomes measured over time and across multiple sites (see Table 1).

Recent studies have scrutinized teams in critical care and primary care settings. Two such examinations of the use of a hospital-wide critical care/medical emergency outreach team reported increased survival to discharge and decreased readmission to critical care (Ball, Kirkby and Williams 2003), fewer adverse events, lower mortality rates after surgery, and shorter length of stay (Bellomo et al. 2004). The use of a multidisciplinary team and collaborative care model in a primary care setting led to improvements in depression symptomatology, but these came at an added cost resulting from higher patient enrollment in cognitive and behavioral therapy and increased prescribing of antidepressants (Hedrick et al. 2003; Liu et al. 2003). While intervention team research is venturing into a greater variety of care delivery settings, there are still too few studies within each setting to make broad generalizations. These studies are also unable to explain how task design affects care delivery team functioning or which aspects of a team's composition or features have the greatest impact on team outcomes.

Team Redesign Intervention Studies

Intervention studies that compared redesigned care delivery teams with usual team care were more likely to study the impact of task redesign on team processes *and* outcomes, using a theoretical model to explain linkages (see Table 2). These studies sought to identify which dimensions of a team's design or functioning contributed to particular team outcomes. Most team redesign intervention studies used quasi-experimental methods; more than half of these were multisite and were more likely to examine both subjective and objective outcomes (see Figure 1). Four types of team redesign were studied: the introduction of self-management, continuous quality improvement (CQI), interdisciplinary rounds, a system-wide quality improvement/chronic care model, and team goal-setting training. These redesigns correspond to changes in task features, team composition, and team processes (see Figure 1). Self-management is an intervention to increase team autonomy and interdependence; CQI involves the use of a quality framework, standardized guidelines, and training to increase a team's CQI knowledge base; interdisciplinary rounds involve an increase in disciplinary diversity and interdisciplinary interdependence; and goal-setting training improves team goal-setting processes, a dimension of team decision making. Because the effects of task redesign were examined in different settings (hospital, primary care, and home), across team types (unidisciplinary and multidisciplinary), across patient populations (chronically ill, critically ill, pediatric),

and using different outcome measures, it is not possible to generalize from these studies.

Increasing team autonomy was associated with higher levels of staff satisfaction on unidisciplinary inpatient nursing units (Weisman et al. 1993) but not on a multidisciplinary home care team (Ling 1996). However, on the home care team, it led to a decline in hospital readmissions, a distinct improvement using objective outcome measures. Autonomy was also associated with higher levels of retention of nursing staff in inpatient settings (Weisman et al. 1993).

Increasing team integration through interdisciplinary rounds was associated with higher levels of staff satisfaction on an acute inpatient unit (Cassard et al. 1994). Interventions to increase team diversity and interdependence lead to a number of improvements in objective organizational outcomes, including decreased patient volume, length of stay and hospital charges, in acute inpatient and trauma team settings (Curley, McEachern, and Speroff 1998; Dutton et al. 2003). Curley, McEachern, and Speroff (1998) also learned that it resulted in increased compliance with treatment recommendations made by allied health professionals.

In a study of CQI teams within a comprehensive Diabetes Health Disparities Collaborative initiative, Chin et al. (2004) found that team training in the use of quality improvement methods was linked with improved patient outcomes, but that the use of a chronic care model was perceived to be more beneficial than QI methods. Because the development and training of CQI teams was part of a much broader intervention, it was hard to distinguish which elements of the intervention led to improved patient outcomes. Team training in the use of CQI methods was not associated with improved patient outcomes in other studies (Irvine-Doran et al. 2002; Goldberg et al. 1998). Irvine-Doran et al. (2002) found that other factors, such as physician involvement and effective group problem solving, were more likely to predict team effectiveness than was CQI training.

Field Studies

The field studies we reviewed examined relationships between team inputs, team processes, and team outcomes, using a theoretical framework or model to select variables to measure and to explain relationships (see Table 3). Table 4 provides a summary of variables that have been found to have a significant relationship with objective and subjective team effectiveness outcomes.

Context. Our review found that organizational culture and structures directly and indirectly influence team outcomes (Bower et al. 2003; Haward et al. 2003;

TABLE 4 Relationship Between Field Study Variables and Team Effectiveness

	Variable Studied	*Objective Outcomes*	*Subjective Outcomes*
Context	Primary-care solo practice structure	+	
	Adequacy of resources/staffing		+
	Dispersion of service across greater number of hospitals	–	
	Ethnic concordance between patients and staff	+	
	Organizational culture—balance		+
	Organizational culture—patient-centered	–	+
Task features	Rules and procedures		+
	Superordinate goals		+
	Longer booking interval	+	
	Quality improvement practices		+
	Workload	+	
	Task clarity		+
	Clarity of leadership		+
	Clarity of goals		+
	Interdependence		+
Team composition	Size	Mixed	–
	Professional tenure		+
	Team tenure		–
	Discipline		+
	Disciplinary diversity	+	
	Team champion		+
	Age, age diversity, ethnic diversity		+
	Status		+
	Willingness to learn	+	
	Stability over time	+	

(continued)

TABLE 4 (continued)

	Variable Studied	*Objective Outcomes*	*Subjective Outcomes*
Team processes	Communication		+
	Coordination		+
	Interdisciplinary collaboration		+
	Cooperation		+
	Conflict		–
	Participation and perceived influence		+
	Leadership	+	+
	Process strategies	+	+
	Level of group development	+	
	Team climate[a]	+	+
Traits	Cohesion		+
	Norms		+

a. Team climate = participation, clarity of objectives, support for innovation, commitment to quality.

Lemieux-Charles et al. 2002; Pinto, Pinto, and Prescott 1993; Shortell et al. 2004; Temkin-Greener et al. 2004; Vinokur-Kaplan 1995). Few studies incorporated measures of organizational culture; however, where such a measure was included, a context that enhanced team orientation was found to promote perceived team effectiveness (Lemieux-Charles et al. 2002; Shortell et al. 2004). Shortell et al. (2004) found that cultural balance was marginally related to improved organizational effectiveness. Surprisingly, this study found that a patient-centered culture, while positively related to perceived team effectiveness, was negatively related to the number and depth of QI changes made. The authors suggest that teams might have felt the need to make fewer changes in organizations that already had a focus on patient satisfaction.

Context variables that have been found to influence task design and/or team processes but that have not been linked directly to team effectiveness include solo rather than partnership primary care practice structures (Bower et al. 2003); unit type, with mental health teams on long-term care units being more cohesive than teams on admissions units (Vinokur-Kaplan 1995); the availability of resources and staffing for long-term care teams participating in

the Program of All-Inclusive Care for the Elderly (PACE; Temkin-Greener et al. 2004); organizational support for quality improvement (Lemieux-Charles et al. 2002); and physical proximity of team members (Pinto, Pinto, and Prescott 1993).

Task features and team composition. A variety of task features are related to perceived team effectiveness (see Table 4), but only one—workload—has been linked to improved patient care (Haward et al. 2003). Higher caseloads with a particular patient population (e.g., breast cancer) lead to the development of specialized skills and improved clinical efficiency. Mixed results have been found on the relationship between team size and team effectiveness, suggesting a potential trade-off between team member satisfaction and quality of care. In some studies, larger teams achieved better patient outcomes (Bower et al. 2003; Haward et al. 2003); however, other studies have found that larger teams perceived themselves to be less effective (Shortell et al. 2004; Vinokur-Kaplan 1995). Team size has also been found to have a negative impact on participation (Poulton and West 1999; Shortell et al. 2004). In Shortell et al.'s (2004) study of primary care QI teams, the authors posit a curvilinear relationship between size and effectiveness. They found that, up to a certain point, team size had a positive impact on the number and depth of QI changes made. Past that point, it had a negative impact.

Using both objective and subjective outcome measures, disciplinary composition has been shown to have a significant and direct impact on team effectiveness. In four studies, perceived team effectiveness varied by discipline and/or professional status. Physicians were more satisfied with team functioning on an inpatient psychiatric unit (Vinokur-Kaplan 1995) and primary care CQI teams (Shortell et al. 2004). On primary care breast cancer teams, breast cancer surgeons and nurses rated teams as higher functioning than did radiologists, oncologists, and pathologists (Haward et al. 2003). Breast cancer teams with a higher proportion of breast cancer nurses were also more likely to provide timely diagnoses and to recommend treatments. Haward et al. (2003) concluded that the level of commitment of breast cancer surgeons and nurses was high because the breast cancer team was central to their work and professional lives. The weakest level of commitment was found among histopathologists and radiologists who belonged to several other cancer teams as well as having obligations to the running of their departments. Temkin-Greener et al. (2004) found that professionals had a higher perception of team effectiveness than paraprofessionals. They note that "compared with paraprofessional, professionals assess their teams as being better on all of the team process constructs. This could reflect their

greater involvement in the core assessment/planning team and thus greater connectedness to the team model" (p. 478).

In an alternative to the professional-commitment explanation for core/periphery membership, Lichtenstein et al. (2004) examined the impact of status differences on team member participation and satisfaction. Basing their study on the value attainment theory of staff satisfaction and on the theory of status characteristics and expectation states, the authors found that team members with higher status had greater perceived influence on team members, participated more in team interactions, and were more satisfied with their relationships with coworkers and level of autonomy. These researchers defined status according to diffuse social characteristics such as gender, race, sex, age, and disciplinary status. This study identifies broader contextual factors in the social world as potential obstacles to effective team functioning, which may require different types of interventions than those considered in the existing literature. Edmondson, Bohmer, and Pisano (2001), for example, found that teams whose leaders selected members on the basis of confidence to give suggestions to higher status surgeons and who actively encouraged participation and real-time learning through trial and error were able to implement a new surgical procedure more quickly than team leaders who focused on technical competence and authoritarian command.

Processes and traits. High-functioning teams have been characterized as having positive communication patterns; low levels of conflict; and high levels of collaboration, coordination, cooperation, and participation (Pinto and Pinto 1990; Poulton and West 1999; Shortell et al. 2004; Temkin-Greener et al. 2004; Vinokur-Kaplan 1995).

These processes are positively associated with perceived team effectiveness. Traits—processes that are stabilized over time and internalized by the team—such as cross-functional cooperation, cohesion, and positive behavior norms are also associated with perceived team effectiveness but more so in relation to team member satisfaction than the achievement of task outcomes (Lemieux-Charles et al. 2002; Pinto and Pinto 1990; Pinto et al. 1993; Temkin-Greener et al. 2004; Vinokur-Kaplan 1995). However, recent studies using validated instruments (Team Climate Inventory and the Group Development Questionnaire) have strengthened this body of evidence by demonstrating that higher functioning teams achieve better patient outcomes (Bower et al. 2003; Haward et al. 2003; Wheelan, Burchill, and Tilin 2003).

In summary, field studies demonstrate the importance of factors that are external to a team, such as organizational support and resources, and identify a range of internal factors that influence team effectiveness.

DISCUSSION

A number of changes can be observed in the way teams have been conceptualized and studied since the literature reviews we cited at the outset of this article. Since 2002, there has been an expansion of care delivery settings in which teams have been studied, greater attention paid to the type of patient population being served, increased reference to the organizational studies literature, and wider use of multidimensional constructs of both the team and team outcomes. Roughly half the studies we reviewed were conducted between 1985 and 2002 ($n = 16$), while the remainder were conducted between 2002 and 2004 ($n = 17$). Before 2002, the majority of health care team research was conducted in the area of geriatric and acute-care inpatient and ambulatory care settings. We noted an increase since then in studies of team effectiveness in critical care and primary care. More recent studies were also more likely to examine team effectiveness in relation to specific patient populations having a specific type of diagnosis.

Building on the widely recognized work of Vinokur-Kaplan (1995) and Poulton and West (1999), team effectiveness researchers are now using more comprehensive models of team effectiveness as well as objective outcome measures. Before 2002, only one study (Vinokur-Kaplan 1995) used objective outcome measures, and this measure of "standards met" was not tied to specific patient or organizational outcomes. Since 2002, most field studies we examined used objective clinical or organizational outcome measures. These changes represent distinct improvements and a growing maturity of health care team effectiveness research. For example, intervention studies of complex system changes are now describing the nature of interventions in more detail and the contexts within which they are carried out. While there has been definite improvement in the design of field studies, the apparent randomness and lack of consistency in selecting and operationalizing context, task design, and process variables are striking.

CONTEXT

Field studies demonstrate that organizational context influences team effectiveness both directly and by determining the initial conditions that promote effective team functioning. The field studies we examined provided better context descriptions than intervention studies, and they investigated specific dimensions of both the structure and culture of organizations. However, the majority of studies did not address characteristics pertaining to organizational contexts, rewards and incentives, resources (in particular, technological and information systems), or broader social and policy contexts.

Context was more likely to be perceived as an important variable in project team research, because of the closer linkage between project teams and their external environments, including senior leadership, and their formation to achieve overall organizational goals. The mandate of project teams tended to be given by members of organizations that were external to the teams; in addition, they were more likely to be monitored and evaluated externally. Organizational context was found to affect the design of project teams and the training and resources available to them. In intervention studies, both organizational support for QI in general and specific QI practices themselves were associated with perceived team effectiveness.

Greater detail regarding organizational contexts, care delivery settings, and care delivery strategies is needed to enable assessment of the transferability of findings to different settings and populations. The body of literature is currently too small and too inconsistently theorized to pool studies within, let alone across, environments. Yet we need to determine whether systematic comparisons of teams across health care settings (e.g., hospital, community, and home) and across different patient populations and disease types are reasonable. In exploring why airline organizational structures and systems, including the structure of cockpit crews, were so similar worldwide, Hackman (2003) found that cockpit technology, regulatory procedures, and standards and the culture of flying are so deeply rooted institutionally that leadership and regulatory initiatives might not be able to alter them. Is this likewise the case in health care? We know that assumptions are made, for example, about differences between intensive care units and other settings; however, we have not examined and compared those differences. One might investigate, for instance, whether research carried out in intensive care units is comparable with that carried out in long-term care settings. Temkin-Greener et al. (2004 [see Table 3]) tested the reliability and validity of a survey tool developed for intensive care units and grounded in a comprehensive theoretical framework, demonstrating its reliability and construct validity in long-term care. However, results were not compared across settings. Could we expect that the structures and processes found in intensive care units in one country would be the same as in another and different from those in primary care?

TASK DESIGN

Future team effectiveness research needs to use a more consistent and clearly defined set of variables to examine task features and team composition in relation to both processes and outcomes. Disciplinary composition, diversity, and the presence of clear team goals appear to be the most promising variables linked to both team processes and outcomes. The question is, What particular expertise is needed, and how can it be mobilized within a

team? Individual members and leaders appear to need a balance of technical and interpersonal skills, and a team as a whole must function well together technically and interpersonally. We found it surprising how frequently team composition and its relationship to processes were not examined in field studies or adequately described in intervention studies.

Most studies also overlooked the characteristics of the work being carried out by teams and how this affected team functioning. For example, intensive care unit teams have much shorter work cycles, and team membership is unstable. These teams work in an environment considered to be complex and highly uncertain. Obviously, such teams will have very different characteristics and processes than teams in complex continuing care, where teams are highly stable and team members work together over long periods of time to achieve incremental changes. As Devine (2002) and Sundstrom et al. (2000) have suggested, it might be inappropriate to seek similar explanations for team effectiveness across different team types. If team researchers begin to pay greater attention to work characteristics, it might be possible to identify a parsimonious set of task design variables specific to particular team types and care delivery settings.

In our review, managerial interventions, such as self-management and CQI, did not show great promise in improving team effectiveness. While autonomy and interdependence can have a positive impact on team effectiveness and staff satisfaction, in the studies we reviewed, autonomy was narrowly defined as self-management (Ling 1996; Weisman et al. 1993), and models of self-managed work teams (Yeatts and Hyten 1998) did not guide them. Although autonomy generally refers to the organization of work, it is sometimes confused with the professional autonomy health care providers already possess. Our review suggests that the type of task features affecting team processes and outcomes might vary depending on care delivery settings and that generalizations across studies must be made very carefully.

Overall, we found that the intervention studies were unable to explain how task design affected care delivery team functioning or which aspects of a team's composition or features had the greatest impact on team outcomes. It is therefore difficult to replicate the interventions. Many of the studies found that, over time, few differences were found, but it is unclear whether this was due to changes in patient population or team functioning. Future studies need to consider both in order to explain observed changes.

PROCESSES AND TRAITS

Our review of field studies confirmed a large body of existing team research on the relationship between positive team processes and perceived team effectiveness. This review also provides some confirmation that highly

functioning teams perform better on objective outcomes. However, we also found that in some circumstances, there was a trade-off between perceived effectiveness and better patient and organizational outcomes. While larger team size and disciplinary diversity were the single greatest predictors of objective outcomes, some studies found that larger, more diverse teams were less satisfied with team functioning (Shortell et al. 2004; Vinokur-Kaplan 1995). This is an important finding for health care managers, as it suggests there might be an optimal point at which both team functioning and objective performance are maximized.

Field studies also demonstrated significant differences between different disciplines' perceptions of team effectiveness, yet these studies rarely examined power differentials and expertise across disciplines and how these factors influenced team cohesion, efficacy, problem solving, and decision making. This review identifies two explanations for differences in participation between core and peripheral members. According to the first, team members with a similar disciplinary status will participate differentially depending on their level of task involvement and level of commitment to other functional units or teams (Haward et al. 2003). According to the second, status differences, based on characteristics such as age, gender, race, and discipline, might impede the participation of lower status members who are equally committed to team goals (Lichtenstein et al. 2004). These variations in level of team member commitment and participation present challenges to defining team membership and improving team performance.

The ITEM we devised and employed enabled us to conclude that the team effectiveness literature has reached a point of saturation in linking improved processes to improved outcomes and needs now to focus on how to create and maintain high-functioning teams in different work settings. Two areas have been overlooked. The first is the relationship between task design, processes, and the establishment of stable psychosocial traits. While positive team norms and cohesion were linked to team effectiveness in some studies, few provided insights into how to create the conditions necessary for those traits to become established. Other traits, such as problem-solving capacity and a culture of team learning, were rarely examined, although these emerged in some studies as key determinants of effectiveness (e.g., Irvine-Doran et al. 2002; Edmondson, Bohmer, and Pisano 2001). Greater clarity is needed in defining traits that are used interchangeably, such as *cohesion*, *integration*, and *cross-functional collaboration*, and in distinguishing among traits, processes, and outcomes. The difference between *efficacy*, as a measure of a team's belief in its ability to be effective, which may in turn influence a team's actual or perceived effectiveness, and *perceived team effectiveness*, a subjective outcome measure, is also unclear.

The second area that has been overlooked is the multiple and changing membership of teams, which threatens the stability of team culture boundaries. Team boundaries are often unclear and fluid, as team members usually belong to multiple work groups and move in and out of groups to achieve different goals (Sundstrom et al. 2000). Hackman (2002), a leading expert on group behavior, has observed that teams of professionals are at special risk of "underboundedness because their main work invariably involves extensive and often intensive engagement with a variety of other individuals and groups" (p. 47). In these instances, teams might be composed of *core* and *extended* team members. Core and extended membership can change over time, but the team retains its form as long as task completion requires interdependence. Interactions between teams and across traditional boundaries (e.g., across patient care units; across organizations; and between hospitals, communities, and patients' homes) and across status hierarchies have not been systematically examined. Furthermore, team leadership, which may play a key role in managing instability and shaping team culture and norms, has been studied in only a limited way. Most studies focus on the instrumental aspects of leadership (e.g., establishing common goals) rather than the psychosocial aspects of leadership (e.g., establishing a climate of safety and participation). Given the context of health care restructuring and change, longitudinal studies that examine how teams change and adapt over time are also needed. Are some teams more adaptable to organizational change than others? How is team member turnover best managed?

EFFECTIVENESS

While team researchers are using broader conceptualizations of team effectiveness, including objective and subjective measures, the team effectiveness literature continues to be troubled by a lack of specificity regarding what teams are expected to be effective at doing. Measures of patient and organizational effectiveness are usually high-level measures, such as mortality or length of stay. These types of measures do not take into account the specific goals that teams set for themselves or the differences in goals across different patient populations and care delivery settings. Greater specificity of outcomes is needed in future research.

More attention also needs to be paid to the attribution of causality across levels. Hackman (2003) noted that even though research is generally conducted at a single level of analysis, researchers often turn to the next level for explanatory mechanisms. While many studies in this review examined individual and team-level interactions, few considered interactions with the organizational and system/environment level. Given the importance of context

in explaining interactions among variables within and between different levels, it is important to move beyond models that consider only two levels. In team effectiveness research, there are many challenges in considering "one level up or down" (Hackman 2003, 906). Hackman suggests that researchers use "informed induction," which consists of "drawing upon all the information one can capture—qualitative, quantitative and archival—to identify the structures and processes located at adjacent levels that are likely to powerfully shape or be shaped by one's focal phenomena" (p. 919). This approach requires investigators to be completely immersed in the settings within which their research is taking place in order to identify factors at multiple levels that influence team functioning. Through this type of analysis, we would be in a better position to determine whether there are differences between different types of settings.

Recently, in exploring what might account for the large amount of unwarranted variation in quality and outcomes of care, Shortell (2004) proposed a multilevel model to highlight the interdependencies across levels and the need to align change at all levels to increase the probability of significant improvements in quality and clinical efficiency. Perlow, Gittel, and Keitz (2004) also suggested that interventions to change team processes must be aligned across multiple levels. In their "nested theory of structuration," the authors suggest that patterns of work group interaction shape are themselves shaped by organizational structures and broader social contexts, as well as individual action. To change these patterns of interaction, it is necessary to understand the mutually reinforcing relationships between levels. These authors used an ethnographic study design to examine software engineering teams across three national contexts to identify patterns of interactions, reward structures, reward-helping systems, and institutional context. They found significant differences in how national and organizational contexts shaped interaction patterns, suggesting that aggregating data from one level to another might conceal important factors influencing team interactions.

STUDYING TEAMS EMBEDDED IN CHANGE

As we proceeded with our review, we were struck by the number of studies that are now embedded in larger efforts to improve service delivery and quality of care. We believe these efforts will permit development of knowledge about teams and their functioning within particular broader system contexts. We noted that the VA system has incorporated models of service delivery that include multidisciplinary teams as the backbone of these efforts. These include the Collaborative Care Model (Hedrick et al. 2003; Liu et al. 2003), the HBHC (Hughes et al. 1990), and the TM/HBPC (Hughes et al. 2000).

Researchers are also moving from single-site studies to multisite studies (Hughes et al. 2000). A recent review (Temkin-Greener et al. 2004 [see Table 3]) studied teams participating in PACE, which is a community-based, managed-care program. Two other studies (Chin et al. 2004 [see Table 2]; Shortell et al. 2004 [see Table 3]) examined teams involved in QI collaboratives and using a Chronic Care Mode (CCM). The CCM has six components: community resources and policy, patient self-management, use of evidence-based guidelines and protocols, delivery system redesign, use of clinical information systems, and health system/organization change (Wagner et al. 2001). The QI collaboratives use the Institute for Healthcare Improvement's Breakthrough Series methodology (Wagner et al. 2001) to develop practitioners' abilities to use QI. They "bring together groups of practitioners from different healthcare organizations to work in a structured way to improve one aspect of the quality of their service" (Ovretveit et al. 2002, 345). The participation of multidisciplinary project teams is a key component of a QI collaborative.

In a recent review of lessons learned from research on the QI collaboratives that have gained prominence in the United States, the United Kingdom, and Sweden, Ovretveit et al. (2002) suggested that factors contributing to the failure or success of teams included their ability to work as a team (processes), their ability to learn and apply quality methods, the strategic importance of their work to their home organizations, the culture of their home organizations, and the type and degree of support from management. In our review, we found it difficult to disentangle what constituted service delivery teams (i.e., teams that actually delivered care) and projects teams (i.e., teams that were developing recommendations for improvement). It was not always clear whether the latter were implementing the proposed changes. In general, these interventions are more complex than a redesign (e.g., interdisciplinary rounds) and highlight the need for greater attention to context in the design of team effectiveness research.

CONCLUSION

This review shows that there is a great deal of activity and interest in studying team effectiveness in the health care arena. Unfortunately, taken as a whole, published studies do not provide clear direction on how to create or maintain high-functioning teams. While multiple research designs and methods can be used to understand different aspects of team performance, rigorous conceptualization of team dimensions, processes and traits, and outcomes are needed in all health care team effectiveness research.

By integrating concepts from the organizational studies and health care team effectiveness literatures, the ITEM developed for and used in this review

clarifies the multiple dimensions of health care teams as well as their processes and outcomes. It also provides a useful framework for understanding multidimensional relationships among complex phenomena in dynamic health care delivery settings. The use of a single, overarching model of team effectiveness in organizational studies can be abandoned in favor of multiple models tailored to particular team types and work processes (Devine 2002; Sundstrom et al. 2000). Health care researchers need to adapt and tailor organizational models in order to produce findings that will be useful to health care managers and teams. We hope the next wave of health care team research fills in some of the gaps we have identified by developing models of team effectiveness specific to each type of work and care delivery setting. Such research will provide a new body of literature that decision makers can use to help improve the quality and efficiency of care.

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