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ALTERNATIVE CONCEPTUALIZATIONS OF "TEAM" AS THE UNIT OF ANALYSIS IN EXAMINING THE OUTCOMES OF "TEAM" HEALTH CARE DELIVERY

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In my presentation I would like to talk about three alternative strategies for conceptualizing team outcome research that are emerging in recent literature. The three strategies are differentiated, in part, by how the "team" unit of analysis is conceptualized. This conceptualization has implications both for the measurement of outcomes and explanations for results of outcome studies.

The first strategy is the one we have used in our own geriatric team research program (see, for example, Feiger & Schmitt, 1979; Farrell, Heinemann & Schmitt, 1986; Farrell, Schmitt & Heinemann, 1988; Schmitt, Farrell & Heinemann, 1988). In our research, the unit of analysis is the formalized interdisciplinary team-as-a-small-group. The second is a strategy developed by Dr. Judith Baggs, a colleague in the nursing school at Rochester, who has been studying outcomes of team efforts in the ICU setting (Baggs, 1990a, 1990b; Baggs, Ryan, Phelps, Richeson & Johnson, in press). The team unit of analysis in her research is focused at the more microscopic level of the nurse-physician dyad involved in making a particular kind of ICU patient care decision for a particular patient. The third strategy is a more macroscopic strategy than the individual patient-oriented dyad, or the team-as-small-group. This is the team as a "unit" within a larger organizational structure. A research group that typifies this approach to studying team outcomes is that of Knaus, Draper, Wagner and Zimmerman (1986) in their widely cited study of the outcomes of 13 ICU's, and, more recently, the work of Shortell, Rousseau, Gilles, Devers, and Simons (1991), who have been collaborating with Knaus and colleagues on a nationwide study of outcomes of 42 ICU's.

Team-As-Small-Group Strategy

In approaching outcome research using the team-as-small group strategy, one examines the multiple outcomes potentially associated with the comprehensive interdisciplinary team delivery of care to a cohort of patients over a specific period of time. This approach requires the availability of formally organized teams as small groups of professionals whose members work together over time around a shared group of patients.

In studying the outcomes associated with the team delivery of care using this approach, the most common design that has been used is a randomized experiment or non-equivalent comparison group quasi-experiment. Using these designs, outcomes of a cohort of patients who have experienced a formalized

team approach to care are compared with those who have experienced a "usual care" approach, expecting to show a positive difference in outcomes associated with the team approach. While some studies have demonstrated a difference using teams, others have not. Though this design has been the most commonly used in the literature, it has important limitations in demonstrating the relationship between the team approach to care and outcomes. Presumably, using this strategy, the team, as a small work group, has "something" to offer that the usual care situation does not that makes the difference. Very often, that "something" goes unexamined and unmeasured, severely limiting the ability to explain any differences discovered or account for a lack of differences. In short, demonstrating outcome differences is not enough.

In order to explain what accounts for differences we have to be able to conceptualize in clearer terms what is different about the team-as-small-group approach to health care delivery. Progress on this issue has been slow because: 1) the conceptualization task is a difficult one (there are many aspects of the team-as-a-small-group that could potentially be studied) and, 2) once we have conceptualized properties of the team-as-a-small-group we think make the difference in outcomes, then studies need to be designed that measure the degree to which teams' variation on these properties is correlated with variation in outcomes. This requires a study design in which many teams are studied, not just one. This kind of design is relatively rare. Such designs, however, allow us to examine variation in team properties and provide us with potential explanations for the differences found in outcomes. This gives us a better idea about how to intervene with teams to improve their outcome effectiveness.

As those of you who have been at this conference before know, the theoretical approach that we have taken to examining properties of teams that we believe are linked to outcomes has evolved over time, but has consistently drawn on a small group frame of reference. In the earliest studies we reported at this conference this frame of reference involved the concept of "collegiality". This concept was defined in terms of the dynamics of small group communication. In situations, like an interdisciplinary team, gender, age, and occupational prestige differences typically produce patterns of hierarchical communication that work against the open communication that is fundamental to bringing to bear interdisciplinary expertise in the patient care situation. We defined collegiality as the degree to which teams could overcome this pattern of communication and approximate the more equal give and take characteristic of colleagues. Our later work has broadened the definition of collegiality, which is closely linked to the concept of collaboration (Baggs & Schmitt, 1988), and integrated it with the concept of team development, drawing on small group development literature, as a framework for understanding the variable contributions of the team delivery of care to outcomes. This involves not only the measurement of collaboration/collegiality, but, also, examination of the factors by which teams achieve the ability to function as more collaborative groups.

Leaving aside for the moment the conceptualization of the independent variable, there are several important conceptual and methodological issues related to the measurement of outcomes to consider when the team-as-small-group is responsible for a cohort of patients and the effectiveness of the team is being examined.

1. The patient population should be one that can benefit from the team's interventions.

If the majority of patients who are receiving team delivery of care have problems that are not amenable to the special services the particular team(s) can provide, no effort to show that teams positively affect outcomes will be successful. In the more recent team studies, we have seen investigators begin to use this criterion in a precise way. For example, at the Sepulveda Veterans Affairs Medical Center, Rubenstein, Abrass, and Kane (1981) estimated that only 15% to 20% of the hospitalized geriatric patients could benefit from the team approach characterizing their Geriatric Evaluation and Management Unit, where care was delivered via an interdisciplinary team of geriatric rehabilitation specialists. In their randomized, controlled trial of outcomes of the GEM as compared to regular hospital management, only 8.5% of the patients over 65 years of age in the hospital after 1 week met screening criteria for their study (Rubenstein, et al, 1984a, 1984b). They recognized that patients who had chronic or unstable medical problems, as compared with those who were recovering from conditions such as stroke, myocardial infarction or whose primary diagnosis was a common geriatric problem, were unlikely to benefit much from GEM care. They were able to show important differences in outcomes related to GEM management of the selected sub set of patients. The likelihood of showing significant differences between the GEM team and usual care situation would have been much less if the positive effects for those who could benefit from their care had been diluted by averaging into the mean differences between groups all those who showed no change because they could not benefit from the team's care. Unfortunately, while they demonstrated significant differences linked to the team's care, this was a single team vs usual care comparison, where it was impossible to sort out what it was about the team's care that made a difference.

2. The Choice of outcome measures should reflect the range of outcomes that might be affected by team intervention.

Too often investigators limit the measurement of outcomes of team care to one or a few outcomes when the team treatment could be expected to effect a broader range of outcomes. The outcomes chosen should be those that "fit" the disciplinary resources the team has to offer. In geriatrics, interdisciplinary teams typically encompass a broad range of disciplines ranging from the nurse, physician and social worker to occupational, physical, speech, and other therapies, nutritionist, psychologist, and pharmacist. Some of the outcomes of geriatric team effort that commonly have been assessed include mortality, functional ability [including both improvement and no deterioration (no change)], and the number of days spent at higher levels of care (which conceptually is related to functional ability). Other outcomes such as mental status, morale, social involvement, control of specific chronic disease states, drug interaction problems, and patient and family satisfaction with care may all be potentially affected in a more positive way depending on the configuration of resources in the team.

One methodological issue is important to consider when multiple outcomes are measured. Unless one has a sample where the needed intervention is homogeneous for the cohort--e.g., almost everyone has needs for improvement in functional ability or mental state, or morale--one may need to alter

measurement of outcomes to reflect the variability in the type of intervention needed by specific patients in the cohort. If only a small sub set of the cohort need help with improving morale, the measurement of mean change in morale of the cohort will dilute the positive effects the team intervention may have had on those who needed assistance with morale by averaging the positive individual results with the entire group, many of whom may not have needed professional intervention in this area. An overall measure that "counts" the number of deteriorations, no changes, and improvements from pre to post intervention regardless of the type of need may more effectively measure the success of the team's efforts.

An increasingly important area of team outcome measurement is costs of care. This outcome variable is of interest because the potentially higher costs of team delivery of care associated with the use of a broader range of professional expertise must be balanced against the amount of improvement realized. Again, there is a significant issue in cost measurement that should be taken into account in designing cost studies. This is that the measurement of costs is complicated by the fact that team care may be more expensive initially through involving a greater range of professionals, but save patients from expensive readmissions and emergency care later on. Thus, the time frame within which costs are measured as well as the types of costs tracked are important determinants of overall cost differences between team delivery and usual care delivery methods.

Decision-Focused Team Strategy

In contrast to the focus of the first strategy that begins with the measurement of a comprehensive set of outcomes in a cohort of patients linked to the interdisciplinary resources and collegial/collaborative dynamics of the team-as-small-group, this approach begins with the identification of decisions that if made collaboratively between professionals from different disciplines are likely to be of better quality and therefore are believed to be associated with improved outcomes. There are many critical decision points in the delivery of patient care for which shared decision making may make a difference. Just three will illustrate this.

First is the decision to discontinue suicide precautions for patients who have been isolated because of the potential to do physical harm to themselves. There are important negative consequences associated with the wrong decision. If the decision is made to keep someone on suicide precautions unnecessarily, the patient is cut off from a more therapeutic social situation and the costs of care are greater as a function of the close supervision required while someone is on suicide precautions. On the other hand, if the decision is made to discontinue suicide precautions prematurely, there is a risk that the patient might make further attempts to do harm to him/herself. Theoretically, the likelihood of avoiding a bad decision should be increased if at least the nurse(s) who has been involved in the ongoing care and observation of the patient is involved with the physician in a collaborative decision about whether to terminate suicide precautions.

The second example is the decision about discharge from the ICU. This is the decision that my colleague Judith Baggs has been studying.

In a project examining the transfer decisions for 286 patients from an ICU, she asked separately the nurse and physician responsible for care of the patient on the shift at the time of the transfer decision to rate the amount of collaboration involved in the process of making the decision to transfer. The negative outcomes associated with poor decisions of this type include increased mortality and possible readmission due to premature discharge. The latter outcome has direct cost implications. On the other hand, a decision to retain a patient in the ICU longer than necessary also has undesirable outcomes related to the negative effects of the ICU environment on the patient and increased costs of care. Baggs found that the degree of collaboration in the decision to discharge, as rated by the nurse, had a significant inverse relationship with mortality and readmission (Baggs et al, in press).

A third example also is related to discharge decision making. This is the example of the decision to discharge very low birth weight infants earlier than usual (at a lower weight and gestational age, if other criteria are met). The consequences of a poor decision of this type also can be easily identified. Among other outcomes, premature discharge would be associated with higher morbidity post discharge and higher rates of readmission. On the other hand, retaining these infants as inpatients too long exposes them to iatrogenic illnesses associated with the NICU environment, delays their integration into family life, and generates enormous additional financial costs. The consequences of an early discharge program that includes nurse specialist home follow-up in which the decision to discharge is made jointly between the nurse specialist involved in the care and the physician has been studied by Brooten and colleagues (Brooten et al, 1986; Brooten et al, 1988). Measures of morbidity, health care service utilization, and developmental status, among others, showed no differences between the early discharge group and very low birthweight babies discharged under the usual protocol, demonstrating the safety of such early discharges. There were enormous cost savings associated with the early discharge alternative.

Studying the team approach to care from this unit of analysis perspective generates differences in both outcomes and explanations for team factors that account for outcome differences. Outcomes to be studied are determined by the nature of the decision making task. In looking for explanations of better or worse outcomes, the focus is on theories that account for the degree of willingness/interest of the health professionals involved in the specific patient care situation to engage in a collaborative decision making process. Lamb (1991) has examined nurse practitioners' decisions to involve physicians in decision making about individual patients using both a medical technology framework and a social exchange framework as possible explanations for the decision making behavior. From the medical technology perspective, the decision to involve the physician in decision making about the patient would be determined by the need for medical expertise beyond that possessed by the nurse practitioner. From a social exchange perspective, the decision to involve the physician in decision making about the patient would be determined by the social costs and rewards (to the patient) of the interpersonal transaction. In Lamb's research, she found that indicators from the social exchange model were more powerful predictors of the nurse's decision to involve the physician in decision making than indicators

from the medical technology model. No similar studies have been done of physicians' decisions to involve nurses in the decision making process.

While some of the same outcomes may be measured as in the team-as-small-group approach, the meaning and interpretation of outcomes will be different in the two approaches. A good example is mortality as an outcome indicator. From the decision-focused team perspective, using the examples given earlier, mortality may be a gross indicator of poor dyadic decision making aggregated over many decisions, i.e. the decision has been made to transfer patients to care situations that do not have the resources to meet their needs. From a team-as-small-group perspective, reduced mortality also may be seen as an appropriate indicator of team effectiveness. Explanations for the reduction in mortality in a cohort of patients would be sought in the team's ability to use available interdisciplinary resources to diagnosis and treat preventable causes of death.

One advantage of the decision-focused team approach is that the decision involves a team (in this case the nurse-physician dyad) formed around a single patient, which is likely to change from patient to patient or from shift to shift. This approach captures the dynamic nature of patient care particularly in the acute care setting, where the concept of a team-as-a-small-group responsible for a cohort of patients often is not operative. In Baggs' words with regard to studying the ICU transfer decision, "The transfer decision is a discrete event that exemplifies the focus of collaborative efforts" (1990a, p. 68).

The Team-As-Organizational-Unit Strategy

Those working from the third strategy, the team-as-organizational-unit, take a more macroscopic perspective towards the interdisciplinary collaborative effort believed to characterize improved outcomes. There is no longer a small group of professionals who are consistent work partners in sharing responsibility for a cohort of patients. Rather, there is a large interdisciplinary staff who must find ways of implementing a collaborative working relationship. While the outcomes measured may be similar to those studied at either of the other levels, e.g. mortality, the interdisciplinary process by which these outcomes are produced is conceptualized to be embedded in the characteristics of the interdisciplinary unit and the quality of its interface with the larger organization of which the unit-team is a part. The focus is on key organizational processes and managerial practices that may serve as indicators of collaborative effort.

In the 1986 study by Knaus and colleagues, such factors as unit coordination, joint nurse-physician decision making practices, etc. were identified post hoc as potential factors accounting for differences in mortality among 13 ICU's studied. Shortell and colleagues (1991) recent report describes the development of measures of these unit level ICU characteristics that will be linked to unit mortality rates in 42 ICU's included in a national study. Self report scales measuring the organizational factors of leadership and unit culture supportive of collaborative efforts, and managerial practices reflective of coordination, communication and conflict management have been developed. While many of these factors also are relevant

to the working dynamics of the team-as-small-group, at this level, because a large number of people are involved who work together in varying combinations, one looks for indicators of greater institutionalization of certain practices fostering collaborative working styles. For example, do policies and procedures stipulate certain expectations for written communication between disciplines within the unit such as joint charting, or joint sign off of certain types of decisions? Are there regular meetings, rounds, committees that facilitate communication between disciplines and across units? Outcomes, such as mortality rates of ICU's, controlling for overall differences in levels of severity of patients between units, can then be linked to the variation among units on organizational characteristics that facilitate collaborative work patterns among different health care professions.

Linking the Three Strategies in a Comprehensive Conceptualization

While these three strategies for examining the relationships between team collaboration and outcomes generate different research emphases in outcome measures and explanations for outcome differences, each of which adds to our comprehensive understanding of the team delivery of health care, there is also a role for research that examines the interrelationships among these different levels of collaborative activity. As more and more studies are published that link improved outcomes to greater interdisciplinary collaboration. While these interventions could be designed for the interpersonal dyad, the small group, or the organizational unit, it would be helpful to speculate about what the consequences of various levels of intervention might be.

It is likely that modifications of organizational processes and managerial procedures would be the most efficient in bringing about change in degree of collaborative effort. Depth of effectiveness likely would be enhanced by carrying out interventions at team-as-small-group level, particularly with the core management group who have control over developing and evaluating collaboration-promoting policies and, then, with the team-as-dyad level to solidify personal commitment and experience in implementing unit and organizational level policies. Enthusiasm for undertaking interventions to facilitate collaborative efforts will rest in the continued demonstration of the relationship between these collaborative efforts and improved outcomes.

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