Measurement of Change in Rehabilitation Team Dynamics With the Team Assessment Profile (TAP)

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Teamwork is fundamental in rehabilitation, yet research on team structure and function is lacking. The Teamwork Assessment Profile (TAP) is a rehab specific survey instrument for team dynamics used before and after institution of a novel team format, Issue Oriented Rehabilitation Staffing (IORS), on a rehabilitation unit. With IORS, a "Person Responsible" leads each "Issue." Highly structured team meetings focus on team coordination, not reporting or documentation. Statistically significant team dynamic changes occurred on the TAP after IORS, including team interdependence, length of staffing, and percent of staffing time viewed as useful. Sample size and uncontrolled covariables limit conclusions, but the TAP demonstrated face validity. IORS is a viable staffing format. Measurement of team dynamics may improve quality and efficiency of rehabilitation teams.

KEY WORDS: rehabilitation; transdisciplinary; multidisciplinary; team; administration.

INTRODUCTION

The team approach to patient care is a unique and important aspect of rehabilitation medicine (Keith, 1991; Melvin, 1988; Rothberg, 1982). Still, it remains poorly studied. Almost two decades ago, Halstead (1976) reviewed the literature on teams and found only a handful of articles that applied a research model. This limited base lead him to conclude that teamwork improves patient outcome. Our recent study comparing outpatient team versus a physiatrist alone is one of the few articles in the recent literature that addresses Halstead's conclusion (Haig *et al.*, 1995). A few other studies (Strasser *et al.*, 1994; Wanless *et al.*, 1992) have evaluated certain aspects of the team process. Since Halstead, however, we have found in the rehabilitation literature more presidential addresses and memorial lectures on the team process than actual research (Fordyce, 1981; Melvin, 1988; Rothberg, 1982). Rothberg, 1985). In the meantime, the emphasis on teamwork may be eroding as a result of increased fiscal and government constraints (Keith, 1991).

At the same time, there exists a call for our field to lift itself above a multidisciplinary model to an interdisciplinary (Melvin, 1988) or even a transdisciplinary (Magrun and Tigges,

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1982) status. The concept of transdisciplinary teamwork has achieved some popularity in the rehabilitation community, but it remains poorly defined in the medical literature. We suggest that it implies that the best way to meet patient needs is with therapists who break out of the traditional roles of their professions. In contrast to multidisciplinary teams in which different specialists all work independently on the patient, and interdisciplinary teams in which different therapists communicate with each other in the process of patient care but have well-defined roles according to their training, we take transdisciplinary to mean that the team works together but each team member also assumes responsibility for the patient as a whole. Thus, each therapist does whatever work is necessary to accomplish the patient's goals, whether the tasks are traditionally part of the work for that allied health profession or not.

This change from parallel play to supervised interactive play to true cooperation sounds good, but there also appears to be a downside. One suspects that accompanying the transdisciplinary approach is an increase in time spent in team coordination, which increases cost of service delivery. Sharing of roles might decrease the emphasis on strong leadership, a trait synonymous with success in other businesses. Specialized training and experience may not fully get utilized if team members focus only on the areas where collaboration is necessary.

At a grassroots level, the actual format of rehabilitation staffing varies greatly within the parameters set by accreditation agencies. The first author has worked in hospitals where staffings included family members and routinely lasted over 30 min. In other hospitals, staffings consisted of brief numerical reporting of status on an outcome scale completed in less than 5 min. One would assume that the quality of team interaction differed in these two settings. Is either format accomplishing its goals in terms of team interaction or patient outcome? There is a need for simple measurement of team interaction on inpatient units if individual programs are to assess the effect of changes in personnel or policies on the team.

This article describes an innovative method of inpatient rehabilitation team management, Issue Oriented Rehabilitation Staffing (IORS), which promotes autonomy, sharing of tasks, and decision making but provides structure, time limits, and leadership. It describes the process of implementing IORS. For this study, we prospectively measured changes in staff interaction using a simple tool designed for the study, the Teamwork Assessment Profile (TAP).

METHODS

IORS is a team management method developed at our center as an alternative to routine staffing programs. Our hypothesis for this study was that IORS would allow transdisciplinary rehabilitation to occur and improve staff autonomy yet maintain a structure necessary to satisfy the requirements of payers and reviewers, a realistic time limit in formal communication meetings, and a structure that promotes specialized approaches to difficult patients.

Definitions

In the IORS system, the definitions of Person Responsible (PR), Issues, and Case Manager (CM) are unique.

Person Responsible

Staff members, regardless of their training, may be the PR for any of a number of Issues. Typically, the PR volunteers because he or she sees a need to coordinate a specific issue among the team or a subgroup of the team, but sometimes random assignment of the PR is necessary in order to make sure that all team members understand the challenges unique to some patient issues.

Issues

"Issues" are important problems or areas worthy of team attention. Examples might be feeding, mobility, or family coping, but only if team members feel that one of these required significant interaction between team members. We begin with a standard list of Issues as shown in Appendix A, but we typically eliminate many of them and add others as needed. For a given Issue, the PR must know the patient's status and develop weekly goals, discharge goals, and long-term (6 month) goals with the patient. He or she is responsible for coordinating team members who have involvement with the Issue. This occasionally involves separate formal or informal discussions with a small group outside of staffings.

Case Manager

Each patient get assigned a CM. The CM's responsibility is to understand the patient's overall goals and report them to the team, report team plans to the patient and family, and act as facilitator of the team meeting. In the team meeting, the CM is responsible for assigning a PR for each Issue, writing a one paragraph summary of progress, insuring that all others write their parts of the team report and sign the report, insuring identification of issues not on the "standard" Issue list (see Appendix A), identifying a tentative discharge date and time, and keeping the staffing on schedule.

Staffing Format

Staffings occur on a weekly basis and last 20 min. There are three types of staffing: initial staffing, interim staffing, and discharge staffing. All staffings begin with 1–2-min reports from each discipline. These allow team members to share basic information without interruption or competition. Reports are in a precise order: physician, nurse, dietician, physical therapist (PT), occupational therapist (OT), speech/language pathologist, psychologist, therapeutic recreation staff, and social worker. Using this order, general information gets presented first. Staff members who present later than others don't feel the need to restate information of which the whole team is already aware. They can concentrate on specific areas of their specialty. Staff report only what is pertinent to other staff members. They may need practice to avoid repeating what previous reporters have already said and to avoid simply reading aloud their progress for the week. It is perfectly appropriate, for instance, for therapists to report only "I have nothing to add." Collegues hold their questions or comments until all reports are complete.

After discipline reports, open discussion occurs for about 5 min. The team identified unique issues for each patient and coordinates plans. Therapists seek additional information from each other.

Organization and closure follow. At initial staffings, the PR for each issue gets identified by volunteering or random assignment. Any new team issues that evolve get added to the standard list. The team identifies a tentative discharge date and location and schedules further small group meetings among staff or family meetings. The team also assigns follow-up and long-term goals.

At interim staffings, discipline reports are very short; open discussion is longer. At discharge staffings, closure involves assignment of follow-up therapy and planning to accomplish long-term goals.

Documentation

Documentation is a shared responsibility coordinated by the CM. Goals for each Issue get documented in the staffing report (see Appendix A). Short-term goals are those that patients or staff can generally accomplish by the next staffing. Discharge goals are those that are essential or highly desirable for discharge. Long-term goals reflect the potential status of patients 6 months after discharge.

During or immediately after the initial staffing, the CM documents patient and family goals briefly. Each discipline writes a brief one or two sentence report. The PR's name and discipline appear written before each issue. Discharge date and location get written during or after staffing. Each PR is responsible for filling out short-term goals and discharge goals for his or her issue (one to two sentences). After staffing the CM writes a one paragraph summary of progress, updates discharge date, discharge location, and patient/family responses to the plan. PR's document modifications in short-term and discharge goals.

Sometime before each subsequent staffing, each PR checks on the status (i.e., accomplished, not accomplished, no longer applicable) of short-term and discharge goals. If goals are complete, a one line explanation gets written.

At discharge staffing, follow-up plans involving team members, physicians, and agencies get documented. PRs write long-term goals. In clinic 1 month after discharge, the rehabilitation nurse practitioner reviews the long-term goal sheet with the patient and family and identifies areas of progress. The physician then evaluates and proposes changes and treatment.

Weekly documentation of PT, OT, and other therapy treatment time and therapistspecific goals for insurance purposes appear separately on a check list.

The Physiatrist's Role

In addition to his or her role as a team member with expertise in medical issues, physiatrists have an important leadership role. Because physiatrists are the only team members with some formal education in all disciplines, they seem uniquely suited to "read between the lines" during staffing. For instance, if an OT notes problems with spasticity, the physiatrist may be the person who realizes that morning stretching by nursing staff, positioning by PT, medication, or a urinalysis may be the answer.

Two areas that may not be intuitively obvious are protocol development and staff coaching. The physiatrist drives development of protocols for specific disease categories

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by modifying the "standard" Issue list and determining the resources that may be useful to accomplish goals in the Issue area. With amputees, for example, we would not automatically consider communication deficits an Issue, whereas wound healing would be an Issue added to the routine issue list.

The physiatrist works with different management and goal setting skills of individual CMs and PRs. Certain team members may consistently report rote memory information that may not be relevant to peers. The physiatrist may gently confront irrelevance by asking individuals to occasionally explain to other staff members relevance of information presented. Some individuals cannot clarify their thoughts or prioritize them into a 1–2-min report. Chronically long-winded staff members might get assigned to a timekeeper role to increase their sensitivity to the timeliness of reporting. Preplanning or individual counseling with CMs improves their leadership skills. At occasional staffings, the physiatrist may change the pace (e.g., "Today, direct all comments to the physical therapist. Please explain the relevance of all your concerns to that person"). Such exercises are helpful when new staff join the team.

Implementation

The Center for Rehabilitation Services is a 16-bed Committee on Accreditation of Rehabilitation Facilities (CARF) accredited inpatient rehabilitation unit serving patients with a variety of disorders in Northeast Wisconsin. Prior to 1989, the center used a formal, rigid therapy-by-therapy reporting format. After a change in medical director and administration, the center utilized an unstructured format for a 6-month "washout." The rehabilitation team then met at a retreat to brainstorm on optimal structure for staffing. The team developed a preliminary plan that met the team's requirements. A committee met over a 6-month period to alter documentation procedures and develop a training system. Staff training included a videotape with explanations and a modeled staffing, a handbook with written instructions and examples of the paperwork, and a lighthearted quiz.

After all team members received their basic education, IORS was the method used in all staffings. On an occasional basis, the directors of speech pathology and occupational therapy observed team interaction. They looked for extraneous conversation, repetition, and irrelevant or highly technical reporting. They then shared these with staff in a nonjudgmental way.

Outcome Measurement

The TAP, illustrated in Appendix B, is an instrument developed to measure various aspects of team interaction, both within and outside of staffings. It contains two parts. On the first part team members rates the value of other professions to the rater. Respondents rank the importance of their interaction with all other team members on a 1–3 scale with 1 as very important, 2 as somewhat important, and 3 as not very important. The second part quantifies staff feelings about various aspects of team dynamics. Team members answer a number of specific questions about staffing, leadership, paperwork, etc. with a mark on a 10-cm visual analog scale. Responses get rounded to the nearest centimeter.

We circulated TAP questionnaire to staff members before institution of IORS and 6 months after the program had begun. We performed statistical analyses using the Number Cruncher Statistical System (NCSS) (Hintze, 1987).

We also noted other outcomes, including inspection of the unit by accreditation agencies, payment for service (suggesting documentation was adequate), subjective assessments of changes and external variables that might have affected data collection. Staff and management designed IORS to be in place when CARF and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) reviewers arrived to review the rehabilitation unit.

RESULTS

Results of the TAP staff surveys before and after institution of IORS appear in Table I and Figs. 1–3.

Figure 1 shows scores for each discipline before and after IORS. The only statistically significant difference between before and after IORS was that interaction with Speech Language Pathology was more valuable to other team members after IORS than before IORS.

The second part of the TAP demonstrated a number of team management issues. As described in Appendix B, the paperwork and planning time questions would ideally receive a score of 5, and most other ratings were such that 0 was the most positive answer. The question about relevance of the staff meeting to the individual would ideally score 10. Results presented in Figs. 2 and 3 demonstrate that team interdependence, length of staffing, and percent of time spent in a staffing that was relevant to the rater were statistically significant different from pre to post. Positive changes were evident in all other areas except one, but these did not reach statistical significance. IORS met all of the standards of CARF and JCAHO and received special praise from reviewers. During the entire period of study, three insurance letters of denial occurred. None of them related to case management or documentation, and insurance carriers overturned all three on appeal.

In this study, we did not control for significant external events that were likely to influence scores. During the study period, the rehabilitation center moved to a newly designed unit, which for the first time had PT on the same floor as the rest of the team. Census fluctuated substantially, resulting in highly variable staff morale and work load. In the initial survey, all general hospital therapists saw rehabilitation inpatients, but by the second

Rater	Ν	RN	PSY	MD	SLP	РТ	OT	TR	SW	DIET	Mean
RN	13		1.62	1.38	1.62	1.31	1.31	1.54	1.15	2.0	1.49
PSY	2	2.0		2.0	2.5	2.5	2.0	2.0	2.0	3.0	2.25
MD	2	1.0	1.5		1.5	1.0	1.0	2.0	1.0	3.0	1.5
SLP	3	1.0	2.0	1.33		2.0	2.0	2.33	1.67	2.0	1.79
PT	8	1.25	1.88	1.0	2.0		1.0	2.0	1.63	2.88	1.67
OT	7	1.43	2.43	1.14	1.71	1.57		1.57	1.17	2.0	1.64
TR	2	1.5	2.0	2.0	2.0	1.5	2.0		1.5	2.0	1.81
SW	2	1.0	2.0	1.0	1.5	1.5	1.5	2.0		2.0	1.56
DIET	1	1.0	2.0	1.0	2.0	3.0	2.0	3.0	2.0		2.0
Mean		1.30	1.89	1.29	1.78	1.51	1.38	1.81	1.38	2.29	1.64
F				2.99		3.67	4.44		2.33	4.33	2.14
p<		ns	ns	.02	ns	.006	.003	ns	.05	.002	.06

Table I. The Importance of Interaction

Note. Team members rated the importance of their interaction with other disciplines on a 1–3 scale with 1 as most important. Statistical significance (ANOVA) suggests the various disciplines value their interactions with the rated discipline differently. RN = Registered Nurse; PSY = Psychologist; MD = Physician; SLP = Speech/Language Pathologist; PT = Physical Therapist; OT = Occupational Therapist; TR = Therapeutic Recreation Staff; SW = Social Worker; DIET = Dietician.



Fig. 1. Team rating of importance of interaction with specific disciplines before and after institution of IORS. The only statistically significant change was for Speech Language Pathology (t = 2.49, p < .02). RD = Dietician, MD = Physician, OT = Occupational Therapist, PSY = Psychologist, PT = Physical Therapist, RN = Nurse, SLP = Speech Language Pathologist, SW = Social Worker, and TR = Therapeutic Recreation.



Fig. 2. Team rating of various staff parameters before and after IORS, scored on a 10-cm visual analog scale. 0 = good, 10 = bad. See Appendix B for actual questions. Team interdependence (t = 2.23, p < .03) was a statistically significant change. Captions refer to the first eight questions on the TAP in Appendix B. For instance, "mgmt" refers to the visual analog scale question on Team direction/management.



Fig. 3. Team rating of time and relevance of staff work. Paperwork and planning time range in measures from $0 = \text{too little to } 10 = \text{too much. Relevance is on a 100% scale. See Appendix B for specific questions. Length of staffing (<math>t = 2.49$, p < .02) and amount of staffing that directly pertained to the rater (t = 2.12, p < .04) were statistically significant changes. Captions refer to the last three questions of the TAP as noted in Appendix B.

survey, a specific team was assigned to the unit. Hospital administration and rehabilitation unit leadership changed substantially.

In the year after the second TAP test, the IORS system evolved to a traditional format in which we automatically assigned Issues to certain disciplines, and individual therapist goals were discipline specific rather than team oriented. The major driving force behind this change was an unacceptably high rate of incomplete paperwork related to the difficulty of having a single written document passed between PRs before staffing. A change in administrators and the subsequent change in management philosophy was another factor in the modification of IORS.

Subjectively, IORS was a limited success. Team members listened more to each other and felt more importance in their roles than they had prior to implementation of IORS. Staffings were interesting and challenging. It appeared that more creative planning took place with IORS implementation than prior to it.

DISCUSSION

This article presents a new tool, the Teamwork Assessment Profile, which is a practical way for rehabilitation teams to measure their interaction. It also describes Issue Oriented Rehabilitation Staffing, an attempt to provide the benefits of a transdisciplinary team within a structured environment. It is the first description of the process of establishing and maintaining an inpatient team we have found in the literature.

Transdisciplinary is a relatively new term in rehabilitation. Although this philosophy has appeared in the medical literature in the past (Magrun and Tigges, 1982), no one has yet defined it well or studied it in a medical context. We believe transdisciplinary

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implies that team members do not restrict their efforts to the limitations of their training but rather coordinate efforts toward patients individualized rehabilitation needs. This requires therapists to be acutely aware of the efforts and expertise of their colleagues, and most importantly, that patients' needs are the driving force behind therapists' efforts. The team may need to deal with issues that may not fit into any of the traditional therapist roles.

Transdisciplinary rehabilitation is not without problems. If done without structure, there may be a lack of clear individual responsibility for tasks. There is a risk of decreased emphasis on specialized or subspecialized skills. Lack of structure may lead to omission of certain critical areas of concern. Team leaders may find it difficult to provide clear direction during a controversy. Diffusion of responsibility for documentation of progress and attainment of goals may cause problems with reimbursement as well as quality of care. The staff may increase time spent in communication, thus increasing health care costs.

Although IORS attempts to foster transdisciplinary thinking and staff autonomy, it is quite a structured team management process. Team meetings have tight agendas. Responsibilities of individual staff members are not traditional, but they are quite specific and clear. The actual transdisciplinary planning often occurs most efficiently outside of staffing in small informal groups, consisting only of persons with a stake in an Issue, led by the PR.

The most significant problem with IORS was lack of simultaneous access to patient charts for documentation. A low tech solution would be adhesive based notes that staff members could stick to charts before staffing. In systems with computer networks, simultaneous access is not a problem.

We piloted the TAP in this study. In future versions of the TAP we would try to improve sensitivity to change by expanding the scores for rating disciplines from a 3-point to a 5-point scale. It would be possible to generate a summary score to compare a team's overall interaction with norms or past performance. Substantial research into its repeatability and reliability is necessary before using it with confidence. If proven valid, the TAP may be quite useful for measurement of changes in team dynamics. Such measurements would help academic centers with future research on rehab team dynamics. Community rehabilitation units, such as the one in which this study occurred, may also find this simple tool helpful in objectifying and improving team interaction.

The changes that occurred in TAP scores were encouraging. The importance of communication with the speech pathologist appeared to improve. The statistically significant improvement in team interdependence, length of staffings, and amount of staffing that pertained to the rater's treatment of patients all suggested that IORS accomplished its goals. Nonsignificant trends in almost all other scales suggested the same. This data correlates with our subjective observation.

The study raises a number of questions about the concept of the rehabilitation team. Fordyce has stated, "Mainstream rehabilitation is interdisciplinary, whereas despite the use of the word 'team,' the health care system is not interdisciplinary and may not even be multidisciplinary" (Fordyce, 1981). Halstead's review concluded that, although the scientific support is not ideal, there is substantive evidence that the team approach to certain disabling illnesses improves outcomes (Halstead, 1976).

Although Rothberg (1982, 1985) has stated that the literature on teams in the delivery of health and illness services is enormous, the only articles we have found in the rehabilitation literature that present original research are by Wainless *et al.* (1992) and Strasser *et al.* (1994). Wainless *et al.* (1992) demonstrated a lack of consensus on use of common

terms among rehabilitation team members. Strasser *et al.* (1994) attempted to objectify staff perceptions of the hospital environment, the team environment, and interprofessional relations by comparing three different rehabilitation teams using various surveys.

Research on team functioning in other fields is of value. Given and Simmons (1977) indicated personal qualities vital to interdisciplinary team function. These include the ability to accept differences and perspectives of others; function independently; negotiate roles with other team members; form new values, attitudes and perceptions; tolerate constant review and challenge of ideas; take risks; possess personal identity and integrity; and accept team philosophy of care. At the same time, they describe barriers to interdisciplinary team formation: educational preparation, role ambiguity and incongruent expectations, authority, power, status, autonomy, and personal characteristics of members. Purtillo (1988) notes the struggles that teams go through in order to remain ethical in their proceedings. Team need to be competent but must also concern themselves with patient welfare.

Nagi (1975) reviewed team research regarding status, power, authority, influence, roles and professional domains, decision making, and communication in healthcare teamwork. He suggested that research on effectiveness of teams, patient reactions, gatekeeping decisions, and manpower and training are lacking.

But this literature is too vague for practical use by the hundreds of inpatient rehabilitation teams. Exactly what is the format for team interaction? Personal observation of teams in different settings suggests that team management techniques vary to the extremes. How does one decide how much time to allocate to staffings? What is the optimal format? How can one tell that his or her team is working at its best? How do changes in team structure affect patient satisfaction, cost, or functional status? These are researchable questions that remain unstudied. One must conclude that teamwork is effective, but we don't know exactly what teamwork in rehabilitation is.

Because the extent of teamwork necessary for successful rehabilitation is an unknown and it is easy to calculate the cost of holding team meetings by the lost productive wages of various therapists, we believe that the "face value" cost savings of cutting down on amount of time spent in staffings will drive many centers to minimize staff meeting times. Purtillo and Meier (1993) and Keith (1991) have written that competition, manpower shortages, preoccupation with cost, and government deliberation about funding changes adversely affect the team process. Whether this results in changes in staff dynamics and whether these changes result in changes in patient outcome or cost is not clear. Without a tool to measure effects of such changes, rehabilitation units may make costly mistakes. Research on effects of time constraints, documentation requirements, administrative leadership, and financial pressures is crucial for our field. Individual rehabilitation teams need a valid tool to use in pursuit of continuous quality improvement, a management system that is becoming increasingly prominent in health care (McEachern *et al.*, 1991).

CONCLUSION

The experience with IORS and TAP demonstrate that it is possible to experiment with and study rehabilitation team interaction. Research in larger centers, with better validity and fewer confounding variables than is currently available, and most important, with correlation to actual patient outcome is necessary if rehabilitation teams are to flourish.

APPENDIX A: IORS INTERIM STAFFING SUMMARY⁴

Patient Name:

Case Manager:

Staffing Date:

Signatures of staff members present:

Brief Summary: (3-4 sentences)

Patient input: (1–2 sentences written by CM)

Anticipated discharge date:

Anticipated discharge location:

Short-term goals (from last week)

Goal Met Not met (PR's initials) Eating If not met: (reason – 1 sentence) Grooming If not met: Bathing If not met: Dressing If not met: Ambulation If not met: Other (Issues not included in the standard issue list) If not met:

(Other standard Issues include bowel, bladder, toileting, transfers, mobility, medical stability, comprehension, expression, problem solving, equipment, sexuality, avocational interests, substance abuse, transportation, family teaching, home environment, safety, support system, work, pain, and family adjustment.)

⁴For publication purposes, the form is an abbreviated form and includes clarifying comments in parentheses.

APPENDIX B: THE TEAM ASSESSMENT PROFILE⁵

Which discipline reports at staffing are most important to you? Put an X on your discipline and rank all other disciplines as follows:

- 1 = Almost always very helpful or important
- 2 = Often helpful or important
- 3 = Seldom helpful or important

____ Dietary

- ____ Physician
- ____ Occupational Therapist
- ____ Psychologist
- ____ Physical Therapist
- ____ Nurse
- ____ Speech Language Pathology
- ____ Social worker
- ____ Therapeutic Recreation

Place a mark on the lines below to rank the effectiveness of the current team organization in the following areas:

Team direction/management Good	Bad
Therapist independence Good	Bad
Team interdependence Good	Bad
Orientation to goals Good	Bad
Patient's program fits their specific needs Good	Bad
Team communication Good	Bad
Format of staffings Good	Bad
Length of staffings Good	Bad
Paperwork Too Little	Too Much
Time spent in planning Too Little	Too Much
How much of staffing is directly related to your care of the patient?	100%

⁵ On the actual test forms, the visual analog scale is 10-cm long.

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