



Feedback to enhance safe lifting.

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FEEDBACK TO ENHANCE SAFE LIFTING

A Thesis Presented

By

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University of Massachusetts in partial fulfillment
of the requirements for the degree of

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Department of Psychology

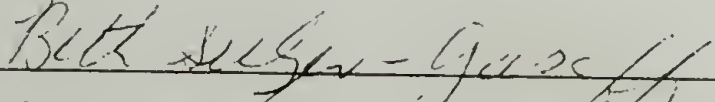
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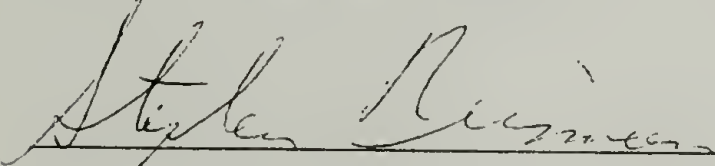
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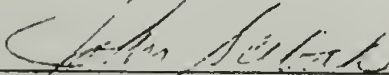
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ABSTRACT

Feedback to Enhance Safe Lifting

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Training in safe practice and individual, written and verbal performance feedback, including approval of safe technique, were examined to determine their influence on the safety with which physically disabled clients were transferred. Two client transfer techniques were task analyzed and six direct service providers' on-the-job performance was measured twice weekly. A multiple baseline across settings and subjects was used to evaluate the effects of interventions. Consumer satisfaction and the costs of developing and operating the procedures were also assessed.

The results showed that training was accompanied by a slight increase in the number of task components safely performed. Feedback was consistently followed by substantial improvements in safe performance. These improvements tended to maintain as feedback delivery was faded. Participants gave highly favorable ratings to the feedback procedure and consistently recommended provision of this intervention to other direct-care staff.

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
 Chapter	
I. INTRODUCTION	1
Performance Feedback	3
Dimensions of Feedback	4
Performance Feedback in Human Services	6
Performance Feedback in Industry	9
Safety	12
Experimental Question	14
II. METHOD	15
Participants and Settings	15
Personnel	19
Materials	21
Observation System	21
Specification of Dependent Variables	21
Observer Training	25
Interobserver Agreement	26
Experimental Design	28
Procedures	30
Baselines	30
Training in Safe Technique	31
Performance Feedback	31
Maintenance	33
Consumer Evaluation	34
III. RESULTS	35
IV. DISCUSSION	46
.
REFERENCES	59
APPENDICES	66
A. INFORMED CONSENT FORM	67
B. CHECKLIST--TOTAL-LIFT-TRANSFER	69
C. CHECKLIST--STAND-PIVOT TRANSFER	70
D. SAMPLE FEEDBACK FORM	71
E. TRAINING TAPE NARRATION	76
F. INSTRUCTIONS TO OBSERVERS	80

LIST OF TABLES

1. Characteristics of Participants Remaining in Study to the Conclusion	16
2. Characteristics of Experimental Settings	20
3. Task Analysis of One-Person Total Lift Transfer	23
4. Task Analysis of Stand-Pivot Transfer	24
5. Interobserver Agreement Scores	27
6. Component Analysis: The Percentage of Each Transfer Component Performed Safely	39
7. Participants' Response to Feedback Evaluation Questionnaire	41
8. Time for Developing and Operating Feedback Program	44

LIST OF FIGURES

1. Number of Task Components Safely Performed by Each
Participant During Baseline, Feedback, and
Maintenance Conditions 37

C H A P T E R I

INTRODUCTION

A recent survey of public residential treatment facilities for the developmentally disabled (Scheerenberger, 1982) reported demographic data on the 282 operational facilities in the United States. The population of these facilities, although steadily decreasing over the past decade, remains high. Over 125,000 developmentally disabled individuals resided in public residential facilities in 1982. Scheerenberger (1982) estimated these facilities' total employee complement to be approximately 217,000, yielding a staff-to-client ratio of 1.37:1. Significantly, the therapist-to-client ratios were much greater, ranging from 1:14 for educators to 1:60 for psychologists. Scheerenberger (1982) concluded that recent improvements in programs and treatments within these facilities may be offset by budget cuts forcing position deletions. Based on an analysis of the client and administrative data, Scheerenberger (1982) projected continued problems in meeting the needs of these facilities' residents.

These data, particularly the therapist-to-client ratios, illuminate the challenges faced by therapists working within public residential facilities for the developmentally disabled. In addition to large caseloads, therapists are also confronted with multiple client needs compounded by long histories of institutionalization, rapid staff turnover, deteriorating physical plants, overcrowding, uncertain budgets, and convoluted and unwieldy management systems.

For the therapist working in such difficult circumstances, meeting their clients' needs requires a combination of many services. The most essential include programming, staff training, staff management, and multiple related support systems.

An extensive body of research has described effective training procedures for the developmentally disabled (Matson and McCartney, 1982; Grabowski and Thompson, 1977; Sulzer-Azaroff and Mayer, 1977). In a review of published research on treatment strategies for the severely and profoundly mentally retarded, Whitman and Scibak (1982) have reported that in the past twenty years, researchers have developed an extensive technology for increasing clients' adaptive behaviors and reducing inappropriate responding. Currently, a considerable array of options is available to therapists and behavior change agents selecting treatment programs for their developmentally disabled clients. Whitman and Scibak (1982) noted 280 published reports assessing the effects of a variety of behavior change procedures for the severely and profoundly mentally retarded alone.

Compared to this extensive library of treatment procedures, relatively fewer published papers report assessing strategies for managing staff in treatment facilities for the developmentally disabled. Behavior change agents are faced with the responsibility for providing long term treatment and care for their developmentally disabled clients. They must select effective, efficient staff management procedures to insure that acceptable levels of treatment are consistently maintained by direct service providers. Otherwise,

as Favell, Favell, Riddle, and Risley (1984) report, an alarming discrepancy develops between the services recommended in clients' treatment plans and the services actually delivered. According to Favell, et al. (1984), such deficiencies are prevalent in residential facilities for the mentally retarded, be they large state institutions or smaller community-based programs.

There is an expanding data base supporting the application of behavior analysis to the problems of staff management. By systematically controlling the antecedents and consequences of behavior and measuring the ensuing changes in staff performance, behavior analysts have identified strategies and tactics to improve work performance and maintain that improvement over time.

Performance Feedback

One staff management strategy which has been the subject of much recent research is performance feedback. In a review of the organizational behavior management literature, Prue and Fairbanks (1981) reported performance feedback to be effective in improving employee performance in both human service and industrial organizations. Basically, performance feedback strategies involve providing employees with an objective measure of their performance over some specified interval or for some particular task. For example, the number of occasions on which a staff person initiates interaction with clients might be counted and the employee then informed of the number of observed interactions.

Feedback may serve multiple functions as it is both a consequence

of preceding behavior and an antecedent to subsequent behavior. Prue and Fairbanks (1981) note feedback may serve as a reinforcing stimulus, as a discriminative stimulus, and as a setting event. Feedback is reinforcing if it increases the probability of the behavior upon which it is contingent. It functions as a punisher if it decreases the probability of the behavior upon which it is contingent. It serves as a discriminative stimulus if it occasions more frequent or more precise goal behaviors. And feedback may function as a setting event if it facilitates behavior change. For example, feedback may increase an individual's attention to his/her performance and the controlling contingencies, thereby promoting behavior change.

Dimensions of Feedback

In reviewing the research on performance feedback, it is apparent that feedback may vary along multiple dimensions. Ford (1980) has suggested a classification system to organize feedback research and to assist in a functional analysis of the various feedback dimensions. Ford noted that: Feedback may be provided to an individual or to a group; may be publicly presented or delivered privately; may be personally or mechanically delivered; may be immediate or delayed; and, may be delivered along various schedules (i.e., may be delivered on a continuous or variable schedule). Prue and Fairbanks (1981) included the additional dimensions of content of feedback and source of feedback in their classification. In terms of content, an employee's performance can be compared with his or her previous

performance or with some standard. The individual's performance might also be measured as a percentage of a group's performance. These variations in content may pertain to group performance as well. The source of feedback is an additional dimension possibly influencing its effect. Feedback might be self-recorded, or delivered by a peer, or by a supervisor. The prestige of the source and the contingencies controlled by the source may influence the effectiveness of the feedback.

This classification system is useful and addresses the need for operationally defining independent as well as dependent variables in research. Peterson, Homer, and Wonderlich (1982) have indicated that researchers in applied behavior analysis have tended to overlook precise definitions of all independent variable conditions. In some of the literature describing the effects of feedback strategies, the content of the feedback and delivery systems are not clearly specified. This impedes analysis and replication of results.

Ford (1980) illustrated the utility of precisely describing the dimensions of feedback by describing the effects of individual verbal and written feedback, delivered along various schedules, on the maintenance of goal writing skills by professionals developing programs for the mentally retarded. Ford noted that weekly performance feedback was superior to both no feedback and monthly feedback for maintaining goal writing skills. In a cost benefit analysis of the three conditions, Ford concluded that monthly feedback, although less effective than weekly, was more cost effective. Ford identified monthly feedback as the optimal schedule

of the three for maintaining adequate employee performance.

Performance Feedback in Human Services

Quilitch (1975) assessed the maintenance of delivery of daily recreational programming by mental retardation staff under three staff management procedures. An administrative memorandum advising staff to lead recreational activities and an eight hour workshop teaching staff recreational programming techniques were ineffective in maintaining service delivery. Daily posted feedback noting the number of active residents per ward and a posted schedule of recreational activities increased service delivery. Delivery was maintained under the feedback/schedule condition, prompting the facility's administrators to adopt a weekly feedback package.

Using verbal feedback with similar staff and tasks, Brown, Willis, and Reid (1981) noted that employees' off-task behaviors decreased when supervisors provided verbal feedback specifying measures of off-task activity. Only when verbal feedback was paired with approval statements of staff-client interactions, did the frequency of these targeted interactions increase. The experimenters concluded that verbal feedback, alone, functioned as a punisher in this circumstance, decreasing off-task behavior and not affecting the alternative target behavior (staff-client interaction). When feedback was coupled with approval of instances of the targeted behavior, interactive behaviors increased, indicating that feedback, when combined with approval statements, served as a reinforcer. Similarly, Fabry and Reid (1978) noted verbal feedback and approval to have been

effective in maintaining training skills used by foster grandparents working with mentally retarded clients.

Often multiple forms of feedback are combined into feedback packages. While this is likely to increase the probability of successful staff management, it clouds analysis of the effects of specific feedback components on recipients' performance. Maher (1981) combined written feedback, goal setting, approval statements, and general discussion of job duties into a package to increase the number of consultations and behavior management programs delivered by school psychologists. This feedback, provided weekly, effectively increased the delivery of services over baseline levels. An analysis of the components of this package was not accomplished, leaving unclear the relative effects of the various types of feedback. Shook, Johnson, and Uhlman (1978) combined individual performance feedback, group feedback, posted instructions, and social praise to increase data graphing by human service employees. Their interventions were successful in increasing routine performance by employees and effective in maintaining performance. In an earlier experiment, described in the same report, Shook et al. noted that the same intervention package, without individual feedback and social praise, was effective in initially improving performance but ineffective in maintaining improvement. This suggests that individual feedback and/or social praise are necessary, although perhaps not sufficient, conditions for maintaining improvements in employee performance of routine tasks in a human service setting.

In reviewing the research on performance feedback as a management

strategy for human service staff, several trends are apparent. First, the recipients of feedback are typically the direct service providers. Subjects have included direct care staff in institutions (Panyon, Boozer, and Morris, 1970; Welsch, Ludwig, Radiker, and Krapfl, 1973; Quilitch, 1975; Kreitner, Reif, and Morris, 1977; Quilitch, 1978; Prue, Krapfl, Noah, Cannon, and Maley, 1980; Brown, Willis, and Reid, 1981; Lattimore, Stephens, Favell, and Risley, 1984), volunteer workers (Fabry and Reid, 1978), and professional therapists (Shook, Johnson, and Uhlman, 1978; Ford, 1980; Maher, 1981). Research has not tended to focus on management personnel or staff providing support services (i.e., clerical staff, maintenance workers, and kitchen staff).

A second trend has been a consistent focus on some form of service delivery, as the performance to be improved. Researchers have looked at staff-client interactions (Prue et al., 1980; Brown et al., 1981), staff use of training procedures (Panyon et al., 1970; Welsch et al., 1973; Quilitch, 1975; Kreitner et al., 1977; Fabry and Reid, 1978; Lattimore et al., 1984), and delivery of professional services such as consultations and program development (Maher, 1981), assessment (Ford, 1980), and data collection (Shook et al., 1978). In facilities for the developmentally disabled, important areas not heavily researched include contingencies controlling supervisory functions, such as rates of providing feedback to employees, scheduling activities, and allocating staff resources.

Another area requiring further research is safety. In addition to the costs to employees in terms of injuries and lost work time,

unsafe work practices threaten the quality of services provided to clients. Services are often disrupted or suspended due to the employee absences resulting from occupational accidents. Research is needed to elaborate management systems effective in improving the safe performance of work activities by human service staff.

Performance Feedback in Industry

Research conducted in industrial settings has shown performance feedback to be effective in managing a variety of work practices. Staff productivity has been demonstrated to increase when performance feedback was provided (Emmert, 1978; McCarthy, 1978; Runnion, Johnson, and McWhorter, 1978). A decrease in a supervisor's negative comments was noted by Chandler (1977), when performance feedback and approval of desired work behaviors were provided. Reductions in hazardous conditions were demonstrated in a laboratory (Sulzer-Azaroff, 1978) when lab supervisors were provided written performance feedback and corrective suggestions, and, in an industrial plant (Sulzer-Azaroff and deSantamaria, 1980) when semi-weekly written feedback and approval of hazard reductions were provided. Rhoton (1980) reported improvements in compliance with safety regulations by underground coal miners when interventions consisting of systematic observation, contingent positive verbal feedback, and graphic feedback were used by safety inspectors.

Komaki, Barwick, and Scott (1979) reported substantial improvements in worker safety in a food processing plant when employees were provided training in safety practices and posted group feedback

indicating the percentages of hazardous tasks they performed safely. This study did not evaluate the relative contributions of training (antecedent control) and feedback (consequent control), leaving unclear the relative effects of each condition on the improved performance. In a more recent study, Komaki, Collins, and Penn (1982) evaluated the separate effects of antecedent conditions (training, posting safety rules, staff discussions) and consequent conditions (posted group feedback, discussion of data at weekly staff meetings) on the safe performance of employees of a poultry processing plant. Results indicated antecedent control was effective in significantly improving safe performance in only two of four departments studied. Consequent control, however, led to substantial improvements in safety in all departments, leading the experimenters to conclude that caution be exercised in selecting only antecedent control conditions to improve safe performance.

The research conducted in industrial and business settings complements that done in human service settings. The findings suggest that performance feedback is a promising strategy for enhancing the effects of training and managing multiple types of work behaviors conducted in human service settings. Further research is warranted to test the generality of performance feedback, as a staff management procedure, as important differences between the contingencies operating in industrial and human service work environments may interact with feedback mechanisms and produce differing effects. To illustrate, readily quantifiable behaviors (e.g., productivity) are typically the focus of industrial feedback, whereas, qualitative

improvements in employee performance (e.g., use of training procedures) are the focus of feedback in human service settings. Employees receiving feedback regarding readily measurable performance, such as productivity, might be more likely to acquire accurate self-assessment skills. Subsequently, they might better manage their performance than employees receiving feedback regarding qualitative, difficult to measure performance.

Feedback in industrial settings is often paired with other incentive systems. The goal of most industrial feedback strategies is to improve employee productivity and ultimately increase profits. These profits may be shared with feedback recipients through bonus systems and pay raises. Yoking these incentives with performance feedback is likely to influence the feedback's effectiveness. Such systems are uncommon in public residential facilities for the developmentally disabled. Supervisors in these settings must rely more heavily on performance feedback alone, compared with their counterparts in industry, as feedback is one of few manipulable variables available to manage employee performance.

Clearly, performance feedback is an effective and positive method for enhancing performance. The accumulating evidence suggests that feedback strategies may be adapted to improve additional deficient performance areas and may be successfully used with diverse populations. Research to systematically replicate previous studies is warranted to delineate the generality of this intervention.

Safety

As noted previously, in human service organizations relatively little research has been conducted to assess the contribution of feedback to accident prevention programs. Accidental occupational injuries pose a substantial problem for human services, particularly those providing care to physically handicapped clients. According to the U. S. Department of Health and Human Services (NIOSH, 1981), human service industries account for the highest proportion of overexertion injuries reported by American industries. Sixty-two percent of the injuries reported by health care workers are categorized as overexertion injuries; 48% of these injuries are classified as strains or sprains (NIOSH, 1981). This overexertion accident rate is greater than that reported by manufacturing, distribution, and merchandising industries. Most of the overexertion injuries to caregivers are incurred during the lifting and transferring of physically disabled clients (NIOSH, 1981).

Research in the prevention of lifting injuries includes multiple disciplines. A thorough review of the literature from each of those disciplines is beyond the scope of this thesis. A brief summary of each would help to illuminate the contribution of behavior analysis to these efforts.

Engineering research has provided a wealth of data on ergonomic and human factor approaches to occupational safety. This research has evaluated task variables (e.g., the work environment, job design, equipment design) and employee characteristics (e.g., age, gender,

strength) in an effort to better design tasks to fit the worker. For example, Snook (1978) assessed multiple task (height, size, weight of object; distance carried) and employee variables (age, gender, physique) on the lifting capacities of industrial workers; Konz and Coetzee (1978) assessed gender differences in employee lifting capacities; Mital and Manivasagan (1983) assessed the effects of material density, center of gravity, hand preference, and frequency of lift on the maximum acceptable weight of lifts. The focus of this field is to improve the safe design of work environments and reduce employee exposure to hazards in the work place.

A related approach has been biomechanical analyses to better match employees to specific job tasks. Keyserling, Herrin, Chaffin, Armstrong, and Foss (1980) performed a representative study developing screening programs to test workers before placing them on jobs which might exceed their strength capabilities.

A third approach has been training employees in safe lifting techniques. Training typically involves variations of one or more of the following types of antecedent control: instruction, audiovisual presentations, and practice (White, 1983). Additionally, a variety of manuals (e.g., Rantz and Coutal, 1977) and texts (e.g., Frazer and Hensinger, 1983) are available describing safe lifting and transfer techniques. While educational approaches are a popular component of interventions to enhance safe lifting, no controlled studies have been found that demonstrate a reduction in lifting accidents or injury rate as a consequence of training (NIOSH, 1981). As noted earlier, Komaki, et al. (1982) cautioned against selecting only

antecedent control procedures to improve safe performance. These researchers reported that consequent control procedures, namely feedback, were markedly more effective than antecedent conditions in improving the safety of employee performance. It appears that a controlled study has yet to be conducted to evaluate performance feedback as a procedure to improve safe lifting.

Experimental Question

The purpose of this study was to evaluate the effects of a behavioral management strategy on the safety of lifting and transferring clients by human service caregivers. Using an intensive experimental design, a multiple baseline across subjects and settings (Baer, Wolf, and Risley, 1968), this study sought to demonstrate a functional relation between the safety of transfers and individualized performance feedback.

The research question posed was: What are the effects of training in safe practice and individual, written and verbal feedback, including approval of safe technique, on the safety with which clients are transferred? The project was designed to systematically replicate previous feedback research and test the viability of this procedure as a strategy to improve the safe lifting of clients by human service personnel.

C H A P T E R I I

METHOD

Participants and Settings

Six direct care staff working in a medical services/nursing unit of a state residential school for the mentally retarded were the subjects of this study. Based on a review of the accident reports generated by the unit's employees and discussions with the facility's administrators regarding areas most likely to profit from a safety program, employees assigned to those areas were asked to volunteer for this study. The author provided sixteen employees an explanation of the study during an intershift staff meeting and asked for their signed informed consent to participate. A copy of the informed consent form is included as Appendix A. Twelve employees volunteered. During the six months of data collection, six of these volunteers withdrew. One resigned her position, four were reassigned to settings which did not require client transferring, and one volunteer declined to be observed. Demographic data on the employees who participated in the entire project are presented in Table 1.

Additional ethical safeguards included review and approval of this study by the Human Subjects Committee in the Department of Psychology at the University of Massachusetts (approved July 27, 1983), the Human Rights Committee at the state school (approved September 7, 1983), the superintendent of the state school (approved October 17, 1983), and the president and labor attorney

TABLE 1

Characteristics of Participants Remaining in Study to the Conclusion

Name	Position	Work Site	Shift	Sex	Age (years)	# Years in Current Assignment	# Accident Reports Filed (Transfer Injury)	Maintain Routine of Physical Exercise?	Estimated # Transfers per day
S.1	MRT	Ward A	2nd	F	43	3	0	No	over 30
S.2	MRA	Ward A	2nd	F	49	2	0	Yes	over 30
S.3	MRT	B Cottage	2nd	F	31	3	0	Yes	15-20
S.4	MRT	B Cottage	2nd	F	27	4	1 ¹	Yes	25-30
S.5	MRA	Ward C	2nd	F	27	2	0	No	15-20
S.6	MRA	Ward D	1st	F	20	8 months	0	Yes	25-30

MRA - Mental Retardation Assistant

MRT - Mental Retardation Technician

¹Back injury incurred during client transfer, two weeks lost work time (January, 1984).

for the collective bargaining unit representing the facility's direct care staff (reviewed October 26, 1983; tentatively approved December 1, 1983).

A review of accident reports submitted by the facility's employees during a one year period (August 1, 1982 to August 1, 1983) indicated that a total of 1,152 reports were filed by staff members. One hundred and sixty of these incidents involved employee lost work days as a result of the injuries incurred. Sixty four of the year's reports described injuries incurred during client transfers. Of these, twenty three involved employee lost work days.

These data indicated that a substantial number of accident reports are filed by the facility's 1,400 staff. However, relatively few (approximately 14%) of reported incidents involved lost work time, suggesting that many of the accident reports described minor incidents. Of the sixty four reports describing injury incurred while lifting and transferring physically handicapped clients, twenty three (approximately 36%) resulted in employee lost work time. This indicated that while transfer accidents comprised a relatively small percentage of all the accidents reported, they tended to involve more serious injury to employees and often resulted in lost work time. These data validated the selection of transferring tasks as the target behaviors of this safety study. Breakdown of the transfer accident reports by job classification indicated fifty five of the sixty four reports (86%) were filed by direct care employees. Subjects for this study, therefore, were recruited from this population.

The setting for this study was a unit of a state residential facility serving approximately four hundred mentally retarded individuals. Clients reside in 21 residential buildings, organized into four units. Due to the diversity of these residences and the varying needs of the clients residing therein, areas within each unit pose different safety problems for employees. For example, employees working in residences for physically aggressive clients are exposed to potential injury from client violence. Scratches, bruises, and other injuries from aggression comprised a large percentage of the injuries reported in such settings. Groundskeepers, kitchen workers, and maintenance personnel are exposed to potential injury from mechanical devices, slips and falls, and overexertion injuries from lifting heavy objects. Employees working with nonambulatory clients are at risk for overexertion injuries when lifting and carrying physically disabled individuals.

The facility's infirmary unit, serving clients with multiple physical handicaps and severe ambulation problems, was chosen as the setting for this study. Breakdown of the facility's accident report data into site occurrence indicated that thirty five (55%) of the injuries incurred while transferring clients occurred in this unit.

The cottage and wards selected for study were staffed on three shifts, providing round-the-clock care to residents. The selection of work shifts for study was based on a review of the accident reports generated during the year preceding this study and discussion with unit administrators. First and second shifts (6:45 a.m. to 3:00 p.m. and 2:45 p.m. to 11:00 p.m.) generated the majority of

accident reports and were therefore targeted for the study. Descriptive data on the cottage and wards in which this study was conducted are given in Table 2.

Personnel

The author (hereafter referred to as the experimenter) and four undergraduate students conducted the employee observations. The research assistants were trained and supervised by the experimenter. The students were informed of the purpose of the study, but were naive to the intervention and the schedule of feedback. During the first twelve weeks of data collection, three students collected the primary data while the experimenter conducted reliability observations. During the second twelve weeks, the experimenter collected primary data while a fourth student served as a reliability observer. This arrangement was necessitated by the graduation of the initial three observers midway through data collection and a delay in recruiting and training a new observer following their absence.

Members of the facility's staff contributed significantly to the design and implementation of this project. The Director of Physical Therapy, Unit Director of the Infirmary, Director of Staff Development, and physical therapists and aides assisted in the identification of unsafe transfer practices and development of the observation system. Infirmary supervisors assisted in developing and delivering the performance feedback.

TABLE 2

Characteristics of Experimental Settings

Setting	Number of Residents	Number of Staff per Shift (minimum)	Number of Nonambulatory Residents	Resident Age Range (Years)	Resident Weight Range (Kg)	Living Arrangements
Ward A	12	two	6	31-81	28-73	Dormitory with cubicles formed by privacy screens. Multi-ward institutional building.
B Cottage	14	two	14	26-70	39-71	Group home type residence. Private and semi-private rooms.
Ward C	11	two	10	35-65	31-75	Same as Ward A.
Ward D	11	two	11	35-69	33-72	Same as Ward A.

Materials

Checklists, containing task analyses of lifting/transfer techniques (see Appendices B and C) were used to assess employees' on-the-job performance..

Graphic displays, illustrating the number of task components performed safely by each subject across each observation, were maintained during the course of the study. These were used to evaluate the stability of each participant's performance and to determine the occasions on which feedback was initiated and terminated.

Standardized memoranda, from the experimenter to each participant, provided performance feedback on designated practices. A brief description of the task components safely performed, the number of observations on which the feedback was based, specific suggestions for improving safety, and approval of increasingly safe performance was included. Appendix D provides a sample feedback form and shows the initial, intermediate, and final feedback messages provided to one participant.

A questionnaire, assessing participants' satisfaction with the procedures, was administered at the conclusion of the feedback phase (see the Results section for questionnaire items).

Observation System

Specification of Dependent Variables

After review of the facility's accident records, which indicated the occurrence of accidental injury incurred by staff during client

transfers, the Director of Physical Therapy and the managers of the facility's infirmary were consulted. All agreed that client transfers presented safety problems for employees and that the staff members working with physically disabled clients would benefit from procedures to enhance the safety of client transfers.

With the assistance of the infirmary's managers and physical therapists, the experimenter specified the client transfer techniques most likely to be used by employees working in the facility's infirmary. Based upon the facility's in-service training materials, consultation with the Director of Physical Therapy, and a review of relevant manual lifting literature (NIOSH, 1981; Chaffin & Ayoub, 1975; Karhu, Kansi, and Kuorinka, 1977), two client transfer techniques were task analyzed into detailed sequences of component steps. These task analyses specified the steps involved in preparing a client and surfaces for transfer, the body position and posture of the employee during the lift, and the procedures to lift, position, and secure the client on the new surface. Task analyses for stand-pivot transfers and total-lift-transfers by one person were then reviewed by the Director of Physical Therapy and the physical therapists working in the facility's infirmary. The task analyses were revised in accordance with their recommendations for optimal employee and client safety. The final drafts of the task analyses (shown as Tables 3 and 4) were shared with the facility's physical therapy staff for use in their orientation and follow-up training programs. This was done to encourage consistency between the facility's training materials and the feedback messages delivered

TABLE 3

Task Analysis of One-Person Total Lift Transfer

Step Number	Component
1	Position wheelchair near goal (transfer across shortest distance. Ninety-degree angle is best).
2	Explain to client what you are to do (words or gestures).
3	Lock wheelchair brakes.
4	Remove adaptive devices:
5	a. tray
6	b. arm rests (if possible)
6	c. seat belt(s), other adaptive equipment.
7	Staff position for lift to be:
8	a. Standing at side of chair, at client's hip angle,
9	b. with feet apart (width of hips, at least).
9	c. Bending, posture, <u>knees bent</u> , AND <u>spine straight</u> , may be slight bend forward at waist.
10	Slide client forward on seat, to permit adequate room for step 11.
11	Staff supports client for lift:
12	a. One arm beneath client's arms and shoulders to support head, neck, and upper torso.
12	b. Other arm beneath client's thighs to support pelvis.
13	Hug client to you (reduce distance from client to staff).
14	Staff lifts straight up <u>by unbending knees</u> (back remains straight and erect). SMOOTH MOVEMENT.
15	Staff pivots (turns on balls of feet, or short steps, without twisting torso) and aligns client with new surface.
16	Staff <u>bends knees</u> , lowers client to new surface. Back straight.
17	Securely position client on new surface, then release.
18	Fasten seatbelts, where appropriate.

TABLE 4
Task Analysis of Stand-Pivot Transfer

Step Number	Component
1	Position wheelchair near goal (transfer across shortest distance). Ninety-degree angle is best.
2	Explain to client what you are to do (words or gestures).
3	Lock wheelchair brakes.
4	Move footrests aside (if possible), calf pads aside, rests up.
5	Undo seatbelts, remove adaptive devices.
6	Staff position for transfer to be:
7	a. Standing directly in front of chair.
8	b. Feet apart for balance (width of hips, at least).
8	c. Bending posture (KNEES BENT), AND <u>Spine straight</u> , may be slight bend forward at waist.
9	Prompt/slide client forward on seat to edge.
10	Prompt client to lean forward.
11	Grasp client by belt, waistband, or waist.
12	Hug client to you (reduce distance from client to staff).
13	Instructions to client ("1-2-3, stand") as action begins.
14	Staff stands by <u>unbending knees</u> (back remains straight and erect). SMOOTH MOVEMENT.
15	Staff pivots (turns on balls of feet, short steps) with client and aligns with new surface. (WITHOUT TWISTING TORSO).
16	Staff <u>bends knees</u> , lowers client to new seat/surface.
17	Securely position client on new surface, then release.
18	Fasten seatbelts, where appropriate.

during this study.

A videotape of samples of the client transfer techniques was prepared with the assistance of the facility's physical therapy staff (see Appendix E for narration). This videotape, containing both safe and unsafe demonstrations of the transfer techniques, was used to train observers to record observations of the participants' performance.

(A third transfer technique, total-lift transfers by two employees, was also task analyzed during development of the observational system. Observation of actual client transfers indicated that this technique was infrequently used in the experimental settings. This technique, therefore, was not included in the observational system as one person transfers comprised most lifts.)

Observer Training

During training, the observers reviewed the task analyses, response definitions, descriptions of likely errors, and scored videotaped samples of each transfer procedure using checklists incorporating the task analyses. While viewing each sample, the observers scored each task component as occurring safely, unsafely, or not being applicable. A component was scored as "safe" if it occurred in the correct sequence and its topography was consistent with the response definition. Components that were omitted, performed out of sequence, or were inconsistent with the response definition were scored as "unsafe". Components that were not relevant to the particular performance and circumstance were scored as "not appli-

cable" (e.g., some clients do not require a full complement of adaptive devices--removal of these supports would be irrelevant and observers scored these components as "not applicable").

During assessment of the videotapes, observers were instructed not to interact with one another. Interobserver agreement (IOA) measures were taken during these independent training assessments. Training continued until observer agreement remained above 85% on each transfer type, for three consecutive assessments. Interobserver agreement was calculated, on a per response basis, by comparing the number of agreements between each observer's record and a standard record prepared by the experimenter. The IOA indices were determined by calculating the number of agreements and dividing by the number of agreements plus disagreements, then multiplying by 100.

Interobserver Agreement

Simultaneous and independent observations were conducted throughout the study with each observer. Interobserver agreement scores were then calculated, as during training, to assess the accuracy of the measurement system. An agreement was defined as both observers scoring a task component as "safe", "unsafe", or "not applicable". The videotape, used to train observers, was preserved and used to recalibrate observers during the course of data collection. On two occasions observers were retrained to control for observer drift when IOA indices fell below 80%. Table 5 presents the interobserver agreement scores obtained for each participant during baseline and feedback conditions.

TABLE 5
Interobserver Agreement Scores

Participant	Number	Checks	Range (%)	Mean (%)
S.1	6	baseline	83-100	90.7
	8	feedback	83-100	91.5
S.2	6	baseline	83-89	87.0
	9	feedback	83-100	92.8
S.3	4	baseline	72-94	85.75
	0	feedback	---	---
S.4	7	baseline	72-94	80.7
	4	feedback	89-94	91.5
S.5	3	baseline	72-94	85.0
	4	feedback	89-100	95.75
S.6	1	baseline	---	89.0
	0	feedback	---	---
Total	27	baseline	72-100	85.85
	25	feedback	83-100	92.64
Overall	52		72-100	89.11

During the course of data collection, a total of 52 agreement checks was performed. Interobserver agreement ranged from 72% to 100% agreement. The overall mean percent agreement was 89.11%.

Experimental Design

A multiple baseline across subjects and settings design (Baer, Wolf, and Risley, 1968; Komaki, 1977) was used to evaluate the effects of the interventions. Baselines, noting the number of transfer components safely performed, were recorded concurrently, for each participant. Once stable responding was demonstrated, the intervention was introduced in one setting while baselines continued with the remaining participants. Following an observed change in performance, the intervention was introduced in a second setting, while baselines continued in those remaining. This process of concurrent baselines and staggered interventions continued until the experimental procedures had been introduced to all settings.

Using six participants and four experimental settings, this design provided the opportunity for the experimental effect to be reproduced across six subjects at four different points in time. The rationale underlying this design is a form of reasoning known as affirmation of the consequent (Johnson and Pennypacker, 1980). Demonstrating stability of baselines convincingly suggests that performance would not significantly change given that the environment remained unchanged. Introduction of the independent variables, while other potential sources of performance variability (e.g., administrative action, education, change in job duties) are held constant,

permits the following logic: First, if the interventions influence safe transfers, performance will change when they are made available; second, participants are provided the same interventions, successively, and performance changes when and only when the procedures are implemented; third, the changes, therefore, are a function of the effects of the interventions.

Employees were scheduled to receive the interventions based on the extent to which each volunteer had the opportunity to work and interact with other participants. Employees working in the same settings and shifts were assigned simultaneously to treatment. To reduce the potential influence of employee communication about the independent variables' effect(s), employees having the least opportunity to interact with other participants received treatment last.

The function of these design arrangements was to eliminate, or render unlikely, alternative explanations of the observed performance, so that a single condition, namely the independent variable may be regarded confidently as being functionally related to the behavior change. History can be dismissed as a potential confounding variable as it is highly unlikely that an extraneous event would coincide with the staggered introductions of treatment and produce the observed effect(s). Instrumentation is an unlikely source of variability, as frequent interobserver agreement checks were made during the course of the data collection to evaluate observer drift. Maturation is evaluated as a potential confound by examining the stability of responding during repeated measurement. If maturation or aging were contributing to behavior change, performance would be likely to change

gradually and not suddenly concurrent with the treatment condition.

Procedures

Baselines

Prior to the start of the project, each participant was informed by the experimenter that she would be observed transferring her clients. Participants were asked to provide their work schedules and to indicate the times during their shift when they were most likely to transfer clients. Observers were then scheduled to visit participants twice per week, in the work site, to observe and score transfers. Observers were instructed to observe discretely and avoid calling undue attention to themselves during data collection. See Appendix F for instructions to observers. Participants were asked not to request feedback from the observers and were encouraged to direct any questions or concerns to the experimenter.

During the initial site visits, observers familiarized themselves with the settings, clients, and participants and established a friendly relationship with both the participants and their clients. Baseline data collection began in all four settings with all twelve volunteers on February 14, 1984. In staggered succession, baselines ended across settings with intervention beginning immediately afterward. Baseline ended in setting one on April 18, 1984; setting two on May 8, 1984; setting three on June 16, 1984; and setting four on July 8, 1984.

(As noted previously, six participants withdrew from the study; five withdrew during baseline conditions. Heavy subject withdrawal

had been anticipated and more than double the number of subjects necessary for a robust design were recruited.)

Training in Safe Technique

The facility's physical therapists were asked to provide onsite training in the two selected transfer techniques. A schedule was arranged whereby therapists would provide training at the conclusion of baselines and feedback would begin immediately afterward. Data collected during baseline observations, describing both the safe and unsafe performance areas for each participant, were shared with the trainer to focus training to pertinent need areas. The first training session was scheduled for March 28th. Difficulties in coordinating the trainers' and participants' schedules were encountered and training was rescheduled several times. This series of events prompted the experimenter to initiate feedback before training was provided. One participant (S.6) received orientation training in mid-May by another of the facility's physical therapists. This unanticipated event, indicated by an asterisk on Figure 1, provided the sole opportunity to assess the effects of training on the safety of client transfers. (Such difficulties in providing training are probably not uncommon in this, and similar, work settings. This suggests that training may not be the most expeditious method for improving employee performance.)

Performance Feedback

The primary intervention consisted of written and verbal feedback provided to each participant by a residential manager and/or the

experimenter. Following observations, the safety ratings of these transfers were summarized by the experimenter on a standardized form (see Appendix D for a sample) as follows: Transfers were divided into four basic sections: 1. position of wheelchair, client preparation; 2. staff position and posture; 3. lift/transfer; 4. lower and reposition client. Specific comments describing how safely the participant performed each of these activities were noted. Beneath these descriptions of current safe practice were noted specific suggestions for further improving the safety of transfers. The feedback also included a count of the number of observed transfers on which the feedback was based and approval of increasingly safe technique when appropriate.

Feedback was provided approximately weekly to each participant. Variation in the feedback schedule was the result of employee absences during vacations, holidays, and sick time as well as a three week absence of observers midway through the study. Each participant's initial feedback message summarized all the observations during her baseline.

During the initial feedback session, the experimenter and residential manager visited the employee at her work site and briefly explained the feedback. The participant was informed that observers would continue to view her transfers and feedback regularly would be provided based on these observations. The employee was then provided the feedback form and asked to review it. Following this review, the participant, manager, and experimenter briefly discussed the feedback contents. Observation of safe technique was acknowledged and praised.

The experimenter clarified any unclear items and asked the participant not to inform observers that the feedback had begun. These initial feedback sessions lasted approximately ten minutes.

Subsequent feedback messages were delivered to each participant, after approximately five observations, by either a residential manager or the experimenter. These sessions were very brief. The recipient was given the feedback form and advised that it was based on the most recent observations. The participant was asked to read the form, at her earliest convenience, and a brief positive summary of the contents was provided (e.g., "Your transfers are improved over last week" or "Your transfers continue to be very safe"). (See Figure 1 in the Results section for feedback intervals.)

Five volunteers remained in the study through the conclusion of the feedback condition. One participant transferred to another unit four weeks after entering the feedback condition and withdrew from the study. Her data are included. Provision of feedback continued with the other participants until a criterion of consistently safe transfer techniques was demonstrated (16 of 18 steps scored as safe for five consecutive observations). When participants met this criterion, acknowledgement of this accomplishment was noted in the feedback and the individual was advised that the feedback would now end.

Maintenance

Following conclusion of the feedback, each remaining participant was asked to permit periodic follow-up observations. All agreed. Probes were conducted with each participant approximately one week,

two weeks, and one month after conclusion of feedback to evaluate the maintenance of safe performance. No feedback was provided to participants following these probes.

Consumer Evaluation

During the maintenance condition, each participant was given a questionnaire (see Results for items) asking their opinion of the procedures. The participants were provided stamped self-addressed envelopes and asked to mail their responses to the experimenter at their earliest convenience. All five participants did so.

C H A P T E R I I I

RESULTS

Figure 1 illustrates the safe performance of targeted transfers by each participant during baseline, feedback, and maintenance conditions. The delivery of feedback messages and the occurrence of unanticipated events are also shown on this figure.

During baseline, participants' performance tended to be variable and unsafe practices were noted with all participants. Inspection of Figure 1 indicates that participants' baseline performance ranged from a low of ten to a high of 17 task components safely performed, with individual participant's average safe baseline performance at 13.5, 14.1, 14.8, 13.8, 11.7, and 12.1 components safely performed. With the exception of subject six, no clear evidence of trends are apparent during participants' baseline performance. Subject six received orientation training during mid-May. Her performance following training improved in safety relative to pre-training transfers by an average of three task components. However, this improvement appeared not to maintain as her performance tended to return to pre-training levels near the end of her baseline.

With all participants, transfer-safety improved when feedback was provided. Inspection of Figure 1 indicates that this effect was reproduced, as feedback was introduced along staggered intervals, in each experimental setting. Following initial feedback messages, the safety of all participants' performance improved, although variability in technique persisted. With additional feedback, safety

Figure 1. Number of task components safely performed by each participant during baseline, feedback, and maintenance conditions. Solid circles show total-lift transfers, open circles show stand-pivot transfers. Arrows indicate delivery of feedback messages. Point A (S.3) indicates reassignment of that employee to a new setting (Ward A). The asterisk (S.6) indicates training session in safe technique. Point B (S.6) indicates reassignment of that employee to a new setting (client transfers not required).

further improved and perfect, or near perfect, technique was shown by five participants. As noted earlier, participant six transferred to another unit one month after entering the feedback phase. Her performance under the feedback condition improved but did not reach the level of consistently safe performance demonstrated by other participants. Inspection of Figure 1 indicates that variability in performance was reduced under the feedback condition. Participants' transfers during the feedback phase ranged from a low of 13 to a high of 18 task components safely performed, with individual participant's average performance being 16.4, 16.7, 17.3, 16.8, 15.8, and 14.9 components safely performed.

Participants' safe performance maintained following the conclusion of the feedback phase. Inspection of Figure 1 indicates that safe transfer technique was demonstrated during follow-up observations of the four remaining participants assessed during maintenance probes.

Table 6 provides a component analysis of each employee's transfer performance during baseline and feedback observations. While inspection of the graphed data indicated unsafe performance during baselines and generally safer transfers following feedback, Table 6 shows the safety of specific transfer components performed during baseline and feedback conditions. The data in Table 6 indicate that seven total lift transfer components (numbers 1, 2, 9, 13, 14, 15, and 16) were often performed unsafely during baselines as these components were scored "safe" during less than 75% of observations. Similarly, six stand-pivot transfer components (numbers 1, 8, 11, 14, 15, and 16) were frequently performed unsafely during baselines. Following

TABLE 6

Component Analysis: The Percentage of Each Transfer Component Performed Safely

Employee	Technique	Condition	Component Number																	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S.1	Total Lift	Baseline	90	40	100	100	100	100	77	32	96	82	77	73	56	68	32	100	100	100
		Feedback	100	97	100	100	100	100	94	70	100	100	94	100	58	94	30	100	100	100
S.2	Total Lift	Baseline	66	81	91	100	67	100	76	33	95	95	81	76	24	81	10	95	100	100
		Feedback	87	96	100	100	100	100	100	100	87	96	100	87	100	78	87	26	100	100
S.3	Total Lift	Baseline	40	70	90	100	100	100	100	50	80	100	100	50	60	50	0	100	100	100
		Feedback	86	100	100	100	71	100	100	100	71	100	100	100	71	86	29	100	100	100
S.4	Stand-Pivot	Baseline	50	100	100	100	100	100	50	100	100	67	100	100	67	50	15	100	100	100
		Feedback	100	100	100	100	100	92	100	100	100	100	100	100	100	100	92	58	100	100
S.5	Total Lift	Baseline	28	46	78	100	100	100	82	18	100	82	91	73	9	9	9	91	100	100
		Feedback	94	94	94	100	100	100	94	47	100	100	100	100	47	94	29	100	100	100
S.6	Total Lift	Baseline	36	59	73	100	68	100	92	0	41	100	100	46	5	23	5	96	100	100
		Feedback	78	100	89	100	100	100	100	100	44	100	100	100	33	55	0	100	89	100
Mean %	Total Lift	Baseline	51	64	89	100	82	100	88	26	83.5	91	90	66	31	48	9	97	100	100
		Feedback	82.5	98	97	100	95	99.5	98	64	99	100	97	100	59	80.5	22	100	100	100
Mean %	Stand-Pivot	Baseline	57.5	100	100	100	100	100	42.5	97.5	100	58.5	95	92.5	48.5	37.5	7.5	100	100	100
		Feedback	100	100	100	100	100	96	100	98	100	98	100	98	100	93	54	100	100	100

provision of feedback, the safe performance of nearly all transfer components either improved or remained at high levels. After feedback, three total lift components (numbers 9, 14, and 16) and one stand-pivot component (number 16) were scored as "safe" during less than 75% of observations.

The responses of the participants to the feedback evaluation questionnaire were positive as indicated in Table 7. All respondents agreed that the feedback improved the safety of their transfers. All would recommend the procedures to co-workers.

Table 8 provides estimates of the time to develop and operate the feedback procedure. The majority of the development time was spent specifying precise measures of safe transfer technique, developing an accurate recording system, and training observers. Operation of the procedures required little time expenditure, with the exception of collecting performance measures. During this study, observers were research staff and not facility employees. Considerable time was spent by the observers waiting for participants to transfer clients. In light of this, operation of the procedures could be conducted with an expenditure of only several hours per week if caregivers or supervisors conducted the observations during the course of routine work activities.

TABLE 7

Participants' Responses to Feedback Evaluation Questionnaire

1. How did you feel about having observers watch you transfer clients?					
1	2	3	4	5	
quite uncomfortable	mildly uncomfortable	neutral	mildly at ease	quite at ease	
		XX	X	XX	
2. How do you think your clients felt about having observers watch their transfers?					
1	2	3	4	5	
quite uncomfortable	mildly uncomfortable	neutral	mildly at ease	quite at ease	
		X	XX	XX	
3. I feel the feedback improved the safety of my lifts/transfers.					
1	2	3	4	5	
strongly disagree	disagree	neutral	agree	strongly agree	
			XX	XXX	
4. If a co-worker expressed interest in receiving help with learning safe transfer techniques, would you recommend our program to him/her?					
1	2	3	4	5	
definitely not	no, I don't think so	no opinion	yes, I think so	definitely yes	
			XX	XXX	
5. Did you discuss the content of the feedback you received with co-workers? that is, did you discuss specific aspects of your transfer technique?					
Yes	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
No					— — — — —

TABLE 7 (continued)

6. Would you like to see the State School adopt a safety program like ours to teach safe transfer techniques? That is, a program of on-the-job observation and feedback?

1	2	3	4	5
definitely not	no, I don't think so	no opinion	yes, I think so	definitely yes
			XX	XXX

7. The information we gathered shows that the feedback helped improve safe transfer techniques. Below are several possible reasons why this was the case. Check off any (one or more) that you think contributed to safer transfers.

- X X X X a. The feedback helped remind me to be safe.
- X X X X b. The feedback taught me new techniques
which I had not used before.
- - - X c. It was just a coincidence.
- - - X d. I knew if the safety of my transfers
improved, my efforts would be acknowledged.
- X X X X X e. I knew if the safety of my transfers
improved, risk of injury to myself would
be reduced.
- - - X f. Other. Please Explain.

Additional Comments:

- I think the program was excellent. Everyone working in the Infirmary should know how to safely lift a client. It is for the benefit of both the client and the staff person. I have also shown some of the newer staff how I lift and the importance of being as close to the surface as possible, and bending your knees.
- Because of this program, the correct procedure for lifting was always uppermost in my mind--even when I wasn't being observed.
- I think the program has helped me very much and do think it would help a lot of other people.

TABLE 7 (continued)

-- I really enjoyed this course--I felt I learned a lot from this program--would like to see more people get involved in this for safety reasons for not only themselves but also for clients. What we were taught in orientation was very little. This is an excellent program.

TABLE 8

Time for Developing and Operating Feedback Program

Program Development	
<u>Activity</u>	<u>Time Spent</u>
Record Reviews (developing forms, reviewing facility records, summarizing data)	15 hours
Developing Observation System	
Task Analyzing Transfers	30 hours
Developing Recording Checklists	15 hours
Observer Training	15 hours
Developing Feedback Procedures	5 hours
TOTAL	80 hours

TABLE 8 (continued)

Program Operation	
<u>Activity</u>	<u>Time/Week</u> (for four settings, six employees)
On-the-job Observations	12 hours ¹
Summarizing Data/Writing Feedback	20 minutes (per employee)
Delivering Feedback	5 minutes (per employee)
Summarizing and Graphing Data	15 minutes (per employee)
Xeroxing	15 minutes
TOTAL	13 hours

¹Observers spent approximately three hours per week, per setting, to view and score client transfers. To view and score one transfer required approximately 1 minute; the remaining time was spent waiting for transfers to occur. Considering this, observation time would be considerably less if caregivers or supervisors conducted the observations during the course of routine duties.

C H A P T E R I V

DISCUSSION

The results indicated that individual, written and verbal feedback, including approval of safe technique, was effective in improving the safety with which caregivers lifted and transferred physically disabled individuals. With the provision of feedback, all participants demonstrated more standard, routine, and safe on-the-job transfer technique than they had during baseline. The multiple-baseline evaluation of the data indicated that notable improvements in performance safety, and reductions in between-and-within-participants' variability, occurred when, and only when, feedback was provided. These results demonstrated a functional relation between improvements in safe technique and delivery of feedback.

During baselines, observations of participants' on-the-job transfers indicated multiple unsafe practices and wide variability in how transfers were performed. Differences were noted in how participants prepared clients for transfer, how participants positioned clients and surfaces for transfer, and the participants' position, posture, and movements during the lifting, transferring, and lowering of clients. Some of the performance variability appeared to result from inadequate advance preparation (i.e., of the client, equipment, and surfaces) prior to transfers, so conditions were optimal for safe lifting. During baselines, participants often failed to position clients and the new surface in the safest

configuration for transfer. As a result, participants frequently found it necessary to carry clients over unnecessarily long distances, to lift clients over removable obstacles (e.g., armrests), and to align clients with new surfaces by rotating through excessively long arcs. Each of these activities is contrary to the recommended lifting guidelines presented by the U. S. Department of Health and Human Services (NIOSH, 1981) and increases the risk of injury to employees. For example, unnecessarily long carries is fatiguing and increases risks of falls; lifting over obstacles moves the center of gravity of the weight lifted away from the employee's body and increases lifting stresses; aligning clients with new surfaces by turning through excessively long arcs (e.g., in excess of 90°) leads employees to twist or bend their torsos while bearing weight and places hazardous stresses on the spine.

Following feedback, the safety of participants' transfer techniques changed in a number of significant areas. First, employees arranged the immediate environment for safer transfers. They positioned clients and surfaces for shorter and closer transfers, removed obstacles when possible, and nearly always locked wheelchair brakes. Second, the participants usually positioned themselves for safer transfers by standing in line with, and close to, the client's center of gravity. Third, participants tended to bend their knees and maintain an erect back while lifting and lowering clients. At times, the design of equipment and height of surfaces precluded precise conformation to the posture definition specified by the observational system. Following feedback, unsafe

employee posture during lifting and lowering continued to be noted, although less frequently than during baselines. Fourth, participants' transfer performance became more routine following feedback. Reductions in performance variability, both between and within participants, contributed to safer practice, in that clients are less likely to react unexpectedly to consistent handling. It is logical to assume that routinizing client transfers decreases the possibility that a client may be startled during transfer by unaccustomed movements. A client's startle reaction may draw the employee off balance, cause the employee to fall, or lead the employee to overexert herself in an effort to control the client's movements while simultaneously bearing the client's weight. And lastly, following feedback, participants more frequently pivoted with clients when aligning them with the new surfaces and avoided asymmetrical and unstable twisting movements. In summary, the feedback was effective in changing multiple components of the participant's transfers. These changes significantly enhanced employee safety along five measured performance areas.

Follow-up assessments of four of the subjects at one week, two weeks, and one month after conclusion of interventions indicated that safe practices tended to maintain in the absence of the feedback. One participant (S.3) transferred to a new setting during the maintenance assessments. Despite some changes in client characteristics and equipment (clients in her new setting had more severe physical impairments and required more total lift transfers), performance improvements tended to generalize and maintain in her new setting. This unanticipated employee transfer provided the sole opportunity

to assess the generalization of treatment effects across different job situations. Given that generalization evaluations were not conducted with other participants, these encouraging results must be regarded with caution. The remaining participants (S.1, S.2, S.4) observed during maintenance assessments continued to exhibit levels of safe practice which had been established under the feedback conditions.

The results of the anonymous feedback evaluation questionnaire indicated that participants favorably regarded the intervention. No respondent indicated discomfort with the on-the-job observations and feedback. All agreed that the feedback improved the safety of their transfers, and all would recommend the procedures to other employees. Most participants personally thanked the experimenter for recognizing the need for providing more safety programming and for offering this service. While previous research in similar settings (e.g., van den Pol, Reid, Fugua, 1983) indicated that verbal responses and answers to questionnaire items are not always consistent with subsequent performance, the enthusiasm expressed for this procedure suggests that individualized feedback is a socially acceptable method for enhancing the safety of employee lifting and transferring. An additional indication of the acceptability of this procedure was the interest expressed by employees who had not volunteered for the study. On a number of occasions during the course of this study, co-workers of participants asked to be included in the intervention. Due to the limited amount of observer resources, these unsolicited volunteers were not included.

Inspection of the results suggests that the feedback served multiple functions in changing employee performance. The feedback operated as a discriminative stimulus, both as a positive and negative reinforcer, and as a setting event. This combination of influences was responsible for the clear performance changes evidenced across each experimental setting.

First, the feedback was a discriminative stimulus occasioning more precise and safer behavior. The feedback prompted new behaviors which the participants had not previously exhibited. The repeated feedback messages served as instructions for each individual, specifying safer procedures for transferring clients. Four of the five respondents to the questionnaire indicated that the feedback taught them new techniques.

Second, the feedback was reinforcing and increased the probability that specified behaviors would re-occur. The reductions in variability, noted following feedback, indicate that safe practices were differentially reinforced relative to unsafe practices. With repeated feedback, the safe practices came to replace less safe alternatives. The feedback included acknowledgement and approval of increasingly safe technique. Given the characteristics of an institutional work environment, where staff management often relies heavily on aversive control (Reid and Whitman, 1983), feedback which is primarily positive in content undoubtedly serves as a powerfully reinforcing event.

In some performance areas, the feedback suggested employee responses which increased the efficiency of client transfers and reduced the effort required to complete some transfers. This reduc-

tion in the effort requirement immediately and powerfully reinforced performance. For example, when employees closely positioned clients next to new surfaces, the length of carries was reduced and the transfers were less fatiguing. Similarly, removing wheelchair armrests reduced the difficulty employees experienced when lifting and lowering clients. Removal of the armrest eliminated an obstacle interfering with efficient transfer and consequently would be reinforced. This reduction in the effort of transfers probably contributed to the maintenance of safe technique in the absence of feedback.

All five questionnaire respondents indicated that they knew if the safety of their transfers improved, risk of injury to themselves would be reduced. Discussions of occupational injuries, incurred while lifting clients, appeared to be common among participants in this study and their co-workers. One participant (S.4) had been injured while transferring a client, prior to this study, and had lost several weeks of work as a result. Participants in this study and their co-workers were generally aware of the frequency of injuries incurred during transfers, and had knowledge of the expense, inconvenience, and suffering resulting from these injuries. Under these circumstances, the feedback negatively reinforced safe practice. Avoidance of potential injury encouraged and strengthened adherence to the feedbacks' corrective suggestions.

Third, the feedback may have served as a setting event, encouraging participants to recognize the subtleties of safe practice and some of the natural contingencies controlling their behavior. Each of the participants in this study was responsible for providing direct-care

services to up to seven clients. These services involved assisting their clients to bathe, dress, eat, toilet and other activities which required clients to transfer from wheelchairs to other surfaces. Given the clients full programming schedules, the direct-care services were provided promptly so as to not interfere with or delay programs. These circumstances may have encouraged expedient performance and tended to diminish attention to employee safety. Provision of feedback may have altered the salience of various environmental cues influencing employee performance and enhanced employees' attention to relevant safety cues (i.e., arrangement of equipment, body position, posture, etc.). The added emphasis on performance safety, provided by the feedback, may thus have enhanced behavior change and promoted maintenance of safer technique.

Since training in safe practice was provided to only one participant (S.6), conclusions regarding the effects of this procedure must be regarded cautiously. The available data suggests that training led to improvements in safe practice, but these improvements tended not to maintain. Since all participants in this study reported having received training at some time during their employment, the unsafe practices demonstrated during baselines indicate that training alone is insufficient in maintaining safe technique. This is consistent with previous research (Komaki et al., 1982) which found antecedent control procedures not always effective in promoting behavior change. The results of this study indicate that feedback, which is not paired with training, is more effective in promoting and maintaining safe behaviors than training without feedback.

The results of this study are consistent with previous feedback research (Panyon et al., 1970; Welsch et al., 1973; Quilitch, 1975; Prue et al., 1980; Brown et al., 1981) which found feedback strategies to be effective in improving the performance of caregivers. The results are also consistent with many previous safety studies (Komaki et al., 1979; Sulzer-Azaroff and de Santamaria, 1980; Komaki et al., 1982; Fellner and Sulzer-Azaroff, 1984) which found feedback to be effective in enhancing workers' safety. According to Reid and Whitman (1983) most feedback studies have evaluated the effects of publicly posted feedback. Relatively few studies (Ford, 1980; Repp and Deitz, 1979) assessed the effects of individual, private feedback. This investigation replicates the previous findings that individualized feedback strategies are effective management procedures.

This study makes several contributions to the literature regarding accident prevention and the utility of feedback systems for enhancing worker safety. First, the observational system developed in this study provides an efficient, reliable method for assessing the safety of lifting during on-the-job performance. This system was useful in both measuring behavior change and in collecting relevant performance data to be fed back to employees. Second, this study demonstrates that lifting technique can be improved by behavior management strategies, specifically feedback, and that improvements will tend to maintain over time. This feedback procedure would appear to significantly contribute to a systems approach, including engineering, ergonomic, and biomechanical interventions, for reducing employee injuries incurred during lifting tasks. As noted earlier, equipment

and furniture at times precluded safe transfer technique. The observational system detected repeated unsafe employee postures and actions when participants transferred clients to some surfaces (e.g., bathing units, and some beds). Specifically, high-walled bathing units and traditionally-styled beds with low mattress height required awkward, and potentially unsafe, movements when employees lifted clients to and from these surfaces. Employees were unable to alter these unsafe practices because of design limitations. The effects of equipment modifications (e.g., raising bed heights, removing bed side boards, designing flexible bathing unit walls) on transfer safety could be readily assessed using the observational system employed in this study.

The estimated time of 80 hours required to develop and of thirteen hours per week to operate the feedback system would be considerably reduced if employees' peers or direct supervisors conducted the on-the-job assessments during the course of ongoing residential activities. An estimated allocation of one hour per employee per week would be required if residential staff operated the program. These estimates indicate that the procedure is cost efficient and would not significantly tax an institution's staff development resources. Considering the time required to hire and train replacements for injured employees, prevention of only a few employee injuries would offset the costs of implementing this system. The average cost of a disabling injury is \$14,000 (Accident Facts, 1982). Assuming this procedure were to be developed by a program manager earning fifteen dollars per hour and operated by a residential

supervisor earning ten dollars per hour, the annual cost of this program for a workforce of twenty five employees would be \$14,200.00. These estimated costs are likely to be liberal. Even as given, the prevention of one disabling injury would offset the cost of the program.

During the course of conducting this research, a number of challenges arose threatening the completion of this project. Such obstacles are commonly encountered in applied research and are well documented (e.g., Reid and Whitman, 1983; Barber, Barber, and Clark, 1983; Ball, Jarvis, Pease, 1983; Fisher, 1983). Fortunately, planning to cope with some of these in advance (e.g., by obtaining a large pool of initial volunteers) alleviated some difficulties. For instance, of the original twelve volunteers for this study, half withdrew during the first six months of the procedures. Five of the six withdrawals occurred because of staff resignations or transfers to other work sites. Considerable difficulty was also encountered in attempting to arrange safety training for employees despite the efforts of physical therapists and residential managers. Difficulties in scheduling training sessions and competing activities interfered with altering the facility's training schedule to accommodate the experimental design. Staff absences (vacations, sick days, "floating" to other areas) often conflicted with data collection. These obstacles, and others, not only challenge the conduct of applied research but also imperil effective staff management. Unstable workforces produced by employee turnover and absences, inefficient communication, and unclear job duties challenge widescale application of systematic management

procedures to staff performance problems. While this investigation indicated that a performance feedback strategy is effective in enhancing performance on a relatively narrow scale, the difficulties encountered in conducting this study suggest that widescale application would be quite difficult to generate from within most institutional systems.

This investigation revealed a number of areas for further research. Analysis of the generalization of this feedback procedure to other lifting tasks (i.e., lifting materials, packages, equipment, etc.) is warranted to evaluate further application of this procedure. The viability of using this procedure with other audiences (e.g., parents and family of physically handicapped individuals) is also worthy of additional research.

Implementation of these procedures by employees working within human service organizations needs to be studied. The differential effects, if any, of having workers, peers, supervisors, therapists, and others from within the organization conduct the performance assessments and deliver the feedback is unclear. In a study of feedback as a strategy to promote delivery of fire-safety training, Fox (1984) found no differences in performance measures as a function of the source of feedback. That study suggests that source of feedback may not be a vital parameter influencing feedback effectiveness and consideration may be directed to consumer acceptability and cost-effectiveness when selecting sources of feedback. Further study is necessary to replicate the Fox study to determine potential interactions between setting characteristics, content of feedback

and source of feedback.

No attempt was made during this study to evaluate changes in occupational injury rate as a consequence of this procedure. Given the small sample size of subjects, detectable changes in injury rate were not anticipated. Further research should evaluate application of this procedure to larger audiences and assess changes in injury rate as a consequence of enhanced safe practice.

During this study, feedback messages were provided at approximately one week intervals. Ceilings of safe practice were achieved after three to four feedback messages. Considering that some participants in this study performed thirty or more transfers per day, employees in these settings face frequent opportunities for injury. Further study is warranted to assess accelerated schedules of feedback for more rapidly establishing safe practice. The long term maintenance of treatment gains after dense and intermittent feedback schedules needs also be studied.

Lastly, basic research is warranted to study the environmental and organizational prerequisites for effective employee management. Once these characteristics are established in the workplace, wide-scale application of systematic management strategies might be implemented, maintained, and evaluated. Greenblatt (1983) identified a number of institutional characteristics necessary to support innovative change. These included a priority list of goals, incentives for progress towards goals, evaluation of programs, and cultivation of stable workforces. Research to study the contingencies controlling these parameters is indicated to determine processes to

establish the prerequisite conditions for supporting effective management, evaluation, and institutional change.

In summary, this research demonstrated that the safety with which physically disabled individuals are lifted and transferred can be improved by provision of individualized feedback. The on-the-job observational system, developed during this study, is efficient, reliable, and generally acceptable to employees. This study also suggested areas for future research to further elaborate the applications of behavior analysis to improving occupational safety.

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APPENDICES

A P P E N D I X A
INFORMED CONSENT FORM

A common concern in facilities for the developmentally disabled is injuries received by employees while lifting and transferring physically disabled clients. Lifting a physically disabled client is a difficult and strenuous task and can lead to sprains, strains, and other injuries to employees performing this work.

I would like to conduct a research project to investigate the effectiveness of an instructional method to teach how clients may be safely lifted and transferred. The people who participate in this program are likely to benefit from a decreased likelihood that they will be injured on the job. The research program involves four parts: First, participants will be observed lifting and transferring clients by independent observers hired by me. Second, participants will be taught safe methods to lift and transfer clients. Third, participants will again be observed lifting and transferring clients by independent observers. Fourth, at a later date, each participant will receive information pointing out how he or she is transferring clients. This information will concern how the individual receiving the comments lifts and may contain suggestions as to how to lift more safely.

I expect to use the data collected in this research in partial fulfillment of my master's degree requirements and perhaps for presentation at professional conferences and/or publication in professional journals. Participants' names will never be made public. As in all research of this type, the participants' identities always

remain anonymous. Only my research assistants and I will see records that include your name. Your supervisors will not be informed about the action of any participant. The information collected during the study will not be used as the basis for any personnel action against any employee.

I will be happy to answer any questions you have regarding this research. In four to six months, when the project is completed, I will provide a summary of the research to all participants.

Your participation in this project is totally voluntary and you should feel free to withdraw at any time (although I would appreciate advance notice). Please contact me, Mark Alavosius, at the telephone numbers listed below if you have any questions.

I have read the above and agree to participate in this study. I understand that I may withdraw at any time.

Name (please print)

Signature

Mark Alavosius
Office: (413) 545-0794
Home: (413) 323-4542

Date

A P P E N D I X B

ONE PERSON TRANSFER (TOTAL LIFT)

Employee _____ Unit/Ward _____
 Date/Time _____ Location _____
 Observer _____ Purpose of Lift _____

Sketch Position: _____

CHECK			TASK COMPONENT
YES	NO	NA	
			1. Position wheelchair near goal (transfer across shortest distance). Ninety-degree angle is best.
			2. Explain to client what you are to do (words or gestures).
			3. Lock wheelchair brakes.
			4. Remove adaptive devices:
			a. tray
			b. arm rests (if possible).
			c. seatbelt(s), other adaptive equipment.
			5. Staff position for lift to be:
			a. Standing at side of chair, at client's hip angle,
			b. with feet apart (width of hips, at least).
			c. <u>Bending posture, knees bent, AND</u>
			spine straight, may be slight bend forward at waist.
			6. Slide client forward on seat, to permit adequate room for step #7.
			7. Staff supports client for lift:
			a. One arm beneath client's arms and shoulders to support head, neck, and upper torso.
			b. Other arm beneath client's thighs to support pelvis.
			8. Hug client to you (reduce distance from client to staff).
			9. Staff lifts straight up <u>by unbending knees</u> (back remains straight and erect). SMOOTH MOVEMENT
			10. Staff pivots (turns on balls of feet, or short steps, without twisting torso) and aligns client with new surface.
			11. Staff <u>bends knees</u> , lowers client to new surface. Back straight.
			12. Securely position client on new surface, then release.
			13. Fasten seatbelts, where appropriate.
			TOTAL

Describe unsafe components, if any: _____

How long did it take to complete this observation? _____

A P P E N D I X C

ONE PERSON TRANSFER (STAND PIVOT)

Employee _____ Unit/Ward _____
 Date/Time _____ Location _____
 Observer _____ Purpose of Lift _____

Sketch Position: _____

<u>CHECK</u>			<u>TASK COMPONENT</u>
YES	NO	NA	
			1. Position wheelchair near goal (transfer across shortest distance). Ninety-degree angle is best.
			2. Explain to client what you are to do (words or gestures).
			3. Lock wheelchair brakes.
			4. Move footrests aside (if possible), calf pads aside, rests up.
			5. Undo seatbelts, remove adaptive devices.
			6. Staff position for transfer to be:
			a. Standing directly in front of chair.
			b. Feet apart for balance (width of hips, at least).
			c. { Bending posture (KNEES BENT), AND
			{ Spine straight, may be slight bend forward at waist.
			7. Prompt/slide client forward on seat to edge.
			8. Prompt client to lean forward.
			9. Grasp client by belt, waistband, or waist.
			10. Hug client to you (reduce distance from client to staff).
			11. Instructions to client ("1-2-3, stand") as action begins.
			12. Staff stands <u>by unbending knees</u> (back remains straight and erect). SMOOTH MOVEMENT
			13. Staff pivots (turns on balls of feet, short steps) with client and aligns with new surface. (WITHOUT TWISTING TORSO)
			14. Staff bends knees, lowers client to new seat/surface.
			15. Securely position client on new surface, then release.
			16. Fasten seatbelts, where appropriate.
			TOTAL

Describe unsafe components, if any: _____

How long did it take to complete this observation? _____

Purpose of lift: _____

A P P E N D I X D

FEEDBACK FORM

Dear _____

(participant's name)

This feedback is based on observations of your transfers during the preceding weeks 2/14/84-4/10/84. Based on 22 lifts.

(dates)

We have divided each type of transfer into four sections. The comments below describe how safely you completed each section.

Total Lifts

Position wheelchair,
prepare client

- Some lifts are well positioned (wheelchair close to new surface at 90° angle is best)
- Almost always locks wheelchair brakes
- Usually explains lift to client at time of lift

Staff position
and posture

- Always stands at client's hip angle at time of lift (good position--helps to stabilize load)

Lift/Transfer

- Safely supports clients during lift (supports client's head and shoulders and thighs)
- Lifts are smooth, quick, co-ordinated movements (safe)

Lower and reposition
client

- Always securely positions client on new surface before releasing

SUGGESTIONS TO IMPROVE SAFE TRANSFERING:

1. Continue safe components as noted above.
2. Consistently position client and new surface more closely--try to position wheelchair at 90° angle to other surface [this will avoid need to carry clients unnecessary distances, and keep you from twisting your torso while supporting clients' weight].
3. Spread your feet more (width of hips) for better base of support when lifting.
4. Remove arm rests, when possible, to avoid lifting over this obstacle.
5. When lifting and lowering, bend knees more, try to keep back straight.

Your lifts are generally good--these suggestions will refine safe lifting.

Thank you for your cooperation.

(date)

FEEDBACK FORM

Dear _____

(participant's name)

This feedback is based on observations of your transfers during the preceding weeks 4/25/84-5/1/84. Based on 8 lifts.

(dates)

We have divided each type of transfer into four sections. The comments below describe how safely you completed each section.

Total Lifts

Position wheelchair,
prepare client

- Lifts continue to be safely positioned (wheelchair close to new surface, at 90° angle)
- You always locked brakes and removed arm rests (when possible)
- Good explanations to client at time of lift

Staff position
and posture

- Stance for lift is good (standing at client's hip angle). Could spread feet more for better base of support.
- You are bending your knees more at time of lift, and keeping back straighter (improvement over last week)

Lift/Transfer

- You securely support the clients during lifts
- Lifts are smooth, coordinated movements and slower than lifts observed earlier (when you lift more slowly, you twist your torso less--try to avoid twisting at all when lifting and lowering clients--keep shoulders and pelvis in line)

Lower and reposition
client

- You continue to securely and safely position clients on new surface. You are bending your back forward when lowering clients and bending your knees--try to use knees when lowering as much as possible.

SUGGESTIONS TO IMPROVE SAFE TRANSFERING:

1. Continue safe components as noted above--your lifts are safer and more consistently performed than last week.
2. Slow down your lifts, particularly your pivot, and try not to twist your torso at all when carrying clients.
3. Remember to spread your feet for a good base of support and bend your knees (rather than your back) when lifting [try to tighten your stomach muscles when lifting and keep your spine straight and erect].

Thank you for your cooperation.

(date)

FEEDBACK FORM

Dear _____

(participant's name)

This feedback is based on observations of your transfers during the preceding weeks 6/16/84. Based on 6 lifts.

(dates)

We have divided each type of transfer into four sections. The comments below describe how safely you completed each section.

Total Lifts

Position wheelchair,
prepare client

--Safely positioned lifts, good preparation with clients. You always locked brakes and removed arm rests (when possible).

Staff position
and posture

--Good position and posture during lift--you are always bending your knees and keeping your back fairly straight

Lift/Transfer

--Lifting technique is very good--smooth movements, not twisting your torso, bending with knees (less so with back)

Lower and reposition
client

--You continue to safely and securely position clients on new surface--you tend to bend forward when lowering clients to bed (probably impossible to do it much differently given height of beds)

SUGGESTIONS TO IMPROVE SAFE TRANSFERING:

1. Continue safe components--your lifts appear to be very safe. Your lifts are smooth and coordinated, you pivot well, you're bending your knees and keeping your back fairly straight--well done.

Thank you for your cooperation.

(date)

A P P E N D I X E
TRAINING TAPE NARRATIVE

This training tape contains examples of two client transfer techniques. These include stand-pivot transfers and one-person total lift transfers. Both safe and potentially unsafe performance of these two procedures are depicted. The tape was made to assist in training observers to record the level of safety demonstrated by employees using these procedures in actual work sites. The video tape shows samples of the tasks performed by physical therapy staff in an institutional ward setting. No clients were involved in the taping. Staff members role-played the parts of physically disabled clients and attempted realistically to model the extent of assistance offered by clients who require these transfers.

Scene One: This scene depicts a safe stand-pivot transfer of a client from a wheelchair to another chair. During this segment, the staff person closely positions the client and the surface to which the transfer will occur. Next, the staff person prepares the client and surface for transfer (locks brakes, unfastens seatbelt, informs client, removes adaptive equipment). The staff person then positions herself and the client for the actual transfer. In a stand-pivot transfer, the staff member assists the client, who is able to bear some weight, in locating to a new surface. Note that during this scene, the staff person assists the client in standing, pivoting to the new surface, and then lowering to a sitting position.

Special consideration should be given to the staff person's

body position and posture during the lift. Notice that the staff person draws the client to within several inches of herself. The staff person firmly grasps the client and smoothly rises with her to a standing position. The staff person then pivots, without crossing her feet or twisting her torso, and assists the client in lowering to the new surface. A component by component analysis of this transfer is provided on the accompanying checklist.

Scene Two: This sequence depicts a stand-pivot transfer involving several unsafe components. These occur when the staff person attempts to assist the client to stand. Note that the staff person bends her back forward into a crouching position when she grasps the client. The safe alternative is to draw the client forward in her wheelchair permitting the staff person to maintain a straight spine while embracing the client for the lift. Also, note that the client places her arms around the staff person's neck prior to standing. This compounds the poor back posture of the staff and may occasion pulling the staff person off balance during the lift. In this circumstance, the staff person should reposition the client's arm by prompting the client to place her hands on the staff person's shoulders. The remaining features of the transfer are consistent with safe practice as described in scene one.

Scene Three: This scene also demonstrates a stand-pivot transfer involving unsafe components. First, the staff person fails to position the surfaces as near to each other as possible. This then requires transfer across a longer distance than necessary. During

this sequence, the staff person crouches her back when lifting the client. The hazard introduced is a possibility of straining her back during the lift. The alternatives to these unsafe components would be to closely position the surfaces prior to the transfer, and to draw the client forward before attempting to lift. The remaining components of the lift are consistent with safe practice.

Scene Four: This segment contains a safe one-person total lift transfer. Total lift transfers are used with clients who are physically incapable of bearing their weight while standing. The staff member(s) lift and support all of the client's weight during these transfers.

During this scene, the staff person closely positions the surfaces at a ninety-degree angle to each other. He then removes adaptive devices and secures the wheelchair by locking the brakes. During the actual lift, the staff person maintains a straight spine and lifts by bending and then unbending his legs. He then carries the client, across the shortest distance necessary, and smoothly lowers her to the new surface. A component by component analysis of this transfer is listed on the corresponding checklist.

Scene Five: This scene depicts a total lift transfer including several potentially unsafe components. First, the staff person does not position the surfaces as closely as could be possible in the given circumstances. This necessitates a lift and carry across longer than necessary distance. Second, the staff person neglects to fasten the wheelchair brakes leaving open the possibility of the chair moving

during the transfer and causing unsteadiness or a fall. Third, the staff person's posture during the actual lift is potentially unsafe. Notice that he neglects to remove the wheelchair's armrest. This requires him to lift the client over an obstacle and prevents him from maneuvering the client close to his own body as he begins the lift. As a result, the staff person needs to stretch forward, by bending his back, to embrace and lift the client out of the wheelchair. This unnecessarily strains his back and could have been prevented by removing the armrest, drawing the client close to his center of gravity, and then lifting by unbending his legs. The remainder of the transfer is consistent with safe practice.

A P P E N D I X F

INSTRUCTIONS TO OBSERVERS

Data Collection:

1. Please be prompt for your observation sessions. Call the Infirmary staff if you are unable to make a session or will be late. Also, it is a good idea to dress neatly.
2. When you arrive, tell the contact person(s) that you have arrived to observe--proceed to the wards. See these people when you leave also.
3. Be social, as you all are, with clients and staff. If asked about the research, explain that we are looking at ways to teach safe ways to transfer clients. Do not disclose anything about the participants. Respect their confidentiality. Refer anyone with direct questions to me.
4. When observing:
 - a. Let the participant(s) know that you are there to observe. Ask that they continue their work and try to forget that anyone is watching.
 - b. Be discrete--stay at a distance to see the lifting without being intrusive.
 - c. Maintain a neutral expression when watching--try not to look pleased with safe lifting, or displeased or concerned with unsafe lifting.
 - d. Note all identifying information for each session.
 - e. Score as we practiced--remember, if an employee begins a component unsafely, then self-corrects, score NO.
 - f. To be accurate: Divide the transfer into sections--Preparation; Position/Posture; LIFT; Placement. Watch each section then score the NOs and NOT APPLICABLEs, then watch and score the next section. Try to divert your eyes from the employee only during pauses in the action to score. At the end of the transfer, fill in the YESs.
5. During each session, try to score at least three separate lifts, of each type, for each participant you observe.

6. Inform the participants when you leave. If anyone asks how they did, tell them we need to review the data and we will provide feedback when the system is worked out. Do not disclose any information at that time. We need to provide feedback in a standard and consistent manner.
7. If anything unusual happens, LET ME KNOW.

Some Conditions:

Respect the privacy of both clients and employees. Do not disclose any information, outside of our research meetings, about events you see. All data is strictly confidential.

Some of the activities you witness on the wards may be unsettling. Try not to be critical of what you may see. The clients are living and the employees are working in challenging circumstances--try to always be respectful of that.

