Cognitive impairment is a major cause of institutionalization among older adults. Approximately two thirds of nursing home residents exhibit moderate to extreme dementia (Public Health Service, 1978). Judging from the literature, the most common form of treatment provided for such regressed persons is reality orientation (Holden & Woods, 1982). Although the philosophy of reality orientation is broad enough to encompass a wide range of interventions intended to reorient impaired persons to their environment, reality orientation as it is typically administered is essentially a classroom-based, verbally oriented therapy that focuses on the repetition and relearning of basic information, such as a person's name and place of residence (Hanley, McGuire, & Boyd, 1981).

Despite the popularity of reality orientation, there is scant evidence documenting its effectiveness. The accumulated research suggests that improvement in verbal orientation is the most likely outcome and that carryover to daily living behaviors is problematic (Holden & Woods, 1982). In fact, the most dramatic effect of reality orientation may lie in its impact on caregivers. Caregivers providing reality orientation reported that they felt better about themselves and the quality of care provided than did caregivers not involved in reality orientation (Harris & Ivory, 1976).

Since evidence of beneficial behavior effects of reality orientation for the patient is lacking, there is a critical need to explore therapeutic alternatives. One approach that appears to hold promise for severely regressed geriatric patients is sensory training (Marcus, 1983; Richman, 1969; Weiner, Brok, & Sadowsky, 1978). The primary goal of sensory training is to bring the regressed person back in touch with the environment. This is done through intensive stimulation of the senses. The rationale underlying sensory training posits that cognitive dysfunction in the regressed patient is in part attributable to sensory deprivation, and that by increasing sensory stimulation, some of the dysfunction can be ameliorated. This paper describes the use and outcomes of sensory training with Maude, a severely cognitively impaired older adult (Marcus, 1983). The paper concludes with suggestions for devising sensory training programs.

Case Study

The patient. Maude was a 90-year-old Caucasian woman diagnosed with senile dementia, gout, hypertension, head injury, depression, and possible cancer. She had been receiving the major tranquilizer Haldol, the antidepressant Elavil, and the bowel regulator Colace for almost 2 years. No changes in her medication were initiated during the treatment period. She
was nonambulatory, unable to propel her wheelchair, bowel and bladder incontinent, and totally dependent in feeding, dressing, and grooming. She was disoriented to persons, time, and place and spent most of the day sitting with her eyes closed. Generally, she remained inert when spoken to, but on occasion she responded with one or two inappropriate words. Over the past year, she had lost 50 pounds and because of her weight loss was being force-fed. She had been in this facility for 2 years and prior to admission had lived in various rest homes for 3 years.

The facility. Treatment was conducted at a 58-bed skilled nursing and intermediate care facility in the Piedmont region of North Carolina. The facility serves multiply impaired individuals, primarily over the age of 65 years, who require maintenance and nursing care. The facility sponsored an activities program, which was conducted daily by an aide, and a hymn singing and bible study group, which was held by volunteers once a week. Rarely would a staff member bring Maude to these sessions. The sensory training program described here was conducted by an occupational therapy student completing a fieldwork Level II internship under faculty supervision. The facility serves as a training site for family practice residents from the School of Medicine at the University of North Carolina, Chapel Hill.

The treatment program. Maude received intensive sensory training 4 days a week for 5 weeks. The duration of treatment sessions was determined pragmatically and reflected the time available within the fieldwork Level II education. A review of the literature failed to provide guidelines regarding the period of time over which behavioral changes could reasonably be expected, since the available studies incorporating sensory training (Bower, 1967; Burnside, 1969; Ernst et al., 1977; Loew & Silverstone, 1971; Paire & Karney, 1984, White, 1970) were conducted on individuals who were able to respond to test batteries and cooperate in structured activities programs and hence were functioning at a much higher cognitive level than Maude.

Although treatment was administered individually, it was carried out in a group setting. The group included five other regressed geriatric residents. The Paracheck Geriatric Behavior Rating Scale (Paracheck) (Miller & Paracheck, 1974) was used to screen residents for the sensory training program. This instrument considers physical condition in terms of ambulation, eyesight, and hearing; self-care in terms of toileting, eating, hygiene, and grooming; and social behavior in terms of contributions to the ward, individual response, and group activities. The five residents scored 24 or lower on the Paracheck. Their scores are indicative of substantial physical and mental deterioration. The five residents were selected from a larger group of 30 residents who were identified by the nursing staff as being the most impaired in the facility and from among nine residents who scored 24 or lower on the Paracheck. The group consisted of three women and two men; three were non-ambulatory and two required assistance for safety when walking.

Initially, half-hour treatment sessions were planned for the morning and the afternoon. The afternoon session was discontinued in the 2nd week because an increase in lethargy and a coincident increase in nonresponsiveness and uncooperative behaviors was noticed in the participants during the afternoon sessions. The morning session was increased from 30 to 45 minutes. During the 3rd week, a volunteer was recruited to help transport participants to the session more expeditiously and hence to reduce the participants’ waiting time before the session was started. Sessions were generally conducted in a screened outdoor sun porch. On very hot days, the session was moved to the indoor lounge area. The treatment area was closed off to other residents during the session. The participants sat in a semicircle.

At the beginning of the session, the leader welcomed each participant by name, touched his or her hand, and sought eye contact. Treatment focused on stimulating the visual, auditory, olfactory, gustatory, tactile, and proprioceptive senses. After the initial greeting ten core activities were presented. The participant was asked to do the following:

1. Look at the bell, which was held at midline slightly below eye level.
2. Ring the bell, which was positioned at the midline slightly above elbow height.
3. Smell a particular item, which was held for approximately 30 seconds about 2 inches from the nostrils. (Flowers, coffee, peanut butter, garlic, onions, and oranges were used.)
4. Eat a particular item, which was placed in the line of vision. (Snacks consisting of coffee, orange juice, orange jam, oranges, candy, cookies, peanut butter, and popsicles were used.)
5. Blow a pinwheel or blow out a candle, which was held about 12 inches in front of the participant slightly below mouth level.
6. Clap hands or stamp feet to music. (A march or ethnic music was played for 3 to 5 minutes on a tape recorder.)
7. Taste a sweet food (jelly, ice cream) and then a sour food (lemon, lemon juice), which was placed in the hand or near the mouth.
8. Catch a large beach ball, which was dropped into the lap.

Paracheck, 1974) was used to screen the facility. The(acility.
9. Throw a large beach ball, which was placed in the lap, to the leader.
10. Move arms away from the side of the body, knees in flexion and extension, and chins up and down and to the right and left. (These actions were demonstrated.)

These 10 activities were always presented in the same order to habituate the participants to the activity routine.

Each stimulus was presented to the participants on a one-to-one basis, and participants were assisted in perceiving the stimuli through verbal, visual, and physical cues. For example, if a participant failed to look at the bell voluntarily, the bell was oscillated slightly in the line of vision to call attention to it, or the leader gently turned the participant's head so that the bell was in view. Similarly, if a participant did not move to music, physical assistance was used to provide passive motion and encourage active motion.

In addition to the core activities, other activities were periodically introduced to supplement the basic stimulation program. Participants were encouraged to do the following: wash hands with scented soap in a basin of warm water; dry hands with a soft towel; rub hand lotion on the hands; comb hair while looking in the mirror; feel sandpaper, velvet, burlap, and fur; bat a balloon with the hand; listen to familiar sounds on a tape recorder, such as a train whistle, a car horn, a dog barking, or a baby crying; sing or hum a familiar tune; play rhythm instruments; and pet and play with a dog.

To conclude each session, the leader shook hands with each participant, gave him or her a hug, and asked for a hug in return.

Outcomes. While some gains were made by all program participants, the most dramatic gains were made by Maude. To evaluate response during the treatment session, a ratio of the number of independent responses made to the core activities in relation to the number of times the core activities were presented was calculated. A weekly average of independent activities was obtained from the 2nd through the 5th week. During the 2nd week, Maude made 29% of her responses without help; during the 3rd week, 48%; during the 4th week, 52%; and during the 5th week, 69%. Thus, there was a consistent increase in independent functioning during the sensory training sessions. This independence was not confined to one or two activities but was observable in all 10. Maude's initial belligerence and hostility toward the leader subsided at 3 weeks and was replaced by open affection. She became meaningfully talkative for the first time during the session when the dog was brought in. Subsequently, she initiated conversations with the leader and made comments about what the other participants were doing.

Preprogram and postprogram evaluation was done by a therapist who was associated only with the administrative and planning aspects of the program. Whereas at the beginning of the program Maude was disoriented to persons, time, and place, at the conclusion she was oriented to person and place. She was also oriented to time in the sense of knowing whether it was before or after breakfast or morning, afternoon, or evening, but not in terms of the day of the week or the month and year. Initially, she failed to make eye contact when spoken to, but at posttesting, she looked at and held the gaze of the examiner when addressed. When asked simple questions about herself or her day (e.g., How are you? What did you have for lunch?), she responded in short, but appropriate phrases. Her comments were often accompanied by facial expressions such as smiles or frowns. Previously, she had been nonresponsive or had babbled in reply. During the 4th week, Maude began to feed herself finger foods at mealtimes. During the last week of treatment, she wheeled herself to the dining area (a distance of about 12 ft) and helped herself to an apple. The nurses' aides reported increased mental alertness, the initiation of conversation regarding basic needs, responses to questions by staff members, and improved cooperation with care-giving tasks, as would be required during bathing. The family practitioner serving the facility agreed that changes in alertness, concentration, orientation, general disposition, feeding, and mobility had occurred and that there was no other explanation for them except the sensory training program. The gains made by Maude were sustained for the 1 year during which follow-up was done.

Discussion

Maude's status from the time of admission to the nursing facility until the initiation of the sensory training program 2 years later remained essentially unchanged. She was disoriented to persons, time, and place, totally dependent in self-care, and hostile when being cared for. Over the 5½ weeks, during which she participated in about twenty, 30- to 45-minute sessions of intensive sensory stimulation, she exhibited impressive gains in orientation, attention, concentration, self-feeding, mobility, communication, and ability to cooperate with care giving. Having made these personal gains, Maude became a person to the staff. Staff members were able to interact with her through general conversation and in physical care in more productive and meaningful ways. This, in turn, provided additional stimulation, although not as focused as the modalities used in the sensory training program, and contributed to the maintenance of program gains.

Sensory training is based on the concept that deficiencies in physical and mental stimulation contrib-
ute to cognitive impairment. The ill and frail elderly have a decreased capacity to respond to environmental stimuli because of disease- and age-related changes in sensory, perceptual, and information-processing mechanisms. Those living in institutions are further deprived because of their constant exposure to bland and monotonous environments, immobility, and inactivity. Common characteristics of sensory deprivation seen in normal persons under experimental conditions are disorientation, irritability, confusion, lethargy, and hallucinatory phenomena (Zubek, 1969). Such symptoms are apt to be exaggerated in severely impaired persons living in stimulus-restricted situations. Regression may be so severe as to be indistinguishable from irreversible dementia. Adequate sensory stimulation plays a vital role in maintaining normal behavior. After the treatment was completed Maude continued to exhibit marked cognitive impairment. Nonetheless, once the “excess disability” hypothesized to have been caused by stimulus deprivation had been reduced through the provision of a stimulus-rich intervention program, remarkable behavioral improvements were discernible. To have achieved such dramatic results in such a severely impaired individual over a short time period was encouraging.

In conducting the sensory training program for these severely regressed participants, therapists noticed that some activities seemed to elicit more responsiveness than others. Music, particularly if it had a marked and brisk rhythm, like a march would, or if it evoked old memories, like ethnic and old popular tunes would, seemed to be most effective. Food of any kind, but especially sweet food, was generally well received. Gross motor actions involving only the body and not including objects often elicited repetitive movement. However, stimuli requiring motor responses, even when objects were involved, were more successful than those requiring verbal responses. These qualities should be considered in future programming for severely regressed persons.

In developing a program for severely regressed participants, two major problems need to be addressed. (a) Identifying the specific behaviors where change is most likely to occur and (b) developing procedures for measuring these changes. Retrospectively, we recognized a need to be more cognizant of facial movements and expressions, eye contact, imitation of movements, posture, appropriate verbalization, and self-initiated action outside the core activities during the sessions. The use of audio and audiovisual recordings is recommended. In addition, systematic feedback from aides on improvements in self-care, reductions in problem behaviors such as screaming, hitting, and nighttime wakefulness, and increased cooperation with care-giving tasks seem to be a promising approach to documenting the outcomes of sensory training.

Despite the improvements seen in Maude, some may well ask, Is it worthwhile to put forth so much effort to achieve such small improvements in task and social behaviors. Our response is that the maintenance of the physical life of a human being carries with it a concomitant responsibility to restore as much cognitive and emotional health as possible. Occupational therapists, with their understanding of attention and arousal and with their skills in eliciting action, are well prepared to plan and implement or supervise sensory training programs with severely regressed individuals.

References


