EMOTIONAL distress, especially anxiety, frustration, and depression, are common problems after stroke and other chronic, disabling illnesses. Estimates of the prevalence of clinically significant levels of depression after stroke range from 26 to 60%. Other common difficulties include overdependence on others, inflexible and rigid thinking, impatience, irritability, impulsivity, denial and lack of awareness of problems, insensitivity to others, and poor social perception. Occasionally, suicidal ideation and paranoid delusions occur.

The emotional reaction to the sensory and motor symptoms is complicated and compounded by the cognitive deficits caused by the lesion: in language, reading, writing, memory, visual perception, planning, judgment, logic, initiative, etc. These cognitive problems can contribute to emotional problems in a number of ways. For example, brain-damaged patients may jump to conclusions after considering only part of the relevant data. Such behavior often leads to misinterpretation of emotions of others and erroneous conclusions. One man observed his wife talking with his roommate in a nursing home and reasoned that they were having an affair and that his roommate wanted to kill him. Impaired initiative and lack of empathy can contribute to insensitive, demanding behavior and a resulting breakdown in interpersonal relationships.

Clinical Description

Depression occurs commonly, either in the acute or chronic stage. Patients with limited awareness of their deficits may avoid depression temporarily, but eventually they will be forced to confront the losses of mobility, physical vigor, occupation, hobbies, and cognitive abilities that accompany their disability. Many questions their self-worth; people value themselves through their activities.

Anxiety is common after stroke and is frequently associated with periods when the patient is left alone, leading to greater dependence and loss of freedom of movement for caregivers. The causes of this anxiety are varied and often unknown. They include projected hostility with resulting fear of abandonment, fear of a medical emergency, need for attention and control of others, and feelings of helplessness.

Irritability and inability to control anger often lead to temper outbursts after stroke. Such outbursts, usually verbal rather than physical, are sometimes viewed with remorse by the patient. In some cases this is the most prominent residual of a mild stroke.

Of all the symptoms caused by brain lesions, lack of awareness of disability (anosagnosia) is perhaps the most fascinating. In the acute stage a patient may deny the existence of a paralyzed limb or identify it as belonging to someone else. Later, during the early rehabilitation phase, a patient may acknowledge the paralysis but deny its implications. For example, a carpenter stated that he could build houses with one hand by using a nail gun in place of a hammer. Long after rehabilitation, a patient may question limitations and disclaim knowledge of reasons for them despite repeated and careful explanations. This questioning of limitations is probably a mild form of anosagnosia.

Family Problems

The greater the alterations in the patient's behavior, cognition, and emotion, the greater the suffering experienced by the family. If a patient is demanding, depressed, irritable, and lacking in the capacity to initiate affection or to empathize with others, it is likely that a loved one will respond with depression, anger, or guilt.

Families often experience similar reactions. Initial relief over survival and hope for full recovery of the patient can be reinforced by religious faith. Disbelief in complete recovery may be seen as irreverent and is beyond the experience of people more accustomed to the recovery from broken bones, surgical incisions, or colds than to the effects of chronic illness and disability. Feelings of entrapment, isolation, and disappointment and despair are reactions when the hoped-for complete recovery does not occur. The spouse may be left without a partner who can participate meaningfully in the activities of life. "It's like having another child in the family" is the all too familiar complaint of many spouses. If a relationship was poor before the stroke, it will not improve under the stress of organic personality change. However, a stroke and ensuing guilt may be the only thing preventing a divorce.

Sexual Concerns

Although sexual concerns are claimed to be of limited or no importance by most stroke patients in the early convalescent phase, sex may become increasingly
important once activities of daily living are mastered. Questions about sex are not always asked by patients, and clinicians must take the initiative in addressing sexual issues.

Sexual functioning often changes after stroke. Libido may be diminished, while erections, ejaculation, female orgasm, and sexual relations may be more difficult and even cease. Premenopausal women may suffer temporary or permanent amenorrhea. However, many patients will retain their pre-stroke sexual capabilities.

Sexual behavior is a function of physiological, pharmacological, and psychological variables. The physiological effects of a stroke on sexual activity have not been determined conclusively. Barbiturates, diazepam, and antihypertensives, such as methylodopa, guanethidine, and propranolol, may cause difficulties, especially for males.

One common worry is that another stroke could be caused by sexual excitement, but reassurance can be provided by telling the patient what is known: that there is only a rare association between stroke and sexual activity. Another common concern is that the stroke patient feels unattractive and undesirable. Often, a cessation in sexual relations will occur if the patient no longer behaves in a seductive or amorous fashion with the sexual partner. The partner will respond in kind, confirming the patient's feeling of unattractiveness.

Physical mobility can necessitate changes in how intercourse is accomplished. Handles on the headboard, side rails, trapezes, footboards, extra pillows, or different positions can facilitate sexual intercourse.

Stroke patients can still achieve satisfaction and intimacy, especially if they existed before the stroke. Some patients can benefit from the reminder that sexual functioning is more than just intercourse; it also includes verbal affection, the quality of the relationship, and simple embraces.

Locus of Lesion and Emotions

There are some known relationships between the locus of brain damage and the type of emotional problems, but much remains to be discovered. Anosognosia and the indifference reaction are more likely after right brain damage than left brain damage, particularly in patients with left neglect. Impulsivity and multiple accidents in the rehabilitation setting are also more characteristic of right brain damage. Brief periods of tears, rage, and distress, termed "catastrophic reactions," are often observed, especially in nonfluent aphasics. However, right brain-damaged patients can also experience rage and frustration over their disability. Depression can occur with lesions to either side but may be delayed in some patients because of initial denial. Flat affect (lack of animation in speech and gesture) is associated with right brain damage, and there is some evidence that comprehension of emotional intonation is also impaired after right brain damage.

In one model of the anatomical organization of affect, areas of the right hemisphere are involved in the comprehension and expression of affect in a way that is analogous to the role of Wernicke's and Broca's areas in the expression and comprehension of language. It has also been hypothesized that left anterior damage has a stronger association with depression than left posterior damage.

Clinical experience suggests that right brain damage is more often associated with serious family problems than left brain damage, communicative impairments notwithstanding. Right brain-damaged patients can be more disruptive of families than aphasics because they are more likely to lose their sensitivity to the needs of others, yet their families have high and unmet expectations because their language is intact.

Assessment and Management

Assessment of emotional problems in brain-damaged patients can be problematic for several reasons. First, they are often poor historians because of aphasia, lack of awareness, or denial. Second, they may be on medications that produce an effect on response time that mimics depression. Third, the interpretation of vegetative signs of depression is complicated by the fact that strokes cause suppression of appetite and easy fatigability and often decrease the frequency of sexual relations, whether or not depression is present. Fourth, there is some disagreement about the definition and significance of the emotional overflow of stroke patients.

Stroke patients may also have defective control over emotional expression, especially crying. This affective display has frequently been labeled as "pseudobulbar affect" or "emotional lability." These terms are misleading, however, because the affect is not usually associated with pseudobulbar palsy after stroke and because the patients usually deny feeling sad when crying is triggered by a stimulus of limited emotional significance. There is dispute as to whether or not pathological crying signals depression regardless of a patient's denial.

Guidelines have been formulated for the diagnosis of depression in brain-damaged patients. The first symptoms may be unexpectedly poor recovery or deterioration, poor cooperation in rehabilitation, and behavioral outbursts. The patient's reported mood may not reflect the true depressive state; assessment of vegetative signs, checking with informants, and distinguishing between flat affect and depressed affect are all crucial to the diagnosis.

The use of the dexamethasone suppression test in psychiatric populations will result in positive findings in about half of the depressed patients with very few false positives. Its usefulness in the diagnosis of depression in stroke patients has been tentatively documented.

The test requires only that a plasma cortisol measurement be taken at 11 PM, just before a 1-mg dose of dexamethasone. Blood samples are again taken at 4 PM and 11 PM the next day. The second sample can be omitted with outpatients for convenience. Non-suppression, plasma cortisol above 5 μg/dl, suggests depression if no other illnesses or medications that
Management of emotional problems can be accomplished through psychotherapy with the patient or the family, pharmacotherapy, or electroconvulsive therapy for severe depression. The cognitive deficits caused by brain damage must be determined by careful assessment of mental status before treatment plans can be made. Unrealistic expectations are all too common when these deficits and their implications go unrecognized.

The family, as the primary support system, should always receive counseling about the patient's limitations and problems. While families may turn a deaf ear in the early stages to information about permanent deficits, they will eventually comprehend such messages. A common error of both clinicians and families is failure to appreciate the effect and the extent of brain damage on current behavior. Many lay people do not realize that, by definition, stroke patients with residual neurological deficits are brain damaged. At the same time predictions about limitations should be phrased in a way that does not deny the hope of the patient and family. Statements about future recovery phrased with uncertainty are less likely to cause despair than certain predictions.

Specific advice and suggestions to the family include information about the following:

1. Cognitive and emotional impairment, which often bewilders lay people.
2. The need to relieve some patients of previous responsibilities, such as paying bills, driving, and working.
3. The need for more explicit displays of affection.
4. The tendency of patients to withdraw from family roles that they can still perform in some fashion. For example, some aphasic patients can continue to provide emotional support to others.
5. The need for the caretakers not to neglect themselves in service of the patient. Guilt feelings can sometimes be relieved with the advice, "Who will take care of him if you get sick?" Regular respite care is often needed, since some caretakers find themselves with the patient around the clock.
6. The increased tendency of stroke patients to become fatigued by activity or distracted by noise.
7. Sexual concerns, as discussed previously.
8. "Poor motivation," which explains disability less often than depression and organic lack of initiative.
9. Illogic, impatience, and impulsivity may not be easily modified by rational arguments.
10. The need for temporary or permanent nursing home placements in some cases.
11. The availability of self-help groups for patients and families, such as American Heart Association Stroke Clubs.

In cases of limited neuropsychological impairment, the depressed, irritable, or anxious patient can be treated with psychotherapy. Treatment of depression may be aimed at decreasing devaluing self-statements by the patient, increasing their schedule of pleasant events, or the more complex issue of increasing independent activity. Anxiety can sometimes be treated with training in self-hypnosis, although defects in concentration and visual imagery abilities make any relaxation therapy difficult. Fear of separation can be treated with a combination of in vivo desensitization, i.e., gradually increasing the length of separation, and self-hypnosis, usually with the aid of an audio tape. Temper outbursts can be treated with a combination of behavioral therapy, relaxation therapy, and medication such as haloperidol.

The greater the neurological and neuropsychological impairment, the more limited the goals of psychotherapy must be. Change can be accomplished through family therapy with the patient absent, and this option must be seriously considered in all cases, especially when patients have difficulties with reasoning or language. The family can receive great benefit from an understanding of the problems and limitations caused by sensorimotor and mental deficits and from permission to take care of their own needs instead of constantly serving the patient.

Treatment of the stroke patient with psychotropic medications is complicated by concurrent illnesses, other medications, and advanced age. Tricyclic antidepressants are contraindicated for elderly patients receiving guanethidine, benzathine, deseridoquine, clonidine, and alpha-methyldopa and should be used with caution with the elderly patient receiving quinidine or procainamide or who has pre-existing cardiovascular disease. Endogenous depression (melancholia), characterized by marked vegetative signs, abnormal biological markers including the dexamethasone suppression test, and pervasive anhedonia, can be distinguished from nonendogenous depression because of the more consistent response of the former to medication. The latter is characterized by normal biological markers and fewer vegetative signs.

Other somatic forms of treatment may be indicated for emotional problems. Haloperidol is frequently used to control delusional and agitated brain-damaged patients. Severe depression after stroke with mild neurological residual has been treated with electroconvulsive therapy, but treatment with medications should be attempted initially.

Conclusion

Although a period of psychological adjustment is needed to cope with the disability of stroke, advice that "you're just going to have to live with it" is not sufficient or appropriate treatment for a patient with emotional problems. Improvement in cognitive, sensory, and motor deficits that can be explained physiologically will probably cease within weeks or months after the stroke, yet later improvement can occur, often because of a healthier emotional outlook. A crisis in a family can be prevented by imparting information about limitations in a hopeful manner and through brief counseling. Psychological and somatic therapies for emotional
EMOTIONAL PROBLEMS AFTER STROKE/Binder

problems are frequently helpful, particularly if the clinician is sensitive to the limitations associated with brain damage.

Acknowledgment
Daniel Casey and Elaine Greif made helpful suggestions during the preparation of the manuscript.

References
Emotional problems after stroke.
L M Binder

Stroke. 1984;15:174-177
doi: 10.1161/01.STR.15.1.174

Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1984 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/15/1/174.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org/subscriptions/