Early Intervention in Patients with Poststroke Depression

An evidence-based review of risk factors, screening, and management.

ABSTRACT: Nearly one-third of stroke survivors experience depression. Poststroke depression is associated with longer hospital stays, poor physical and cognitive recovery, poor quality of life, high caregiver distress, increased risk of recurrent stroke, and higher rates of morbidity and mortality. Poststroke depression, however, often goes unrecognized and untreated because the physical and cognitive repercussions of stroke make it difficult to identify. Nurses are well positioned to recognize poststroke depression, educate patient caregivers, and aid patients who have poststroke depression in their efforts to achieve physical, cognitive, and emotional recovery. This article explains how poststroke depression often manifests, describes associated risk factors, and discusses the screening tools and therapeutic interventions nurses can use to identify and help manage depression in patients following stroke.

Keywords: assessment, depression, nursing interventions, poststroke depression, poststroke rehabilitation, stroke

In the United States, roughly 795,000 new or recurrent strokes occur annually. According to the American Heart Association, about 6.6 million American adults have had a stroke and, by the year 2030, this figure is expected to grow by 3.4 million.[1] Despite rehabilitative efforts to provide poststroke physical, cognitive, and psychological therapy, the development of poststroke depression is often overlooked and the condition undertreated. When not treated effectively, poststroke depression is associated with the following:

- reduced participation in rehabilitation
- decreased functional recovery and increased functional dependence[2]
- poorer recovery of cognitive function[3]
- increased 12- and 24-month mortality rates[4, 5]
- prolonged institutional care[6]
- a shorter interval to ischemic stroke recurrence[7]

Poststroke depression is a multifaceted phenomenon requiring careful nursing assessment and management. This article seeks to familiarize nurses with poststroke depression, its prevalence, risk factors, and common manifestations. It discusses assessments nurses can use to identify depression in patients who

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have had a stroke and describes related nursing interventions.

UNDERSTANDING POSTSTROKE DEPRESSION

Depression is one of the most common neuropsychological consequences of stroke. Pooled data from 61 studies that included more than 25,000 participants with a clinical diagnosis of stroke suggest that roughly 31% of stroke survivors experience depression within the five years following stroke.[8] The onset of depression following stroke varied among studies in this meta-analysis, with frequency ranging from 5% within five days to 84% at three months.[8] Depression may manifest in a variety of ways, including but not limited to the following signs and symptoms[9]:

- persistent feelings of sadness, hopelessness, or emptiness
- diminished pleasure or interest
- sleep disturbances (insomnia or hypersomnia)
- excessive fatigue
- poor concentration
- changes in appetite or weight
- recurrent thoughts of death or suicide, or suicidal plans or attempts
- observable agitation or feelings of being slowed down
- feelings of worthlessness or inappropriate guilt

Poststroke depression is characterized by the same symptoms, and research suggests that when such somatic symptoms as sleep disturbance, fatigue, appetite or weight changes, and poor concentration occur in patients following stroke, they should be evaluated as potential clinical manifestations of depression, rather than simply as consequences of stroke.[10] As Folstein and colleagues demonstrated in the late 1970s, depression is far more common in patients who have had a stroke than in patients with comparable physical limitations due to orthopedic injuries.[11]

ETIOLOGY OF POSTSTROKE DEPRESSION

The mechanisms underlying the development of poststroke depression remain elusive. Many believe poststroke depression to be a form of vascular depression, a phenomenon resulting from small vessel ischemia at the microvascular level.[12] Mast and colleagues, however, found that patients with poststroke depression and those with vascular depression demonstrated different symptom patterns, clinical correlates, and

prevalence rates, suggesting that the two syndromes are unique, each associated with distinct levels of vascular disease.[13]

Proposed mechanisms to explain the relationship between stroke and depression focus on the role of social isolation, inflammatory signaling, hypothalamic–pituitary–adrenal (HPA) axis dysfunction, and autonomic nervous system dysregulation.[14-16] In addition to regulating immune responses, the HPA axis and autonomic nervous system regulate the body's response to stress. Such stressors as depression (and its sequelae) or stroke stimulate the HPA axis, triggering an immune response and activating the sympathetic nervous system, which in turn creates a state of chronic inflammation. This chronic inflammatory state in turn contributes to increasing susceptibility to such inflammatory disease states as stroke.[14]

Wei and colleagues found that patients with both motor and sensory dysfunction at admission were significantly more likely to have poststroke depression than patients with motor or sensory dysfunction alone.[26] In addition to apraxia, speech and language dysfunction are more prevalent in patients with poststroke depression than in patients who are not depressed following stroke.[17] Cognitive impairment, especially executive dysfunction, is also strongly related to poststroke depression.[25]

Social support and social utilization. Development and severity of poststroke depression have been found to be significantly and inversely correlated with social support.[20] Similarly, patients who demonstrate a low degree of social utilization or community participation are more likely to develop poststroke depression.[21, 26]

The extent of physical impairment as measured by dependence in performing activities of daily living is more predictive of poststroke depression than any other factor.

RISK FACTORS FOR POSTSTROKE DEPRESSION

Researchers continue to explore risk factors for poststroke depression, though its development is definitively linked to the following characteristics[14, 17-21]:

- greater stroke severity
- higher levels of physical impairment
- a personal history of depression or anxiety
- a family history of depression
- social isolation
- limited social support
- low levels of serum vitamin D

In addition, it's been hypothesized that women,[22] people with diabetes,[18] or non-Hispanic white people[23] may be at higher risk for poststroke depression, but further research is needed to substantiate these claims.

Greater loss in function, autonomy, and communication may raise the risk of severity of poststroke depression.[17, 24-26] The extent of physical impairment as measured by dependence in performing activities of daily living is more predictive of poststroke depression than any other factor. When De Ryck and colleagues performed an 18-month prospective study of 125 patients following stroke, they found that every unit increase in patient activity as measured by the Stroke Impact Scale was associated with a 5% decrease in the risk of poststroke depression.[24] In a study of 368 patients enrolled within two weeks of stroke onset,

In collaboration with other members of the health care team (physicians; social service workers; and physical, occupational, and speech therapists), nurses should assess patients' social support, living situation, and need for services, encouraging patients to use the resources available to them, and urging caregivers to become involved in patient care as soon as possible following stroke. Patients and caregivers should be asked detailed questions about postdischarge care, including the following:

- home accessibility, including bathroom access and setup
- scheduling of primary caregivers
- financial concerns
- meal preparation
- assistance with medication administration
- physician appointments
- management of chronic conditions (such as hypertension and diabetes) that may have precipitated the stroke
- strategies for maximizing functional independence
- plans for maintaining social interaction with friends for both patient and caregiver
- respite care for caregivers

Recommendations for achieving best outcomes should be outlined by the health care team and reinforced with the patient and caregiver. Caregivers should be taught how to help patients with bathing,

dressing, and using assistive devices, but they also may need advice on caring for themselves and their own psychological well-being. In a 12-month longitudinal study that included 399 caregiver–stroke survivor pairs, caregiver emotional distress was associated with patients' poststroke depression, but not with patients' physical disability.[27]

In addition to providing caregivers with information that helps them manage patients' poststroke depression, nurses can remind caregivers that participating in respite programs that allow them to engage in valued activities can improve their own well-being and that of the patient. Individualized teaching coupled with realistic goal setting can minimize the severity of the patient's depression and reduce caregiver burden.

SCREENING PATIENTS FOR POSTSTROKE DEPRESSION

In 2013, the Joint Commission announced that care certification for comprehensive stroke centers would require institutions to routinely screen stroke survivors for depression prior to discharge.[28] Many of the tools used to screen for general depression have also been used to screen for poststroke depression. Additionally, several researchers have focused on designing scales and tools with the specific purpose of predicting a patient's risk of developing depression in the immediate poststroke period. In selecting the best screen or predictive tool to use for this purpose in a particular clinical setting, as well as for use in ongoing assessment, nurses must consider such factors as patient characteristics and the time required to complete and

Table 1. Screening Tools for Poststroke Depression[29-36]

Tool	Verbal Capacity	Rater	Time to Complete	Description	Languages
Patient Health Questionnaire 9 (PHQ-9)	Nonaphasic	Self	> 5 minutes to complete and to score	A 9-item questionnaire useful for screening, diagnosing, and monitoring depression frequency and severity	English and 30 + others
Patient Health Questionnaire 2 (PHQ-2)	Nonaphasic	Self	> 5 minutes to complete, seconds to score	A 2-item questionnaire consisting of the first 2 questions of the PHQ-9; useful for depression screening only	English and 30 + others
Hospital Anxiety and Depression Scale (HADS)	Nonaphasic	Self	5 minutes to complete and to score	A 14-item anxiety and depression screening scale with 7 items related to anxiety and 7 to depression; diagnostic cutoff (normally ≥ 8) is lowered in patients with stroke	115, including all major European languages, Arabic, and Chinese
Beck Depression Inventory–Fast Screen (BDI-FS)	Nonaphasic	Self	Up to 10 minutes to complete, less than 5 minutes to score	A 21-item multiple choice questionnaire measuring depression severity	
Stroke Aphasic Depression Questionnaire 10 (SADQ-10)	Aphasic	Nurse/ caregiver	3–4 minutes	A 10-item questionnaire to detect depression in aphasic stroke patients	Several, including Spanish, Italian, Japanese, and French
Stroke Aphasic Depression Questionnaire 10–Hospital version (SADQ-H10)	Aphasic	Nurse	2–4 minutes	A 10-item questionnaire to detect depression in hospitalized patients	Several, including Spanish, Italian, Japanese, French, Swedish, and German
Signs of Depression Scale (SODS)	Aphasic	Nurse	> 1 minute	A 6-item questionnaire to detect depression	

score the assessment (see Table 1[29-36]). Although patients with aphasia or other cognitive or language deficits are at higher risk for poststroke depression, some screening and assessment tools are inappropriate for use in this population.

Screening nonaphasic patients. Ideally, patients should be screened for depression as soon as possible after a stroke; for nonaphasic patients who have experienced ischemic stroke or intracerebral hemorrhage, it's often feasible to conduct such screening within the acute care setting.[37, 38] To screen for poststroke depression in a timely manner within the confines of a limited acute care hospital stay, de Man-van Ginkel and colleagues developed a clinical predictive model that uses information from the patient's medical history, psychiatric history, and the "dressing" item from the Barthel Index.[37] This model—the Post-Stroke Depression Prediction Scale (DePreS)—is a valid tool for predicting risk of poststroke depression in a hospital setting within one week of a stroke.[37] Using this scale, a medical history of hypertension or angina, a history of depression or other psychiatric disorders, and dependency on help in dressing are predictive of poststroke depression. While immediate assessment is imperative, ongoing assessment is also necessary, especially in patients who demonstrate persistent emotional lability, lack motivation, or fail to progress in the rehabilitative process. In the inpatient setting, screening should be performed daily. Before discharge, nurses should teach caregivers the signs and symptoms of poststroke depression, impressing on them that depression can delay patient progress, increase caregiver burden, and raise the risk of stroke recurrence.

Several depression screening tools, which require no specialized training, can be used by nurses in the clinical setting to identify poststroke depression with accuracy in patients who do not have aphasia.[39] Before administering a self-rating scale, nurses should assess their patients' ability to read and understand the scale. If a patient is unable to read but able to understand the questions, the nurse can read the questions aloud to the patient and score the results.

It's been suggested that self-rating instruments may be more useful than ratings provided by family caregivers, as proxies often score patients as more severely depressed than patients would score themselves, and their scoring is potentially confounded by their own depression.[40] But caregivers are often well positioned to identify symptoms of poststroke depression that patients hide from their health care providers. For this reason it's important for nurses to seek information about the patient's mood and behavior from both the patient and the caregiver, recognizing both the potential insights and the potential biases caregivers may provide.[41]

Screening aphasic patients. There are limitations to the meaningful use of depression rating scales in aphasic patients, as most require language skills. The challenge of verifying understanding in aphasic patients may undermine the validity of the assessment.[34]

A review of six depression screening instruments available for use in patients with stroke-related aphasia found that only three have acceptable feasibility in the clinical setting: the 10-item Stroke Aphasic Depression Questionnaire, the hospital version of the 10-item Stroke Aphasic Depression Questionnaire, and the Signs of Depression Scale.[34] However, most patients' limited acute care hospital stay immediately following stroke makes it difficult to use these instruments in the immediate poststroke period.[37] In such cases, nurses may use the DePreS to predict risk of poststroke depression.

INTERVENTIONS

Pharmacologic management of poststroke depression includes traditional antidepressants, particularly selective serotonin reuptake inhibitors (SSRIs), which may be used prophylactically—not only to prevent depression following stroke, but also to improve motor function and (because of their antiplatelet properties) reduce the risk of subsequent vascular disease.[42, 43] Additionally, the use of fluoxetine (Prozac, Sarafem) or nortriptyline (Pamelor) has been shown to improve stroke-related cognitive deficits[44] and increase survival after stroke, in patients both with and without a diagnosis of poststroke depression.[45]

Five major classes of drugs are used to treat poststroke depression: SSRIs, serotonin–norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs), and

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Table 2. Antidepressant Medications for Poststroke Depression[46, 47]

Drug Class	Class Considerations and Possible Risks	Drug Name	Adverse Effects	Additional Uses
SSRIs	• When combined with MAOIs, serotonin syndrome may occur • Possible risks: suicide in children and young adults, hyponatremia, GI bleeding	Fluoxetine (Prozac, Sarafem)	Sexual dysfunction, nausea, weight gain, headache, insomnia, nervousness, anxiety	OCD, bulimia nervosa, panic disorder; off-label uses include PTSD, social anxiety disorder, and ADHD
		Citalopram (Celexa)	Nausea, somnolence, dry mouth, erectile dysfunction	Off-label uses include panic disorder, social and generalized anxiety disorders, OCD, PTSD, and PMDD
		Escitalopram (Lexapro)	Nausea, somnolence, insomnia, sweating, fatigue	Generalized anxiety disorder; off-label uses include panic disorder, OCD, PTSD, and PMDD
		Sertraline (Zoloft)	Headache, tremor, insomnia, agitation, nervousness, nausea, diarrhea, weight gain, sexual dysfunction	Panic disorder, OCD, PTSD, social anxiety disorder, and PMDD; off-label uses include generalized anxiety
SNRIs	Possible risk of suicide in children and young adults	Venlafaxine (Effexor XR)	Nausea, headache, anorexia, nervousness, insomnia, somnolence, sexual dysfunction, hypertension	Generalized anxiety, social anxiety, and panic disorders
		Duloxetine (Cymbalta)	Nausea, dry mouth, insomnia, somnolence, constipation, fatigue, blurred vision, sweating	Fibromyalgia, generalized anxiety, and diabetic and musculoskeletal pain; off-label use for stress urinary incontinence
TCAs	Possible risks: seizure, hypomania, cardiac toxicity, suicide in children and young adults	Amitriptyline	Sedation, hypotension, anticholinergic effects	Off-label uses include fibromyalgia, neuropathic pain, and insomnia
		Nortriptyline (Pamelor)	Sedation, hypotension, anticholinergic effects	Off-label use for chronic neurogenic pain
MAOIs	• Interferes with the breakdown of tyramine (in many foods and beverages, including aged cheeses, cured meats, alcoholic and caffeinated beverages), potentially causing hypertensive crisis • Interacts with numerous drugs • Possible risk of suicide in children and young adults	Phenelzine (Nardil)	CNS stimulation, orthostatic hypotension, hypertensive crisis	
Atypicals	• May lower seizure threshold • Increase sexual desire and function in both women and men • Should not be used concurrently with CNS depressants • Possible risks: dysrhythmias, prolonged QT interval, priapism	Bupropion (Wellbutrin and others)	Agitation, headache, dry mouth, weight loss, weight gain, nausea, vomiting, tremor, hypertension	Seasonal affective disorder and smoking cessation; off-label use for ADHD in adults and to increase sexual desire in women
		Mirtazapine (Remeron)	Somnolence, weight gain, increased appetite, elevated cholesterol	Off-label use for panic disorder, generalized anxiety disorder, and PTSD
		Trazodone (Oleptro)	Sedation, hypotension, nausea	

ADHD = attention deficit–hyperactivity disorder; CNS = central nervous system; GI = gastrointestinal; MAOIs = monoamine oxidase inhibitors; OCD = obsessive–compulsive disorder; PMDD = premenstrual dysphoric disorder; PTSD = posttraumatic stress disorder; SNRIs = serotonin–norepinephrine reuptake inhibitors; SSRIs = selective serotonin reuptake inhibitors; TCAs = tricyclic antidepressants.

atypical antidepressants (see Table 2[46, 47]). Each class of drugs works in a unique way to increase the availability of monoamine neurotransmitters at the synaptic junction, which alleviates the severity of depression. The SSRIs, SNRIs, and atypical antidepressants, such as bupropion (Wellbutrin and others) and mirtazapine (Remeron), are the first-line therapy choices. Because of the less favorable toxicity profile of TCAs and MAOIs, these drugs are typically reserved for those who respond poorly to first-line therapy.[48]

Exercise can reduce depressive symptoms and improve quality of life in patients with poststroke depression.

A thorough patient history and ongoing nursing assessment are key to identifying the best treatment for patients with poststroke depression and to managing both the depression and any adverse pharmacologic effects. Common adverse effects of antidepressants include weight gain, central nervous system (CNS) stimulation or sedation, sexual dysfunction, anticholinergic effects, orthostatic hypotension, and gastrointestinal upset.[47] Since a common manifestation of poststroke depression is excessive fatigue, an SSRI, such as fluoxetine, or an atypical antidepressant, such as bupropion—both of which are known to stimulate the CNS—may be prescribed in patients with overwhelming fatigue and no known risk of seizure. The atypical antidepressant mirtazapine, which has sedative effects, may be used by patients with insomnia. Bupropion, which is known for increasing libido, may be a good choice for patients whose poststroke depression has caused sexual dysfunction. The SNRI duloxetine (Cymbalta) is indicated for chronic pain in addition to depression, and the TCAs are used off label to manage chronic pain.[47]

It is essential to be familiar with the unintended—and potentially adverse—effects of antidepressants and to reinforce the patient's understanding of them. It's also important to inform patients that, while antidepressant effects may begin within one to three weeks of initiating treatment, the full effects of the drugs may not be felt until week 12. Understanding this timeline will help patients manage their expectations and remain alert for changes in their response to the drugs. Patients should be advised not to discontinue antidepressant therapy abruptly, but rather to taper off the medications slowly under the supervision of their health care provider.

Although pharmacologic antidepressant therapy is effective in treating poststroke depression, it is not without risks. Of special concern for patients who have had a stroke is the elevated risk of hemorrhage and hemorrhagic stroke in patients taking SSRIs.[49, 50]

Nonpharmacologic management. Strategies such as motivational interviewing, life review therapy, behavioral–psychosocial support programs, and structured physical exercise, used in conjunction with usual care, including antidepressant therapy, have been shown to improve symptoms of poststroke depression.[51-57]

Motivational interviewing is a talk-based therapy designed to help patients modify their behaviors by strengthening their motivation for and commitment to specific goals.[58] Following stroke, this intervention may be used to encourage both self-efficacy and optimism.[57] The interviewer asks open questions, listens reflectively to the patient, offers advice with permission, and provides affirmation and support. Motivational interviewing requires training, but nurses who frequently care for patients with poststroke depression may find it worthwhile, as this therapy can improve patient outcomes. Motivational interviewing can begin soon after a stroke (in one study, the process was initiated within the first week) and sessions can be completed in 30 to 60 minutes.[57]

Life review therapy. The "life review" was first described by Butler in the 1960s as a naturally occurring process through which older adults reminisce about past experiences and unresolved issues.[59] According to Butler, the life review may contribute to depression or produce serenity and wisdom. Based on this idea, life review therapy seeks to help patients use the life review process to tap the insights and knowledge they've acquired throughout life to help them cope with their current struggles. In a small study of 14 patients recovering from stroke in a rehabilitation center, three one-hour life review therapy sessions led by the nurse researcher resulted in significantly lower levels of depression and higher levels of life satisfaction among the seven patients in the intervention group compared with the seven in the control group.[52] Despite the small sample size, the study supported the feasibility of administering life review therapy in a rehabilitation setting. Nurses administering life review therapy may use each session to focus on a particular period in the patient's life (childhood, adolescence, or adulthood) or on major milestones (personal or professional achievements, important relationships, birth of children, or personal losses).

Behavioral–psychosocial support programs have been shown to reduce poststroke depression symptoms in both the short and the long term.[54, 55] In a randomized controlled trial of 101 patients recovering from a stroke that had occurred within the past four months, Mitchell and colleages demonstrated the efficacy of a nurse-delivered behavioral–psychosocial intervention

as an adjunct to usual care, which included antidepressant therapy as prescribed by the stroke care or primary care provider.[54, 55] All patients received information about stroke recovery and depression. Those in the intervention group met with the nurse interventionist individually (though they could opt to have a family member or caregiver join the sessions) nine times over eight weeks. During the sessions, patients were taught individualized problem-solving strategies and ways to identify and overcome negative thought patterns. The goal of treatment was to increase the patients' experience of pleasant social and physical activities to counteract depressive symptoms. Severity of depression in the intervention group was significantly reduced at one year, compared with that in the control group, and significantly more patients in the intervention group were in remission both immediately following treatment and at one year.[54, 55]

This study highlights the importance of recognizing depressive symptoms and developing a plan for altering maladaptive behavior and negative thought patterns. Nurses can teach patients and caregivers how to recognize symptoms and develop effective methods for controlling them. They can help patients discover ways to maximize their functional capacity within the confines of their poststroke disabilities and to identify pleasant activities and social interactions in which they can realistically participate, thereby countering the adverse effects of social isolation.

Physical activity. Moderate physical activity, defined for adults with disabilities as 150 minutes of moderate physical activity per week, 75 minutes of vigorous aerobic activity per week, or an equivalent combination of the two,[60] has been shown to lower the risk of depressive symptoms and major depressive symptoms by 74% and 89%, respectively.[51] Nurses can encourage physical activity among patients who have had a stroke by reinforcing its importance in poststroke recovery. Structured exercise has been found to reduce depressive symptoms and improve quality of life in patients with poststroke depression, while lessening stroke-related impairment and functional limitations in both depressed and nondepressed patients recovering from stroke.[53, 56]

FUTURE RESEARCH

Further research is required to identify all the mechanisms underlying the development of poststroke depression. While vitamin D deficiency has been recognized as a risk factor,[19, 61, 62] studies on the effect of vitamin D supplementation have been disappointing, with the supplement having neither improved nor worsened depressive symptoms in seven randomized controlled trials.[63]

Because of the nature of aphasia, currently available screening tools for depression in aphasic patients have not yet been proven valid and reliable.[34] More research is needed to develop valid and reliable means of screening patients with poststroke aphasia. Nursing research on the impact and feasibility of providing motivational interviewing and life review therapy within the clinical setting to patients with poststroke depression may be beneficial in generating strategies to help patients develop coping styles. Likewise, it would be helpful to test empirically whether early recognition in the acute care setting of risk factors for poststroke depression could serve a preventive purpose. ▼

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