
Post-Stroke Depression/Rehabilitation/Caregivers' role

Often overlooked and undertreated, post-stroke depression (PSD) can occur in at least one-third of stroke survivors. Nurses and other formal caregivers can help by recognizing and responding to those who become depressed after experiencing a stroke. This article identifies the incidence and prevalence of post-stroke depression, describes assessment considerations to detect the disorder and outlines and comments on a number of treatment and care approaches.

By Dr. Sherri Melrose

Post-Stroke Depression: How can nurses help?

Emotional disturbances following the trauma of experiencing a cerebral vascular accident or stroke are not unexpected. Stroke survivors often feel angry, fearful and experience a deep sense of loss. Rehabilitating from the devastation of paralysis, sensory disturbance, language deficits and problems with thinking and memory is seldom straightforward. All too often, however, the psychiatric illness of post-stroke depression is overlooked and undertreated within the rehabilitative process.

Depression

The Diagnostic and Statistical Manual of Mental Disorders DSM 5 (APA - American Psychiatric Association, 2013) categorizes post-stroke depression (PSD) as a mood disorder due to a general medical condition. Criteria include:

- a persistent period of depressed mood;
- diminished interest or pleasure in most activities; and
- significant impairment in social, occupational, or other important areas of functioning (APA, 2013).

Sleep disturbances, vegetative symptoms and social withdrawal are especially problematic (Llorca, et al., 2015).

Concerns closely associated with the stroke itself, such as hypochondriac issues, lethargy, diminished energy, weight loss, insomnia, poor concentration and psychomotor alterations are often present (Teasell and Hussein, 2014).

It has been estimated that major depression

is present in 15% of stroke survivors, with minor depression present in an additional 28% (Roger and Johnson-Greene, 2008).

Incidence and prevalence

The incidence, or number of new cases of post-stroke depression, ranges from 5% to 63% (Johnson, et al., 2006). The prevalence, or number of cases, of post-stroke depression in a population ranges from 25% to 79% (Thomas and Lincoln, 2008). The wide range of incidence and prevalence rates is related to methodological differences among studies, inconsistent definitions of depression, use of different depression screening instruments, excluding stroke patients with physical or cognitive impairments, and assessing depression at different time intervals post-stroke. Despite these variances, at least 31% of survivors of strokes of all types can be expected to experience a diagnosable clinical depression (Hackett and Pickles, 2014) - with more than half of these neither diagnosed nor treated (Llorca, et al., 2015).

Risk factors for PSD

Risk factors for post-stroke depression (PSD) include a history of depression, increased stroke severity, and post-stroke cognitive or physical impairment. The condition is more common among those living in a rehabilitation setting than in the general community (Johnson, et al., 2006).

Stroke survivors with aphasia are at high risk for post-stroke depression (Johnson, et

al., 2006), as are those with reduced mobility (De Ryck, et al., 2013).

Despite an abundance of research, the influence of stroke location on the risk for developing post-stroke depression has not been determined (Teasell, Foley, Salter, et al., 2008). Whether the stroke location was ischemic, hemorrhagic or a supratentorial, infratentorial, lacunar, cardioembolic, cortical, subcortical or subarachnoid stroke subtype, the severity of a stroke is the strongest predictor of post-stroke depression (Johnson, et al., 2006).

Etiology

The etiology of post-stroke depression is not well understood. Researchers have hypothesized that increased production of pro-inflammatory cytokines (small proteins known to promote systemic inflammation) due to brain ischemia (blood restrictions) in cerebral areas is linked to the pathogenesis of mood disorders (Spalletta, et al., 2006).

With increased inflammation, particularly in the limbic areas, serotonin can become depleted. Serotonin, a neurotransmitter, regulates level of alertness, the ability to categorize information, and one's perception of well-being and happiness. Lack of serotonin, or disruption of the serotonergic system when neuronal synapses are injured or destroyed, may lead to post-stroke depression (Llorca, 2015).

Post-stroke depression has been associated with poor recovery and rehabilitation response, reduced social functioning, great-

er use of healthcare services, increased risk of subsequent cardiac and stroke events (Mitchell, et al., 2009), and greater mortality rates (Hornsten, 2013; Meader, et al., 2014).

Although the negative and distressing impact of depression on stroke survivors is well recognized, health care professionals often fail to respond to this distress, both at an early stage after the stroke and later on in the recovery process when the distress has become established as a mood disorder (Kearins and Luciano, 2015; Watkins and French, 2009). This failure by health care professionals to respond may be related to difficulty assessing PSD and understanding treatment approaches that can help.

Measurement considerations

Assessing post-stroke depression is particularly challenging in that vegetative symptoms such as fatigue, loss of appetite, insomnia, or psychomotor retardation may be related directly to the stroke disorder and are also part of the criteria for diagnosing depression (Berg, et al., 2009).

One in three stroke survivors will experience aphasia, defined as impaired language comprehension and expressive abilities; yet, aphasic individuals are often excluded from research examining PSD (Townend, et al., 2007). Aphasia and other cognitive problems make it almost impossible to adequately assess depression with interview questions and observation alone (Roger and Johnson-Green, 2009).

Despite these challenges, nurses can invite family members and all staff members who are or have been involved with a stroke survivor's care to share their observations of the individual's mood. When stroke survivors themselves cannot speak about their feelings of devastating sadness, nurses must speak for them.

Knowing that 10% to more than 50% of individuals who suffer a stroke will experience a clinical depression within the first three months, and that the depression can last for several years if left untreated (Johnson, et al., 2006), recognizing and responding to depression is a priority for nurses and formal carers.

Assessment scales

Nurses can use scales or questionnaires to assess post-stroke depression. Although

Table 1
Geriatric Depression Scale - Short Form

Choose the best answer for how you have felt over the past week:

1. Are you basically satisfied with your life? Yes/No
2. Have you dropped many of your activities and interests? Yes/No
3. Do you feel that your life is empty? Yes/No
4. Do you often get bored? Yes/No
5. Are you in good spirits most of the time? Yes/No
6. Are you afraid that something bad is going to happen to you? Yes/No
7. Do you feel happy most of the time? Yes/No
8. Do you often feel helpless? Yes/No
9. Do you prefer to stay at home, rather than going out and doing new things? Yes/No
10. Do you feel you have more problems with memory than most? Yes/No
11. Do you think it is wonderful to be alive now? Yes/No
12. Do you feel pretty worthless the way you are now? Yes/No
13. Do you feel full of energy? Yes/No
14. Do you feel that your situation is hopeless? Yes/No
15. Do you think that most people are better off than you are? Yes/No

A score > 3 points ('Yes' answers) is suggestive of Post Stroke Depression.

A score > 5 points is suggestive of depression.

A score > 10 points, almost always indicative of depression.

Source: Sheikh, J. and Yesavage, J., *Geriatric Depression Scale: Recent findings and development of a shorter version*, 1986. In: Brink, T L. (ed.), *Clinical Gerontology: A guide to assessment and intervention*. New York: Howarth Press.

scales, also referred to as instruments, are used extensively in research studies, they are underused in routine clinical care. Scales can be constructed as:

1. Self reporting, where stroke survivors provide answers themselves; and
2. Observational, where caregivers record observations.

Before implementing any kind of scale, it is necessary to review the original publication where the instrument was introduced and to investigate the kind of reliability and validity testing that has been done.

(1) Self-reporting scales

Self-report scales offering reliable and valid assessment of PSD include:

- The Beck Depression Inventory-BDI (Beck, Ward, et al., 1961)
- The Hamilton Rating Scale for Depression (Berg, et al., 2009)
- The Center for Epidemiologic Studies Depression Scale (Radloff, 1977)
- The Patient Health Questionnaire PHQ-9 (Kroenke, et al., 2001), and
- Geriatric Depression Scale-Short Form (GDS-SF) (Roger and Johnson-Greene, 2009).

See Table 1, Geriatric Depression Scale - Short Form.

The Beck Depression Inventory - BDI (Beck, Ward, et al., 1961), originally developed to assess depression in psychiatric settings, requires specialized training and is copyrighted by the American Psychological Association, so may not be used freely.

The Hamilton Rating Scale for Depression - Ham-D (Hamilton, 1960) is often used in clinical trials to measure efficacy of anti-depressant medication and is appropriate for adults of all ages.

The Center for Epidemiologic Studies Depression Scale - CES-D (Radloff, 1977) is used extensively in epidemiologic research to investigate depression in the general adult population.

The Patient Health Questionnaire PHQ-9 (Kroenke, et al., 2001) is a brief and easy-to-use instrument that nurses found reliable and valid when used with stroke patients who are able to communicate adequately (De Man-van Ginkel, Gooskens, et al., 2012).

The Geriatric Depression Scale-Short Form (Sheikh and Yesavage, 1986), is used widely and efficiently with adults over 65,

and with a cut-off score of 3, is currently recommended for post-stroke depression screening (Roger and Johnson-Greene, 2008).

Observation scales

Observation scales that offer reliable and valid assessment of PSD include:

- The Clinical Global Impression Scale-CGIS (Berg, et al., 2009); and,
- The Signs of Depression Scale-SOS (Lightbody, et al., 2007). (See Table 2)

The Clinical Global Impression Scale - CGIS (Guy, 1976) requires clinicians to have psychiatric experience as they compare the individual being assessed to typical cases.

The Signs of Depression Scale - SOS (Hammond, et al., 2000), initially developed as a tool for screening depression in elderly medical patients, is now emerging as a relevant, easy to complete tool specifically for nurses and formal caregivers to use in the assessment of post-stroke depression (Lightbody, et al., 2007).

Scales such as the *Visual Analog Scale*, where cartoon characters and symbols are used instead of written questions, were not recommended (Berg, et al, 2009). Similarly, scales such as the *Stroke Aphasic Depression Questionnaire* and the *Aphasic Depression Rating Scale* were found to have limited reliability and validity at present (Lightbody, et al., 2007).

When assessing aphasic individuals, nurses can point to 'yes' or 'no' choices and record non-verbal responses on more established scales. Involving family members and staff caregivers as informants is an adaptive strategy for assessing depression even when aphasia is present (Townend, Brady and McLaughlan, 2007).

With the exception of the Beck Depression Inventory, all of the scales mentioned are readily available on the internet simply by typing in the name to a search engine such as Google or Bing, etc. They can be printed out, completed at different times and included on stroke survivors' files.

Traditionally, nurses/formal caregivers have not always included scales in the assessment processes; and yet, scores on universally recognized depression scales can provide strong advocacy data for treating the debilitating symptoms of PSD.

Table 2
Signs of Depression Scale

1. Does the patient sometimes look sad, miserable or depressed? YES/NO
2. Does the patient ever cry or seem weepy? YES/NO
3. Does the patient seem agitated, restless or anxious? YES /NO
4. Is the patient lethargic or reluctant to mobilise? YES/NO
5. Does the patient need a lot of encouragement to do things for him/herself? YES/NO
6. Does the patient seem withdrawn, showing little interest in the surroundings? YES/NO

Score 1 for 'yes' and 0 for 'no'.

A score > 2 points is suggestive of depression

Source: Hammond, M.F., O'Keeffe, S.T. and Barer, D.H., Development and validation of a brief observer-rated screening scale for depression in elderly medical patients, *Age and Ageing*; 29(6); p.511-515; 2000.

Crying behaviour

Identifying the distinctions among crying behaviours is an important aspect of assessing post-stroke depression (Melrose, 2010). While crying is an expected coping response, frequent and sustained crying can also be an indication of depression.

Observing crying responses in relation to whether a motivating stimulus or trigger is present is a critical distinction. For example, when crying is congruent with discussion of, or private reflection on, sadness, the crying behaviour is a reflection of mood. And, when congruent crying occurs often and continues for long periods, depression is likely present (Melrose, 2010).

However, other crying behaviours, such as pathological crying, emotional incontinence and catastrophic reactions are disorders of emotional expression rather than symptoms of a depressive mood disorder.

Pseudobulbar affect (PBA) or pathological crying (or pathological laughing) occurs without any apparent triggering stimulus and may be related to damage in the motor areas of the cerebral cortex and brainstem (Cichoń, et al., 2015; Parvizi, et al., 2009).

Emotionalism or emotional incontinence occurs when the person has difficulty controlling their emotional behaviour and may suddenly start crying (or, less commonly, laughing) for no apparent reason and may be related to damage in the right cerebral hemisphere (House, et al., 2004).

Catastrophic reactions are expressed when crying is accompanied by anxiety, aggressive behaviour, swearing or withdrawing,

and may be triggered by a task made difficult or impossible by a neurologic deficit, such as trying to move a hemiplegic (paralytic) arm (Yudofsky and Hales, 2008).

Pathological crying, emotionalism and catastrophic reactions all often co-exist with post-stroke depression, but they are separate conditions and require separate treatment approaches (National Stroke Association, 2011). While facial expressions and the presence of tears may appear similar among all types of crying behaviours, assessing the congruence between crying and a mood or affect of sadness will help distinguish the diagnosis of PSD.

Previous coping

Given the difficulty of singling out features of PSD from neurologic deficits caused by the stroke itself, the importance of understanding how the individual has coped in previous crisis situations becomes clear. Asking individuals who are able to speak to describe situations where they have tackled overwhelming challenges in the past will illustrate the kinds of coping strengths they value. Similarly, asking family members to paint a picture of how the stroke survivor coped with previous difficulties will reveal important insights.

Assessment of previous coping must also include inquiring about past responses to loss, typical expressions of anger and anxiety as well as patterns of crying. Knowing that individuals previously diagnosed with depression are significantly at risk for developing post-stroke depression, assessing

previous psychiatric history, including both treatments that worked and those that did not, is critical.

Treatment approaches

Prevention

Given the high incidence and prevalence of post-stroke depression, including immediate and continued assessment of depression once a stroke has occurred, is an essential feature of any treatment protocol. Despite the challenge of aphasia and other cognitive impairments, early interviews with family can help distinguish expected grief reactions from clinical depression.

Completing 'self report' and 'observational scales' at different times will offer data that can be used to measure the depression as well as the stroke survivor's response to treatment. And, before depressive symptoms develop into a mood disorder, prompt initiation of antidepressant medications, therapy and alternative treatment approaches can help.

Antidepressant medication

Preventing post-stroke depression with prophylactic anti-depressant medication (i.e., Escitalopram), and problem solving therapy within three months of a stroke, has been found to reduce the rate of post-stroke depression (Mikamin, et al., 2011; Robinson, et al., 2008). Stroke survivors receiving either kind of treatment were less likely to develop depression compared to those on placebo. For Escitalopram, the risk was 4.4 times less than on placebo; for problem-solving therapy it was 2.2 times less (Robinson, et al., 2008).

Escitalopram is a Selective Serotonin Reuptake Inhibitor or SSRI anti-depressant. Robinson and colleagues' seminal work with post-stroke depression has generated considerable interest in the merit of prescribing SSRI medication as soon as a stroke has occurred (Robinson, et al., 2008). Similarly, mirtazapine, a tetracyclic antidepressant, has been found effective in preventing and treating post-stroke depression (Niedermaier, et al., 2004).

Once post-stroke depression is determined to be present, other SSRI anti-depressant medications, such as sertraline, citalopram and nortriptyline, have demonstrated efficacy (Starkstein, Mizrahi and Power, 2008).

An important consideration with any pharmacological treatment of the medically ill is that the doses required to achieve therapeutic blood levels may be lower or even half the usual dose and may take time to titrate. SSRI antidepressants may take longer to absorb, distribute, metabolize and be eliminated (Austin and Boyd, 2014). Common side effects include nausea, sedation, dizziness, somnolence, headache, weight gain, and, when first started, excitability (Ibid., 2014). Taking SSRI's with meals to reduce gastro-intestinal disturbances is recommended (Antai-Otong, 2009).

While many stroke survivors respond to antidepressant therapy with a decrease in their vegetative symptoms in about a week, others may take longer. If antidepressants are found to have no effect after four to six weeks, their discontinuation should be tapered rather than abrupt (Coggins, 2015). Simultaneously monitoring side effects of antidepressant medications, post-stroke depression symptoms, stroke deficits and any existing medical conditions is not easy.

Therapy

Therapeutic intervention to address potential or established depression must also become part of any post-stroke care protocol. Actively involving family members early and co-ordinating practical and psychosocial support for both clients and their families is essential (Vallury, Jones and Gray, 2015). Problem solving therapy, where mental health professionals meet with stroke survivors to facilitate awareness of problems and help come up with solutions, as Robinson (2008) and colleagues demonstrated, can be helpful.

Similarly, brief psychosocial behavioural intervention, where stroke survivors are provided with opportunities to interact with educational materials and interventionists, can also help.

One program implemented by a nurse (Mitchell, et al., 2009) involved giving participants written stroke recovery materials from the American Stroke Association, including information about depression, and meeting with a study interventionist once a week for eight weeks. Participants completed a medication diary and were encouraged to include family members and caregivers in the meetings. The intervention, in combination with antidepressants, signifi-

cantly reduced post-stroke depression and the effect was sustained for up to two years (Mitchell, et al., 2009).

Alternative approaches

Acupuncture shows promise in treating post-stroke depression, an approach that has fewer side effects (He and Shen, 2007; Qian, Zhou, et al., 2015).

Chinese herbs, such as the herbal supplement, 'Free and Easy Wanderer Plus (FEWP)', are tolerated well and show good efficacy and safety in post-stroke depression (Li, Wang, et al., 2008).

Repetitive transcranial magnetic stimulation, or rTMS, may be an effective and safe alternative for post-stroke survivors who do not respond to antidepressants (Jorge, et al., 2004).

Music listening during the early post-stroke stage can enhance cognitive recovery and prevent negative mood (Särkämö, et al., 2008).

Electroconvulsive, or ECT therapy, may also be an effective treatment (Teasell, et al., 2008; 2014).

Conclusion

Post-stroke depression is a very real and very serious problem that complicates recovery for more than a third of stroke survivors. Nurses/caregivers can help by recognizing the condition as a psychiatric illness and responding with an understanding of treatment approaches. Stroke survivors living in a rehabilitation setting and severely impaired by stroke, and those who are aphasic or immobile, are especially vulnerable.

DSM-5 criteria for depression (APA, 2013), and scales such as the Geriatric Depression Scale (GDS), or the Signs of Depression Scale (SODS), offer reliable and valid measurement and can be readily included in routine nursing assessments. Similarly, working with family and caregivers to distinguish crying that is congruent with a mood of sadness is important.

Knowing about the strengths survivors demonstrated when coping with previous crises will help support their present efforts. Treatment such as antidepressant medications, therapy and alternative approaches have all demonstrated efficacy.

As nurses and formal caregivers continue to learn about post-stroke depression and

seek out ways to understand the condition more fully, other opportunities to reach out and help will emerge.

References

- APA - American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*; 2013; 5th Edition (DSM-5); American Psychiatric Association, Arlington, Virginia.
- Antai-Otong, D., *Psychiatric nursing pocket guide*; 2009; Jones and Bartlett, Sudbury, Massachusetts.
- Austin, W. and Boyd, M., *Psychiatric and mental health nursing for Canadian practice*, (3rd ed.); 2014. Philadelphia: Lippincott, Williams and Wilkins.
- Beck, A., Ward, H., Mendelson, M., Mock, J. and Erbaugh, J., An inventory for measuring depression, *Archives of General Psychiatry*; 4; p.53-63; 1961.
- Berg, A., Lonnqvist, J., Palomaki, H. and Kaste, M., Assessment of depression after stroke: A comparison of different screening instruments, *Stroke*; 40(2); p.523-529; 2009.
- Cichoń, N., Bijak, M., Miller, E., Niwald, M. and Saluk, J., Poststroke depression as a factor adversely affecting the level of oxidative damage to plasma proteins during a brain stroke, *Oxidative Medicine and Cellular Longevity*; vol. 2015; Article ID: 408745; 2015. **See:** <<http://www.hindawi.com/journals/omcl/2015/408745/>>.
- Coggins, M., Poststroke depression, *Today's Geriatric Medicine*; 8(5); p.6; 2015.
- De Man-van Ginkel, J., Gooskens, F., Schepers, V., Schuurmans, M., Lindeman, E., et al., *Screening for poststroke depression using the patient health questionnaire*, *Nursing Research*; 61(5); p.333-41; 2012.
- De Ryck, A., Brouns, R., Fransen, E., Geurden, M., Van Gestel, G., et al., A prospective study on the prevalence and risk factors of post-stroke depression, *Cerebrovascular Diseases (Extra)*; vol. 3(1); p.1-13; 2013. **See:** <<http://www.karger.com/Article/FullText/345557>>.
- Guy, W., ECDEU Assessment manual for psychopharmacology - Revised. NIMH Psychopharmacology Research Branch, Division of Extramural Research Programs; p.218-222; 1976.
- Hackett, M. and Pickles, K., Part I: Frequency of depression after stroke: an updated systematic review and meta-analysis of observational studies, *International Journal of Stroke*; 9; p.1017-1025; 2014.
- Hammond, M., O'Keefe S. and Barer D., Development and validation of a brief observer-rated screening scale for depression in elderly medical patients, *Age and Ageing*; 29(6); p.511-515; 2000.
- Hamilton, M., A rating scale for depression, *Journal of Neurology, Neurosurgery and Psychiatry*; 23; p.56-62; 1960.
- He, J. and Shen, P., Therapeutic effect of acupuncture in the treatment of post-stroke depression [Abstract], *Zhen Ci Yan Jiu*; 32(1); p.58-61; 2007. **See:** <https://www.acupuncture.com/newsletters/m_july07/res.htm#1>.
- Hornsten, C., Lovheim, H., Gustafson, Y., The association between stroke, depression, and 5-year mortality among very old people, *Stroke*; 44; p.2587-2589; 2013.
- House, A., Hackett, M.L., Anderson, C.S., Horrocks, J.A., Pharmaceutical interventions for emotionalism after stroke, *Cochrane Database of Systematic Reviews*; Issue 2; Article Number: CD003690; 2004. **DOI:** <10.1002/14651858.CD003690.pub2>.
- Johnson, J., Minarik, P., Nystrom, K., Bautista, C. and Gorman, M., Post-stroke depression incidence and risk factors: An integrated literature review, *Journal of Neuroscience Nursing*; 38(4); Supplement; p.316-327; 2006.
- Jorge, R., Robinson, R., Tateno, A., Narushima, K., Acion, L., Moser, D., Arndt, S. and Chemerinski, E., Repetitive transcranial magnetic stimulation as treatment of poststroke depression: A preliminary study, *Biological Psychiatry*; 55(4); p.398-405; 2004.
- Kearins, B. and Luciano, J., *Post stroke depression: Screening and assessment tools* [Fact sheet]; American Heart and Stroke Association, Dallas, Texas; 2015.
- Kroenke, K., Spitzer, R. and Williams, W., The PHQ-9: Validity of a brief depression severity measure, *Journal of General Internal Medicine*; 16(9); p.606-13; 2001.
- Li, L., Wang, S., Ge, H., Chen, J., Yue, S. and Ye, M., The beneficial effects of the herbal medicine 'Free and Easy Wanderer Plus' (FEWP) and Fluoxetine on post-stroke depression, *Journal of Alternative and Complementary Medicine*; 14(7); p.841-846; 2008. **See:** <<http://online.liebertpub.com/doi/abs/10.1089/acm.2008.0010>>.
- Lightbody, C., Auton, M., Baldwin, R., Gibbon, B., Hamer, S., Leathley, M., Sutton, C. and Watkins, C., The use of nurses' and carers' observations in the identification of poststroke depression, *Journal of advanced Nursing*; 60(6); p.595-604; 2007.
- Llorca, G., Castilla-Guerra, L., Moreno, F., Doblado, S. and Hernández, J., Post-stroke depression: An update, *Neurología*; 30(1); p.23-3; 2015. **DOI:** <10.1016/j.nrleng.2012.06.006>.
- Meader, N., Moe-Byrne, T., Llewellyn, A. et al., Screening for poststroke major depression: A meta-analysis of diagnostic validity studies, *Journal of Neurology and Neurosurgery Psychiatry*; 85; p.198-206; 2014.
- Melrose, S., How to uncover post-stroke depression, *Nursing Made Incredibly Easy*; 8(4); p.31-37; 2010. **See:** <http://journals.lww.com/nursingmadeincrediblyeasy/Fulltext/2010/07000/How_to_uncover_post_stroke_depression.9.aspx>.
- Mikamin, K., Jorge, R., Moser, D., Arndt, S., Jang, M., Increased frequency of first-episode poststroke depression after discontinuation of Escitalopram, *Stroke*; 42; p.3281-3283; 2011. **DOI:** 10.1161/STROKEAHA.111.626507
- Mitchell, P., Veith, R., Becker, K., Buzaitis, A., Cain, K., Fruin, M., Tirschwell, D. and Teri, L., Brief psychosocial-behavioral intervention with antidepressant reduces poststroke depression significantly more than usual care with antidepressant, *Stroke*; 40(9); p.3073-3078; 2009.
- National Stroke Association, *Explaining unpredictable emotional episodes* [Fact sheet], June, 2011; Centennial, Colorado. **See:** <http://www.stroke.org/sites/default/files/resources/NSA_PBA_brochure.pdf>.
- Niedermaier, N., Bohrer, E., Schulte, K., Schlattmann, Heuser, J., Prevention and treatment of post-stroke depression with mirtazapine in patients with acute stroke, *The Journal of Clinical Psychiatry*; 65(12); p.1619-1623; 2004.
- Parvizi, J., Coburn, K., Shillcutt, S., Coffey, E., Lauterbach, E. and Mendez, M., Neuroanatomy of pathological laughing and crying: A report of the American Neuropsychiatric Association Committee on Research, *Journal of Neuropsychiatry and Clinical Neurosciences*; 21(1); 75-87; 2009.
- Qian, X., Zhou, X., You, Y., Shu, S., Fang, F., et al., Traditional Chinese acupuncture for poststroke depression: A single-blind double-simulated randomized controlled trial, *Journal of Alternative and Complementary Medicine*; 21(12); p.748-753; December, 2015. **See:** <<http://online.liebertpub.com/doi/abs/10.1089/acm.2015.0084>>.
- Radloff, L., The CES-D scale: A self-report depression scale for research in the general population, *Applied Psychological Measurement*; 1(3); p.385-401; 1977.
- Robinson, R., Jorge, R., Moser, D., Acion, L., Solodkin, A., Small, S., Fonzetti, P., Hegel, M., Arndt, S., et al., Escitalopram and problem-solving therapy for prevention of poststroke depression: A randomized controlled trial, *Journal of the American Medical Association*; 299(20); p.2391-2400; May, 2008. **See:** <<http://jama.jamanetwork.com/article.aspx?articleid=181981>>.
- Roger, P. and Johnson-Greene, D., Attitudes toward depression among rehabilitation participants with acute stroke: evidence of an age cohort effect, *Rehabilitation Psychology*; 53(2); p.210-214; April, 2008. **DOI:** 10.1037/0090-5550.53.2.210

- Särkämö, T, Tervaniemi, M., Laitinen, S., et al., Music listening enhances cognitive recovery and mood after middle cerebral artery stroke, *Brain*; 131(3); p.866-876; 2008.
 - Sheikh, J. and Yesavage, J., Geriatric Depression Scale (GDS): Recent findings and development of a shorter version. 1986. In: Brink, T. L. (ed.), *Clinical Gerontology: A guide to assessment and intervention*, NY, Howarth Press.
 - Spalletta, G., Bossu, P., Ciaramella, A., Bria, P., Caltagirone, C. and Robinson, R., The etiology of poststroke depression: A review of the literature and a new hypothesis involving inflammatory cytokines, *Molecular Psychiatry*; 11; p.984-991; 2006.
 - Starkstein, S., Mizrahi, R. and Power, B., Antidepressant therapy in post-stroke depression, *Expert Opinion on Pharmacotherapy*; 9(8); p.1291-1298; 2008.
 - Teasell, R., Foley, N., Salter, K., Bhogal, S., Jutai, J. and Speechley, M., Post-stroke depression. Evidence-Based Review of Stroke Rehabilitation (EBRSR), 11th ed.; Parkwood Hospital, London, Ontario; Canadian Stroke Network, 2008.
 - Teasell, R. and Hussein, N., Stroke Rehabilitation Clinician Handbook. Canadian Stroke Network, London, Ontario; 2014.
 - Thomas, S. and Lincoln, N., Predictors of emotional distress after stroke, *Stroke*; 39(4); p.1240-1245; 2008.
 - Townend, M., Brady, M. and McLaughlan, K., A Systematic evaluation of the adaptation of depression diagnostic methods for stroke survivors who have aphasia, *Stroke*. Published online 2007: **See:** <<http://stroke.ahajournals.org/content/38/11/3076.full>>.
 - Vallury, K.D., Jones, M., Gray, R., Do family-oriented interventions reduce poststroke depression? A systematic review and recommendations for practice, *Topics in Stroke Rehabilitation*; 2015.
- DOI:**<10.1179/1074935715Z.00000000061>.
- Watkins, C. and French, B., Psychological intervention poststroke: Ready for action? *Stroke*; 40(9); p.2951-2952; 2009.
 - Yudofsky, S. and Hales, R., Neuropsychiatry and Behavioral Neurosciences (4th ed.); 2008; Arlington, VA: American Psychiatric Publishing Inc.

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