

- from comparison subjects matched for vascular risk factors. *Am J Psychiatry* 2008;165:524-32.
71. Serafini G, Pompili M, Innamorati M, Negro A, Fiorillo M, Lamis DA, Erbuto D, Marsibilio F, Romano A, Amore M, D'Alonzo L, Bozzao A, Girardi P, Martelletti P. White matter hyperintensities and self-reported depression in a sample of patients with chronic headache. *J Headache Pain* 2012;13:661-7.
 72. Grangeon MC, Seixas C, Quarantini LC, Miranda-Scippa A, Pompili M, Steffens DC, Wenzel A, Lacerda AL, de Oliveira IR. White matter hyperintensities and their association with suicidality in major affective disorders: a meta-analysis of magnetic resonance imaging studies. *CNS Spectr* 2010;15:375-81.
 73. Pompili M, Innamorati M, Mann JJ, Oquendo MA, Lester D, Del Casale A, Serafini G, Rigucci S, Romano A, Tamburello A, Manfredi G, De Pisa E, Ehrlich S, Giupponi G, Amore M, Tatarelli R, Girardi P. Periventricular white matter hyperintensities as predictors of suicide attempts in bipolar disorders and unipolar depression. *Prog Neuropsychopharmacol Biol Psychiatry* 2008;32:1501-7.
 74. Fazekas F, Niederkorn K, Schmidt R, Offenbacher H, Horner S, Bertha G, Lechner H. White matter signal abnormalities in normal individuals: correlation with carotid ultrasonography, cerebral blood flow measurements, and cerebrovascular risk factors. *Stroke* 1988;19:1285-8.
 75. Alexopoulos GS, Kiosses DN, Choi SJ, Murphy CF, Lim KO. Frontal white matter microstructure and treatment response of late-life depression: a preliminary study. *Am J Psychiatry* 2002;159:1929-32.
 76. Li L, Ma N, Li Z, Tan L, Liu J, Gong G, Shu N, He Z, Jiang T, Xu L. Prefrontal white matter abnormalities in young adult with major depressive disorder: a diffusion tensor imaging study. *Brain Res* 2007;1168:124-8.
 77. Ma N, Li L, Shu N, Liu J, Gong G, He Z, Li Z, Tan L, Stone WS, Zhang Z, Xu L, Jiang T. White matter abnormalities in first-episode, treatment-naive young adults with major depressive disorder. *Am J Psychiatry* 2007;164:823-6.
 78. Taylor WD, MacFall JR, Payne ME, McQuoid DR, Provenzale JM, Steffens DC, Krishnan KR. Late-life depression and microstructural abnormalities in dorsolateral prefrontal cortex white matter. *Am J Psychiatry* 2004;161:1293-6.
 79. Bae JN, MacFall JR, Krishnan KR, Payne ME, Steffens DC, Taylor WD. Dorsolateral prefrontal cortex and anterior cingulate cortex white matter alterations in late-life depression. *Biol Psychiatry* 2006;60:1356-63.
 80. Nobuhara K, Okugawa G, Sugimoto T, Minami T, Tamagaki C, Takase K, Saito Y, Sawada S, Kinoshita T. Frontal white matter anisotropy and symptom severity of late-life depression: a magnetic resonance diffusion tensor imaging study. *J Neurol Neurosurg Psychiatry* 2006;77:120-2.
 81. Zhang A, Leow A, Ajilore O, Lamar M, Yang S, Joseph J, Medina J, Zhan L, Kumar A. Quantitative tract-specific measures of uncinate and cingulum in major depression using diffusion tensor imaging. *Neuropsychopharmacology* 2012;37:959-67.
 82. Steffens DC, Taylor WD, Denny KL, Bergman SR, Wang L. Structural integrity of the uncinate fasciculus and resting state functional connectivity of the ventral prefrontal cortex in late life depression. *PLoS One* 2011;6:e22697.
 83. Guo WB, Liu F, Xue ZM, Gao K, Wu RR, Ma CQ, Liu ZN, Xiao CQ, Chen HF, Zhao JP. Altered white matter integrity in young adults with first-episode, treatment-naive, and treatment-responsive depression. *Neurosci Lett* 2012;522:139-44.
 84. Aghajani M, Veer IM, van Lang ND, Meens PH, van den Bulk BG, Rombouts SA, Vermeiren RR, van der Wee NJ. Altered white-matter architecture in treatment-naive adolescents with clinical depression. *Psychol Med* 2013. [Epub ahead of print].
 85. Cullen KR, Klimes-Dougan B, Muetzel R, Mueller BA, Camchong J, Houry A, Kurma S, Lim KO. Altered white matter microstructure in adolescents with major depression: a preliminary study. *J Am Acad Child Adolesc Psychiatry* 2010;49:173-83.e1.
 86. Walther S, Hügli S, Höfle O, Federspiel A, Horn H, Bracht T, Wiest R, Strik W, Müller TJ. Frontal white matter integrity is related to psychomotor retardation in major depression. *Neurobiol Dis* 2012;47:13-9.
 87. Cole J, Chaddock CA, Farmer AE, Aitchison KJ, Simmons A, McGuffin P, Fu CH. White matter abnormalities and illness severity in major depressive disorder. *Br J Psychiatry* 2012;201:33-9.
 88. Colloby SJ, Firkbank MJ, Thomas AJ, Vasudev A, Parry SW, O'Brien JT. White matter changes in late-life depression: a diffusion tensor imaging study. *J Affect Disord* 2011;135:216-20.
 89. Korgaonkar MS, Grieve SM, Koslow SH, Gabrieli JD, Gordon E, Williams LM. Loss of white matter integrity in major depressive disorder: evidence using tract-based spatial statistical analysis of diffusion tensor imaging. *Hum Brain Mapp* 2011;32:2161-71.
 90. Wu F, Tang Y, Xu K, Kong L, Sun W, Wang F, Kong D, Li Y, Liu Y. Whiter matter abnormalities in medication-naive subjects with a single short-duration episode of major depressive disorder. *Psychiatry Res* 2011;191:80-3.
 91. Ouyang X, Tao HJ, Liu HH, Deng QJ, Sun ZH, Xu L, Liu ZN, Xue ZM. White matter integrity deficit in treatment-naive adult patients with major depressive disorder. *East Asian Arch Psychiatry* 2011;21:5-9.
 92. Zhu X, Wang X, Xiao J, Zhong M, Liao J, Yao S. Altered white matter integrity in first-episode, treatment-naive young adults with major depressive disorder: a tract-based spatial statistics study. *Brain Res* 2011;1369:223-9.
 93. Lamar M, Charlton RA, Morris RG, Markus HS. The impact of subcortical white matter disease on mood in euthymic older adults: a diffusion tensor imaging study. *Am J Geriatr Psychiatry* 2010;18:634-42.
 94. Zou K, Huang X, Li T, Gong Q, Li Z, Ou-yang L, Deng W, Chen Q, Li C, Ding Y, Sun X. Alterations of white matter integrity in adults with major depressive disorder: a magnetic resonance imaging study. *J Psychiatry Neurosci* 2008;33:525-30.
 95. Alexopoulos GS, Murphy CF, Gunning-Dixon FM, Latoussakis V, Kanellopoulos D, Klimstra S, Lim KO, Hoptman MJ. Microstructural white matter abnormalities and remission of geriatric depression. *Am J Psychiatry* 2008;165:238-44.
 96. Liao Y, Huang X, Wu Q, Yang C, Kuang W, Du M, Lui S, Yue Q, Chan RC, Kemp GJ, Gong Q. Is depression a disconnection syndrome? Meta-analysis of diffusion tensor imaging studies in patients with MDD. *J Psychiatry Neurosci* 2013;38:49-56.
 97. Murphy ML, Frodl T. Meta-analysis of diffusion tensor imaging studies shows altered fractional anisotropy occurring in distinct brain areas in association with depression. *Biol Mood Anxiety Disord* 2011;1:3.
 98. Taylor WD, Kuchibhatla M, Payne ME, Macfall JR, Sheline YI, Krishnan KR, Doraiswamy PM. Frontal white matter anisotropy and antidepressant remission in late-life depression. *PLoS One* 2008;3:e3267.
 99. Nobuhara K, Okugawa G, Minami T, Takase K, Yoshida T, Yagyu T, Tajika A, Sugimoto T, Tamagaki C, Ikeda K, Sawada S, Kinoshita T. Effects of electroconvulsive therapy on frontal white matter in late-life depression: a diffusion tensor imaging study. *Neuropsychobiology* 2004;50:48-53.
 100. Kozel FA, Johnson KA, Nahas Z, Nakonezny PA, Morgan PS, Anderson BS, Kose S, Li X, Lim KO, Trivedi MH, George MS. Fractional anisotropy changes after several weeks of daily left high-frequency repetitive transcranial magnetic stimulation of the prefrontal cortex to treat major depression. *J ECT* 2011;27:5-10.
 101. Bezerra DM, Pereira FR, Cendes F, Jackowski MP, Nakano EY, Moscoso MA, Ribeiz SR, Avila R, Castro CC, Bottino CM. DTI voxelwise analysis did not differentiate older depressed patients from older subjects without depression. *J Psychiatr Res* 2012;46:1643-9.
 102. Abe O, Yamasue H, Kasai K, Yamada H, Aoki S, Inoue H, Takei K, Suga M, Matsuo K, Kato T, Masutani Y, Ohtomo K. Voxel-based analyses of gray/white matter volume and diffusion tensor data in major depression. *Psychiatry Res* 2010;181:64-70.
 103. Kieseppä T, Eerola M, Mäntylä R, Neuvonen T, Poutanen VP, Luoma K, Tuulio-Henriksson A, Jylha P, Mantere O, Melartin T, Rytasala H, Vuorilehto M, Isometsa E. Major depressive disorder and

- white matter abnormalities: a diffusion tensor imaging study with tract-based spatial statistics. *J Affect Disord* 2010;120:240-4.
104. Weber K, Giannakopoulos P, Delaloye C, de Bilbao F, Moy G, Ebbing K, Moussa A, Herrmann FR, Gold G, Canuto A. Personality traits, cognition and volumetric MRI changes in elderly patients with early-onset depression: a 2-year follow-up study. *Psychiatry Res* 2012;198:47-52.
 105. Weber K, Giannakopoulos P, Delaloye C, de Bilbao F, Moy G, Moussa A, Rubio MM, Ebbing K, Meuli R, Lazeyras F, Meiler-Mittelu C, Herrmann FR, Gold G, Canuto A. Volumetric MRI changes, cognition and personality traits in old age depression. *J Affect Disord* 2010;124:275-82.
 106. Serafini G, Pompili M, Innamorati M, Fusar-Poli P, Akiskal HS, Rihmer Z, Lester D, Romano A, de Oliveira IR, Strusi L, Ferracuti S, Girardi P, Tatarelli R. Affective temperamental profiles are associated with white matter hyperintensity and suicidal risk in patients with mood disorders. *J Affect Disord* 2011;129:47-55.
 107. Rihmer A, Rozsa S, Rihmer Z, Gonda X, Akiskal KK, Akiskal HS. Affective temperaments, as measured by TEMPS-A, among nonviolent suicide attempters. *J Affect Disord* 2009;116:18-22.
 108. Picerni E, Petrosini L, Piras F, Laricchiuta D, Cutuli D, Chiapponi C, Fagioli S, Girardi P, Caltagirone C, Spalletta G. New evidence for the cerebellar involvement in personality traits. *Front Behav Neurosci* 2013;7:133.
 109. Laricchiuta D, Petrosini L, Piras F, Macci E, Cutuli D, Chiapponi C, Cerasa A, Picerni E, Caltagirone C, Girardi P, Tamorri SM, Spalletta G. Linking novelty seeking and harm avoidance personality traits to cerebellar volumes. *Hum Brain Mapp* 2014;35:285-96.
 110. Bjørnebekk A, Westlye LT, Fjell AM, Grydeland H, Walhovd KB. Social reward dependence and brain white matter microstructure. *Cereb Cortex* 2012;22:2672-9.
 111. Westlye LT, Bjørnebekk A, Grydeland H, Fjell AM, Walhovd KB. Linking an anxiety-related personality trait to brain white matter microstructure: diffusion tensor imaging and harm avoidance. *Arch Gen Psychiatry* 2011;68:369-77.
 112. Van Schuerbeek P, Baeken C, De Raedt R, De Mey J, Luypaert R. Individual differences in local gray and white matter volumes reflect differences in temperament and character: a voxel-based morphometry study in healthy young females. *Brain Res* 2011;1371:32-42.
 113. Kaasinen V, Maguire RP, Kurki T, Brück A, Rinne JO. Mapping brain structure and personality in late adulthood. *Neuroimage* 2005;24:315-22.
 114. Krishnan KR, McDonald WM. Arteriosclerotic depression. *Med Hypotheses* 1995;44:111-5.
 115. Alexopoulos GS, Meyers BS, Young RC, Campbell S, Silbersweig D, Charlson M. 'Vascular depression' hypothesis. *Arch Gen Psychiatry* 1997;54:915-22.
 116. Lenze E, Cross D, McKeel D, Neuman RJ, Sheline YI. White matter hyperintensities and gray matter lesions in physically healthy depressed subjects. *Am J Psychiatry* 1999;156:1602-7.
 117. Inzitari D, Simoni M, Pracucci G, Poggesi A, Basile AM, Chabriat H, Erkinjuntti T, Fazekas F, Ferro JM, Hennerici M, Langhorne P, O'Brien J, Barkhof F, Visser MC, Wahlund LO, Waldemar G, Wallin A, Pantoni L, Group LS. Risk of rapid global functional decline in elderly patients with severe cerebral age-related white matter changes: the LADIS study. *Arch Intern Med* 2007;167:81-8.
 118. Steffens DC, Bosworth HB, Provenzale JM, MacFall JR. Subcortical white matter lesions and functional impairment in geriatric depression. *Depress Anxiety* 2002;15:23-8.
 119. Steffens DC, Potter GG, McQuoid DR, MacFall JR, Payne ME, Burke JR, Plassman BL, Welsh-Bohmer KA. Longitudinal magnetic resonance imaging vascular changes, apolipoprotein E genotype, and development of dementia in the neurocognitive outcomes of depression in the elderly study. *Am J Geriatr Psychiatry* 2007;15:839-49.
 120. Teodorczuk A, O'Brien JT, Firbank MJ, Pantoni L, Poggesi A, Erkinjuntti T, Wallin A, Wahlund LO, Gouw A, Waldemar G, Schmidt R, Ferro JM, Chabriat H, Bazner H, Inzitari D, Group L. White matter changes and late-life depressive symptoms: longitudinal study. *Br J Psychiatry* 2007;191:212-7.
 121. Teodorczuk A, Firbank MJ, Pantoni L, Poggesi A, Erkinjuntti T, Wallin A, Wahlund LO, Scheltens P, Waldemar G, Schrotter G, Ferro JM, Chabriat H, Bazner H, Visser M, Inzitari D, O'Brien JT. Relationship between baseline white-matter changes and development of late-life depressive symptoms: 3-year results from the LADIS study. *Psychol Med* 2010;40:603-10.
 122. Jollant F, Lawrence NS, Giampietro V, Brammer MJ, Fullana MA, Drapier D, Courtet P, Phillips ML. Orbitofrontal cortex response to angry faces in men with histories of suicide attempts. *Am J Psychiatry* 2008;165:740-8.
 123. Jia Z, Huang X, Wu Q, Zhang T, Lui S, Zhang J, Amatya N, Kuang W, Chan RC, Kemp GJ, Mechelli A, Gong Q. High-field magnetic resonance imaging of suicidality in patients with major depressive disorder. *Am J Psychiatry* 2010;167:1381-90.
 124. Hopkinson G. A genetic study of affective illness in patients over 50. *Br J Psychiatry* 1964;110:244-54.
 125. Schulz B. A statistical analysis of mental disorders in the families of manic-depressives grouped by age and sex. *Arch Psychiatr Nervenkr Z Gesamte Neurol Psychiatr* 1951;186:560-76.
 126. Post F. Dementia, depression and pseudodementia. In: Benson DF, Blumer D, editors. *Psychiatric Aspects of Neurologic Disease*. New York: Grune and Stratton; 1975. p. 99-120.
 127. Komaki S, Nagayama H, Ohgami H, Takaki H, Mori H, Akiyoshi J. Prospective study of major depressive disorder with white matter hyperintensity: comparison of patients with and without lacunar infarction. *Eur Arch Psychiatry Clin Neurosci* 2008;258:160-4.
 128. Dupont RM, Jernigan TL, Butters N, Delis D, Hesselink JR, Heindel W, Gillin JC. Subcortical abnormalities detected in bipolar affective disorder using magnetic resonance imaging. Clinical and neuropsychological significance. *Arch Gen Psychiatry* 1990;47:55-9.
 129. McDonald WM, Tupler LA, Marsteller FA, Figiel GS, DiSouza S, Nemeroff CB, Krishnan KR. Hyperintense lesions on magnetic resonance images in bipolar disorder. *Biol Psychiatry* 1999;45:965-71.
 130. Figiel GS, Krishnan KR, Rao VP, Doraiswamy M, Ellinwood EH Jr, Nemeroff CB, Evans D, Boyko O. Subcortical hyperintensities on brain magnetic resonance imaging: a comparison of normal and bipolar subjects. *J Neuropsychiatry Clin Neurosci* 1991;3:18-22.
 131. Ringelstein EB, Kleffner I, Dittrich R, Kühlenbäumer G, Ritter MA. Hereditary and non-hereditary microangiopathies in the young. An up-date. *J Neurol Sci* 2010;299:81-5.
 132. Sprooten E, Sussmann JE, Clugston A, Peel A, McKirdy J, Moorhead TW, Anderson S, Shand AJ, Giles S, Bastin ME, Hall J, Johnstone EC, Lawrie SM, McIntosh AM. White matter integrity in individuals at high genetic risk of bipolar disorder. *Biol Psychiatry* 2011;70:350-6.