

# Acute Predictors of Social Integration Following Mild Stroke

Frances M. Wise, PhD,\*† Darren W. Harris, PhD,‡ John H. Olver, MD,†  
Stephen M. Davis, MD,§ and Peter B. Disler, PhD||¶

*Background:* Despite an acknowledged need to accurately predict stroke outcome, there is little empirical evidence regarding acute predictors of participation restriction post stroke. The current study examines prediction of social integration following mild stroke, using combinations of acute poststroke factors. *Patients and Methods:* In a prospective, longitudinal study, a cohort of 60 stroke survivors was followed up at 6 months post stroke. Hierarchical multiple regression analyses were employed to evaluate the value of acute poststroke variables in predicting social integration at 6 months post stroke. *Results:* A combination of age, number of comorbidities, stroke severity, social support factors, and general self-efficacy in the acute poststroke period accounted for 42% of the variance in 6-month social integration. The largest amount of variance (20%) was explained by inclusion of social support factors, including number and types of support. Post hoc analysis was conducted to establish whether marital status was the mediating variable through which early poststroke social support factors exerted influence upon subsequent social integration. The new combination of acute variables accounted for 48% of the variance in 6-month social integration. Results suggested that subjects with partners perceived higher levels of functional social support and lower levels of participation restriction. *Discussion:* Stroke survivors with partners may receive greater amounts of companionship and encouragement from their partners, which enhances self-esteem and confidence. Such individuals are possibly more able to participate in and maintain relationships, thus improving social integration. *Conclusions:* Social support factors, mediated via marital status, are the strongest predictors of subsequent social integration following mild stroke. **Key Words:** Stroke—social integration—social support—handicap—ICD—outcome prediction.

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From the \*Cardiac Rehabilitation Unit, Caulfield Hospital, Australia; †Epworth Monash Rehabilitation Medicine Unit, Epworth Healthcare, Australia; ‡Aspex Consulting, Australia; §Melbourne Brain Centre, The Royal Melbourne Hospital and University of Melbourne, Australia; ||School of Rural Health, Monash University, Australia; and ¶University of Melbourne School of Rural Health, Australia.

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Address correspondence to Frances M Wise, PhD, Cardiac Rehabilitation Unit, Caulfield Hospital, 260 Kooyong Road, Caulfield, Vic 3162, Australia. E-mail: [f.wise@cgmc.org.au](mailto:f.wise@cgmc.org.au).

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## Introduction

### *Social Integration and Participation Post Stroke*

Stroke has been reported to be the third major cause of disability-adjusted life years in developed countries and the sixth major cause worldwide.<sup>1</sup> In Australia, it is estimated that nearly 400,000 individuals (2% of the population) have suffered a stroke at some time in their lives.<sup>2</sup>

For nearly 20 years, the consequences of health conditions such as stroke have been described using the International Classification of Functioning, Disability and Health (ICF).<sup>3</sup> The ICF framework provides a model for the description of health and health-related states in terms of “Activities” and “Participation.”<sup>4</sup> Participation

describes the involvement of the individual in all areas of life. Social integration is an important dimension of participation, reflecting the extent to which individuals are able to participate in social activities and meaningful relationships.<sup>5</sup> Importantly, low levels of social integration have been linked to increased risk of depression,<sup>6</sup> adverse events post stroke,<sup>7</sup> psychological distress,<sup>8</sup> poorer self-rated physical health,<sup>9</sup> reduced life satisfaction,<sup>4</sup> and increased mortality risk.<sup>10-12</sup> Conversely, significant problems with social integration and participation in relationships have been observed as sequelae of stroke.<sup>4,13</sup> In 1 study, over 40% of the community dwelling stroke population (compared with 9% of controls) was restricted in social activities, and at risk of social isolation that can result in further negative health events.<sup>14</sup>

### *Predictors of Social Integration Post Stroke*

The ability to accurately predict social outcomes following stroke has been the subject of numerous cross-sectional studies. Some have examined social support as a predictor variable with conflicting results regarding its importance.<sup>15,16</sup> Others have reported that depression<sup>15,17,18</sup> and cognitive impairment<sup>19</sup> are associated with poorer social integration, but some have only accounted for small amounts of variance in social outcomes.<sup>17</sup>

Early prediction (i.e., in the acute stages of stroke) of longer-term stroke outcome is felt to be desirable and necessary for the purposes of providing cost-effective rehabilitation programs designed to meet patients' needs, in addition to appropriate goal setting and discharge planning.<sup>20-22</sup> However, despite a long-acknowledged need,<sup>23</sup> there is little, if any, empirical evidence regarding acute or early predictors of poststroke social integration. In addition, even where longitudinal stroke studies have examined early predictors of social outcomes, inappropriate outcome measures have been used. For example, a study of 207 stroke survivors measured social outcome with the Frenchay Activities Index,<sup>24,25</sup> which is, in fact, a measure of activities of daily living. Other longitudinal studies have not included potentially important factors such as social support.<sup>26</sup>

The aim of the current study was to find the combination of acute poststroke variables that most accurately predicted longer-term social integration. It was hypothesized that levels of social integration at 6 months post stroke would be predicted in the acute stage by the following:

- illness-related factors such as severity of stroke, number of comorbidities, impairment and activity limitation, maintaining consistency with the ICF framework<sup>24,27,28</sup>;
- theoretically important demographic factors including age,<sup>23</sup> educational level,<sup>29</sup> and marital status; and
- factors which are also predictive of other social outcomes such as psychosocial adjustment to illness;

specifically, social support<sup>16,30-32</sup> and cognitive appraisals such as self-efficacy.<sup>33-37</sup>

## **Methods**

### *Participants*

Participants were recruited from the Acute Stroke Unit at a large inner-city public hospital. Patients who had been admitted to the Unit via the Hospital's Emergency Department with the diagnosis of ischemic stroke or intracerebral hemorrhage were considered. Subjects were required to be community dwelling prior to admission, and deemed to be well enough to tolerate up to 1 hour of questionnaires and physical examination. Because of the nature of the instruments used, patients were also excluded if they suffered significant visual impairment or receptive or global dysphasia, or lacked sufficient understanding of the English language to comprehend the questionnaires. Such criteria can result in a high exclusion rate, which has been described in previous studies of psychosocial aspects of stroke.<sup>38</sup> Other exclusion criteria included neurological conditions that could potentially affect performance, such as dementia, schizophrenia, multiple sclerosis, or intracranial malignancy. Subjects were also excluded if they had suffered previous stroke that had produced ongoing sequelae.

Over the 10-month recruitment period, 311 potentially eligible participants were identified on the Stroke Unit. Seventy-four percent of these were excluded. Thus, a total of 26% ( $n = 80$ ) of individuals admitted to the Stroke Unit were initially recruited for this investigation. The recruitment process and subject dropouts are presented in [Figure 1](#).

A summary of demographic characteristics and stroke type identified in the current sample is presented in [Table 1](#).

### *Sample Size Determination*

Sample size calculation was performed to ascertain the number of subjects required to detect associations between depression (one of the most important potential predictors) and social integration. Based upon previous studies,<sup>23</sup> a correlation coefficient of at least .40 between depression and social integration was expected in the current study. Power calculations revealed that a sample size of at least 40 was required to achieve an acceptable level of power (at least .80) at a significance level (alpha) of .05 for the desired correlations.

Furthermore, as regression analyses were also planned for this study, power calculations revealed that 48 subjects were required to detect an  $R^2$  of at least .30 with 6 independent variables at a significance level (alpha) of .05 and .90 power. Thus, this study aimed to collect complete data on at least 50 subjects.

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