Return to Work After Stroke
A Nursing State of the Science

Catherine Harris, PhD, MBA, CRNP

There is a lack of research related to return to work (RTW) after acute ischemic stroke. Historically considered a disease of the elderly, acute ischemic stroke studies have not routinely used RTW as an outcome. Major stroke trials have not routinely collected these data as an end point. However, the mean age for acute ischemic stroke (AIS) has declined to 69 years of age, whereas the incidence in patients aged <55 years has increased to 19%. Changes in retirement age have also affected RTW as a consideration in patients with stroke. Failure to RTW after recovery from AIS has been associated with negative health outcomes such as increased cardiac disease, depression, and higher rates of mortality and social consequences such as isolation and poor coping ability.

RTW has not been extensively studied in the AIS population. However, with an aging, yet active population and an increased awareness of AIS in younger patients, the relevance of RTW is becoming increasingly important. According to current research, ≤50% of stroke survivors are likely to RTW if they can walk, their cognition is relatively intact, they were previously used, are younger than the mean age, and have a white-collar position. The physical, psychological, social, financial, and economic consequences associated with loss of productivity for patients with AIS and their caregivers are reported to cost billions of dollars each year. With an increasing prevalence of survivors, the ability to RTW has gained significant importance as an area for further research.

The purpose of this review was to provide nurses working with patients with stroke empirical evidence related to RTW outcomes. The evidence used came from current studies of AIS from January 2008 to May 2014. This time frame was used to capture the most recent evidence-based practice and current research, particularly in patients who appear functionally intact or ≤2 years after stroke. Psychiatric morbidity after stroke has also been shown to reduce the likelihood of RTW, particularly in patients who appear functionally intact or of limited physical disability. Rehabilitation was found to be associated with a decreased likelihood of RTW even ≤2 years after stroke. Psychiatric factors are emerging as significant factors.

Fatigue was found to be associated with a decreased likelihood of RTW even ≤2 years after stroke. Psychiatric morbidity after stroke has also been shown to reduce the likelihood of RTW, particularly in patients who appear functionally intact or of limited physical disability. Rehabilitation was found to be an important predictor of RTW. O’Brien and Wolf reported poorer rates of RTW despite mild to no physical impairments. They concluded that vocational training may help facilitate RTW. Finally, social factors also play an important role in RTW. Many studies demonstrated improved rates to RTW for patients who are white, have white-collar occupations, have higher levels of education, and receive higher incomes. The South London Stroke Registry showed that economic context played a significant role in predicting RTW, functional disability involving impaired activities of daily living and aphasia is significant. The effect of comorbidities on RTW has not been well described; however, psychiatric factors are emerging as significant factors.

Consistent themes found in RTW after stroke are physical, social, and psychiatric disabilities. Stroke severity remains one of the most consistent predictors of RTW, as well as younger age.6,9 Patients aged <65 years are much more likely than patients aged >65 years to RTW. However, age is not a significant predictor in RTW for different age groups under the age of 65 years.3 Although stroke location has not played a strong role in predicting RTW, functional disability involving impaired activities of daily living and aphasia is significant. The effect of comorbidities on RTW has not been well described; however, psychiatric factors are emerging as significant factors.

Fatigue was found to be associated with a decreased likelihood of RTW even ≤2 years after stroke. Psychiatric morbidity after stroke has also been shown to reduce the likelihood of RTW, particularly in patients who appear functionally intact or of limited physical disability. Rehabilitation was found to be an important predictor of RTW. O’Brien and Wolf reported poorer rates of RTW despite mild to no physical impairments. They concluded that vocational training may help facilitate RTW. Finally, social factors also play an important role in RTW. Many studies demonstrated improved rates to RTW for patients who are white, have white-collar occupations, have higher levels of education, and receive higher incomes. The South London Stroke Registry showed that economic context played a significant role in predicting RTW.

Discussion
The literature yielded many articles on RTW. The range of RTW varies widely from 18% to 69% in these studies, with RTW outcomes after acute ischemic stroke and English language. Studies that were primarily on traumatic brain injury or hemorrhagic stroke were excluded. The appraisal method by Greenhalgh was used to determine whether the studies provided a sufficient description of methodology. Finally, a descriptive summary of the findings was completed.

Data Evaluation and Analysis
The database search yielded 436 articles. After excluding duplicates, case studies, and reviews, 12 quantitative research studies whose primary focus was on RTW after acute ischemic stroke were reviewed. The articles are listed in the Table.

Key Findings
Consistent themes found in RTW after stroke are physical, social, and psychiatric disabilities. Stroke severity remains one of the most consistent predictors of RTW, as well as younger age. Patients aged <65 years are much more likely than patients aged >65 years to RTW. However, age is not a significant predictor in RTW for different age groups under the age of 65 years. Although stroke location has not played a strong role in predicting RTW, functional disability involving impaired activities of daily living and aphasia is significant. The effect of comorbidities on RTW has not been well described; however, psychiatric factors are emerging as significant factors.

Fatigue was found to be associated with a decreased likelihood of RTW even ≤2 years after stroke. Psychiatric morbidity after stroke has also been shown to reduce the likelihood of RTW, particularly in patients who appear functionally intact or of limited physical disability. Rehabilitation was found to be an important predictor of RTW. O’Brien and Wolf reported poorer rates of RTW despite mild to no physical impairments. They concluded that vocational training may help facilitate RTW. Finally, social factors also play an important role in RTW. Many studies demonstrated improved rates to RTW for patients who are white, have white-collar occupations, have higher levels of education, and receive higher incomes. The South London Stroke Registry showed that economic context played a significant role in predicting RTW.

Discussion
The literature yielded many articles on RTW. The range of RTW varies widely from 18% to 69% in these studies, with RTW outcomes after acute ischemic stroke and English language. Studies that were primarily on traumatic brain injury or hemorrhagic stroke were excluded. The appraisal method by Greenhalgh was used to determine whether the studies provided a sufficient description of methodology. Finally, a descriptive summary of the findings was completed.

Data Evaluation and Analysis
The database search yielded 436 articles. After excluding duplicates, case studies, and reviews, 12 quantitative research studies whose primary focus was on RTW after acute ischemic stroke were reviewed. The articles are listed in the Table.

Key Findings
Consistent themes found in RTW after stroke are physical, social, and psychiatric disabilities. Stroke severity remains one of the most consistent predictors of RTW, as well as younger age. Patients aged <65 years are much more likely than patients aged >65 years to RTW. However, age is not a significant predictor in RTW for different age groups under the age of 65 years. Although stroke location has not played a strong role in predicting RTW, functional disability involving impaired activities of daily living and aphasia is significant. The effect of comorbidities on RTW has not been well described; however, psychiatric factors are emerging as significant factors.

Fatigue was found to be associated with a decreased likelihood of RTW even ≤2 years after stroke. Psychiatric morbidity after stroke has also been shown to reduce the likelihood of RTW, particularly in patients who appear functionally intact or of limited physical disability. Rehabilitation was found to be an important predictor of RTW. O’Brien and Wolf reported poorer rates of RTW despite mild to no physical impairments. They concluded that vocational training may help facilitate RTW. Finally, social factors also play an important role in RTW. Many studies demonstrated improved rates to RTW for patients who are white, have white-collar occupations, have higher levels of education, and receive higher incomes. The South London Stroke Registry showed that economic context played a significant role in predicting RTW.

Discussion
The literature yielded many articles on RTW. The range of RTW varies widely from 18% to 69% in these studies, with RTW outcomes after acute ischemic stroke and English language. Studies that were primarily on traumatic brain injury or hemorrhagic stroke were excluded. The appraisal method by Greenhalgh was used to determine whether the studies provided a sufficient description of methodology. Finally, a descriptive summary of the findings was completed.
a mean and median of 44% and 53%, respectively. Similar themes emerged from the studies that have not changed over the decades, despite changes in stroke care and stroke delivery systems. Not surprisingly, patients who are younger and have milder strokes have a higher rate of RTW. However, psychiatric morbidity in the form of depression, anxiety, and fatigue is emerging as a strong predictor of RTW and needs to be further elucidated. Socioeconomic factors seem to play a multifactorial role, which was identified in several studies. Factors such as income, education, and occupation had strong predictive properties in RTW. The interrelatedness of the 3 factors is frequently discussed in the literature. Patients who have higher levels of education are more likely to be in higher paying jobs that may provide more flexibility. Patients working in labor-intensive jobs are more likely to be paid by the hour and for a certain level of productivity that may not be attainable or sustainable after a stroke, regardless of the person’s desire to RTW. There also seems to be a significant time element that predicts RTW. There is a reduced probability of RTW for survivors if it does not occur within the first year after the stroke. Rehabilitation after stroke with occupational and vocational therapy has also shown to provide significant benefits to patients who may not otherwise have been able to RTW.

There continues to be a lack of studies targeting interventions to reduce barriers to RTW after stroke. In addition, the importance of evaluating the need for earlier and more intense rehabilitation and choosing patients who may gain the most benefit needs to be established. Studies should also evaluate the importance of implementing occupational and vocational rehabilitation after stroke as a significant benefit to patients.

**Implications for Nurses**

RTW is an attainable goal for patients after stroke and should be a consideration during hospitalization. Nurses need to advocate for the patients to help them receive the resources they may need after the acute phase of the disease process. Assessments for psychiatric morbidity should be initiated in the hospital with appropriate referrals. Nurses can also initiate discussions with patients regarding their short-term and long-term goals regarding work and what resources may be needed to achieve those goals. Nurses can then help guide the patients

<table>
<thead>
<tr>
<th>Study Author/Year/Country</th>
<th>Purpose of Study</th>
<th>Methodology/Design</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andersen (2012), Denmark¹⁴</td>
<td>Fatigue as a factor in RTW</td>
<td>Cohort from prospective study; n=83</td>
<td>53% RTW by 1 y; 58% by 2 y; higher scores on General Fatigue scale negatively correlated with RTW</td>
</tr>
<tr>
<td>Busch (2009), United Kingdom¹³</td>
<td>Determinants of RTW in multiethnic urban population</td>
<td>Cohort from prospective study; n=266</td>
<td>35% RTW by 1 y; lower RTW associated with black ethnicity, women, older age, diabetes mellitus</td>
</tr>
<tr>
<td>Gabriel (2009), Germany¹⁶</td>
<td>Impact of subjective perception on RTW</td>
<td>Prospective longitudinal study; n=60</td>
<td>26.7% RTW by 1 y; perceived functional ability is a positive predictor of RTW</td>
</tr>
<tr>
<td>Glozier (2008), New Zealand¹⁷</td>
<td>Determinants of psychiatric morbidity in younger adults and RTW after stroke</td>
<td>Cohort from prospective study; n=210</td>
<td>53% RTW; early psychiatric morbidity within 6 mo reduced probability of RTW</td>
</tr>
<tr>
<td>Hannerz (2012), Denmark¹⁴</td>
<td>Effect of legislative change on RTW after stroke</td>
<td>Prospective cohort; n=19985</td>
<td>Legislative changes included decreasing sickness absence benefits and introducing flexi-job system. The odds of RTW improved significantly</td>
</tr>
<tr>
<td>Hofgren (2010), Sweden¹</td>
<td>Describe employment status after 1 y</td>
<td>Consecutive patients; n=72</td>
<td>18% RTW after 1 y; reaching primary rehabilitation goals predicted RTW</td>
</tr>
<tr>
<td>Kauranen (2013), Finland¹⁹</td>
<td>Assess cognitive severity of stroke as barrier to RTW</td>
<td>Consecutive patients; n=140</td>
<td>41% RTW at 6 mo; early cognitive deficits only significant predictor of failure to RTW</td>
</tr>
<tr>
<td>O’Brien (2010), United States²⁰</td>
<td>To assess work outcomes</td>
<td>Consecutive patients; n=98</td>
<td>54% RTW at 6 mo; occupational therapy can potentially play a major role in improving work outcomes</td>
</tr>
<tr>
<td>Peters (2013), Nigeria⁹</td>
<td>Determinants of RTW in Nigeria</td>
<td>Consecutive patients at rehabilitation clinic; n=101</td>
<td>55% RTW 1 y; rehabilitation efforts and support programs could help optimize functional ability and improve RTW</td>
</tr>
<tr>
<td>Saeki (2010), Japan¹¹</td>
<td>Determinants of early RTW after stroke</td>
<td>Prospective cohort study; n=253</td>
<td>55% RTW; predictors included male sex, independence in function, hand function; RTW occurred within first 400 days</td>
</tr>
<tr>
<td>Tanaka (2011), Japan⁷</td>
<td>To examine factors associated with early RTW</td>
<td>Prospective cohort study; n=335</td>
<td>30% early RTW at 1 mo. Facilitating factors were mild disability, white-collar occupation, and continued employment while in hospital</td>
</tr>
<tr>
<td>Trygged (2011), Sweden²²</td>
<td>To determine socioeconomic factors to predict RTW</td>
<td>Prospective cohort; n=7081</td>
<td>69% RTW at 1 y; significantly higher probability of RTW in higher social classes</td>
</tr>
</tbody>
</table>

RTW indicates return to work.

---

1. Andersen (2012), Denmark
2. Busch (2009), United Kingdom
3. Gabriel (2009), Germany
4. Glozier (2008), New Zealand
5. Hannerz (2012), Denmark
6. Hofgren (2010), Sweden
7. Kauranen (2013), Finland
8. O’Brien (2010), United States
10. Saeki (2010), Japan
11. Tanaka (2011), Japan
12. Trygged (2011), Sweden

---

Table. Primary Research on RTW After Stroke

<table>
<thead>
<tr>
<th>Study Author/Year/Country</th>
<th>Purpose of Study</th>
<th>Methodology/Design</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andersen (2012), Denmark¹⁴</td>
<td>Fatigue as a factor in RTW</td>
<td>Cohort from prospective study; n=83</td>
<td>53% RTW by 1 y; 58% by 2 y; higher scores on General Fatigue scale negatively correlated with RTW</td>
</tr>
<tr>
<td>Busch (2009), United Kingdom¹³</td>
<td>Determinants of RTW in multiethnic urban population</td>
<td>Cohort from prospective study; n=266</td>
<td>35% RTW by 1 y; lower RTW associated with black ethnicity, women, older age, diabetes mellitus</td>
</tr>
<tr>
<td>Gabriel (2009), Germany¹⁶</td>
<td>Impact of subjective perception on RTW</td>
<td>Prospective longitudinal study; n=60</td>
<td>26.7% RTW by 1 y; perceived functional ability is a positive predictor of RTW</td>
</tr>
<tr>
<td>Glozier (2008), New Zealand¹⁷</td>
<td>Determinants of psychiatric morbidity in younger adults and RTW after stroke</td>
<td>Cohort from prospective study; n=210</td>
<td>53% RTW; early psychiatric morbidity within 6 mo reduced probability of RTW</td>
</tr>
<tr>
<td>Hannerz (2012), Denmark¹⁴</td>
<td>Effect of legislative change on RTW after stroke</td>
<td>Prospective cohort; n=19985</td>
<td>Legislative changes included decreasing sickness absence benefits and introducing flexi-job system. The odds of RTW improved significantly</td>
</tr>
<tr>
<td>Hofgren (2010), Sweden¹</td>
<td>Describe employment status after 1 y</td>
<td>Consecutive patients; n=72</td>
<td>18% RTW after 1 y; reaching primary rehabilitation goals predicted RTW</td>
</tr>
<tr>
<td>Kauranen (2013), Finland¹⁹</td>
<td>Assess cognitive severity of stroke as barrier to RTW</td>
<td>Consecutive patients; n=140</td>
<td>41% RTW at 6 mo; early cognitive deficits only significant predictor of failure to RTW</td>
</tr>
<tr>
<td>O’Brien (2010), United States²⁰</td>
<td>To assess work outcomes</td>
<td>Consecutive patients; n=98</td>
<td>54% RTW at 6 mo; occupational therapy can potentially play a major role in improving work outcomes</td>
</tr>
<tr>
<td>Peters (2013), Nigeria⁹</td>
<td>Determinants of RTW in Nigeria</td>
<td>Consecutive patients at rehabilitation clinic; n=101</td>
<td>55% RTW 1 y; rehabilitation efforts and support programs could help optimize functional ability and improve RTW</td>
</tr>
<tr>
<td>Saeki (2010), Japan¹¹</td>
<td>Determinants of early RTW after stroke</td>
<td>Prospective cohort study; n=253</td>
<td>55% RTW; predictors included male sex, independence in function, hand function; RTW occurred within first 400 days</td>
</tr>
<tr>
<td>Tanaka (2011), Japan⁷</td>
<td>To examine factors associated with early RTW</td>
<td>Prospective cohort study; n=335</td>
<td>30% early RTW at 1 mo. Facilitating factors were mild disability, white-collar occupation, and continued employment while in hospital</td>
</tr>
<tr>
<td>Trygged (2011), Sweden²²</td>
<td>To determine socioeconomic factors to predict RTW</td>
<td>Prospective cohort; n=7081</td>
<td>69% RTW at 1 y; significantly higher probability of RTW in higher social classes</td>
</tr>
</tbody>
</table>

RTW indicates return to work.
to outpatient programs that may help facilitate the transition back to work. Working in conjunction with physical and occupational therapy, nurses can help patients and families to recognize that it is not too early or ambitious to make goals for the future.

Conclusions

RTW after stroke continues to be an important milestone of recovery for patients; however, it is poorly understood by the healthcare community. Work has been established as an achievable outcome for stroke survivors. The importance of work to health and well-being can also not be understated. Future research studies should focus on interventions targeted at known barriers to RTW.

**TAKE-HOME POINTS**

- Return to work is an attainable goal for patients with stroke.
- Referrals made by nursing in the hospital may increase the likelihood of return to work.
- Access to resources after hospitalization may be a key factor in return to work.

Disclosures

None.

References


Key Words: employment | return to work
Return to Work After Stroke: A Nursing State of the Science
Catherine Harris

Stroke. 2014;45:e174-e176; originally published online July 10, 2014;
doi: 10.1161/STROKEAHA.114.006205
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2014 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/45/9/e174

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/