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Aphasia incidence and intervention in the acute hospital setting

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Aphasia Incidence and Intervention in the Acute Hospital Setting

Dominique Lidia Ferreira

A report submitted in Partial Fulfilment of the Requirements for the Award of Bachelor of Speech Pathology Honours, Faculty of Computing, Health and Science,

Edith Cowan University.

Submitted (November, 2012)

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Aphasia Incidence and Intervention in the Acute Hospital Setting

Abstract

Background: Current research highlights the significance of providing early and intensive aphasia therapy to maximise neural plasticity and enhance communication gains. Acute speech pathology service delivery in Australia does not consistently meet best practice standards recommended by the National Stroke Foundation. *Aims:* This study aimed to: i) investigate the incidence of post-stroke aphasia in the acute setting; ii) determine the referral rate to speech pathology for patients with aphasia; iii) investigate the amount of language therapy provided to people with aphasia and iv) explore the relative proportion of aphasia service delivery within the overall caseload management of speech pathologists. *Method & Procedure:* People admitted to an acute-care Australian hospital with confirmed stroke were screened for aphasia using the Frenchay Aphasia Screening Test (FAST) (Enderby et al., 1987) and a clinical diagnosis. Speech pathology management was recorded for all occasions of service, together with the time spent in assessment, treatment and overall management for all people with a confirmed stroke for the duration of their in-patient stay. *Results:* Thirty-one people were admitted with a confirmed stroke, 23 were screened for aphasia and nine patients were diagnosed with aphasia. Of the nine people with aphasia, eight of these were deemed to be candidates for therapy and received aphasia assessment and four went on to receive aphasia therapy. Seven participants without aphasia were referred to speech pathology and received a dysphagia assessment. Four of these people subsequently received dysphagia treatment. Across all the time managing people with stroke, equal proportions of speech pathology time was spent in aphasia and dysphagia management.

Conclusion: Speech pathology management in the acute hospital setting is not yet being delivered according to best clinical practice standards. Although speech pathologists are spending an equal amount of time providing dysphagia and aphasia services, a greater amount of time is spent providing dysphagia treatment. Further research is needed to examine why the prescribed intensity of aphasia therapy is not being delivered in the early phase of recovery.

Keywords: aphasia, incidence, stroke, acute, intervention

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Aphasia Incidence and Intervention in the Acute Hospital Setting

In recent years the role of the speech pathologist within the acute hospital setting has transformed dramatically as a result of time constraints (Armstrong, 2003; Enderby & Petheram, 2002; Lalor & Cranfield, 2004), reduced funding, and service provider organisational policies (Verna, Davidson, & Rose, 2009). Dysphagia referrals have increased exponentially, as has the time spent managing swallowing function in the acute setting (Enderby & Petheram, 2002). Despite aphasia referrals to speech pathology departments also having increased, the time spent working with people with aphasia has decreased (Enderby &Petheram, 2002). The changing demands of clinical services may mean those people with communication impairments, such as aphasia and right hemisphere communication impairments, do not receive the intervention they require.

Cost and Impact of Aphasia

Cerebrovascular disease, including stroke, was the second leading cause of death in Australia in 2010 (Australian Bureau of Statistics, 2010). It is estimated that in Australia each year approximately 60 000 people suffer a stroke and as the population ages this number will increase further (National Stroke Foundation [NSF], 2010). Stroke impacts greatly upon the healthcare system and it is estimated that Australian stroke expenditure is $2.14 billion per annum (NSF, 2010). Following a first ever ischaemic stroke, approximately one third of people will suffer from aphasia (Dickey et al., 2010; Lalor & Cranfield, 2004; Laska, Hellblom, Murray, Kahan, & Von Arbin, 2001; Law et al., 2009; Pedersen, Jorgensen, Nakayama, Raaschou, & Olsen, 1995; Tsouli, Kyritsis, Tsagalis, Virvidaki, & Vemmos, 2009) and that one year later approximately 18-27% of these people have chronic aphasia (Paolucci et al., 2005).

The presence of aphasia is a good predictor of short and long-term mortality (Laska et al., 2001; Tsouli et al., 2009). People with aphasia have almost a fourfold mortality rate when compared to stroke survivors without aphasia in the acute phase (Laska et al., 2001). At ten years post-stroke this difference is maintained (Tsouli et al., 2009). Likewise, aphasia is associated with lower functional improvements during rehabilitation (Gialanella & Prometti, 2009; Guyomard et al., 2009) and is an independent predictor of increased hospital length of stay (LOS). People with aphasia have up to a 14 day longer LOS in hospital than stroke survivors without aphasia (Guyomard et al., 2009; Paolucci et al., 2005), placing an increased burden on the healthcare system and greatly increasing costs (Gialanella & Prometti, 2009; Guyomard et al., 2009).

The consequences of aphasia are devastating for the psychosocial well-being of an individual and their family (Tsouli et al., 2009). Aphasia is a strong predictor of increased depression, poor functional recovery and is associated with compromised independence in activities of daily living (Tsouli et al., 2009). People with aphasia are more frequently discharged to long-term rehabilitation and residential care than people without aphasia (Dickey et al., 2010; Guyomard et al., 2009; Laska et al., 2001;Tsouli et al., 2009). Aphasia is an expense on the healthcare system, and its management is time consuming and relies on extensive community resources. Research suggests rehabilitation during the very early post-stroke recovery phase is both feasible and results in greater communication outcomes as a result of enhanced neuroplastic changes (Godecke, Hird, Lalor, Rai, & Phillips, 2011; Paolucci et al., 2005; Robey, 1994, 1998).

Neuroplasticity

The principles of neuroplasticity can be applied to provide aphasia management that maximises language recovery and reduces the negative outcomes associated with aphasia. A restitution model of neuroplasticity suggests the majority of neuroplastic processes occur in the early stroke recovery phase until four weeks post-stroke (Rothi & Horner,1983). This model outlines a pattern of neurorecovery, whereby the function of the lesioned area is not entirely lost as a result of stroke. Consequently rehabilitation has the potential to support the recovery of the reduced function by facilitating the process of neurorecovery (Godecke et al., 2011; Rothi & Horner, 1983). Therapeutic models suggest a significant proportion of spontaneous recovery in language function occurs within the first three months post-stroke (Robey, 1998) and so providing aphasia therapy during this phase corresponds with the optimum timing of neural recovery. However, there is ongoing debate surrounding the efficacy of aphasia therapy in the early phase after stroke. Factors believed to influence outcomes include the timing of therapy commencement and the intensity of treatment (Godecke et al., 2011).

Treatment Intensity and Efficacy

When to commence therapy. Research literature is divided as to the feasibility and impact of very early intervention. The NSF (2010) proposed that early intervention results in superior communication outcomes for individuals with aphasia. This is supported by two meta-analyses by Robey (1994, 1998) that concluded the commencement of aphasia intervention during the first three months post-stroke results in treatment effects which are nearly twice that of spontaneous recovery. Additionally, Paolucci et al. (2005) demonstrated that treatment responsiveness within the first 20 days post-stroke is six times higher than after

delayed intervention. Although early intervention has shown improved communication outcomes, some propose that aphasia therapy during the very early phase is not feasible due to medical instability and compromised physical and mental ability (Bakheit et al., 2007a; Laska et al., 2001). In contrast, two randomized controlled trials (Godecke et al., 2011; Laska, Kahan, Hellblom, Murray, & von Arbin, 2008) demonstrated individuals with aphasia tolerated therapy as early as three days post-stroke.

It is recognised that some people may not tolerate very early aphasia therapy. Lazar et al. (2010) proposes that as long as therapy is commenced within the first three months post-stroke, positive communication gains are achieved. Thus, whilst aphasia therapy during the very early period results in greater treatment effects than intervention during the post-acute period (Robey, 1994), it is significant to note that intervention during both these phases results in superior communication outcomes than spontaneous recovery alone (Godecke et al., 2011; Robey, 1994). Recent evidence (Godecke, Ciccone, Granger, Hankey, & Phillips, 2009) demonstrated the importance of very early aphasia therapy when Godecke et al. (2009) compared a very early intervention cohort to a usual care cohort (Godecke et al., 2011). The comparison study by Godecke et al. (2009) demonstrated that people who received very early aphasia therapy achieved positive communication outcomes at therapy completion and these gains continued to outstrip improvements made by the usual care cohort at a 26 week follow-up.

Intensity of therapy. The terms ‘intensity’ and ‘frequency’ are used interchangeably within the literature, however the terms have different meanings when considering the provision of therapy. Therapy intensity is defined as the quantity of time engaged in therapeutic activity, whereas therapy frequency relates to

the number of sessions per week (Godecke, 2008). Increased therapy intensity has been shown to contribute significantly to positive treatment outcomes (Bhogal, Teasell, & Speechley, 2003; Robey, 1998). Studies have concluded that aphasia therapy should be provided for at least two hours a week within the first two to three months post-stroke to yield the greatest gains in communication (Bhogal et al., 2003; Godecke et al., 2011; Robey, 1998). Treatment provided at less than 1.5 hours per week has shown reduced treatment effects resulting in minimal difference from spontaneous recovery alone (Godecke et al., 2011; Robey, 1998).

Despite coexisting morbidities of fatigue, illness, depression, and attention related problems (Marshall, 1997) people with aphasia are able to tolerate daily intervention in the very early phase of recovery. For example, Paolucci et al. (2005) demonstrated people with aphasia could attend up to 60 minutes of therapy per day, five days a week during their hospital stay. Furthermore, Godecke et al. (2011) found medically stable individuals were able to tolerate two and a half hours of aphasia therapy per week within the very early phase of recovery. Positive communication outcomes as a result of more frequent (i.e. daily) aphasia therapy are maintained at six month post-stroke (Godecke et al., 2011) and these gains can be extended with ongoing aphasia therapy (Bakheit, Shaw, Carrington, & Griffiths, 2007b). This suggests that as a result of neuroplastic changes, the benefits of aphasia therapy continue after therapy termination.

Current Level of Care in Australia

Given research evidence regarding the timing and intensity of aphasia intervention it is important to consider the translation of this research into current clinical practise. The results of some studies, for example Lalor and Cranfield (2004) who investigated aphasia management in acute hospital settings, indicate that

the NSF (NSF, 2010) early aphasia management service recommendations are not consistently met in Australian clinical settings. Two main issues impacting on service delivery are: i) the under identification of people with aphasia and ii) the lack of intervention provided to people with aphasia (Armstrong, 2003; Lalor & Cranfield, 2004; Verna et al., 2009). Due to reduced services in Australian healthcare settings the majority of language recovery noted in the very early phase following stroke is therefore attributed to spontaneous recovery; the rapid and early natural recovery processes following infarction, rather than aphasia treatment (Godecke, 2008).

Australian and New Zealand speech pathologists report they conduct aphasia assessments within the first two days of hospital admission (Vogel, Maruff, & Morgan, 2010). However, there is conflicting evidence suggesting almost 31% of people admitted to the acute hospital setting are not assessed for aphasia (Lalor & Cranfield, 2004). Reasons for this include reduced service provision, coexisting morbidities, mortality, or being from a non-English speaking background (Lalor & Cranfield, 2004). It is suggested that time constraints placed upon clinical services may also impact aphasia service delivery (Armstrong, 2003; O'Halloran, Worrall, & Hickson, 2011;Verna et al., 2009).

Studies investigating the amount of treatment provided in the acute hospital setting are limited. Lalor and Cranfield (2004) investigated the incidence and management of aphasia in an acute hospital setting in Western Australia over a one year period. They found over 75% of people with aphasia who were appropriate candidates for aphasia therapy, did not receive intervention for the duration of their in-hospital stay. People with aphasia received an average of 13 minutes of therapy per week in the acute hospital setting (Godecke et al, 2011). An Australian based

survey (Verna, et al., 2009) found that only nine percent of speech pathologists provide daily therapy during their patient's stay in the inpatient acute hospital setting. Additionally, it is reported that on average two to two and a half hours of direct therapy is provided each week to clients with aphasia in the inpatient acute hospital setting (Katz, 2000; Verna, et al., 2009).Whilst this figure is in accordance with national standards (NSF, 2010), it is necessary to consider that this is a figure reported retrospectively by speech pathologists through a survey and may not reflect services to all patients in the hospital setting.

Research Aims

The psychosocial and economic consequences of aphasia are extensive for the individual and community. In consideration of the potential benefit of very early aphasia intervention, and the reported variability in aphasia service provision during the early recovery phase, this study aimed to investigate and confirm previous research on aphasia service provision during the early post-stroke recovery phase. Specifically, this study aimed to:

1. Determine the incidence of aphasia in stroke survivors admitted to an acute hospital and the rate at which patients with aphasia were referred for ongoing speech pathology management.
2. Determine the proportion of patients with aphasia considered candidates for aphasia therapy.
3. Determine the proportion of patients with aphasia who received therapy.
4. Determine the amount of language therapy provided to patients with aphasia.
5. Determine the proportion of time, in their overall caseload management, that speech pathologists spent delivering aphasia services in the acute setting.

It was hypothesised that: i) the post stroke aphasia incidence at Royal Perth Hospital (RPH) will be similar to previous studies (Lalor & Cranfield, 2004; Godecke et al., 2011); ii) not all people with aphasia post stroke will be referred to speech pathology for the clinical management of aphasia; and iii) the amount and frequency of aphasia intervention received in the very early post-stroke recovery phase will be similar to levels reported in previous studies (Lalor & Cranfield, 2004; Godecke et al., 2011).

Method

Setting

Participants were identified from patients admitted to RPH, in the Perth metropolitan area, during a five week period between September and October 2012. Ethical approval was obtained from RPH's and Edith Cowan University's Human Research Ethics Committees.

Participants

Individuals admitted to RPH with a possible diagnosis of stroke were the participants in this study. All participants were within the first ten days of admission and only participants with a confirmed diagnosis of stroke were included in the study. Patients with a previous major head injury or neurodegenerative disease, a subarachnoid or subdural haemorrhage, or a previously diagnosed major depression were excluded from the study.

Procedure

Figure 1: Overview of the research procedure.

Note: SP= speech pathology.

As outlined in Figure 1 the data collection process involved five steps. Potential participants were initially identified via the hospital census admission data list. The medical notes of all patients with a provisional diagnosis of stroke, falls, confusion, delirium, seizures, and transient ischemic attack were reviewed to confirm a diagnosis of stroke. All patients diagnosed with an acute stroke by a neurologist or medical physician and confirmed with either magnetic resonance imaging (MRI) or computerised tomography (CT) imaging were approached to participate in the study.

Participants with a confirmed stroke were screened to determine the presence of aphasia as identified on the Frenchay Aphasia Screening Test (FAST) (Enderby, Wood, Wade, & Langton Hewer, 1987). The FAST (Enderby et al., 1987) is the only post-stroke acute screening assessment tool which provides reliable, valid, and sufficient detail for the identification of the presence of aphasia (Salter, Jutai, Foley, Hellings, &Teasell, 2006). The result of the FAST (Enderby et al., 1987) screen was documented in the integrated medical notes for each patient screened.

All people identified as having aphasia were then assessed to determine their potential to participate in aphasia therapy. Following criteria established by Godecke et al. (2011) patients were considered appropriate candidates for therapy if they:

- Had aphasia as identified by the FAST (Enderby et al., 1987) or had a clinical diagnosis of aphasia determined by word-finding difficulties and patient self-report, as assessed by the researcher.
- Were able to maintain an alert and wakeful state for a minimum of thirty minutes as assessed by the ward speech pathologist.
- Were conscious and medically stable following assessment with a score of >10 on the Glasgow Coma Scale, which indicates a moderate level of

alertness.

Patients with a confirmed diagnosis of stroke were referred by the treating medical team to the speech pathology department according to usual referral standards. Patients with a confirmed diagnosis of stroke, who were not referred to the speech pathology department, did not receive further speech pathology intervention however were included as participants within this study.

Patients referred to the Speech Pathology Department were then managed according to usual ward-based care as determined by the treating clinician. All speech pathologists managing stroke survivors, not just individuals with aphasia, were asked to manually record all occasions of service (see Appendix) for the duration of the patient's hospital stay. Details of each occasion of service were recorded including the focus of the speech pathology session, for example assessment, treatment or counselling and the area targeted, for example aphasia, dysphagia, dysarthria etc. Additionally the number and length of each session was also recorded. If people with aphasia were not provided with intervention, treating clinicians were requested to record information as to the reasons for this.

The medical files were retrospectively reviewed for patients identified with a possible stroke who were discharged prior to a confirmed diagnosis of stroke. If a patient with a confirmed stroke was discharged from hospital prior to receiving speech pathology intervention, documentation regarding the reason for this was noted.

Statistical Analysis

Descriptive analyses of the demographic and medical data were completed. Data regarding age, gender, date of stroke, type and location of lesion, clinical syndrome (Bamford, Sandercock, Dennis, Burn, &Warlow, 1991), length of stay

(LOS), discharge location, and previous medical history were collected for each patient with a confirmed stroke. The incidence of aphasia in stroke survivors in the acute hospital setting, the percentage of participants referred for the management of aphasia, the proportion of patients determined to be candidates for therapy, the proportion of patients who received aphasia therapy, and the amount of aphasia therapy participants were provided was determined. In addition, the percentage of participants, who did not have aphasia and were referred to speech pathology was also determined together with the amount of therapy provided for these individuals.

Results

Over five weeks of data collection at Royal Perth Hospital, a total of 233 people were admitted with a possible diagnosis of stroke (Figure 2). Diagnosed strokes were confirmed for 31(13.3%) people, 15 (48.4%) of which had a left hemisphere stroke. Of the 31 people with confirmed strokes, 23 were screened for the presence of aphasia. Screening using the FAST (Enderby et al., 1987) occurred within a mean time of 3.13 days (range 0-7 days) post-stroke. Of the eight people not screened for aphasia: four were discharged prior to screening (discharged within a mean of 4 days), three people had a previously diagnosed degenerative neurological condition, and one person had a stroke caused by cerebral metastases. Of the 23 people screened on the FAST (Enderby et al., 1987) and diagnosed through clinical diagnosis, 9 (39.1%) were identified as having aphasia (Table 1). Eight of these people were identified from scores on the FAST (Enderby et al., 1987) and one person was identified by clinical diagnosis and patient self-report of mild word-finding difficulties.

All of the 9 individuals identified with aphasia according to FAST (Enderby et al., 1987) results and clinical diagnosis were referred to the speech pathology for

management of their aphasia (Figure 3). The number and length of speech pathology services provided to patients with and without aphasia was examined. Data collected from the managing speech pathologists working with people with aphasia was examined to determine the number of people considered appropriate candidates for aphasia therapy, and the number of people who subsequently received aphasia intervention. Eight (88.9%) of nine people identified with aphasia were considered appropriate candidates for aphasia therapy based on the study selection criteria. One person with aphasia was not appropriate to receive therapy due to reduced alertness. This person was subsequently discharged back to their nursing home without aphasia therapy being provided.

Of the candidates appropriate for aphasia intervention, four people (50%) did not receive any aphasia therapy (Table 2). For two people the reasons given for therapy not being provided were reduced mood and reduced participation in sessions, and return to a premorbid level of functioning. No reasons were provided for the remaining two individuals.

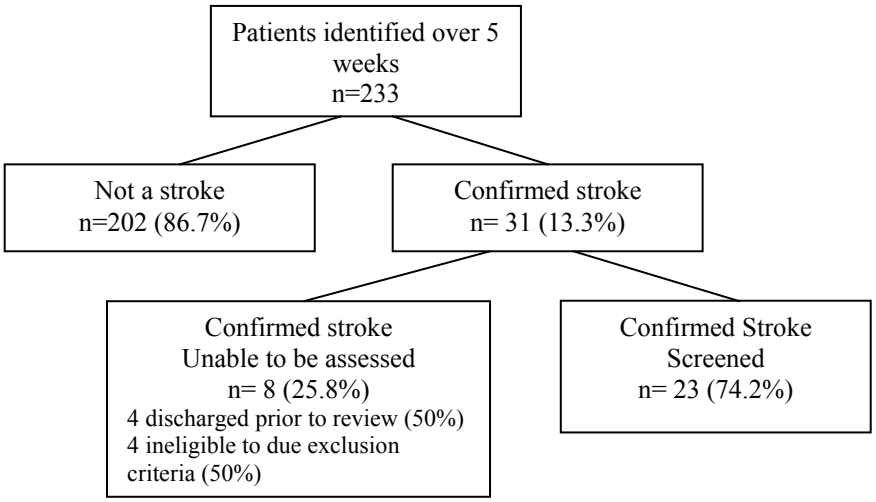

Figure 2: Identification and screening results of all hospital admissions with a possible diagnosis of stroke.

Table 1

Characteristics of screened patients with confirmed diagnosis of stroke.

Participant characteristics	People with aphasia *n*= 9 *(%)*	People without aphasia *n*= 14 *(%)*	Total *N*= 23
Age (mean (range))	63.6 (33-84)	66.5 (47-90)	65 (33-90)
Female (%)	3 (33)	3 (21)	6 (26)
Clinical Syndrome			
PACS (%)	5 (56)	4 (29)	9 (39.13)
TACS (%)	3 (33)	3 (21)	6 (26.09)
POCS (%)	1 (11)	6 (43)	7 (30.43)
LACS (%)	-	1 (7)	1 (4.35)
LOS (days (range))	11.5 (3-18)	7.6 (2-19)	9.55 (2-19)

Note: LOS= length of stay; PACS= partial anterior circulation syndrome, TACS= total anterior circulation syndrome, POCS= posterior circulation syndrome, LACS= lacunar syndrome (Bamford et al., 1991).

The amount and timing of assessment and treatment provided to people with aphasia was investigated (Tables 3 and 4). On average aphasia assessment commenced within the first two days (range 1-4) post stroke. The eight people with aphasia who were deemed suitable for intervention received on average three aphasia assessment sessions, and each session lasted a mean of 35 minutes (range 25-60). For the four individuals who received aphasia therapy it was commenced within an average of 4 days (range 3-6) post-stroke. People with aphasia received a mean of 2.5 (range 1-5) therapy sessions during their admission. The mean length of each therapy session was 29 minutes (range 10-60). By considering the average length of each therapy session and the timing of these sessions across the hospital stay, people with aphasia received approximately 44 minutes of aphasia therapy in their first

week post-stroke. Four of the eight (50%) individuals with aphasia also received dysphagia assessment, and two people (25%) received dysphagia therapy. The four people who received dysphagia assessment received an average of 3.75 (range 2-5) dysphagia assessment sessions during their admission, and each session went for a mean duration of 13 minutes (range 5-20). For the two individuals who received dysphagia therapy, approximately 5 sessions (range 3-7) were provided, and each session had a mean duration of 11 minutes (range 5-20).

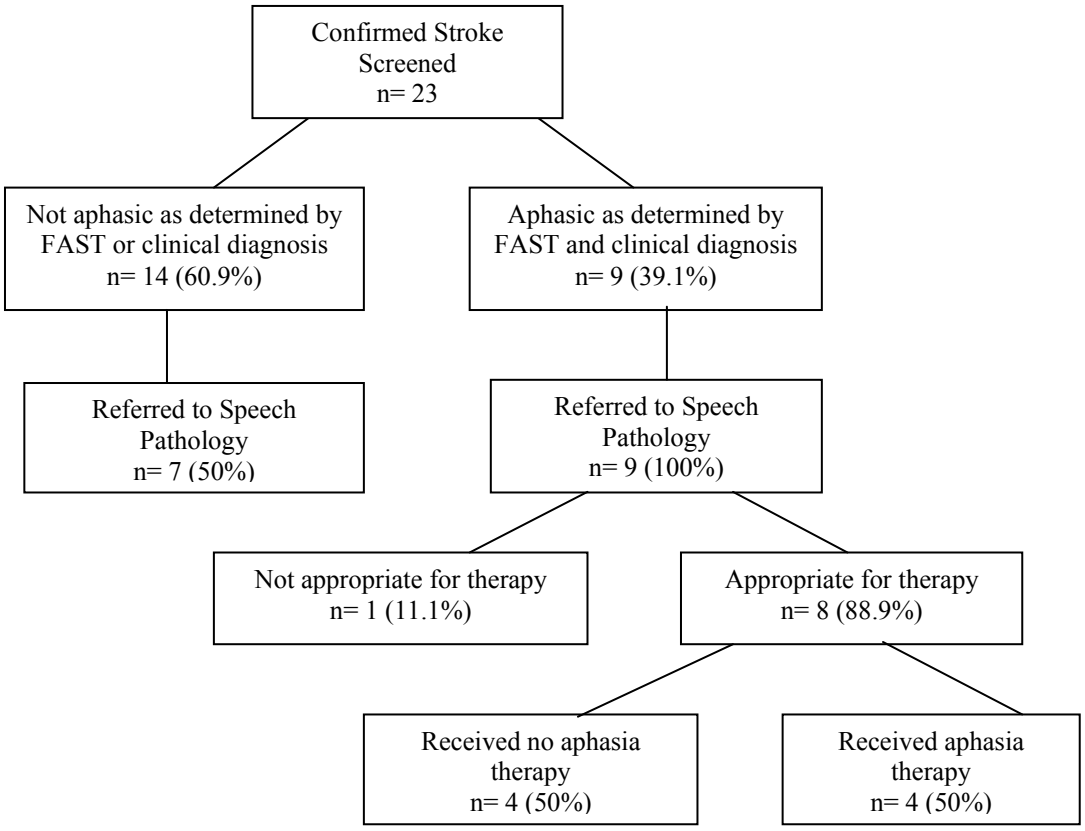

Figure 3: Speech pathology management for participants with a confirmed stroke.

Table 2

Characteristics of patients who were considered appropriate candidates for aphasia therapy, and subsequently did and did not receive aphasia therapy.

	Received therapy *n*= 4	Did not receive therapy *n*= 4	Total *N*= 8
FAST score (mean (range))	7.9 (2-18)	10 (2-13.5)	8.9 (2-18)
Age (mean (range))	54.5 (33-75)	68.75 (45-84)	61.63 (33-84)

For the 14 individuals without aphasia, all of whom had right hemisphere stroke, seven (50%) were referred to speech pathology for further management (Figure 3). All seven of these individuals received dysphagia assessment, and subsequently four (57.1%) of the seven received dysphagia therapy. The four people who did receive dysphagia therapy had a mean of 4.75 sessions (range 2-8) during their admission. The duration of each session had a mean of 19.5 minutes (range 7.5-20) By considering the average length of each therapy session and the timing of these sessions across the hospital stay, people with right hemisphere damage post-stroke, received approximately 85 minutes of dysphagia therapy in their first week post-stroke. Of the seven individuals referred to speech pathology, one person (14.3%) was assessed for the presence of right hemisphere language impairments. This individual did not receive further therapy.

Figure 4 displays the proportion of time people with and without aphasia received speech pathology services. The categories of speech pathology services included are assessment, intervention, and other which includes counselling, education, programming, and discharge planning.

Table 3

Number of suitable candidates with and without aphasia who were referred to speech pathology and received assessment and therapy during admission.

	People with aphasia (*N*= 8)			People without aphasia (*N*= 7)		
(*n* (%))	Aphasia	Dysphagia	Other	Right hemisphere language	Dysphagia	Other
Assessment	8 (100%)	4 (50%)	2 (25%)	1 (14.3%)	7 (100%)	6 (85.7%)
Therapy	4 (50%)	2 (25%)	2 (25%)	0 (0%)	4 (57.1%)	1 (14.3%)

Table 4

Average number of sessions and time spent in assessment and therapy for people with and without aphasia who received various services across their admission.

	People with aphasia			People without aphasia		
M (range)	Aphasia	Dysphagia	Other	Right hemisphere language	Dysphagia	Other
No. assessment sessions	3.13 (1-9)	3.75 (2-5)	3 (3-5)	1 (1)	2.57 (1-7)	1 (1)
Time (mins) of assessments	34.9 (8-60)	13.2 (5-20)	11.7 (5-10)	20 (20)	21.1 (10-50)	15.8 (10-20)
No. therapy sessions	2.5 (1-5)	5 (3-7)	4 (1-7)	0 (0-0)	4.75 (2-8)	4 (4)
Time (mins) of therapy sessions	29 (10-60)	11 (5-20)	14.8 (10-30)	0 (0-0)	19.5 (7.5-20)	11.5 (7.5-15)

Note: Other= dysarthria, apraxia, and voice.

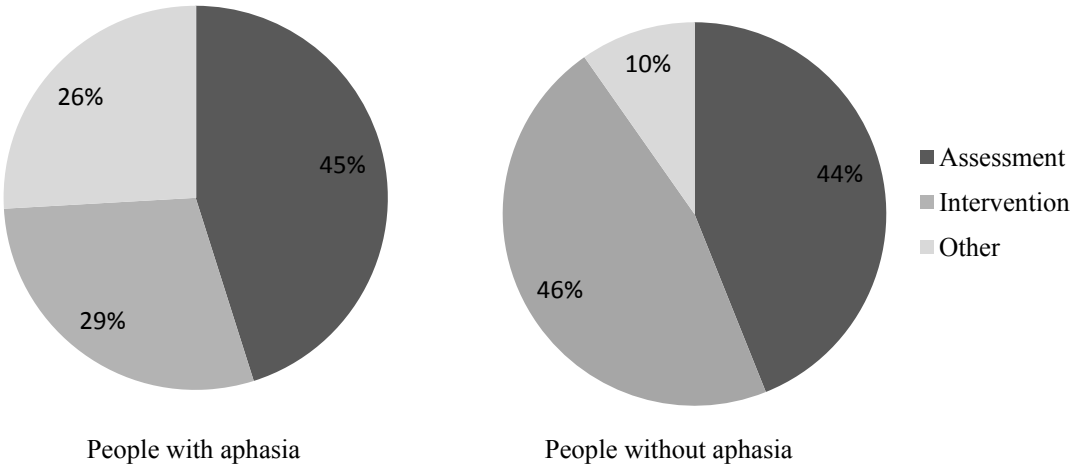

Figure 4: Distribution of speech pathologists' caseload management for people with and without aphasia.

Note: Other= Counselling, education, programming and discharge planning)

The average LOS for individuals with and without aphasia was 11.5 days (range 3-18) and 7.6 days (range 2-19), respectively. A comparison of the discharge locations for people with and without aphasia who were appropriate candidates for therapy is shown in Figure 5.People with aphasia were most often discharged home with RITH support (50%) and to a long-term rehabilitation setting (38%) to receive further intervention. Fewer people with aphasia were discharged home without further services being required (12%). People without aphasia were more commonly discharged home without further service delivery (57%). A lesser proportion of people without aphasia were discharged to a long-term rehabilitation facility (36%), or discharged home with RITH support (7%).

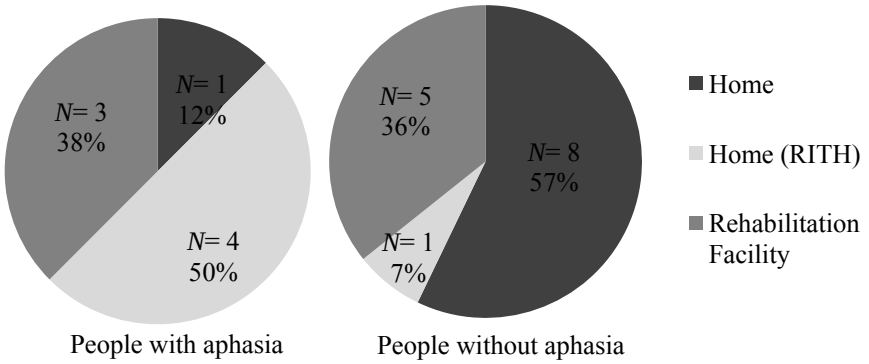

Figure 5: Discharge locations for people with and without aphasia.

The distribution of caseload management for speech pathologists was investigated and is shown in Figure 6. In their overall caseload management, speech pathologists typically spent the most amount of time delivering aphasia (43%) and dysphagia (39%) services, and less time providing services relating to apraxia, dysarthria, voice (17%) and right hemisphere communication impairments (1%). The proportion of time speech pathologists allocated to assessment and intervention in each of these areas is shown in Figure 7. Speech pathologists spent 75% of their time completing aphasia assessments and 25% of time delivering aphasia therapy. In comparison speech pathologists spent 55% of time on dysphagia assessment and 45% of time on dysphagia treatment.

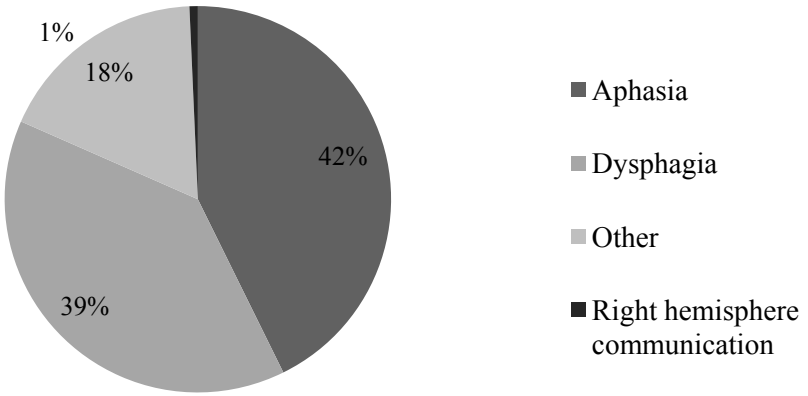

Figure 6: Distribution of caseload management of speech pathologists.

Note: Other= dysarthria, voice, and apraxia.

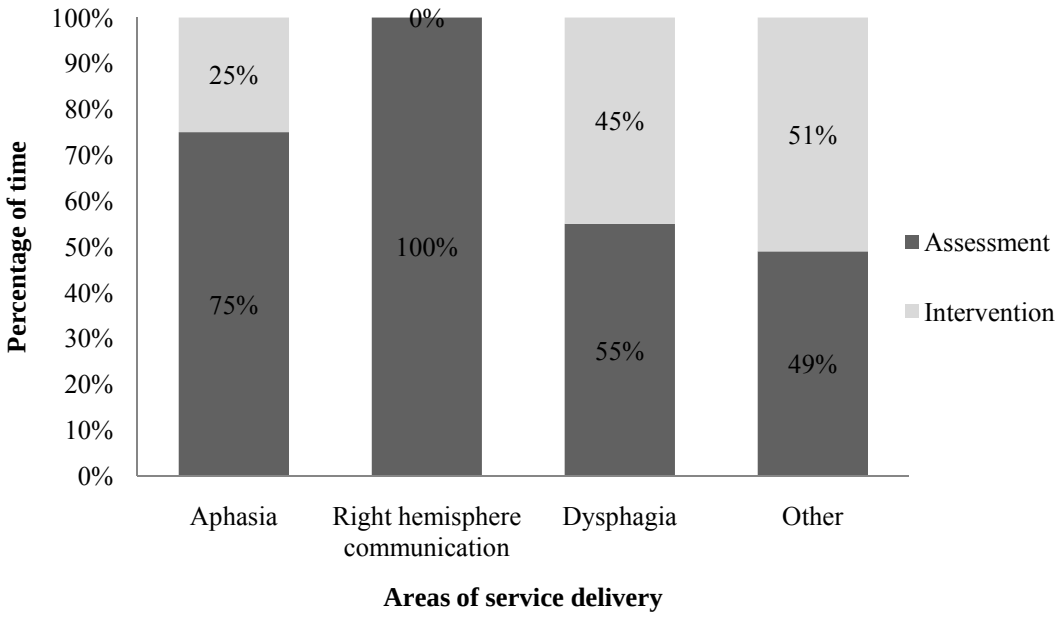

Figure 7: Proportion of time spent in assessment and intervention for all participants.

Note: Other= dysarthria, voice, and apraxia

Discussion

Communication impairments are prevalent post-stroke (O'Halloran, Worrall, Hickson, 2009). Specifically, aphasia imposes an extensive and persisting impact on the individual and their family, as well as a financial burden on the healthcare system (Dickey et al., 2010; Gialanella & Prometti, 2009; Guyomard et al., 2009; Laska et al., 2001; Paolucci et al., 2005; Tsouli et al., 2009). In order to enhance neuroplastic processes and maximise communication outcomes post-stroke, intervention needs to be delivered in a timely and intensive manner (Godecke et al., 2009; Godecke et al., 2011; Robey, 1994, 1998). Therefore, the aims of the current study were to investigate the post-stroke aphasia incidence in an acute setting, determine the rate at which patients with aphasia were referred for ongoing speech pathology management, and to investigate the amount of language therapy provided to people with aphasia in the acute setting. A further aim was to explore the overall caseload

management of speech pathologists in the acute setting, and determine the proportion of this time which is attributed to the delivery of aphasia services. It was originally hypothesised that the incidence of post-stroke aphasia, and the amount and frequency of aphasia intervention received in the very early post-stroke recovery phase would be similar to levels reported in previous studies (Lalor and Cranfield, 2004; Godecke et al, 2011). It was also hypothesised that not all people with aphasia post-stroke would be referred to speech pathology for the clinical management of aphasia.

Aphasia incidence in this study is similar to others, which suggest that approximately one third of people experience aphasia post-stroke (Dickey et al., 2010; Lalor & Cranfield, 2004; Laska et al., 2001; Law et al., 2009; Pedersen et al., 1995; Tsouli et al., 2009). This suggests that across time and locations, the incidence of aphasia has remained relatively stable. It is not surprising that in larger scale settings the reported incidence of aphasia is slightly lower than in this study. Whilst there may be genuine differences, it may also be a reflection of variations in sample sizes, population, healthcare settings, and seasonal fluctuations.

For 25.8% of people with a confirmed stroke the presence of aphasia was unable to be confirmed, as these people were discharged prior to speech pathology assessment or ongoing intervention. This highlights the need for very early communication screening with trained healthcare professionals and further NSF guidelines about the minimum standards of care which people receive post-stroke. It is suggested that medical professionals, such as junior medical staff, may not consistently identify communication deficits due to lack of awareness that communication impairments are present (Lehman Blake et al., 2003; O'Halloran et al., 2011). This may be highlighted in the current study, in which one participant's score on the FAST (Enderby et al., 1987) indicated that aphasia was not present,

however with further investigation a clinical diagnosis was made for the presence of high-level aphasia difficulties. Although this individual was referred to speech pathology, high-level communication difficulties post-stroke may not be identified by other healthcare professionals (Lehman Blake et al., 2003; O'Halloran et al., 2011). O'Halloran et al. (2011) recommends that professionals in healthcare need to be provided with more extensive knowledge and education about communication deficits.

Interestingly in this study, all participants who were identified as having aphasia were subsequently referred by the treating medical team for speech pathology intervention. This contrasts with Lalor and Cranfield's (2004) study in which 10% of people with aphasia were not referred to speech pathology, and may indicate that the rate of aphasia referrals to speech pathology is improving within the acute setting. However, anecdotally, following communication with the stroke ward speech pathologist it has been suggested that the dysphagia screening education program may have contributed to increased referral rates. Therefore, referrals to speech pathology may not be for aphasia but may instead be a result of people with communication impairments being unable to follow commands within the dysphagia screening.

In this study, all participants initially identified as having aphasia received speech pathology aphasia assessment within an average of two days. These findings are in line with the recommendations from the NSF (2010). Referral to speech pathology and timely assessment for the presence of aphasia is vital during the acute stage, given that commencing therapy during the early phases post-stroke optimises therapeutic outcomes (Godecke et al., 2009; Robey, 1994, 1998). Early referral and assessment is also favourable in order to educate and provide support to the

healthcare team and family members about the presence of communication impairments (Marshall, 1997).

Despite this study's small sample size, the proportion of people with aphasia who were not suitable for therapy is comparable to the 11% reported by Lalor and Cranfield (2004). Also similar to Lalor and Cranfield's (2004) research, this study's results indicated that people were more likely to receive aphasia therapy if they were younger. When considering the potential impact this may have on people with aphasia, it is important to consider quality of life and the expectation of returning to a premorbid level of functioning. It has been recognized that even mild aphasia has a negative impact on the individual's return to employment (Morris, Franklin, & Menger, 2011). In this study the average age for people with aphasia who did not receive aphasia therapy was above that of the Australian retirement age. In an Australian study exploring everyday communication of older people with and without aphasia Davidson, Howe, Worrall, Hickson, and Togher (2008) concluded that people with aphasia have fewer friends, and experience greater social isolation and loneliness. Furthermore, loneliness post-stroke is also associated with depression (Davidson et al., 2008; Hilari et al., 2010). In this study the impact of aphasia was not directly examined. Despite this, it can be suggested that the provision of aphasia therapy is vital given the role of communication in maintaining and acquiring satisfying social relationships post-stroke.

Individuals in this study tolerated commencing therapy as early as three days post-stroke. These findings are supported by the randomised control trial by Godecke et al. (2011) which found that 85% of individuals with moderate to severe aphasia were able to tolerate commencing aphasia therapy within the first three days post-stroke. Furthermore, this is also consistent with recommendations of the NSF (2010)

which state that aphasia therapy should begin as early as is tolerated by people with aphasia. This is a significant clinical finding when considering that the commencement of aphasia intervention during the early phase post-stroke results in treatment effects which are nearly twice that of spontaneous recovery (Robey, 1994, 1998). Furthermore, the commencement of early therapy has been demonstrated to result in positive communication gains which outstrip improvements made at a 26 week follow-up by people who receive 'usual' care (Godecke et al., 2009).

The frequency and intensity of aphasia therapy provided in the acute setting was investigated. Of the people who received aphasia therapy, an average of 1.5 sessions of approximately 29 minutes each were delivered within their first week post-stroke; a total average of 44 minutes of aphasia therapy within the first week post-stroke. The NSF (2010) guidelines recommend that people with aphasia should receive at least two hours of therapy a week during the acute phase of recovery within the first six months post-stroke. Despite this recommendation, speech pathologists are not meeting these standards. In an earlier Australian study, Lalor and Cranfield (2004) demonstrated that suitable candidates for aphasia therapy received on average 13 minutes of therapy per week in the acute hospital setting. Therefore, despite improvements made by speech pathologists providing intensive aphasia therapy within the acute setting, the prescribed intensity resulting in the greatest communication outcomes is still not being delivered.

Our results further illustrate the typical overestimation made by speech pathologists regarding the amount of aphasia therapy provided in the acute hospital setting. In a recent Australian-based survey by Verna et al. (2009), speech pathologists reported that they provide just over two hours of direct therapy to people with aphasia in the inpatient acute hospital setting. It is important to note this

as it indicates that although some speech pathologists may be providing aphasia therapy within the acute setting in line with NSF (2010) recommendations, the vast majority are not.

This study illustrated that the proportion of time that people with aphasia received intervention was comparable to the proportion of time people with aphasia received other services, such as counselling and education. This may suggest that people with aphasia are receiving counselling and education in the early stages of recovery at the expense of aphasia therapy. Whilst the importance of counselling and education during the early phases post-stroke has been documented (Holland & Fridriksson, 2001), research suggests that up to 97% of people with aphasia prefer to receive stroke and aphasia information at six months post-stroke (Rose, Worrall, Hickson, & Hoffman, 2010). Speech pathologists working in the acute setting should be mindful that aphasia therapy during the first three months post-stroke corresponds with the optimum timing of neural recovery (Robey, 1998) and supports the process of neurorecovery (Godecke et al., 2011; Rothi & Horner, 1983). Therefore, it may be beneficial to prioritise speech pathology service delivery for aphasia therapy in place of counselling and education in the early stages of recovery.

The present study provides information about the level of services provided to people without aphasia, all of whom had right hemisphere damage (RHD) post-stroke. Of these individuals, only half were referred for speech pathology intervention. This finding is comparable with that of Lehman, Blake, Duffy, Myers, & Tompkins (2002), which found that 44% of patients in an inpatient rehabilitation unit with RHD were referred to speech pathology. Notably, all people with RHD who were referred to speech pathology received dysphagia assessment. This may indicate that if people with RHD do not present with dysphagia post-stroke, they

may not be referred for speech pathology intervention. This is significant, as it is estimated that 88-94% of people exhibit at least one cognitive and/or communication deficit post-stroke (Lehman Blake et al., 2002; O'Halloran et al., 2009). This study did not administer any formal or informal assessment to determine the proportion of people with high level language and/or right hemisphere communication impairments. As a result, conclusions cannot be drawn regarding the existence or incidence of right hemisphere communication impairments in this population. Additionally, conclusions regarding the level of language and communication related speech pathology services delivered to this population, or lack thereof, cannot be further discussed.

Within this study, people with aphasia had a longer LOS than people without aphasia in the acute hospital setting. This finding is consistent with Lalor and Cranfield's (2004) study. Other studies have reported a longer mean LOS in the acute setting for people with aphasia between 20-22 days (Godecke, 2008; Godecke et al., 2011; Lalor & Cranfield, 2004). Reduced LOS for both people with and without aphasia is therefore likely to be a reflection of health service reorganisation and systemic changes in hospital policy and procedure. Research suggests that increased LOS for people with aphasia persists within a rehabilitation setting (Gialanella et al., 2009; Paolucci et al., 2005). This is noteworthy when considering that increased LOS is not only associated with lower functional stroke outcomes for the individual, but is also an additional expense for the healthcare system (Gialanella & Prometti, 2009; Guyomard et al., 2009).

An additional burden on the healthcare system is discharge location. In this study, two times more people with aphasia than people without aphasia were discharged from the acute setting with further service delivery being required.

Furthermore, nearly five times more people without aphasia were discharged home with no further service delivery than people with aphasia. These findings are consistent with those of previous research (Dickey et al., 2010; Laska et al., 2001; Tsouli et al., 2009) and further highlights the burden of aphasia on health service resources.

It has been suggested that as a result of increased dysphagia referrals in recent years, speech pathologists are spending less time in their overall caseload delivering services for aphasia (Armstrong, 2003; Enderby & Petheram, 2002). Australian speech pathologists have previously identified prioritisation of dysphagia as being a barrier in the provision of other speech pathology services (Verna et al., 2009). However this study demonstrates that the proportion of time speech pathologists typically allocate to aphasia management within their overall caseload is comparable to that of dysphagia. A possible explanation is the slightly higher incidence rate of aphasia within this study. This may have resulted in the greater proportion of aphasia services being delivered than would be expected. A further variable to consider is the number of stroke admissions. Although this data was not collected, if for example stroke admissions were below what is normally expected, this may have a large effect on the management time for all speech pathology services delivered.

Despite this, differences have arisen when comparing the amount of aphasia and dysphagia therapy delivered. Whilst speech pathologists spent nearly equal proportions of time providing assessment and therapy for dysphagia, our study indicates that speech pathologists deliver three times more aphasia assessment than therapy. Furthermore, when comparing the amount of aphasia and dysphagia therapy, almost double the amount of dysphagia therapy is provided than aphasia

therapy within the first week post-stroke and throughout admission. Whilst an average of 44 minutes of aphasia therapy was delivered within the first week post-stroke, this increases to 85 minutes for dysphagia therapy. This indicates that despite equal proportions of time allocated to dysphagia and aphasia intervention within the speech pathologist's caseload, greater weight is still placed on delivering dysphagia therapy than on aphasia therapy. It has been documented that dysphagia is perceived to be a prioritisation within the speech pathology caseload (Armstrong, 2003; Enderby & Petheram, 2002; Verna et al., 2009). This study's findings therefore prompts for further research to investigate possible explanations for why, if caseload management for aphasia and dysphagia is comparable, the amount of aphasia therapy being provided is not in line with the amount of dysphagia therapy being provided.

The difference in the amount of aphasia assessment versus therapy being delivered is a pertinent finding given research evidence supporting early and intensive aphasia therapy (Godecke et al., 2009; Godecke et al., 2011; Robey, 1994, 1998). Holland and Fridriksson (2001) suggest that during the early stages of recovery, assessment and intervention should occur simultaneously. In this manner, assessment is not onerous and aphasia therapy is being provided during the early phase. Providing early aphasia therapy not only enhances neuroplastic processes but also results in greater communication gains being achieved and maintained than if commenced at a later phase of recovery (Godecke et al., 2009; Godecke et al., 2011; Robey, 1994, 1998).

Limitations

The present study had several limitations. Firstly, the study was based on patients and speech pathologists from one metropolitan hospital. Therefore, the results may be influenced by sampling biases present in that facility. However, in

line with developments in health care services within the department of health, some changes may be reflective of this. This study's results are also based on a small sample size, which may potentially have two effects. This may possibly increase the incidence of aphasia. A small sample size may also indicate that the management of people with confirmed stroke and speech pathology service delivery to people with aphasia is not truly representative.

A further limitation relates to the seven people who were not identified and were not referred to receive speech pathology intervention. Although this group of individuals may have benefitted from some speech pathology intervention, we cannot comment on whether this was required. Therefore, conclusions regarding the lack of appropriate referral rates for all participants with a confirmed diagnosis of stroke cannot be drawn in this study.

Future Research

Previous research regarding the incidence of communication deficits post-stroke have included people with speech, language, and cognitive and/or language communication impairments, as well as vision or hearing impairment (Lehman Blake et al., 2002; O'Halloran et al., 2009). These factors may have influenced the incidence of communication impairments following right hemisphere damage post-stroke and therefore these results should be interpreted with caution. Further investigation may therefore be warranted to explore the incidence of right hemisphere communication deficits within the acute setting, the rate of referral to speech pathology, and the delivery of all speech pathology services.

It is beyond this study's limitations to comment on whether people with aphasia who were discharged with further service delivery in fact received speech pathology intervention in these settings, and whether this intervention was aphasia

related. It may be therefore warranted for further studies to track the complete journey of people with and without aphasia, from the LOS and services received in the acute setting, to their subsequent discharge location and the services received in the sub-acute and community settings.

A more in depth investigation of speech pathology aphasia service delivery in the acute setting, employing both quantitative and qualitative methods should be conducted. It is suggested that future research should quantitatively examine the amount of aphasia therapy delivered, and subsequently investigate through qualitative methods the barriers or reasons why people with aphasia did not receive the recommended intensity of aphasia therapy.

Implications

Although results of the present study are based on a small sample size, it has been confirmed that the incidence of post-stroke aphasia in the acute hospital setting is comparable over numerous years and in different countries. Despite the predictive nature of aphasia incidence, clinical services have not improved adequately enough to deliver aphasia therapy according to the prescribed best practice standards (NSF, 2010). It has been 13 years since the data collection of Lalor and Cranfield's (2004) study and from the results of the current study it becomes apparent that the relative service delivery for people with aphasia remains substandard and progress has not yet been sufficient.

In recognition of the importance of delivering early and intensive aphasia therapy to enhance neuroplasticity and result in greater positive communication outcomes (Godecke et al., 2009; Godecke et al., 2011; Robey, 1994, 1998) current speech pathology service delivery needs to evolve further. Future speech pathology practice should restructure system management to accommodate for time constraints

(Armstrong, 2003; Enderby & Petheram, 2002; Lalor & Cranfield, 2004) and reduced funding (Verna et al., 2009). If an increase in speech pathology staffing is not feasible within the healthcare budget, different service delivery models may need to be explored, such as delivering early and intensive aphasia therapy within a group environment. If not, individuals with aphasia and their family will continue to experience the negative psychosocial implications of aphasia (Laska et al., 2001; Tsouli et al., 2009), lower functional improvements during rehabilitation (Gialanella & Prometti, 2009; Guyomard et al., 2009), and the impact which aphasia burdens the healthcare system with will continue to persist (Dickey et al., 2010; Gialanella & Prometti, 2009; Guyomard et al., 2009; Laska et al., 2001; Paolucci et al., 2005; Tsouli et al., 2009).

Conclusion

Despite this study's small sample size, the incidence of post-stroke aphasia has remained relatively stable across time and location. People with aphasia in this study not only had a longer LOS but were also more frequently discharged from the acute hospital with further service delivery being required. This contributes further evidence of the financial impact aphasia has on the healthcare system. This study also indicates that speech pathology management of aphasia in the acute hospital setting has improved to some extent, however is not yet being delivered according to best clinical practice standards. Although speech pathologists in this study spent an equal amount of time providing dysphagia and aphasia services, almost double the amount of time was spent providing dysphagia therapy than aphasia therapy. Further research is therefore required to examine why the prescribed intensity of aphasia therapy is not being delivered by speech pathologists to people with aphasia in the early phase of recovery.

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APPENDIX

SPEECH PATHOLOGY OCCASIONS OF SERVICE: DATA COLLECTION FORM

Date	Type of SP Service	Area Targeted During Session	Clinician Comments
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	
Time post-onset_____	☐ Assessment ☐ Therapy ☐ Counselling ☐ Documentation ☐ Programming	☐ Aphasia ☐ Dysphagia ☐ Dysarthria ☐ Voice ☐ Apraxia ☐ Fluency ☐ Other__________________	