

Title: Stroke Communication Partner Training: A national survey of 122 clinicians on current practice patterns and perceived implementation barriers and facilitators

Running head: Stroke communication partner training practice

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ABSTRACT

Background: Communication partners (CPs) find it challenging to communicate with people with communication disorders post-stroke. Stroke communication partner training (CPT) can enhance CPs' ability to support the communication and participation of people post-stroke. While evidence for the efficacy of aphasia-based CPT is strong, implementation in healthcare settings is unclear.

Aims: To investigate Australian speech pathologists' current stroke CPT practices, factors influencing implementation of CPT, and how reported practice compares with the research evidence.

Methods and Procedures: Speech pathologists in Australia, who had worked with people post-stroke, were invited to complete a 99-item online survey. The survey was informed by a comprehensive review of the literature review, the TIDier intervention taxonomy, and the Theoretical Domains Framework. Data were analysed using descriptive statistics and content analysis.

Outcomes and Results: A total of 122 clinicians were surveyed. Most participants reported providing CPT to treat a range of post-stroke communication disorders. While 98.3% reported training familiar CPs, only 66.1% reported training unfamiliar CPs. Current stroke CPT practice is characterised by one to two less-than-one-hour sessions of informal face-to-face education and skills training. Only 13.3% and 10.0% of participants used evidence-based published programs with unfamiliar and familiar CPs respectively. Main barriers included the perceived lack of behavioural regulation, skills, reinforcement, beliefs about consequences, positive social influences, and resources. Main facilitators included clinicians' intentions to provide CPT, perception of CPT as part of their role, and perceived compatibility of CPT with clinical practice.

Conclusion and Implications: A significant evidence-practice gap exists. Research exploring implementation of stroke CPT in healthcare settings, expanding evidence to support CPT for the range of post-stroke communication disorders, developing freely accessible step-by-step CPT programs that consider restrictions in current practice, and providing explicit instructions of CPT best-practice are warranted. A supportive workplace culture and freely accessible formal training opportunities are also needed.

KEYWORDS

speech-language pathology, aphasia, rehabilitation, current practice, barriers

WHAT THIS PAPER ADDS

What is already known on this subject

Evidence for the efficacy of aphasia-based communication partner training is strong, however its implementation in healthcare settings is unclear.

What this study adds

This paper offers comprehensive survey data on current stroke communication partner training practice in Australia, a theoretical approach to examining factors influencing current practice, and a comparison of reported practice with efficacy research evidence. Most participants reported providing communication partner training for a range of post-stroke disorders, through 1:1 or group training. However, few participants used evidence-based published programs. Main perceived barriers and facilitators to implementation were identified. Recommendations include future research addressing the specific clinical needs identified in this paper and organisational-level changes to support the provision of stroke communication partner training.

INTRODUCTION

Communication disorders post-stroke are common. They include aphasia (35%, Dickey et al., 2010), dysarthria (42%, Lawrence et al., 2001), apraxia of speech (11%, Flowers et al., 2013), and cognitive-communication disorders (22-77%, Riepe et al., 2003). People with communication disorders (PwCD) post-stroke have significantly worse functional and well-being outcomes than stroke survivors without communication disorders (e.g., Hilari, 2011).

PwCD post-stroke need to interact with familiar communication partners (CPs), such as spouses, and unfamiliar CPs, such as healthcare providers. However, CPs are known to have difficulty communicating with PwCD and limit the opportunities for PwCD to engage in conversations (McGurk and Kneebone, 2013). For example, nurses were found to control and limit conversations with people with aphasia in acute stroke wards (Hersh et al., 2016), and significant others of people with dysarthria were found to restrict or avoid interactions with people with dysarthria (Brady et al., 2011).

Reduced communication opportunities for PwCD may result in reduced participation in healthcare decision-making (Hemsley et al., 2013), adverse events in hospital (Bartlett et al., 2008), and negative impacts on social participation, well-being, sense of identity, autonomy, and relationships (e.g., Le Dorze and Brassard, 1995). In addition, family members of PwCD, who may also be informal carers, may experience role changes, relationship difficulties, restricted activities, and increased burden compared to carers of stroke survivors without communication disorders (e.g., Bakas et al., 2006). These findings suggest that communication difficulties post-stroke negatively impact the lives of PwCD and their significant others.

Communication partner training

Communication partner training (CPT) is an effective intervention that reduces the detrimental effects of post-stroke communication disorders. The objective of CPT is to provide CPs with the strategies and resources they need to support functional communication and to promote the well-being of PwCD (Simmons-Mackie et al., 2016).

CPT for people with aphasia post-stroke

Aphasia-based CPT programs dominate the stroke literature. Two systematic reviews on CPT for CPs of people with aphasia (Simmons-Mackie et al., 2016, Simmons-Mackie et al., 2010) indicated that CPT was effective in improving CPs' skills in supporting communication with people with aphasia and consequently likely to improve the participation of people with aphasia. Specifically, there was sufficient evidence to support CPT that provided communication skills training, but insufficient evidence to support CPT that provided education and counselling alone (Simmons-Mackie et al., 2016). These reviews also indicated that CPT increased the quality of life of people with aphasia and reduced the negative psychosocial consequences for both people with aphasia and their CPs. Additionally, aphasia-based CPT implementation studies have demonstrated the preliminary feasibility of implementing CPT in healthcare settings (e.g., Jensen et al., 2015, Horton et al., 2016).

The provision of CPT to unfamiliar and familiar CPs of people with aphasia is recommended in international best practice statements (Simmons-Mackie et al., 2017) and national clinical practice guidelines (Stroke Foundation, 2017). Systematic reviews (Simmons-Mackie et al., 2016, Simmons-Mackie et al., 2010) identified a large range of CPT programs used in the aphasia CPT literature. The most extensively-examined CPT program for unfamiliar CPs is the Supported Conversation for Adults with Aphasia (SCATM) program (Kagan et al., 2001) and for familiar CPs, it is Supporting Partners of

People with Aphasia in Relationships and Conversation (SPPARC; Lock et al., 2001). Whilst some researchers have investigated the effect of the original CPT program on CPs, other researchers have explored the effect of modified versions of these published programs. For example, in the study by Wilkinson et al. (2011), SPPARC treatment duration was four hours whereas in the study by Turner and Whitworth (2006) it was 40. Similarly, Welsh and Szabo (2011) investigated the effects of SCATM and included first-hand accounts by people with aphasia. Despite modifying the original program, researchers typically do not provide manualised procedures for further replication (Simmons-Mackie et al., 2016). The range of aphasia CPT programs and the various modifications to CPT programs reported in the research literature, suggests possible divergence in fidelity in clinical practice.

CPT for people with communication disorders post-stroke

Studies investigating the efficacy of CPT for stroke-based communication disorders other than aphasia are limited to four studies with Level IV evidence (McGilton et al., 2011, Sorin-Peters et al., 2010, Ross et al., 2009, Williams and Gurr, 2016). These studies adapted CPT programs validated for aphasia to use with a range of post-stroke communication disorders (e.g., cognitive-communication disorder, dysarthria) and included modifications such as provision of information and tailored communication strategies that may support communication with people with these specific disorders (e.g., Sorin-Peters et al., 2010). These studies provide preliminary evidence that CPT may also be effective for the CPs of people with a range of post-stroke communication disorders. The provision of CPT that targets the range of communication disorders post-stroke is clinically-relevant because an individual may have multiple communication disorders post-stroke. In addition unfamiliar CPs, such as

healthcare providers, need to communicate with different patients who will have different communication disorders (Simmons-Mackie et al., 2016). Despite this, there is limited evidence to guide the clinical provision of CPT for CPs of people with communication disorders beyond aphasia.

Understanding current practice in stroke CPT

Given the high level of evidence for CPT for CPs of people with post-stroke aphasia and emerging evidence for CPT for CPs of people with a range of post-stroke communication disorders, the implementation of CPT clinically should be a high priority. However, only 50% of clinicians in Australia (Rose et al., 2013), 17% in Sweden (Blom Johansson et al., 2011), and 49% in the United States (Simmons-Mackie, 2014) reported regularly providing CPT. In the United Kingdom, Beckley et al. (2016) and Sirman et al. (2017) found that only 3-50% of clinicians used published CPT programs, and that there was wide variation in delivery. These findings suggest a stroke CPT evidence-practice gap.

While these studies indicate an evidence-practice gap in CPT, they are limited in various ways. Some studies reported on CPT with familiar CPs but not unfamiliar CPs (Blom Johansson et al., 2011, Beckley et al., 2016, Simmons-Mackie, 2014) or did not distinguish between CPT for familiar and unfamiliar CPs (Sirman et al., 2017, Rose et al., 2013). Beckley et al. (2016) and Sirman et al. (2017) also had small sample sizes of 37 and 50 respondents respectively, limiting the generalisability of survey results. Additionally, Beckley et al. (2016) and Sirman et al. (2017) explored CPT as one part of conversation therapy and communication strategy training, limiting the investigation of CPT-specific practice. Finally, all studies except Sirman et al. (2017) were limited to a focus on aphasia and did not investigate clinical practice for CPs for a broader range of

post-stroke communication disorders. While the literature suggests an evidence-practice gap in the current practice of CPT, there remains a lack of comprehensive data to understand what is provided to familiar and unfamiliar CPs of people with a range of communication disorders post-stroke and the perspectives of the clinicians in providing CPT.

Understanding factors affecting implementation of stroke CPT

Understanding barriers and facilitators to the implementation of CPT is critical to the development of targeted strategies to facilitate best-practice (Grol and Grimshaw, 2003). Preliminary evidence on factors that influence CPT implementation is available from some surveys on current practice and implementation studies. Clinicians, surveyed about CPT for familiar CPs of people with aphasia, cited perceived lack of time, resources, skills and knowledge, and family unavailability as barriers to providing more frequent and comprehensive CPT (Rose et al., 2013, Blom Johansson et al., 2011). In addition, Wielaert et al. (2016) identified organisation-related time constraints as a key barrier to provision of CPT in an implementation study. They also identified clinicians' motivation as a key facilitator.

A comprehensive understanding of the factors that influence the implementation of CPT in practice may be gained through the application of behavioural change theory, such as the Theoretical Domains Framework (TDF; Michie et al., 2005). To date, nearly all CPT implementation studies have omitted this. One exception is Jensen et al. (2015) who addressed a single known barrier relating to organisational issues by involving stroke unit leaders throughout the implementation process. The literature is therefore limited in providing a comprehensive, theoretically-driven understanding of factors

influencing clinicians' current CPT practice to inform the development of implementation strategies.

In summary, the literature suggests an evidence-practice gap in stroke CPT. However, there is a need for comprehensive data on current CPT practice across familiar and unfamiliar CPs and across a range of communication disorders post-stroke. There is also a need for theoretically-driven research on CPT implementation. This study aims to answer the following questions:

1. What are the delivery methods and content of stroke CPT programs currently provided in acute, inpatient rehabilitation, outpatient rehabilitation, and community settings in Australia, for (i) unfamiliar CPs, and (ii) familiar CPs?
2. What theoretically-driven factors influence the implementation of CPT programs in practice?

METHOD

Design

We used a web-based survey to obtain data from a large cross-section of speech pathologists.

Participants

Qualified speech pathologists were invited to participate in this study if they had worked:

- (a) in Australia;
- (b) with at least one client with a stroke diagnosis in the last five years; and
- (c) in an acute, inpatient rehabilitation, outpatient rehabilitation hospital setting, or community setting in a publicly or privately-funded healthcare setting.

Survey design

Survey design and reporting were informed by guidelines (Eysenbach, 2004) to ensure best-practice in web-based survey construction and transparent reporting (Supplementary Material 1). We used The Intervention Taxonomy (Schulz et al., 2010) and the Template for Intervention Description and Replication (TIDieR; Hoffmann et al., 2014) to capture all the key features of CPT interventions in the survey. To ensure that the survey options reflected the available evidence-based CPT programs, we conducted a systematic search of the literature (Supplementary Material 2) for relevant studies published since the systematic reviews (Simmons-Mackie et al., 2016, Simmons-Mackie et al., 2010). Studies were collated (Supplementary Material 3) and features of the CPT programs (e.g., name of published program, teaching strategies) were incorporated into survey options. Finally, to determine what factors might influence the implementation of CPT based on behavioural change theory, we used the TDF (Michie et al., 2005). We adapted items from the Determinants of Implementation Behaviour Questionnaire (Huijg et al., 2014), a valid and reliable survey based on the TDF, that covers 16 domains in 29 questions (Supplementary Material 4).

Response formats included Yes/No, multiple choice, five-point likert scales, and open-ended text boxes. Question randomisation was applied to the questions from the TDF to minimise order-based bias (Eysenbach, 2004). Forced-response was used to ensure that participants answered mandatory questions prior to progressing.

A 91-item web-based survey was created and piloted with a group of 11 professionals who included speech pathology researchers and clinicians, and a professional with survey methodology expertise. Based on feedback from the pilot group, changes were made to the survey to maximise completion rates including (i)

changes to wording of questions and question formats, (ii) limiting TDF questions to 1-3 items per domain, (iii) removing requirement to answer the TDF questions for both types of CPs and (iv) utilising the Qualtrics platform instead of REDCap to overcome formatting limitations. Furthermore, in the early stages of survey dissemination, three additional questions were added in order to include clinicians who were not currently working with people post-stroke but had done so in previous roles, and to obtain open-ended responses as to why CPT for unfamiliar or familiar CPs was not provided. This process resulted in the creation of the final 99-item survey (Supplementary Material 4) that covered six areas: (1) Participant demographics; (2) General stroke CPT practice; (3) CPT practice for unfamiliar CPs; (4) CPT practice for familiar CPs; (5) Barriers and facilitators; (6) Additional comments.

Recruitment and data collection

The study received ethical clearance from the University of Sydney Human Ethics Committee [2016/1027]. The survey opened between 13/06/2017 and 24/08/2017. Clinicians who worked in the area of stroke across the continuum of care, geographical locations, and in both public and private settings were targeted using a variety of strategically-chosen mailing lists (e.g., a speech pathology chat group in Australia called Speech Pathology Email Chats), social media (e.g., Twitter handles of research team) and websites (e.g., Stroke Foundation).

Data analysis

Data was exported from Qualtrics into a Microsoft Office Excel 2007© spreadsheet and screened. Duplicates, invalid and incomplete responses were removed. Descriptive statistics were used to analyse close-ended responses. The Fisher Exact Test

was used to compare nominal data on demographic differences between drop-out participants and the larger sample. Open-ended responses were imported into NVivo 11 (QSR International) following which the first author (HC) conducted a conventional content analysis (Hsieh and Shannon, 2005). Data were read repeatedly to achieve immersion, openly-coded and grouped into categories and sub-categories before being mapped onto the TDF categories. The coded responses were peer-checked by a second research team member (EP), to enhance the credibility of the results. Total number of responses varied between questions as filter questions were applied. The total number of responses for each survey question is included in the graphs and tables.

RESULTS

Participant sample

Of the 147 participants who commenced the survey, two participants did not meet inclusion criteria and were excluded. Twelve other participants did not attempt any demographic questions and eleven participants completed the demographic questions but did not proceed further. Fisher Exact test revealed no significant differences between these 11 participants and the other participants who continued the survey in terms of sex ($p=1.00$), age ($p=0.260$), highest educational level ($p=0.461$), years since graduation ($p=0.510$), region ($p=0.055$), sector ($p=1.00$), experience in stroke teams ($p=0.751$), percentage of stroke caseload ($p=0.161$), and chosen continuum of care to base responses on ($p=0.788$). These 25 responses were removed from the dataset, leaving 122 valid surveys for analysis. Exact response rate was difficult to calculate given the open recruitment strategies used and the unregistered nature of the Australian speech pathology profession.

The demographic profile of participants included in the analysis is provided in Table 1. Although representation within each demographic variable was achieved, overall the majority of the sample was female, under 41 years, with undergraduate/coursework Masters degree qualifications, who had graduated in the last 15 years. All Australian states and territories were represented. One-third of respondents worked in non-metropolitan locations and the large majority worked in public services. Approximately 40% of respondents were members of dedicated stroke teams and over two-thirds of respondents had at least 30% of their total caseload having had strokes. Virtually all respondents (94.3%) serviced all post-stroke communication disorders. Within the sample, there was representation across acute (26%), inpatient rehabilitation (34%), and outpatient/community (39%) clinicians.

<insert Table 1 here>

Clinicians' understanding of CPT and what it involves (n=122)

A variety of strategies, topics, modalities, and delivery formats were identified. The concept of providing or teaching strategies to facilitate expression, understanding, and verification of the message was most commonly described (72.1%; n=88), as exemplified by one participant who explained CPT as '*...to equip [CPs] with strategies to best support the PwCD to communicate most effectively*'. Other commonly mentioned elements of CPT included the assessment of interactions between CP and PwCD (23.0%; n=28), education about communication disorders (22.1%; n=27), and CP experiential learning (13.9%; n=17). Nineteen participants (15.6 %) defined CPT for CPs of people with aphasia only. Additionally, the definition of who was considered a CP was variable, with thirty-six participants (29.5%) focusing on familiar CPs alone.

Current practice of stroke CPT

Participants' responses to questions on their current stroke CPT practice are summarised in Table 2, with specific results highlighted below. Less than half of participants (45.7%; n=48) reported that their overall current stroke CPT practice was consistent with best practice.

<Insert Table 2 here>

For unfamiliar communication partners

Eighty participants (66.1%) reported providing CPT to unfamiliar CPs. The majority (88.8%, n=71) provided CPT to unfamiliar CPs for more than one communication disorder ranging from 95% of participants (n=76) for aphasia, 77.5% (n=62) for cognitive-communication disorders, 69% for apraxia (n=55), 64% for dysarthria (n=51), and 15.0% (n=12) for 'other' communication disorders (e.g., hearing impairment, neurogenic stuttering, voice disorders related to dysphonia and laryngectomy, dementia).

Educational (didactic) approaches were the most common methods for CPT (92.0%; n=69), followed by skills training approaches (80.0%; n=60). CPT was delivered by speech pathologists themselves (100.0%; n=75). The main unfamiliar CPs who received CPT were nurses (85.3%; n=64) and allied health professionals (82.7%; n=62), followed by medical doctors (50.7%; n=38), volunteers (30.7%, n=23), food service staff (24.0%; n=18), patient service assistants (16.0%; n=12), administrative staff (10.7%; n=8), and 'other' (13.3%; n=10, paid carers and students).

A small percentage (13.3%; n=10) used evidence-based published CPT programs and SCA™ (60.0%; n=6) was the most commonly used, followed by TBI Express (Togher et al., 2010; 20.0%; n=2). No participants reported adhering completely to the program protocol. Instead, 7/10 followed the program but adapted it, and 3/10 used the protocol as a rough guide only. The most commonly covered topics

were general (93.3%; n=70) and individualised (88.0%; n=66) communication strategies, and information about specific communication disorders (84.0%; n=63). The most commonly used teaching strategies were educational strategies such as question-and-answer sessions (64.0%; n=48), group discussions (60.0%; n=45), and didactic teaching (58.7%; n=44).

Nearly all participants (98.7%; n=74) delivered CPT face-to-face and half (50.7%; n=38) also included written delivery methods. The delivery format used varied. Group format was most commonly used (66.7%; n=50), followed by one-on-one format (61.3%; n=46) and dyad (53.3%; n=40). The most common frequency of CPT provision was 'as requested' (49.3%; n=37). In open-ended responses, 27 participants explained that this was '*case-by-case*', '*when specific patients need it*'. Nine participants also indicated that CPT included structured in-services several times a year. The majority of CPT consisted of one to two sessions (86.7%; n=65), with each session lasting up to an hour (97.3%; n=73).

Forty-one participants (33.9%) reported not providing CPT to unfamiliar CPs. The most commonly cited reason for not providing CPT was clinical context. Participants reported '*a busy acute caseload*', '*not always applicable to inpatient rehabilitation setting*', and '*in outpatient setting, I generally have no contact with unfamiliar CPs*'. Some participants also reported documenting strategies in progress notes but did not consider this to be CPT. A general lack of access to and interest from unfamiliar CPs were also reported.

For familiar communication partners

Nearly all participants (98.3%, n=119) reported providing CPT to familiar CPs and providing CPT for more than one communication disorder (95.8%, n=114). Almost

all participants (99.2%; n=118) provided CPT for patients with aphasia, 89.1% (n=106) for cognitive-communication disorders, 86.6% (n=103) for both apraxia and dysarthria, and 92.4% (n=110) for patients who had multiple communication disorders.

Skills training (94.5%; n=104) and education (91.8%; n=101) were the most commonly provided CPT approaches and approximately two-thirds of participants (63.6%; n=70) provided counselling as part of CPT. CPT was delivered by speech pathologists themselves (100.0%; n=110). The main familiar CPs who received CPT were spouses (99.1%; n=109) and family members (95.5%; n=105), followed by friends (61.8%; n=68), employers (10.0%; n=11), community members (9.1%, n=10) and 'other' (6.4%; n=5, regular care providers).

Only 10.0% (n=11) used evidence-based published CPT programs. TBI Express (63.6%; n=7), SPPARC (36.4%; n=4), and SCATM (27.3%; n=3) were the most commonly used programs. Nine participants followed the protocol of the published program but adapted it as needed, while the remaining two used the protocol as a rough guide only, with no participants indicating strict adherence to protocols. The most commonly covered topics were individualised communication strategies (94.5%; n=104), information about specific communication disorders (91.8%; n=101) and stroke (82.7%; n=91). The most commonly used teaching strategy was the skills-based strategy of practising with PwCD (80.0%; n=88), followed by question-and-answer sessions (65.5%; n=72), and evaluation of personal success (43.6%; n=48).

Nearly all participants (99.1%; n=109) delivered CPT face-to-face and the majority (77.3%; n=85) also included written delivery methods. Online CPT delivery was rare (5.5%; n=6). Nearly all participants (95.5%; n=105) used dyad delivery format, involving both the CP and the PwCD. The majority (64.5%; n=71) also used one-on-one delivery format with the CP alone. Sixty-eight participants (61.8%)

provided CPT frequently or usually, with at least 70% of their patients. Nearly half of participants (55.5%; n=61) provided CPT consisting of one to two sessions. Twenty-four participants (21.8%) indicated ‘other’ for the number of sessions, of which fourteen reported that *‘it depends on progress’*, and seven explained that CPT was *‘integrated into therapy block’*, *‘not an exclusive separate training’*. Typically, each session lasted about 30 to 45 minutes (44.5%; n=49) while nearly all sessions were less than an hour (98.2%; n=108).

Two participants (1.7%) reported not providing CPT to familiar CPs. These participants cited barriers including the *‘lack of availability of familiar partners’*, *‘service delivery [model’s emphasis on] dysphagia management over communication treatment’*, and the nature of the acute setting, as *‘CPT will be provided more so in a rehabilitation setting where clinicians can work closely with familiar CPs’*.

Factors influencing current practice of stroke CPT

Participants were asked to respond to statements corresponding to the domains of the TDF using a likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The distribution of participants’ median scores for each domain is summarised in Figure 1 below. Responses 1 to 3 (neutral, disagree, and strongly disagree) were collapsed into one category of Less than Agreement and responses 4 to 5 (agree and strongly agree) were collapsed into category of Agreement. Figure 1 depicts each domain ranked in order of agreement. For detailed question-by-question data for each domain, refer to Supplementary Material 5. The following section contains a description of participants’ likert scale responses for each domain, accompanied with illustrative quotes from the open-ended responses on barriers and facilitators.

<Insert Figure 1 here>

Behavioural regulation

Only 4.7% participants reported having systems for monitoring whether CPT was provided, and workplace policies/procedures that facilitated CPT. Some participants suggested that *'blocking out therapy sessions specifically for this goal'*, *'regular training slot'* for staff [CPs], and *'procedures in place to make accountable for providing training'* would facilitate CPT, although most participants had *'no guidelines or structure from management to support [CPT] to occur in a systematic way'*.

Skills

One-quarter (25.2%) of participants reported having formal training and skills to provide CPT. However, as one participant who had completed formalised training herself reported, *'opportunities like that are few and far between'*. The majority of participants had no formal training, including one participant who reported *'[not knowing] how to implement good teaching methods for CPT'*.

Reinforcement

One-quarter (25.2%) of participants received recognition and encouragement to provide CPT at their workplaces. Such *'positive feedback and support from clients and workmates about the training'* enabled one participant to provide stroke CPT. However, the majority did not receive such recognition and few addressed this view in the open-ended responses.

Beliefs about consequences

One-quarter (27.1%) of participants agreed that providing CPT resulted in CPs being able to facilitate communication and enhance communication success for patients. *'Knowing that it has always previously been helpful for those attending'* was a

facilitator to provide stroke CPT for one participant. However, the majority did not perceive such clear benefits, such as one participant who *'invested large amounts of time providing training to hospital staff with no carry over'*.

Social influences

One-third (36%) agreed that CPT was routinely conducted by fellow colleagues and that potential CPs were usually willing to be involved with participants stating that *'CPT time being condoned by senior staff'* and staff that were *'receptive to being an active part of the client's rehabilitation journey'* enabled best-practice CPT. However, two-thirds did not agree, reporting difficulties providing CPT because it is *'not talked about in [the] practice as something that is a 'must do'*, *'...access to staff [CPs] for training is difficult'*, and there was a lack of engagement of CPs, as *'they don't value it (until they come to a session) ...'*.

Environmental context

A total of 36% participants agreed that their organisation provided sufficient resources and was willing to respond to challenges in providing CPT. For example, one participant had a *'supportive manager who facilitate[d] access to professional development/ resources'*. However, the majority did not have sufficient resources and identified unmet needs such as freely accessible, manualised resources to support implementation, including *'simple tip sheets and explicit instructional videos'* or *'a step-by-step manual to adapt for each patient'*.

Memory and attention

Approximately 41% routinely provided CPT and remembered to do CPT amongst other work tasks with one participant explaining that *'practice'* facilitated provision of best possible CPT. However, CPT *'often is forgotten about or not a priority'* for the majority of participants.

Beliefs about capabilities

Half (49.5%) of participants were confident in, and had control over providing CPT, explaining that *'having plenty of experience in this area boosts [their] confidence in providing effective training'* and *'[being] able to prioritise [CPT] and dedicate time in a client's rehabilitation program to [CPT]'* enabled the provision of best possible CPT. In contrast, one participant reported *'a lack of confidence in [her] skills to provide effective training'*.

Knowledge

Half (52.3%) agreed that there is strong evidence for CPT, that they knew how to deliver CPT per recommendations and what was expected of them. One participant reported that *'knowledge around what is necessary to be successful in delivering CPT'* would facilitate current practice. However, some participants explained that there is *'no clear-cut structure, differing ideas about what is best-practice and what it should involve'*, and that *'it is quite difficult to find explicit instruction in how to provide best-practice CPT in the literature'*.

Goals

More than half (57%) had individual goals to make providing CPT a high priority and to improve CPT practice, such as a participant who reported aspirations of

'having enough time to provide...CPT due to current caseload being manageable'. In contrast, one participant reported that the provision of CPT was not a goal or high priority due to *'competing priorities'* within her acute workplace.

Optimism and Emotion

Two-thirds of participants were optimistic that issues with delivery of CPT can be solved (63.6%), were not stressed at the thought of providing CPT, and found it rewarding (66.4%), with one participant reporting that providing CPT *'is enjoyable to do!'*. In contrast, one-third disagreed and one participant reported *'sometimes I cannot find a way to communicate with a patient, which then makes it difficult/embarrassing to relay that to family'*.

Patient-based

Approximately two-thirds of participants (68.2%) also agreed that patients think CPT will help them when offered and one participant explained that *'buy-in from patient...'* enabled best possible CPT. However, some also experienced barriers due to patient-related factors, with one participant describing that *'in the initial stages of the rehabilitation, patients tend to be very busy with other health professionals, and may be too tired to participate'*.

Social professional role and identity

Most participants (71%) agreed that providing CPT was part of their role and that it was recognised by others at their workplace as part of their role. Some participants reported being able to provide CPT due to *'ward understanding that communication is just as high a priority as swallowing'* and *'support from*

department/peers to dedicate time to this as part of [their] role as a clinician’.

However, some participants reported a *‘limited organisational profile of speech pathologists as communication experts (focus tends to be on dysphagia)’.*

The innovation

Most participants (81.3%) agreed that the provision of CPT was compatible with regular clinical practice, such as one participant who reported that *‘working in community rehabilitation meant [they] can see clients on an ongoing basis’* and thus made CPT provision more feasible. In contrast, one participant disagreed and highlighted that *‘there are also (to [her] knowledge) limited training programs that can be implemented quickly and efficiently in inpatient settings’.*

Intentions

Most participants (83.2%) have intentions to provide CPT in the next three months. One participant indicated that this was motivated by *‘[her] own commitment to the principle’.*

DISCUSSION

This study investigated current stroke CPT practice across the continuum of care in Australia and the factors that are perceived to influence the implementation of CPT. The findings on the current stroke CPT practice were then compared with the efficacy research evidence for similarities and differences.

Aspect of current practice consistent with the evidence

CPT type

Most participants reported that they provide communication skills training to familiar and unfamiliar CPs. This reported CPT type provided is consistent with the research evidence as communication skills training is the only approach with sufficient evidence while education and counselling alone have insufficient evidence (Simmons-Mackie et al., 2016).

Aspect of current practice that deviate from the evidence

Provision of CPT to unfamiliar and familiar CPs

While nearly all participants reported providing CPT to familiar CPs, only approximately 60% reported this to be regular practice ('frequently' or 'usually'), and only two-thirds provided CPT to unfamiliar CPs. This finding is broadly consistent with the surveys in Australia (Rose et al., 2013) and other countries (Blom Johansson et al., 2011, Simmons-Mackie, 2014), which found that CPT was not regularly provided. This result indicates a disparity between reported practice and clinical guidelines that recommend the provision of CPT to unfamiliar and familiar CPs of people with aphasia (e.g., Stroke Foundation, 2017, National Stroke Foundation, 2010).

Type of communication disorders targeted

Consistent with the findings of Sirman et al. (2017), the majority of participants provided CPT for a range of post-stroke communication disorders beyond aphasia. However, research has been focussed on aphasia-based CPT, with few studies investigating broader stroke CPT and thus insufficient evidence for clinical recommendations on broader stroke training (Simmons-Mackie et al., 2016). This survey finding suggests that clinicians have had to apply aphasia-based CPT to a range

of communication disorders to meet clinical needs, with limited guidance from the literature.

Use of published programs and teaching strategies used

Similar to the findings in the United Kingdom (Beckley et al., 2016, Sirman et al., 2017), few participants used evidence-based published CPT programs in Australia, with none adhering strictly to protocols. Teaching strategies used also varied with no single strategy reportedly used consistently across participants. These results indicate an evidence-practice gap in the use of evidence-based CPT published programs. There is a wide range of CPT programs used in the evidence-based, with individual studies introducing significant variations from the original programs and typically not providing manualised procedures for replication (Simmons-Mackie et al., 2016). The lack of consensus as to what constitutes best-practice in the CPT literature may have contributed to this lack of fidelity in current practice. Additionally, the reported barriers relating to practical constraints and accessibility of these resources may have resulted in the low uptake of the programs.

The findings also indicate that TBI Express is one of the most commonly used published CPT programs for CPs of stroke survivors although TBI Express is validated for use with the traumatic brain injury population. This finding is likely the result of research not meeting clinical needs as there are no known published CPT programs targeting post-stroke communication disorders beyond aphasia. It is also possible that due to its manualised program, Australian authors, and free online video resources, that it represented a more locally visible and accessible program that may align to the needs of clinicians with patients with right hemisphere cognitive-communication disorders, or mild to moderate aphasia.

Total treatment duration

The total treatment duration in current practice mainly ranged from less than 30 minutes to 2 hours for unfamiliar CPs, and from less than 30 minutes to 3 hours for familiar CPs. In contrast, total treatment duration in the literature are significantly longer. Studies utilising SCA™ reported in the literature ranged from 75 minutes (Welsh and Szabo, 2011) to 9 hours (Rayner and Marshall, 2003), and from 4 hours (Wilkinson et al., 2011) to 40 hours (Turner and Whitworth, 2006) for SPPARC. The significant difference in total treatment duration suggests a lack of feasibility in applying CPT programs used in research at the prescribed dosage to current practice. Given that the relationship between intensity and outcome is not always linear in speech pathology interventions, identifying active ingredients of CPT, understanding behavioural learning, accommodating individuals' needs, and bridging the disparity between research and clinical limitations will help establish CPT optimal intensity (Baker, 2012).

Factors influencing implementation of CPT in practice

With less than half of participants perceiving their overall stroke CPT practice as consistent with best-practice, understanding the barriers and facilitators influencing the implementation of CPT is critical to addressing the identified evidence-practice gap.

Consistent with Wielaert et al. (2016), clinicians' positive attitude towards providing CPT and believing it to be part of their role were the main facilitators driving CPT. The majority of participants agreed that providing CPT was part of their role, that CPT was compatible with regular clinical practice, and had intentions to provide CPT in

the next three months. Clinicians' attitudes could be reinforced and be used as positive leverage to facilitate the implementation of CPT.

The key modifiable barriers identified can be grouped into two categories: (1) workplace, and (2) clinicians' self-efficacy. The application of the TDF enabled us to identify specific workplace-related barriers, including the perceived lack of behavioural regulation such as monitoring systems and workplace policies to facilitate the consistent provision of CPT, lack of recognition and encouragement from the organisation for providing CPT, and lack of department culture of routinely providing CPT. This finding is consistent with implementation studies that found more broadly that leadership, institutional culture and work environment determined the outcome of CPT implementation in healthcare settings and similarly, these workplace-related barriers could potentially be addressed with organisational changes to make the provision of CPT a culturally-valued expectation within the workplace (e.g., Jensen et al., 2015, Horton et al., 2016).

Consistent with previous surveys (Rose et al., 2013, Blom Johansson et al., 2011) that found CPT implementation barriers such as the lack of resources, skills and knowledge, this study additionally identified barriers limiting clinicians' self-efficacy in the provision of stroke CPT. Specific barriers identified included the perceived lack of resources, skills, knowledge, confidence and sense of empowerment in providing CPT (beliefs about own capabilities), and beliefs about positive consequences of CPT such as CPs' improved ability to facilitate communication after training. These barriers are expected given the lack of CPT programs that can be used with post-stroke communication disorders beyond aphasia, costs associated with training materials and supporting Australian clinicians to travel to Canada for SCATM training, limited opportunities for formal CPT training in Australia, and the lack of explicit instructions

regarding what best-practice CPT should constitute. Clinicians' lack of beliefs about the positive consequences of CPT are also expected given that implementation studies found unfamiliar CPs experiencing difficulties transferring training to practice, due to barriers such as patient factors and time constraints (e.g., Horton et al., 2016) or lack of reinforcement from their organisational and discipline cultures. The development of freely accessible formal training, comprehensive manualised resources, explicit CPT best-practice guidelines, and implementation strategies targeting identified barriers can potentially facilitate stroke CPT by better equipping clinicians.

Recommendations

Table 3 below summarises proposed actions by researchers, organisations, and clinicians to facilitate current stroke CPT practice, based on the evidence-practice gaps and barriers identified in the survey.

<Insert Table 3 here>

Importance, strengths and limitations

This is the first study to use an intervention taxonomy (e.g., TIDieR) to systematically and comprehensively examine all the key features of stroke CPT used in current practice, and to distinguish between CPT practice for unfamiliar and familiar CPs of PwCD in Australia. This is also the first study to use behavioural change theory (Michie et al., 2005), to understand the factors affecting implementation of CPT in practice

Strengths of this study include the large number of respondents forming a diverse and representative demographic profile, which increases the external validity of the study (Braithwaite et al., 2003) and the use of survey guidelines, intervention taxonomies, literature review, the Determinants of Implementation Behaviour Questionnaire (Huijg et al., 2014). The use of the TDF, as one of the major theoretically

driven methods for characterising barriers and facilitators, will allow this research to be more readily compared with existing and future implementation studies including in TDF-focused metasyntheses. Piloting enhanced the content, design, and rigour of the survey. Although this study was conducted in an Australian context, the findings on current practice and factors influencing implementation concur with the emerging global CPT implementation research and may be generalisable to other countries.

This study also had several limitations. To minimise respondent burden and maximise completion rates, only one to three questions for the sixteen domains of the Determinants of Implementation Behaviour Questionnaire were included in the survey, limiting the number of constructs that could be evaluated. Another limitation is the potential sample bias. Given that the participants were self-selecting, they may have been more interested in CPT and may have had a more positive attitude towards CPT than non-participating clinicians. Additionally, findings regarding the barriers and facilitators were based exclusively on clinicians' perceptions. Triangulation of these findings using other research methods such as observation and audit is needed. For example, observation of CPT in practice may reveal the extent to which clinicians actually employ skills-based approaches versus educational strategies in their training.

CONCLUSION

A significant evidence-practice gap exists in the area of stroke CPT in Australia. Despite positive intentions and attitudes towards CPT, clinicians reported a range of barriers to implementing CPT that need to be addressed by researchers, clinicians, and organisations. Only by addressing these barriers will CPs develop the skills they need to engage PwCD post-stroke in successful, rewarding, inclusive conversations.

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We wish to thank all the survey participants for their time and effort to share their current practice, and the professionals who piloted our survey and provided invaluable feedback.

TABLES AND FIGURES

Table 1: Participant demographics

Variables	N	%
Sex		
Female	112	91.8%
Male	10	8.2%
Other	0	0.0%
Age		
20-30 years	51	41.8%
31-40 years	41	33.6%
41-50 years	15	12.3%
51-60 years	14	11.5%
65+ years	1	0.8%
Highest level of education		
Bachelor	53	43.4%
Bachelor with Honours	21	17.2%
Postgraduate certificate/diploma	7	5.7%
Masters by coursework	34	27.9%
Masters by research	7	5.7%
PhD	0	0.0%
Number of years since graduation		
5 years or less	44	36.1%
6-10 years	33	27.0%
11-15 years	21	17.2%
16-20 years	8	6.6%
More than 20 years	16	13.1%
Years of experience working with patients who have had a stroke		
5 years or less	54	44.3%
6-10 years	28	23.0%
11-15 years	22	18.0%
16-20 years	8	6.6%
More than 20 years	10	8.2%
State/territory		
Australian Capital Territory	3	2.5%
New South Wales	50	41.0%
Northern Territory	4	3.3%
Queensland	17	13.9%
South Australia	6	4.9%
Tasmania	3	2.5%
Victoria	29	23.8%
Western Australia	10	8.2%
Region (able to choose more than one)		
Metropolitan (Urban)	81	66.4%
Regional	35	28.7%
Rural	15	12.3%
Remote	2	1.6%
Sector (able to choose more than one)		
Private	19	15.6%
Public	108	88.5%

Currently or previously a member of a dedicated stroke unit team		
Yes	47	38.5%
No	75	61.5%
Approximate % of caseload that includes patients who have had a stroke		
Up to 10%	18	14.7%
11-30%	19	15.6%
31-50%	24	19.7%
51-75%	38	31.1%
More than 75%	23	18.9%
Currently (or most recent relevant role) provide services to patients with (able to choose more than one)		
Aphasia	122	100.0%
Apraxia	116	95.1%
Dysarthria	120	98.4%
Cognitive-communication disorders	115	94.3%
Multiple communication disorders	118	96.7%
Clinical continuum of care to base responses on (able to choose more than one)		
Acute	32	26.2%
Inpatient rehabilitation	42	34.4%
Outpatient rehabilitation/community	48	39.3%

Table 2: Current practice of stroke CPT (frequencies, n=75 for unfamiliar communication partners, n=110 for familiar communication partners, unless specified otherwise)

Characteristic	Unfamiliar communication partners (n=75)		Familiar communication partners (n=110)	
	N	%	N	%
Overall perception of current practice as consistent with best practice	n=105			
Strongly disagree – Neutral	57	54.3%		
Agree – Strongly agree	48	45.7%		
Provided CPT (n=121)	80	66.1%	119	98.3%
CPT provided for (able to choose more than one)	n=80		n=119	
Aphasia	76	95.0%	118	99.2%
Apraxia	55	68.8%	103	86.6%
Dysarthria	51	63.7%	103	86.6%
Cognitive-communication disorders	62	77.5%	106	89.1%
Multiple communication disorders	62	77.5%	110	92.4%
Other communication disorders	12	15.0%	24	20.2%
Selected more than one of the above	71	88.8%	114	95.8%
CPT type (able to choose more than one)				
Skills training	60	80.0%	104	94.5%
Education	69	92.0%	101	91.8%
Counselling	14	18.7%	70	63.6%
Person delivering CPT (able to choose more than one)				
Me, the speech pathologist	75	100.0%	110	100.0%
A therapy assistant/ allied health assistant	2	2.7%	2	1.8%
Volunteer	0	0.0%	0	0.0%
Other	3	4.0%	0	0.0%
Communication partners (able to choose more than one)				
Medical doctors	38	50.7%	na	na
Nurses	64	85.3%	na	na
Allied health professionals	62	82.7%	na	na
Patient service assistants	12	16.0%	na	na
Food service staff	18	24.0%	na	na
Administrative staff	8	10.7%	na	na
Volunteers	23	30.7%	na	na
Other	10	13.3%	na	na
Spouses	na	na	109	99.1%
Family members	na	na	105	95.5%
Friends	na	na	68	61.8%
Employers	na	na	11	10.0%
Community members	na	na	10	9.1%
Other	na	na	5	6.4%
Used published programs in the last 12 months	10	13.3%	11	10.0%
Published programs used in the last 12 months (able to choose more than one)	n=10		n=11	
Supported Conversation for Adults with Aphasia (SCA™);	6	60.0%	3	27.3%

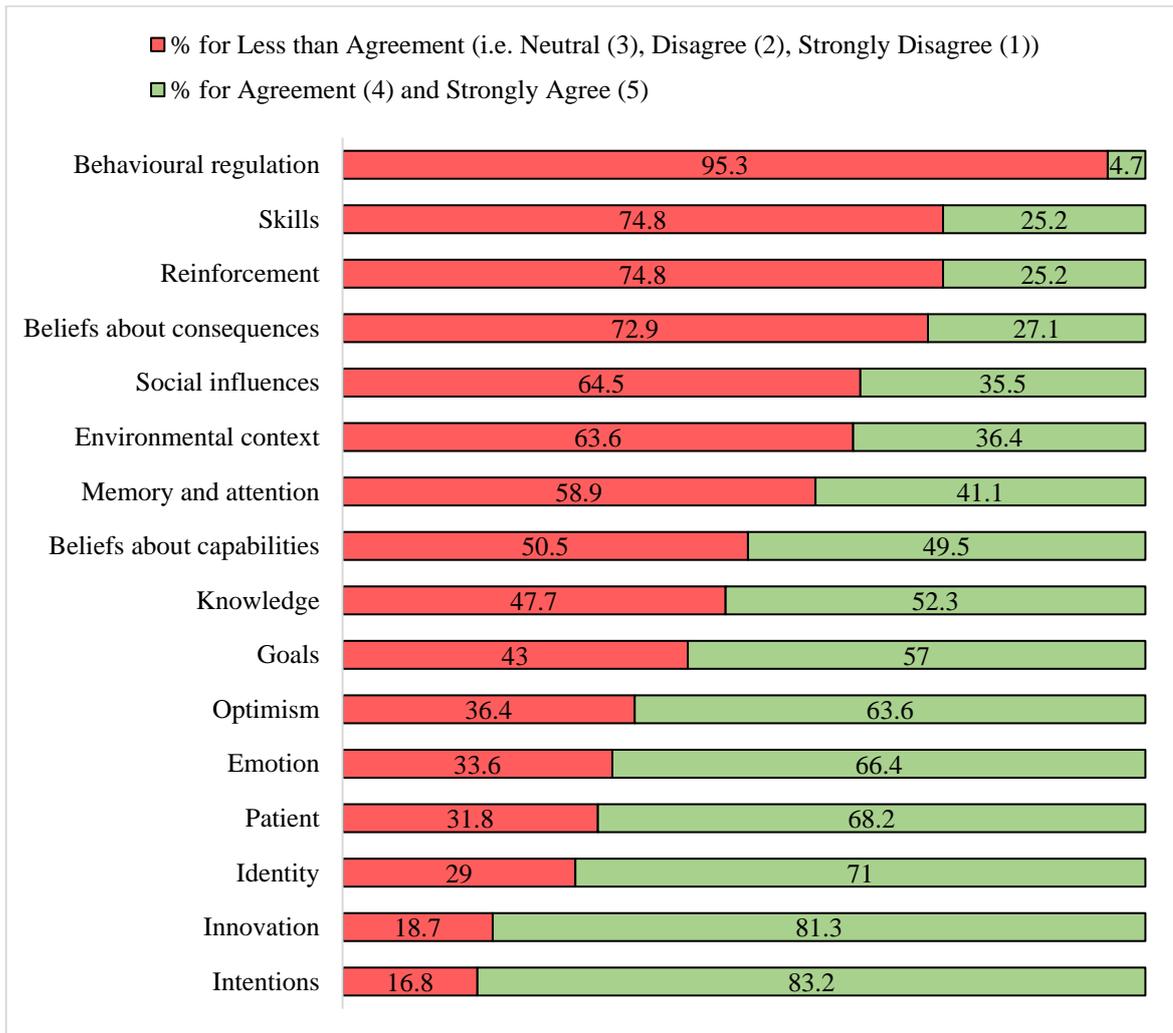
Kagan et al., 2001)				
TBI Express (Togher et al., 2010)	2	20.0%	7	63.6%
Supporting Partners of People with Aphasia in Relationships & Communication (SPPARC; Lock et al., 2001)	0	0.0%	4	36.4%
MESSAGE (Smith et al., 2011); Total Communication (Rautakoski, 2011)	1	10.0%	2	18.2%
Patient-Centred Communication Intervention (PCCI; McGilton et al., 2010)	1	10.0%	1	9.1%
Other	0	0.0%	1	9.1%
Connect's Conversation Partner Scheme (CPS; McVicker et al., 2009); Couples Therapy (Boles, 2009); Communication Therapy for People with Aphasia and their Partners (APPUTE; Nykänen et al., 2013); Conversational coaching (Hopper et al., 2002)	0	0.0%	0	0.0%
How strictly published programs are followed	n=10		n=11	
Strictly follow the protocol	0	0.0%	0	0.0%
Follow the protocol, but adapt it as needed	7	70.0%	9	81.8%
Use the protocol as a rough guide only	3	30.0%	2	18.2%
Topics (able to choose more than one)				
Information about stroke	45	60.0%	91	82.7%
Information about specific communication disorders	63	84.0%	101	91.8%
General communication strategies	70	93.3%	87	79.1%
Individualised patient-focused communication strategies	66	88.0%	104	94.5%
Information about useful services	17	22.7%	74	67.3%
Consequences of communication disorders	51	68.0%	82	74.5%
Other	0	0.0%	3	2.7%
Teaching strategies (able to choose more than one)				
Role plays	29	38.7%	41	37.3%
Practice with patients with communication impairments	33	44.0%	89	80.9%
Didactic teaching	44	58.7%	48	43.6%
Instructional videos	23	30.7%	22	20.0%
Videos/audio recordings for feedback	9	12.0%	17	15.5%
Reflections for evaluation of personal success	19	25.3%	49	44.5%
Group discussions	45	60.0%	24	21.8%
Question and answer sessions	48	64.0%	72	65.5%
Published manuals/workbooks	8	10.7%	17	15.5%
Other	7	9.3%	8	7.3%
Delivery methods (able to choose more than one)				
Face-to-face	74	98.7%	109	99.1%
Written	38	50.7%	85	77.3%
Online	5	6.7%	6	5.5%
Delivery formats (able to choose more than one)				
Group	50	66.7%	13	11.8%
Dyad (including person with stroke)	40	53.3%	105	95.5%
One-on-one	46	61.3%	71	64.5%
Frequency				
Once a year	8	10.7%	na	na
Twice a year	8	10.7%	na	na
Monthly	9	12.0%	na	na
As requested	37	49.3%	na	na
Other	13	17.3%	na	na
Usually (with about 90% of my patients)	na	na	30	27.3%
Frequently (with about 70% of my patients)	na	na	38	34.5%

Sometimes (with about 50% of my patients)	na	na	27	24.5%
Rarely - Occasionally (with up to about 30% of my patients)	na	na	15	13.6%
Number of sessions				
1 session	44	58.7%	31	28.2%
2 sessions	21	28.0%	30	27.3%
3+ sessions	3	4.0%	25	22.7%
Other	7	9.3%	24	21.8%
Length of each session				
Less than 30 minutes	33	44.0%	34	30.9%
About 30-45 minutes	19	25.3%	49	44.5%
About 1 hour	21	28.0%	25	22.7%
More than 2 hours	2	2.7%	2	1.8%

Table 3: Survey findings on evidence-practice gaps and barriers mapped onto proposed actions to address them

Evidence-practice gap or barrier	Proposed actions	Actions by
1. Clinicians experiencing various barriers impeding implementation of stroke CPT in practice and few research providing evidence on how to effectively implement the programs in realistic settings.	To directly explore the implementation of stroke CPT in realistic healthcare settings using implementation strategies to target identified barriers and take advantage of facilitators.	Researchers
2. Clinicians targeting a range of post-stroke communication disorders while research provides limited evidence and guidance beyond aphasia.	To expand evidence for CPT from aphasia to a range of post-stroke communication disorders.	Researchers
3. Low uptake of evidence-based published programs and low fidelity due to various reasons such as the significantly shorter treatment doses used in current practice, cost and lack of accessibility to published programs.	To develop and make freely accessible the manuals of CPT programs that take into consideration the practical limitations in current practice such as the relatively shorter treatment doses.	Researchers
4. Clinicians' perceived lack of knowledge in terms of what best-practice CPT should constitute given the lack of consensus in research.	To identify the active ingredients of CPT and provide explicit instructions on CPT best-practice.	Researchers
5. Clinicians' perceived lack of skills to provide CPT and the limited opportunities for freely accessible formal training.	To provide freely accessible formal training in CPT. For example, through the inclusion in university curriculum.	Other (e.g. universities)
6. A lack of behavioural regulation, reinforcement, positive social influences for the provision of stroke CPT in workplaces.	To advocate for the provision of CPT in the workplace by putting in place policies and procedures, and providing a supportive workplace culture for the practice of stroke CPT.	Organisations
	To create a positive workplace culture for the provision of stroke CPT beginning with self.	Clinicians
7. Clinicians are not routinely providing CPT to CPs, particularly for unfamiliar CPs.	To reflect on and explore ways to change own practice in relation to the common evidence-practice gaps highlighted in this study.	Clinicians

Figure 1: Likert scale responses to statements regarding each domain (n=107)



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