PAPER TO PRACTICE

A mixed-methods study of rolling-groups as a delivery model for the Lidcombe Program treatment for early stuttering within regional communities

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Abbreviations

ANOVA:	Analysis of Variance
LP:	The Lidcombe Program
SP:	Speech Pathologist
SR:	Severity Rating
%SS:	Percent Syllables Stuttered
RCT:	Randomised Controlled Trial
NNSWLHD:	Northern New South Wales Local Health District

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Abstract

Aim

The Lidcombe Program (LP) is considered the strongest evidence-based treatment for young children who stutter. Unfortunately, the traditional individual model consumes a large proportion of clinical hours with the potential to dramatically extend the waiting times for children with other communication issues. This study aimed to determine if the LP delivered in a rolling-group model, by community health-based speech pathologists (SPs), would achieve comparable stuttering reduction outcomes to those published in the literature that often originate from specialist stuttering clinics. Moreover, would a rolling-group model be perceived as a viable and an effective alternative by the clinicians who delivered the program?

Methods

A mixed-methods study was conducted across 4 Northern NSW Local Health District (NNSWLHD) community health centres. A prospective, pre-post measurement design was used to investigate the reduction of stuttering severity of 21 children aged between 2 years 9 months and 6 years who received the Lidcombe Program in a rolling-group model. Measures of stuttering severity were conducted at assessment and 6 months and 9 months post-commencement, with repeated measures ANOVA used to assess differences between scores. Semi-structured interviews were conducted with the 5 participating SPs to ascertain their perceptions pertaining to the viability of this innovative rolling-group model.

Results

Children participating in the LP rolling-groups achieved significantly reduced stuttering severity with the mean percent syllables stuttered (%SS) reducing from 7.4 (SD = 3.9) at initial assessment to 1.4 (SD = 1.7) at 6 months post-commencement ($p=0.001$). Mean parent-clinician agreed severity rating (SR) decreased from 5.3 (SD = 1.6) to 1.6 (SD = 1.0) ($p<0.001$) across the same timeframe. Children completed active treatment reaching Stage 2 in a median of 7 clinical hours, which is lower than literature benchmarks. Participating SPs universally supported the rolling-group model. Themes drawn from the interviews described logistical challenges, the need for proactive support when moving to a rolling-group model and a desire to embrace practice change.

Conclusion and Implications

Rolling-group delivery of the LP by SPs who do not specialize in stuttering within community health centres, is both efficacious and perceived by clinicians to be a viable alternative to traditional individual treatment. This real-world translational research evidence provides further incentive for SPs to embrace the rolling-group model for the treatment of stuttering in early years, particularly where clinical hours are scarce and waiting lists daunting.

Keywords: Lidcombe Program, stuttering, rolling-group model, children, community health

Executive Summary

Recent Australian studies have shown the cumulative incidence of early years stuttering to be almost double the level previously reported (13, 14). This has generated serious concerns for the availability and quality of treatment for this population within our current healthcare framework. Even in preschool years, stuttering is known to lead to negative peer responses such as being mocked or ignored. Children prefer friends who have fluent speech. These early experiences of communication difficulty or failure are now considered to have life-long ramifications. Children who stutter are more likely to be teased or bullied at school and as they move into adulthood, they are far more prone to clinically diagnosable social anxiety or social phobia than the non-stuttering population.

The Lidcombe Program is supported by strong evidence and thus dominates the treatment for young children who stutter. In line with evidence-based practice (EBP), NNSWLHD SPs have placed this client group at a higher priority for treatment, with the unintended consequence of extending the waiting times for children with other communication difficulties. In the NNSWLHD it is not uncommon for a clinician working 16 hours per week, to have up to five children who stutter on their caseload. According to the LP guidelines this would equate to five clinical hours per week, over a possible median period of 25 weeks.

Use of a rolling-group model has recently been investigated, whereby between 2 to 4 child-parent pairs may be seen simultaneously within a standard hourly session. Whilst this single randomized controlled trial (RCT) (25) proved highly efficacious with a 46% reduction in clinical hours, the researchers felt that there were limitations: all of the participants were drawn from a single site, a stringent selection criteria could reduce transferability to standard clinical settings and therapist specific factors as only two highly experienced SPs delivered the program. The current study aimed to address these limitations using multiple community health centres and SPs, together with standard intake criteria for children accessing treatment for stuttering within the NNSWLHD thereby addressing issues of transferability into sustainable real-world clinical practice.

The Study

Twenty-one preschool aged children were invited to participate in the study to investigate the effectiveness of a Lidcombe Program rolling-group model, within community health settings. A prospective, pre-post measurement study was conducted by four generalist or paediatric SPs. Outcome measures included the number of clinical treatment hours, visits and weeks to completion of Stage 1 (little or no stuttering) and percent syllables stuttered when reaching Stage 2 criteria. A repeated measure analysis of variance (ANOVA) was used to assess reductions in stuttering severity over time. Semi-structured telephone interviews were conducted with the six participating SPs who completed the rolling-group training package, to ascertain their attitudes towards the viability of a rolling-group model. Inductive thematic-analysis was used to illuminate their perceptions of this novel model.

Results

Out of the 21 children for whom study consent forms were received, 2 children withdrew prior to 4 weeks and their data was excluded. All remaining clients were included up to the assessment point when they had either withdrawn (n=4), were unavailable (n=2), had completed Stage 1 (n=12) or remained in active treatment (n=3).

This study showed that a rolling-group model for the delivery of the Lidcombe Program within the 4 NNSW LHD community health centres delivered clinically equivalent outcomes to those in the literature. Pertaining to the central issue of clinical hours, children in this study required a median 7.0 clinical hours to complete Stage 1, whereas Arnott et al. (2014) reported a means of 9.2 hours (group arm) and 14.3 hours (individual arm) (25).

Themes detected within the participating SP's semi-structured interview data touched on challenges, scaffolds, betterment and journey. Knitted together they expressed unequivocal support for rolling-group model with an undercurrent of realism depicting personal, organization and professional barriers to be surmounted.

CONCLUSIONS AND RECOMMENDATIONS

Local paediatric SPs have incontrovertibly demonstrated that Lidcombe Program rolling-groups deliver treatment outcomes that are equitable with individual treatment. As such the use of a rolling-group model, with a dramatic reduction of clinical hours, can be considered a cost-effective service delivery measure without risk to client outcomes.

Based on the findings of this research it is recommended that SPs move toward a flexible approach to early years stuttering treatment, where rolling-group treatment may surmount individual sessions as the initial intervention option.

Researcher's Notes

The SPs working in the NNSWLHD are well known to each other and the researcher. As I co-ordinated this study, co-trained the SPs, supported and mentored them throughout the practice-change process, and conducted the semi-structured interviews, there is without doubt the possibility for bias, which needs to be made transparent. Additionally, I was one of the participating SPs in this study and my own experiences were mirrored in those reported by Arnott et al (2014) (25) and in themes generated by my colleagues. I had the advantage of witnessing the Dr Arnott leading her groups when collecting the data for her RCT. Filled with enthusiasm for the rolling-groups, I regularly spoke with colleagues about them, prior to publication, at professional development opportunities related to stuttering. I was almost universally met with concern that they would not be possible in everyday working conditions. I set about with my peers, to establish if these fears could be substantiated. My experience was that they could not. Rolling-groups are no doubt complex and do require the SP to juggle a broad range of stimuli concurrently. The water may be choppy but the rewards are many and greater than the highly valued reduction in clinical hours. It is a pleasure to see stigma and fear broken down for children and parents by working closely with others who are in the same boat; children praising one another's smooth speech, witnessing parents gain increased skills as co-therapists and the open dialogue when times get tough and endurance is required.

Introduction

Early years stuttering treatment proves problematic for community-based clinicians due to monopolizing extensive clinical hours (1) and potential inequity of service across our caseload. However much evidence focused on treatment efficacy and the psycho-social ramifications of stuttering (2, 3), has motivated speech pathologists (SPs) to prioritize early intervention for this population. A rolling-group Lidcombe Program (LP) model has been investigated within a specialist, metropolitan, university-based stuttering clinic. Where community-based SPs are struggling to provide equitable treatment for this population, particularly in rural communities (4, 5) this unfamiliar model may provide a sustainable alternative to traditional individual treatment.

This report describes a prospective mixed-methods study to determine if the LP delivered via rolling-groups, led community-based SPs, can provide comparable results to those reported in the literature and be perceived as a viable alternative by participating clinicians.

Background

Evidence-based practice (6) is the foundation on which allied health professions, including speech pathology, are grounded. In the field of paediatric stuttering, there is an increasing body of evidence to support treatment options (8, 26), with particular reference to the LP for the treatment of early stuttering (7-10). Despite, or rather due to this broad platform of empirical evidence supporting the LP, community-based clinicians are faced with numerous pragmatic dilemmas, particularly pertaining to fidelity with the guidelines (11) and 'dosage'.

Stuttering typically develops before the age of four and is marked by repetitions, fixed postures and superfluous verbal and nonverbal behaviours (12). A child's temperament does not appear to be predictive of the onset of stuttering (13) as children who stutter present as neither more nor less shy than their peers.
The recent Early Language in Victoria Study (ELVS), a prospective observational longitudinal study (n=1619) reported the cumulative incidence of stuttering onset by 3 years to be 8.5% (13) and by the age of 4 years, to be 11.2% (14). At nearly twice the previous estimates (15), this begs the question as to whether the SP profession has the ongoing resources to provide an equitable, quality service for this population.

Why is early intervention critical?

The consensus is that children who stutter are best treated before six years of age (9, 16). Judgement concerning treatment timing has recently shifted somewhat with advances in the field of neuroplasticity (17), together with increasing evidence of the sequelae to stuttering for children, adolescents and adults (2, 18). Stuttering is now considered to be less tractable as a child ages (19).

Onset may be quite sudden proving distressing for both the parent[1] and the child (20). Worryingly, children as young as 4 years of age are almost unanimous in their belief that dysfluent speech is not good and they would prefer a friend who spoke fluently (21). When four pre-schoolers who stutter, between the ages of 3 to 4 years, were videotaped in outdoor free-play, between 2.8% to 28.6% of their stuttered utterances resulted in

[1] For the purposes of this report the term 'parent' is assumed to also encompass non-parent carers of children.

negative peer responses (2). Put simply, for one of these children almost a third of his communication attempts resulted in being interrupted, mocked or ignored. In a further study on the impact of stuttering in preschool years, Langevin (2010) reported that 27% of the 77 respondents felt their child had been teased by peers (22). These rates rise alarmingly with age, with 61% of boys who stutter self-reporting bullying in one study (23). Unfortunately, the evidence of negative impact is even greater for adults who stutter. Iverach et al (2009) compared the presence of DSM-IV anxiety disorders between 92 adults seeking treatment for stuttering and 920 age and gender matched controls. Comparison between these found 6-fold increased odds for any anxiety disorder and 16-fold increased odds for social phobia for those seeking treatment for stuttering (3).

The notion of 'wait and see' as a treatment option is diminished by such evidence. It would appear that treatment needs to be of high quality and provided when children are most able to develop new neural pathways for fluency. The risks of poor outcomes in early years treatment of developmental stuttering are considerable and a weight most SPs and parents would choose not to bear if possible.

Why do we usually choose the Lidcombe Program over other treatment options?

A broad body of empirical evidence has been accrued over the past few decades that advocates for utilizing the LP for treating stuttering with children under six years of age (7, 9, 10, 24). Several randomised controlled trials support the premise that LP is efficacious and can lead to a greater reduction in stuttering frequency than would be expected by natural recovery (8, 9, 25).

Alternative models of treatment are available and in some countries have dominance. Multifactorial treatments such as The Palin Parent-Child Interaction (PCI) Therapy (26, 27), Demands and Capacities Model treatment (8) and The Westmead Program (28, 29), have all shown degrees of success in preliminary level studies. Some have been critiqued for poor replicability (16) and none have the level of empirical evidence that supports the LP. Notwithstanding theoretical and evidence-level debates, it has been mooted that multifactorial approaches and the LP could be used synergistically (30), as there are many structural similarities such as parent-led home practice.

Clinical hours

Whilst extremely efficacious, the LP consumes a disproportionate number of clinical hours to other communication disorders, requiring a median of 16 one-hour clinical sessions followed by 10 one-hour clinical maintenance sessions (1, 7, 25). Rural and some metropolitan SPs, often with limited hours and large caseloads, are left with a quandary; to treat young children according to the LP guidelines (11) may significantly increase the waiting time of children with other communication issues. To date, the only translational study investigating the real-world application of the LP within the community (1) found poor adherence to LP guidelines, particularly in relation to the length and frequency of clinical visits and parents demonstrating treatment within sessions. One may speculate that these detours from the core guidelines are a direct attempt to mitigate the impact of stuttering intervention on caseload management by reduction of time spent in treatment.

The bulk of the LP efficacy research has occurred in specialist, urban environments without exploration of transferability to the wider community (public and private) framework or regional locations. Speech pathologists despite being proponents of EBP, often view scholarly research as neither reflective of their environments nor practicable to replicate in every-day clinical settings (31-33).

Solutions to underservicing and inequity of provision

New technologies, such as the use of Skype™ have been used to deliver LP internationally (32) and to provide specialist services in underserviced locations. A Phase 1 trial has explored the viability of internet webcam LP service delivery (34), reporting that this version had comparable efficacy with the in-clinic model. Whilst this points to the viability of webcam telehealth for rural clients, the reality for many SPs is that organizational or policy barriers may limit or prohibit access to the required technology within their workplace(33). Additionally, although telehealth provides broader access to services it does little to reduce the clinical hours needed per child.

Further possibilities lie in seeing multiple clients simultaneously. Speech pathologists have long utilized group treatment, often with the perception that it is both efficacious and cost-effective. These groups tend to be dyadic, time-limited and cover a wide range of communication issues: adults and adolescents who stutter (35), children with phonological disorders (36) or the Hanen Program for early language development (37) to list but a few. Group therapy is widely advocated for children who stutter in the UK but there seems to be a lack of consensus regarding the main aims of group treatment (38), the most commonly reported being the nebulous goal of increasing children's self-confidence, rather than stutter-free speech.

Rolling-group model

A single RCT has recently reported on the rolling-group delivery of the Lidcombe Program (25) with highly successful results. Fifty four parent-child pairs were randomised into either a control arm (individual) or treatment arm (rolling-group). There were no statistical or clinical differences noted between the arms with regards to number of clinical visits or weeks in treatment. Of great significance to SPs however, was the fact that the rolling-group arm consumed 46% less clinical hours per child to the completion of Stage 1 (little or no stuttering).

Often used in the field of psychology (39, 40), rolling-groups are not a model of care familiar to paediatric speech pathologists. Arnott et al (2014) explained that such groups begin with a set number of child-parent pairs and participants change over time (25). As a child completes active treatment (little or no stuttering), they are replaced by a new child-parent pair. This rolling process creates a group where novice and expert child-parent pairs are simultaneously being treated according to the LP guidelines but at differing levels.

Closing the practice-evidence gap

The possibility of embarking on new models of care, whilst exciting is also daunting. A great divide otherwise know as a 'practice-evidence gap' (41) has historically existed within the SP profession. Whilst SPs are attracted to EBP, they often feel disempowered to make functional changes (42). Several reasons are frequently reported as to why this gap exists: a perceived lack of practicality in research findings (42), lack of time for reading and implementing research (6) and stressful aspects of forgoing a comfortable model for the upheaval of the new (43, 44). The restrictions under which most clinical trials are realized may be discouraging, as SPs perceive highly controlled research conditions, led by experts, as not reflective of their clinical settings (31, 33) and there has been little investigation of how these protocols perform in the real-world.

Therefore, the aim of this study was to determine if NNSWLHD community health speech pathologists could produce clinically equivalent reductions in stuttering severity for young children, when delivering the LP in a novel rolling-group model within their community-based settings. Moreover, would the participating SPs embrace the alternative model, perceiving it as a valuable and sustainable option for future service delivery?

Objectives

The primary objective of this study was to determine if the Lidcombe Program, delivered in a rolling-group model within rural community health settings, by non-specialist speech pathologists, is as effective and efficient as reported in the literature when compared with specialist metropolitan stuttering clinic, for both group and individual treatment.

The secondary objective of this study was to determine viability, including both acceptance and feasibility, of the rolling-group alternative model, by participating speech pathologists.

Methods

Design

This mixed-methods study was designed to investigate the dual research questions**:** Can the LP delivered in a rolling-group model within rural community health settings, by non-specialist SPs, offer clinically equivalent results to those in the literature and moreover be perceived as viable by participating SPs? A prospective, pre-post measurement design was used to evaluate the LP rolling-group effectiveness. The qualitative component followed a realist paradigm using an inductive thematic analysis approach, collecting data though semi-structured interviews with five rural speech pathologists. This dual-design married SPs' insights with the quantitative data, to elicit depth and completeness from complementary findings (45).

Recruitment and consent

Children aged 2 years 9 months to 6 years were eligible for the study if their parents approached one of the six participating NNSWLHD community health centres. Following a standard assessment for stuttering, all children who met the inclusion criteria were invited to join the study. Participating SPs were recruited on a voluntary basis following presentations by the researcher at a local paediatric interest group and NNSWLHD meeting. All parent and SP participants were provided with an opportunity to discuss the project with the researcher, a written information sheet and a written consent form.

Ethical approval

Approval to conduct the study was obtained from the North Coast NSW Human Research Ethics Committee (No. LNR 073) on the 26th February 2014.

Setting and participants

Rolling-groups were established at differing times across four NNSWLHD community health centres, between March 2014 and April 2015. Two centres were unable to begin groups due to limited referrals or SP role change. Semi-structured interviews with the SPs were conducted via telephone in December 2014.

Twenty-one children who approached speech pathology services at the designated centres for stuttering treatment were recruited. The inclusion criteria for the study were: (a) Residents within the NNNSWLHD (b) Diagnosed as stuttering by the assessing SP and (c) Aged 2 years 9 months to 6 years. Exclusion criteria were (a) Children with a major neurological disorder that makes the assessment of unambiguous stuttering difficult

e.g. Tourette's Syndrome (b) Child-parent pairs that cannot or would prefer not to attend group intervention and (c) Child is currently involved in LP treatment. Five SPs volunteered to undertake the training and instigate a LP rolling-group. Formal training by Lidcombe Program Trainers Consortium (LPTC)[2] for individual treatment was the only stipulated requirement. Participating SPs had from eight years to over 35 years clinical experience.

Intervention

Speech pathologist capacity building

In February 2014 all participating SPs were trained in the management of rolling-group LP model by either the program developer, Dr Arnott or the researcher via teleconference. The SPs were encouraged to seek support from the researcher via email and telephone, as is standard practice within the SP profession for peer-mentoring.

Parent training session

Before the commencement of the group, each child-parent pair was offered a single individual session. This 60-minute session enabled parents to develop some of the early skills and knowledge that they would be required to use in treatment. Additional baseline measures of the child's stuttering severity were recorded by the SP.

Lidcombe Program Treatment

The Lidcombe Program (LP) for the treatment of early stuttering, was developed in Australia (46). The LP is a parent-delivered, behavioural treatment, divided into two stages. Parents are trained by the SP to deliver treatment within the child's everyday environment, initially in practice sessions, to enable stutter-free speech. The parent provides verbal contingencies for both stutter-free speech and for stuttering. They are also trained in the ten-point severity rating scale (SR)[3], which they record daily. The SR takes into account not only frequency but also the type and complexity of stutters. During their weekly 45-60 minute clinical session, the parent and SP use the SR scores from the previous week to plan therapy. The SR scores are compared between the parent and the SP to ensure agreement of severity. During Stage 1, treatment progresses from practice sessions for 10-15 minutes each day, to natural conversations, with verbal contingencies judiciously being applied across everyday life. A child completes Stage 1 when the parent reports their severity to be SR=1 or 2 during the preceding week, with at least four days being SR=1 and the clinician's SR=1 or 2 within clinic, over three consecutive weeks (11). Stage 2 is a maintenance phase with a timetable of sessions that become increasingly further apart. Stage 1 clinic visits follow a predictable sequence including the following elements; [a] child conversation, [b] check parent SR, [c] discussion of progress during the previous week, [d] parent demonstrates verbal contingencies [e] parent and clinician discuss the verbal contingencies demonstrated by the parent and [f] planning treatment changes for the coming week (11).

Rolling-group Lidcombe Program model

This study followed the guidelines in The Lidcombe Program of Early Stuttering Intervention Treatment Manual (47)[4]. Each group comprised of between 2 to 4 child-parent pairs. Initially, the groups comprised solely of children starting their treatment, however as one child reached criteria to Stage 2, the child was replaced by another child-parent pair. This 'rolling' aspect to the group composition enables the SP to treat both novice

[2] The Lidcombe Program Trainers Consortium (LPTC) is an international, non-profit group dedicated to providing professional continuing education for the Lidcombe Program (http//sydney.edu.au/health_sciences/asrc/health_professionals/lptc.shtml.)
[3] In January 2015, a 0-9 point SR scale superseded the 1-10 point scale for ease of use. This study continued with the old scale as used at baseline.
[4] The 2011 manual has recently been replaced by The Lidcombe Program Guide in 2015 and is available at http://sydney.edu.au/health-sciences/asrc/health_professionals/asrc_download.html

and expert child-parent pairs simultaneously. Weekly groups were between 45-60 minutes and were led by a single SP. Unlike individual Stage 1 sessions, the treatment elements may occur in different sequences and with diverse configurations of child, parent and SP: child-parent pairs playing separately, all pairs together or all children together whilst parents observe, rate or converse with the SP. The rolling-group floor plan revolved around a combination of 'activity stations' and a main area where the SP could engage in a whole-group activity. Children direct the treatment sequence actively by their interaction with the environment upon entry. Should children wish to engage in free-play, the session may begin with rating and adult problem solving, whereas children choosing to sit for a tabletop activity might lead to a SP or parent demonstration of treatment.

Data collection

The children's stuttering severity was assessed at four points: 1) Pre–treatment assessment, 2) the completion of Stage 1, 3) 6 months post-commencement and 4) 9 months post-commencement. At each point a stuttering severity rating (SR) and percent syllable stuttered (%SS) were calculated within clinic, during the group closest to that date. Participant attrition at the 6 and 9 months post-commencement assessments occurred due to withdrawal (n=6), being unavailable (n=2) or not having been in treatment for the required time (n=3).

A semi-structured interview was conducted with each participating SP at 9 months post-commencement following the inaugural group. Enabling debriefing and reflection, interviews were conducted via telephone by the researcher, for a duration of 15-30 minutes. Notes were hand written concurrently, without the use of a recording device (48). Key reflections from each SP were combined into a written summary, which was returned to the participant, to ascertain if it was a true and full account of their perceptions and experiences of the rolling-group LP process. Only one SP wished to alter the summary.

Assessments

Primary outcome analysis

Speech pathologist's clinical hours per child to the completion of Stage 1

Each weekly group ran for between 45-60 minutes being attended by up to four children. Clinical hours were calculated by dividing the minutes taken for each group by the number of children. Thus three children attending a 60 minute group would be allocated twenty minutes each (25). Clinical hours per week were accrued until each child completed Stage 1 and a total was ascertained.

Secondary outcome analysis

Number of clinic visits and weeks per child to completion of Stage 1

The number of clinic visits to the completion of Stage 1 included all attended group sessions, other than initial parent training session. The number of weeks did not reflect attendance and were calculated from the date of their first attendance to last group, in which criteria for Stage 2 was met.

Stuttering severity change over time

At each assessment point, the two stuttering measures were taken: percent syllables stuttered (%SS) and the Lidcombe Program severity rating scale (SR), as these are widely utilized in the literature pertaining to behavioural treatments for stuttering (34) and together have been proved to show treatment effect (49). Children were assessed within the group when deemed to be chatting naturally. The SP used a two-buttoned rating machine or mobile application (App) to ascertain the %SS, that measures the proportion of stuttering moments compared with spoken syllables, over a minimum sample of 300 syllables. The SR is a measurement

of global stuttering severity, where a score of SR=1 represents "no stuttering" through to SR=10 which represents "extremely severe stuttering". The SP and parent listen for unambiguous stuttering or observe secondary behaviours associated with stuttering. Both assign an SR which are then compared and agreement reached.

Percent syllable stuttered at criteria for Stage 2

At each child's final Stage 1 group session, the clinician recorded a %SS according to the procedure described.

Data analysis

Data Analysis | Rolling-groups

Non-identifiable data was sent to the Rural Research Capacity Building Program's biostatistician and was analyzed using Statistical Package for the Social Sciences (SPSS)- Version 22.

A repeated measure analysis of variance (ANOVA) was calculated for clinician %SS and SR at each assessment point to determine changes in stuttering severity outcomes over time, that could be attributed to the rolling-group intervention rather than spontaneous recovery. This analysis used a within-subject main effect of time (pre-, 6 and 9 months). The data is inherently non-independent because it entails multiple observations, over time, within each subject. An independent t-test was used to compare those who completed to Stage 1 against those who withdrew from treatment, on variables of age, stuttering severity (%SS & SR) and gender.

Data analysis | Interviews

The transcripts from the semi-structured interviews with the SPs were systematically analyzed according to the thematic analysis method described by Braun and Clarke (2006) (50). Handwritten notes from the interviews were transcribed immediately following their completion. When all interviews were transcribed the coordinating researcher immersed herself in the data to ascertain reoccurring topics that could constitute a pattern, leading to codes and themes. Key themes were ultimately broken down into sub-themes, expressing the breadth of the SPs' perceptions regarding the viability of the rolling-group Lidcombe Program model.

Results | LP rolling-group intervention

Attrition

Twelve of the eligible 21 children who stutter completed Stage 1. Of the 9 participants who did not complete Stage 1, a number of clients (n=6) withdrew from the treatment altogether, whilst the remaining clients (n=3) continued with their treatment in the rolling-group at the closure of data collection. Of the child-parent dyads who withdrew, the reasons were varied and often multifaceted ranging from uncertainty about treatment altogether (n=1), prioritizing other areas for treatment such as speech sound disorders (n=1), moving out of area (n=1), failure to re-contact the treating SP following missed sessions (n=1), maternal health (n=1) and balancing siblings needs (n=1). Data for two children who withdrew prior to 4 weeks was not included in the data analysis. Measurements of stuttering severity were collected for all available children at the 6 months post-commencement (n=14) and 9 months post-commencement (n=10) assessments.

Table 1: Baseline assessment information for children who completed to Stage 1 or withdrew.

Characteristics	Excluded <4 Weeks n (%)	Completed Stage 1 n (%)	Total n (%)
Gender			
Boy	7 (36.8)	7 (58.3)	7 (66.7)
Girl	12 (63.2)	5 (41.7)	14 (33.3)
Age (years;months)			
< 3;5	3 (15.8)	1 (8.3)	4 (19.0)
3;5 – 4;5	10 (52.6)	6 (50.0)	11 (52.4)
> 4;5	6 (31.6)	5 (41.7)	6 (28.6)
Mean age (months/years)	49.05/ 4;0	50.58/4;2	48.5 /4;0
Mean %SS pre-treatment (SD)	7.39 (3.89)	6.02 (5.15)	7.22 (3.73)
Mean SR pre- treatment (SD)	5.26 (1.56)	5.0 (1.7)	5.28 (1.45)

Data analyses

On t-test comparing age, stuttering severity (%SS & SR) and gender, there was no evidence of a significant difference between those who completed to Stage 1 and those who withdrew from treatment.

Primary outcomes: SP hours per child to the completion of Stage 1

The mean number of SP hours per child to complete Stage 1 was 7.32 clinical hours (median 7.04, interquartile range 4.3).

Secondary outcomes: number of clinical visits and weeks per child to completion of Stage 1

The median number of clinic visits to the completion of Stage 1 was 15 visits (interquartile range 12.3). The interquartile range values show that 75% of the children completed Stage 1 within 23 visits. The median number of weeks to complete Stage 1 was 27 (interquartile range 19.2). There was some variation around the median number of weeks with 75% of the children reaching Stage 2 within 34.7 weeks.

Percent syllables stuttered (%SS) - stuttering severity per child at the completion of Stage 1

The mean %SS score at the completion of Stage 1 for the entire sample (n=12) was 0.37 %SS (SD = 0.38 Range = 0.00 – 0.98)

Changes to stuttering severity over time

A repeated measures ANOVA was used to analyze both the percent syllables stuttered (%SS) and parent-clinician agreed severity rating (SR) over time at three time points; initial assessment, 6 months post-commencement and 9 months post-commencement. The trajectory for stuttering was towards little or no stuttering across the treatment period (**Table 2).** Children (n=10) who were assessed at 9 months post-commencement of treatment scored a mean %SS of 1.3 %SS (SD = 2.1; Range = 0 – 5.3) whilst the subset of those who had completed Stage 1 (n=7) scored a mean %SS of 0.9%SS (SD = 1.9; Range = 0 -5.3). Therefore, the downward trend was similar for both those who completed Stage 1 and those who were continuing in treatment.

The %SS scores were comparable to the parent-clinician agreed severity ratings (SR) taken within clinic at the same points. The mean SR for all the children assessed at the 9 months post-commencement point was 1.5 (SD = 0.9 Range = 1 to 3). At this time point, 80% of the children were reported to have a SR=2 or less.

Table 2. Clinician percent syllables stuttered (%SS) and parent-clinician agreed severity rating (SR) at initial assessment, 6 and 9 months post-commencement assessment

Severity Measure	Assessment	n	Mean	SD	Min	Max
%SS	Initial assessment	19	7.4	3.9	2.6	17.0
	6 months post-commencement	14	1.4	1.7	0	5.0
	9 months post commencement	10	1.3	2.1	0	5.3
SR	Initial assessment	19	5.3	1.6	3	8
	6 months post-commencement	14	1.6	1.0	1	4
	9 months post commencement	10	1.5	0.9	1	3

For both %SS (p=.001, df=1,9, F=23.810) and SR (p<.001, df=1,9, F=36.506) there was a very strong statistically significant reduction in stuttering between the baseline scores at the initial assessment (T1) and the 6 months post-commencement assessment (T2) with large effect sizes. Subsequently, there was only a small level of change, without statistical significance, between the 6 months post-commencement (T2) and 9 months post commencement assessment (T3) for both %SS (p =.482, df=1,9, F=0.537) and SR (p=.399, df=1,9, F=0.783), with a small effect size (**Table 3**).

Table 3: Repeated measures analysis of variance (ANOVA) comparing clinician percent syllables stuttered (%SS) and parent-clinician agreed severity rating (SR) initial assessment (T1), 6 months (T2) and 9 months (T3) post-commencement

Measure	Time	Wilks' Lambda	F	df	p	eta sq
%SS	T1 vs T2	384.000	23.810	1,9	0.001	0.726
	T2 vs T3	3.100	0.537	1,9	0.482	0.056
SR	T1 vs T2	144.400	36.506	1,9	0.000	0.802
	T2 vs T3	1.600	0.783	1,9	0.399	0.080

Figure 1. Mean clinician percent syllable stuttered (%SS) at initial assessment, 6 and 9 months post-commencement of group treatment. [5]

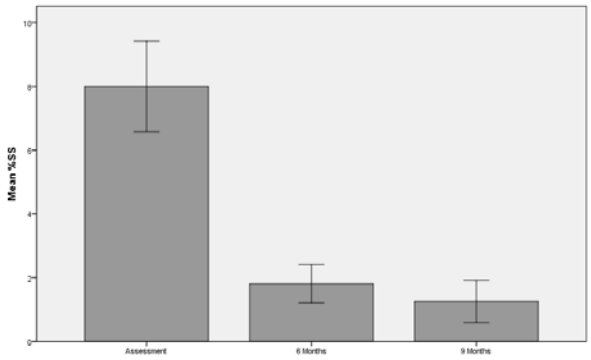
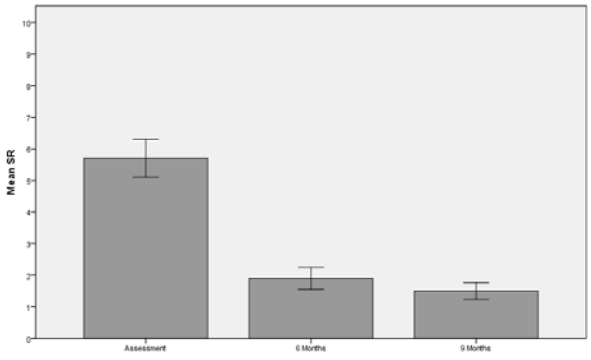


Figure 2. Mean parent-clinician severity rating (SR) at initial assessment, 6 and 9 months post-commencement of group treatment.



[5] For Figure 1 and 2 the error bars represent one standard error.

Results | SP perceptions regarding viability

Four major themes were identified from the analysis of the interview data that reflect a high level of consistency between participants regarding their perceptions of the LP rolling-group intervention. Themes of challenges, scaffolds, betterment, and journey were interwoven creating a rich fabric of change-process understanding.

Challenges

The theme of challenges encapsulates the broad nature of obstacles that the participants either anticipated or encountered as they engaged with the new model. Whilst not insurmountable, the participants expressed concerns over the logistics of establishing rolling-groups, managing the complexity of the new way of working and ever present lack of time for planning and organization.

Logistics : "Need a bigger space."

Despite high levels of motivation following the initial training, some SPs found that they were faced with a range of obstacles. In two cases logistical obstacles prevented the rolling-groups from being established, whereas in the main these were overcome. Whilst logistical issues touched on a wide range of topics such as limited referrals or difficulties coordinating attendance, the participant's greatest barriers related to allocation of a suitable space and limited resources for play activities. As the groups require up to four 'stations' as opposed to the traditional format of a didactic group, the area needs to be quite large: "Issue was room size. Crowded to get three parents and three kids in the room" [#4]. Many participants were concerned that they had insufficient activities to engage all of the children across a diverse range of ages and stuttering severity levels.

> *Lidcombe Program groups are less structured than other groups and therefore more challenging. Other groups are generally an activity being done by the entire group.[#5]*

New way of working: "Controlled chaos."

Rolling-groups are not a familiar platform for pediatric SPs and accounted for numerous comments by participants reflecting on their divergent nature and the pressure that may place on them as clinicians. The majority of participants reflected that LP rolling-groups ran at a higher level of complexity to standard SP groups: "Competing skills and stimuli. Managing multiple stimuli and still staying on track and staying on time and collecting data….quite a complex skill " [#3] The rolling-group format requires new child-parent pairs to start their treatment with others who are already in the group and may have well-established skills, thus novice and expert being treated together. One participant felt this required proactive management in order to avoid parental fears generated by comparison with more experienced parents: *"More thought on new people in the group"[#5].* Participants expressed *a* universal feeling that newly graduated SPs would require extra support.

> *New graduate may need to shadow or watch groups prior to running them. Could be a bit overwhelming. How to keep things going " [#4].*

Time: "Chock-a- block days."

Without doubt the standout obstacle expressed by all the participants was limited time. Several clinicians reflected on the time taken to embed a new process. Most participants had competing demands including senior roles or clinical commitments. Time required for organizing clients and planning the new model was a

challenge: “Biggest concern initially was that it was going to take more time, particularly around coordinating families” [#6]. Time factors were of particular concern for participants who were eager but work limited hours, hampering the change process.

Work so part-time, no time to facilitate that. [#6]

Scaffolds

New builds and renovations equally require scaffolding in order to stand strong at vulnerable junctures. The theme of scaffolds reflects the participant’s sense of elements that enabled them to transfer this novel way of working from a notion to practice. The participants believed that their clinical expertise would supply transferable skills and expressed a pragmatic attitude towards developing their own preparedness through new systems.

Clinician expertise: “May be challenging if you haven’t run group.”

Overwhelmingly the participants felt that a strong level of confidence with the standard individual LP treatment protocol was a core foundation skill, as was prior expertise with the principles of group therapy in a broader sense: “Probably the confidence that you have the knowledge and skills to run the Lidcombe Program first” [#6]. Several comments endorsed that current expertise was supplemented by formal training and informal mentoring: “Good to watch videos of others running groups” [#4]. Whilst some participants felt that it was important to have fidelity with the training, others embraced sticking to key principles.

Keep to broad principles. [#5]

Preparedness “All out and ready to go.”

Participants felt they enabled themselves to embrace the new model by being prepared. Well-prepared resources helped to mitigate concerns over the ‘controlled chaos’ nature of the rolling-groups.

Having a list of activities from structured to unstructured was initially useful.[#6]

Betterment

Betterment broadly encompasses the participants’ sense of both the benefits and future aspirations derived from engaging in the rolling-groups. The major benefits reported were time-efficiency and more real-life communication interactions. Participants were universally optimistic, sharing their aspirations to continue running the LP rolling-groups, regardless of whether they had been able to establish one during the time of the project or not.

Time-efficiency: “Fairly efficient for a big generalist caseload.”

For many managers time-efficiency equates to cost-efficiency, whereas for busy clinicians it eases the day-to-day stress of managing a large caseload: “Grouping stutterers is much more time-efficient way to go as long as outcomes are comparable” [#5]. Temporal advantages were most clearly articulated by the two SPs who ran their groups throughout the entire study. One reflected that the rolling-groups were very pragmatic, as it meant that a clinician’s time was never under used should a client fail to attend an appointment without notice, reflecting that for this reason alone, even if the time frame was longer, it would seem more efficient: “Useful use of time...misses for all sorts of good reasons...always one there”[#5].This participant also raised the issue of the impact traditional stuttering treatment may have on the waiting times for children with other communication issues, particularly as stuttering treatment is continuous and not delivered in ‘blocks’: “Lidcombe Program means stutterers can start to fill up available therapy slots and impact on caseload”[#5]. One participant, who worked very limited hours, reflected that she would not have been able to manage the

referral rates for children who stutter without the rolling-group model.

There is no way I could manage them without a group. [#6]

More real-life: "More real life and functional."

To the outsider the Lidcombe Program rolling-groups may look a little messy and it is hard, for example to inform a graduate student of the exact order of events they will observe, although the components are standard. Participants felt this organized chaos engendered greater cross-fertilization of ideas and support between parents and more real-life communication for the children: "If it's a bit crazy, it's Ok as they are talking naturally" [#6]. Additional benefits mentioned were social supports between parents, less intensity for the child as they were not the only focus of attention and most importantly, enjoyment.

Not just focusing on them [#1]

Aspiration: "Definitely keep running them and encourage service to."

Participants' consensus was that the Lidcombe Program rolling-groups would be part of their service delivery future and they were optimistic even if the circumstances had not afforded them opportunity: "Keen to try. Circumstances just weren't right" [#1]. Most significantly, numerous participants referred to encouraging change across their service not just within individual practice.

Strongly encourage all clinicians to run LP groups [#4].

Journey

Every journey begins with a single step and clinical practice transformation is no different. Journey encompasses ideas of transition, both personally and of clinical skills. Participants touched on the learning process, overcoming confidence issues and not being too hard on themselves, as they took it one step at a time.

Clinical skills: "Heading in the right direction."

Despite years of clinical experience, participants reflected that new treatment models require practice and can engender concern about the likelihood of positive outcomes. Several participants felt that starting with smaller client numbers was initially easier: *"I felt more comfortable with two and moving up to three" [#4].* Overtime the structured checklist approach of the novice began to make way for a more fluid approach as expertise was gained: "Not over thinking what your plan is" [#6]. One participant directly reflected on the fact that the rolling-groups methodology had been bought to the area via the practitioner-led research project.

Bought to us by you. Made it an easy thing to be a part of [#3].

Personal growth: "Be kind to yourself."

Some trepidation was expressed by several participants, particularly those who experienced transitions of new clients entering an established group. Not all participants were confident when treating children who stutter and several expressed nervousness related to the change in treatment platform.

Needed a bit of self-discipline and a leap to do this, try groups. Not comfortable. Made the decision to do it and try hard [#5].

Discussion

Interpretation

The present study showed that the LP, delivered in a rolling-group model, within regional community health settings, by non-specialist SPs, can reduce young children's stuttering severity to little or no stuttering, demonstrating comparable results to those reported in clinical trials for both group and individual outcomes. Moreover insights generated by the participating SPs clearly indicate that this innovative approach is perceived as not only achievable but also highly beneficial. The positive results from this investigation add momentum to the translation of this model for stuttering intervention, from paper to practice, shaping new confidence levels for SPs to venture forth and expand their treatment horizons.

Despite a considerable volume of empirical evidence supporting the LP, to date there has been just one translational study, investigating how community clinicians actually adhere to guidelines and their treatment outcomes. In that study, O'Brian et al (2013) drew a clear distinction between clinical trials with strict research parameters, which ascertain efficacy of treatment effects and translational research, which investigates effectiveness or how treatments metamorphose once propagated in the real-world (1).

The current study falls within this translational research boundary, with the intention to investigate and embed the rolling-group model for the delivery of the LP within regional community health centres. The journey from paper to practice is a long and arduous one. The results from the original RCT investigating group LP treatment were first presented at the Annual Convention of the American Speech-Language-Hearing Association in 2010. Subsequent high-level presentations and peer-reviewed journal publication (25), have resulted in exceedingly limited uptake of this treatment option, posing the self-evident question: Why are speech pathologists not changing their practice with regards to delivery options for the Lidcombe Program?

Pertaining to the issue of 'practice-evidence gap' within the SP profession (41) and the notion that professional change, for numerous reasons (43) may be demanding and stressful, then the answer may fall within the paradigm of research being seen as 'not applicable to us' or not practicable within real-world clinical settings (33, 42). One could hypothesize that translational research is one avenue for circumventing practice inertia, as has been demonstrated wholeheartedly by the outcomes of this investigation.

This study was the first community-based trial to investigate clinical equivalence of outcomes, by SPs who do not specialize in stuttering when delivering the LP in a rolling-group model, to those published in the literature. Across all primary and secondary outcomes, the NNSWLHD SPs achieved clinical equivalence: mean clinician hours to completion of Stage 1 (25), median number of clinical visits and weeks to attain Stage 2 (1, 7, 25) and percentage of syllables stuttered (%SS) at criteria for Stage 2 (9, 25). Stuttering severity levels exhibited a strong level of statistical significance in their reduction between pre-treatment and 6 months post-commencement assessment, that plateaued over the subsequent three months, as would be expected. Without exception, these findings should enable SPs working across many paediatric environments to feel they have sufficient real-world effectiveness evidence to endorse the rolling-group model for the LP, in the management of this expanding population.

The whole picture of this investigation would not be complete without the voices of the practitioners. Empirical clinical equivalence, in no way equates to the perception of a treatment protocol being 'doable' in a

SP's day-to-day clinical setting. Although not formally measured, Arnott et al (2014) made reference to the perceptions of the two SPs involved in the original RCT, recounting that whilst the rolling-groups were considered more demanding than individual treatment, they were also 'clinically gratifying' (25, p11). This overarching sense of optimism towards the rolling-group model featured prominently in the themes derived from the semi-structured interviews with the NNSWLHD SPs. A positive view was interwoven amongst the themes of challenges, scaffolds, betterment and journey.

Challenges perceived by the participants reflected those previously outlined in the literature when embracing clinical change, EBP or research within the SP profession. These may involve logistical issues such as limited space (43) or insufficient diversity of resources. A sense of time pressure or lack of time has consistently been reported by SPs, as a reason behind poor implementation of EBP (6, 51), with "chock-a-block days" [#4], universally referred to by participants in one form or another, as an obstacle. The counterbalance to this challenge is a robust perception that the rolling-groups were highly pragmatic in their time-efficiency, due to the reduction in clinical hours per child and the likelihood that there is usually a child to treat, even when others have failed to attend without notice.

A finding that is starting to emerge in the literature relates to personal factors that either support a proactive 'can do' approach to the challenge of a new treatment model, or those that need to be overcome in order to move forward. This was alluded to by participant SPs, particularly those who led rolling-groups in the most sustained way. Fear has been described as an 'invisible barrier' with regards to SPs' lack of engagement with research (51), whilst the alter egos may be 'initiative' and 'motivation'. The idea of "being kind to yourself" [#5] as you take on the journey of the learning process, was expressed by participants. Creative solutions were sought and tested-out, such as orderly preparation of homework activity sheets or starting the rolling-groups with a small number of child-parent participants. The question arises as to whether participants in this study were a self-selecting homogenous population, being more towards the proactive end of an embracing-change scale, simply by virtue of volunteering for the project.

Both the literature and the participants' perceptions point to clear avenues for future support. Bricks and mortar, or in this case rooms and toys, can only offer limited support if LP rolling-groups are to be widely established. Many challenges faced by SPs at the outset may be solitary and hidden, such as nervousness or fear that research outcomes won't be matched. These fears are likely to impact on the successful translation from paper to practice, and it may be important for managers to proactively free-up a portion of face-to-face clinical time for training, ongoing mentoring and supervision, based on an understanding that there is evidence for the cost-efficiency of the LP rolling-group model.

Importantly, participants endorsed the rolling groups for advantages that were not directly measured such as: more real-world communication, increased cross-fertilization of ideas, support between adults and less intense focus on a single child. Arnott et al (2014) delineated similar gains such as improved parent and child confidence (25). Active problem-solving between parents does appear to add extra elements to the treatment that may be in line with multifactorial approaches, leading one to ponder as Blomgren (2013) has, whether the rolling-group format engenders a more compound intervention scheme (30). It may be that embarking on this journey of actively reducing stuttering severity together, supports a reduction in feelings of stigma and immediately promotes generalisation of skills through the very real issues of resolving who can play with which Barbie and the shared chaotic pleasure of building a train track circuit.

Strengths and limitations

This study has demonstrated that Lidcombe Program rolling-groups have a very real position within the menu of intervention approaches on offer for young children who stutter, within regional community health settings, offering equitable treatment outcomes to the traditional individual model and yet with far greater time-efficiency.

Limitations of this study include the small number of participants and lack of intra-observer agreement over severity ratings. Whilst this has an impact on the ability to draw conclusions for a wider population and reduces statistical power, the 'real-world' nature of this study provides an alternative type of power, moving from the proposition that this model may work within real-world settings, to evidence that it does.

Conclusion

This study demonstrates that the Lidcombe Program, when delivered in a rolling-group model, by community based speech pathologists, is both effective and efficient in the treatment of stuttering for young children. Participating speech pathologists universally felt that rolling-groups were clinically viable and were optimistic about their establishment within their standard service delivery model.

These findings provide a platform for SPs to embrace a more flexible approach to stuttering treatment in the early years, across a broad range of clinical environments but most particularly rural and regional community health settings. Moreover, these positive outcomes give weight to the premise that small-scale research, led by practitioners within everyday clinical settings, plays a crucial role in the evidence-based practice arena. Not only does practitioner-led research, such as this study, provide a greater depth of understanding regarding the effectiveness of specialist researcher-led clinical trials but crucially offers a faster route to embedding new treatment options within everyday clinical practice, thus reducing the lengthy delays currently experienced following research publication.

Future Directions

Utilisation of the LP rolling-group to expand treatment options for young children who stutter .

LPTC training for both individual and rolling-group models of Lidcombe Program intervention to be a recommended prerequisite for paediatric speech pathologists working with young children who stutter.

Strengthening organisational support for speech pathologists evolving their practice.

Mentoring and supervision packages established within NNSWLHD and further afield to support SPs in managing practice-change for this population.

Suggestions for further research

It is recommended that further research be undertaken to unpack the treatment components used within the rolling-group model. Such research may look at how the LP guidelines are flexibly interpreted within the rolling-group model, together with any components that may reflect alternative forms of stuttering treatment. This would enable an accountability and precision pertaining to which treatment 'tool' was being used and why. The breadth and nature of supervision and mentoring required by speech pathologists when establishing the Lidcombe Program rolling-group model, were beyond the scope of this study, but would be of interest for future studies.

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Appendix 1 | Consent form for participating parents/carers and child.

CONSENT FORM FOR PARENTS/CARERS AND CHILD.

Project Title: Rural Implementation of Group Lidcombe Program Treatment for Early Stuttering – An Initial Investigation of Effectiveness.

Investigators: Nicole Rappell
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1.I,……, (print name) consent to my child …….. and myself, being involved in the research project titled *"Rural Implementation of Group Lidcombe Program Treatment for Early Stuttering – An Initial Investigation of Effectiveness."*.

2. I have read the Information Sheet and acknowledge that the nature and purpose of the project have been fully explained to my satisfaction by the research worker and my consent is given voluntarily.

3. I understand that by giving consent all assessment results gathered from my child as part of the Lidcombe Program Group will be included in the research project but will not show our names.

4. I understand that I can contact the coordinating researcher Nicole Rappell on 02 6639 6617, at any time, if I have any question or wish to make any comments.

5. I have discussed participation in the project with my child and my child agrees to their participation in the project.

6. I understand that privacy will be maintained at all times and the results of any assessments involving my child will not be published so as to reveal my child's identity.

7. I understand that participation is voluntary, and I am free to withdraw my child from the project at any stage, without affecting my child's therapy or relationship with the speech pathologist, Child and Family Health Team or any Northern NSW Local Health District services.

8. I can lodge any concerns or complaints about the project by contacting the:

Research Ethics Officer
North Coast NSW Human Research Ethics Committee
P.O Box 821
MURWILLUMBAH NSW 2484
Tel: 02 6672 0269
Email: ethicsNCNSW@ncahs.health.nsw.gov.au

I have read the information above and agree to participate in this study.

Name of Child:……..(Please print)

Name of parent/carer:……(Please print)

Signed ..... this day ……../……../…….

(Participant)

Signed..... this day ……../……../…….

(Researcher)

Appendix 2| Information sheet for participating parents/carers and child.

INFORMATION SHEET FOR RESEARCH PARTICIPANTS

(PARENTS/CARERS AND CHILD PAIR)

Project Title: Rural Implementation of Group Lidcombe Program Treatment for Early Stuttering – An Initial Investigation of Effectiveness.

Chief Investigator: Nicole Rappell

Speech Pathologist

Child and Family Team, Byron Bay Community Health

Tel: 02 6639 6617 Email: nicole.rappell@ncahs.health.gov.nsw.au

Stuttering is a disorder that affects the flow of speech. You may hear repeated sounds, words or phrases (e.g. We we we can do it), prolonged or stretched sounds (e.g. Wwwhere is my shoe?) or blocks (e.g moment when no sound comes out). Treating stuttering before a child is 6 years old has the best outcomes. The Lidcombe Program for the treatment of early stuttering is considered to be the most effective treatment in Australia. Unfortunately, it can take up a great deal a speech pathologist's time. One solution may be to see more than one parent-child pair at a time, in a group. There has been one study that did this, at La Trobe University in Melbourne. The reported results were very impressive, with a reduction in stuttering equal to when the children are seen individually and a 46% reduction in the amount of time the researchers needed to treat all of the children. This is important in rural Community Health centres where we have long waiting lists.

Our study would like to see if we can achieve the same results, with group Lidcombe Program treatment, in our rural sites. We hope that:

1. Group treatment (2-4 parent-child pairs) for children who stutter, will mean that the speech pathologist requires less time for each child. This helps to reduce our waiting lists.
2. You and your child can meet other parents and children who are involved in the treatment of stuttering. This may be more enjoyable for the children and supportive for yourself.

WHAT DOES JOINING THE LIDCOMBE PROGRAM GROUP INVOLVE?

Joining the group Lidcombe Program treatment study requires almost the same commitment from you and your child as the individual Lidcombe Program treatment. Your will be required to:

- Attend a weekly session for 45-60 minutes duration.
- Record daily Severity Ratings.

- Engage your child in a daily talking-time practice and later in the program, offer statements about your child's stuttering or smooth speech, throughout the day e.g. "That was great smooth talking."
- When your child is no longer stuttering or stuttering a very small amount, you will be invited to attend individual maintenance sessions, as per standard individual treatment.

HOW WILL INFORMATION COLLECTED IN THE GROUPS BE KEPT CONFIDENTIAL?

All information collected as part of this study will be kept strictly in accordance with the Northern NSW Local Health District (NNSW LDH) privacy and confidentiality policy. Any findings, reports or publications that come from the project will not identify you or your child.

WHY SHOULD MY CHILD JOIN THE LIDCOMBE PROGRAM GROUP?

Joining the groups will enable you and your child to have all of the treatment advantages of individual Lidcombe Program. Additionally, you and your child may have the opportunity to:

- Meet other children and families who are engaged in stuttering treatment.
- Share treatment ideas and solutions with other parents.

ARE THERE ANY RISKS ASSOCIATED WITH JOINING THE GROUP LIDCOMBE PROGRAM TREATMENT PROJECT?

There are no risks to you or your child's health in participating in this study. As progress will be discussed within the group, with other parent/carer-child pairs there will be some loss of confidentiality.

ARE THERE ANY COSTS TO JOINING?

There is no cost in joining the Lidcombe Program groups.

WHAT IF I DO NOT WANT MY CHILD TO PARTICIPATE?

Participation in the Lidcombe Program groups is entirely voluntary. You and your child are under no obligation to join. You are free to withdraw yourself and your child at any time, without giving a reason and without any negative consequences. This will not affect your or your child's relationship with the Child & Family Team speech pathologist(s) and your child will be offered individual Lidcombe Program treatment.

FURTHER INFORMATION AND CONTACT DETAILS

This study has been approved by the Northern NSW Local Heal District, Human Research Ethics committee, in accordance with the National Health and Medical Research Council's guidelines. You are of course, free to discuss your child's participation in this study with project staff (Nicole Rappell on telephone 02 6639 6617 or email Nicole.rappell@ncahs.health.gov.au) or lodge any concerns or complaints about the project by contacting the:

Research Ethics Officer

North Coast NSW Human Research Ethics Committee

P.O Box 821, MURWILLUMBAH, NSW 2484

Tel: 02 6672 0269 Email: ethicsNCNSW@ncahs.health.nsw.gov.au

Appendix 3| Consent form for participating speech pathologists.

CONSENT FORM FOR SPEECH PATHOLGISTS

Project Title: Rural Implementation of Group Lidcombe Program Treatment for Early Stuttering – An Initial Investigation of Effectiveness.

Investigator: Nicole Rappell
Generalist Speech Pathologist
Child and Family Team,
Byron Bay Community Health
P.O Box 1066, Byron Bay NSW 2481
Tel: 02 6639 6617 Fax: 02 6685 5729
Email: nicole.rappell@ncahs.health.nsw.gov.au

Mentor: Associate Professor John Stevens RN PhD FACN
Adjunct - School of Health and Human Sciences
Southern Cross University
P.O Box 157, Lismore, NSW 2480
Tel: 0428 288 256
Email: John.Stevens@scu.edu.au

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1. I, the undersigned,……., (print name) hereby consent to being involved in the research project titled *"Rural Implementation of Group Lidcombe Program Treatment for Early Stuttering – An Initial Investigation of Effectiveness."*.

2. I have read the information sheet and acknowledge that the nature, purpose and contemplated effects of the project so far as it affects me, have been fully explained to my satisfaction by the research worker and my consent is given voluntarily.

3. I acknowledge that my participation will include the completion of a semi-structured interview about my perceptions and experiences of leading a Lidcombe Program group. I understand that I may choose to have this interview conducted by telephone or face to face and that it's anticipated time will be 15 -20 minutes. I acknowledge that a de-identified summary of the reflections from these interviews will be circulated to fellow participating speech pathologists.

4. I am informed that privacy will be maintained at all times and the results of any assessments related to a child in my care will not be published so as to reveal my identity.

7. I understand that participation is voluntary and I am free to withdraw from the project at any stage, without affecting my relationships, professionally or personally within the NNSW LHD or with the coordinating researcher.

8. I can lodge any concerns or complaints about the project by contacting the:

Research Ethics Officer
North Coast NSW Human Research Ethics Committee
P.O Box 821
MURWILLUMBAH NSW 2484
Tel: 02 6672 0269
Email: ethicsNCNSW@ncahs.health.nsw.gov.au

I have read the information above and agree to participate in this study.

Name of speech pathologist……(Please print)

Signed .....this day ...../...../.....

(Participant)

Signed.....this day ...../...../.....

(Researcher)

Appendix 4| Information for participating speech pathologists.

INFORMATION SHEET FOR RESEARCH PARTICIPANTS

(SPEECH PATHOLOGIST)

Project Title: Rural Implementation of Group Lidcombe Program Treatment for Early Stuttering – An Initial Investigation of Effectiveness.

Chief Investigator: Nicole Rappell

Speech Pathologist

Child and Family Team, Byron Bay Community Health

Tel: 02 6639 6617 email: nicole.rappell@ncahs.health.gov.nsw.au

PROJECT SUMMARY

The aim of the current study is to investigate whether the Lidcombe Program for early stuttering, when delivered in groups, in rural settings, by non-specialist speech pathologists (SP), can generate comparable reductions in stuttering, to those expected from individual treatment.

The Lidcombe Program (LP) is considered best practice within Australia and increasingly worldwide. Unfortunately, individual LP treatment consumes a great deal of the SP's clinical hours. Consequently, alternative modes of delivering stuttering treatment for adults and children, such as telehealth, have been investigated. Several treatments under investigation rely on Internet access, which may be unavailable or inconsistent in rural areas.

A recently completed randomized control trial (RCT) of group delivery of the Lidcombe Program (52) has shown that this approach can significantly decrease stuttering severity, whilst additionally reducing clinician's hours in treatment by 46%. Although this research offers inspiration for an alternative vehicle for stuttering treatment, to date there has been no research that supports the use of group LP outside the confines of a specialist, metropolitan, university-based clinic.

This study aims to address the issue of whether LP groups in rural settings, are effective in reducing the stuttering severity for children, under the age of 6 years, when lead by paediatric or generalist speech pathologists. A secondary aim of the study is to ascertain how the treating speech pathologists view group LP within their own set of skills and as part of rural service delivery.

WHAT DOES JOINING THE LIDCOMBE PROGRAM GROUP INVOLVE

This research will be implemented across multiple Northern NSW LHD Community Health sites. As a participant speech

pathologist you will need to ascertain the availability of a suitable space and resources.
Assistance will be provided with regards to how to use existing resources within this framework.

Children who stutter and their parent/carer, will be offered group LP treatment following their standard intake and assessment for stuttering. Those who accept will have their stuttering severity monitored pre-treatment, at completion of Stage 1 and at 6 and 9 months post-commencement of treatment. Outcomes will be compared those demonstrated in the literature.

The parent/carer of all children who meet the inclusion criteria will be offered a place in a Lidcombe Program group, by the assessing SP. The parent/carer will be offered the choice of discussing the research project their local speech pathologist and/or being contacted by the coordinating researcher to discuss the study and their child's possible participation. Parents/carers will be provided with a participant information sheet. Parents who decline group LP treatment will be offered individual LP treatment. Parent/carers who wish to participate will be provided with a consent form that includes both themselves and their child. These are to be signed in the parent's own time prior to the commencement of the group.

Groups will include 2 to 4 parent-child pairs at a time, between the ages of 2:9-6:0. The groups will be of a 'rolling' design, so that as each child meets the criteria for entry into Stage 2, they will leave their group and their place offered to a new parent-child pair starting Stage 1. All Stage 2 sessions will be individual.

It is anticipated that the LP groups will commence in February or March 2014. A single SP will lead each group. It is a minimum requirement that the treating SP has been formally trained, by the Lidcombe Program Trainers Consortium (LPTC), for individual treatment. Pending publication, it is anticipated that all participating SPs will additionally, be trained in the Australian Stuttering Research Centre (ASRC) web-based training protocol for group treatment, which is due on-line in December 2013. The SPs will have ongoing access to mentoring by the coordinating researcher via email and telephone.

Therefore, the group will require very similar management and documentation to individual treatment. Consent forms and information sheets for your clients will be provided. Each month a copy of the SR sheets and SS% scores need to be forwarded to coordinating researcher via NNSW email.

A semi-structured short interview will be conducted with each participating SP at the 9 month post-commencement point. This will enable both debriefing and reflection. The interviews will be conducted via telephone or in person, by the coordinating researcher and last between 15-30 minutes. Notes will be hand written by the coordinating researcher. Key reflections from each you, will be combined into a written summary. The written summary will be circulated to the participating SPs via the NNSW email. You will be asked to review the summary, to ascertain if it is a true and full account of their perceptions and experiences of the group LP process. Any alterations or additions will be incorporated into the summary of the SP's reflections. A final summary will then be circulated to the participating SPs. Names of individuals or sites will not be included.

HOW WILL INFORMATION COLLECTED IN THE GROUPS BE KEPT CONFIDENTIAL?

All information collected as part of this study will be kept strictly in accordance with the Northern NSW Local Health District (NNSW LDH) privacy and confidentiality policy. Any findings, reports or publications that come from the project will not identify you or your site.

WHY SHOULD I JOIN THE LIDCOMBE PROGRAM GROUP TREATMENT PROJECT?

As a participant speech pathologist you will be part of a vanguard researching alternative ways to maximise our outcomes whilst attempting to minimise the pressure stuttering treatment places on our public health system. It is hoped that leading a group may enable both your own capacity building with regards to stuttering treatment and an opportunity to provide increased support for parents.

ARE THERE ANY RISKS ASSOCIATED WITH JOINING THE GROUP LIDCOMBE PROGRAM TREATMENT PROJECT?

There are no risks to you in participating in this study. There is a small risk of increased fatigue as the groups are a new treatment form. The coordinating researcher will be contactable at any time to discuss any concerns or answers any questions.

ARE THERE ANY COSTS TO JOINING?

There is no cost to you or the NNSW LHD in joining the Lidcombe Program group treatment project. Webinar training costs will be covered by the Health Education and Training Institute (HETI).

WHAT IF I WISH TO WITHDRAW FROM THE PROJECT?

Participation in the Lidcombe Program group treatment project is entirely voluntary. You are under no obligation to join. You are free to withdraw yourself at any time, without giving a reason and without any negative consequences. This will not affect your relationship with the NNSW LHD, participating SPs or the coordinating researcher in any way.

FURTHER INFORMATION AND CONTACT DETAILS

This study has been cleared by the Northern NSW Local Heal District, Human Research Ethics committee, in accordance with the National Health and Medical Research Council's guidelines. You are of course, free to discuss your participation in this study with coordinating researcher (Nicole Rappell on telephone 02 6639 6617 or email Nicole.rappell@ncahs.health.gov.au or lodge any concerns or complaints about the project by contacting the:

Research Ethics Officer
North Coast NSW Human Research Ethics Committee
P.O Box 821, MURWILLUMBAH NSW 2484
Tel: 02 6672 0269 Email: ethicsNCNSW@ncahs.health.nsw.gov.au

Thank you for your interest in the project.

Appendix 5| Interview Guide.

SEMI-STRUCTURED INTERVIEW FOR PARTICIPANT SPEECH PATHOLOGISTS.

Project Title: Rural Implementation of Group Lidcombe Program Treatment for Early Stuttering – An Initial Investigation of Effectiveness

Introduction:

- Interviewer will greet interviewee and ascertain that they are comfortable, feel they won't be disturbed and they continue to consent to the process.
- An explanation will be given as to how the interview will be recorded i.e. hand-written notes and that clarification may be sort by the interviewer.
- The interviewee will be reminded that they can seek clarification or stop the interview, at any time.
- An informal, friendly atmosphere will be facilitated by the interviewer in order to sustain "a 'natural flow' of ideas and opinions." (WHO-Essential Medicines and Health Products Information Portal – How to Investigate the Use of Medicines by Consumers).
- Standard Information to be attained at the commencement of the interview includes:
    - Name.
    - Role.
    - Location .
    - Date.
    - Name of interviewer.
    - Years practicing as a SP.
    - Year trained by LPTC.

Group Lidcombe Project – Semi-Structured Interview Questions

Question 1: (Group LP guidelines fidelity)

- Please paint me a picture of your groups and how they progressed over time.

Probes: In what ways did you feel they followed the training or differed?

I wonder, did the configuration of the groups change? In what ways and why?

Question 2: (Capacity Development)

- Can you tell me about your levels of confidence in treating children who stutter and whether that has changed with the groups?

Probe(s): How common was the LP to usual clinical work previously?

Question 3: (Logistics)

- What kinds of things would you advise someone about to start LP groups to think about or prepare for?

Probe(s): Were there any issues related to space, equipment or getting people to attend?

Question 4: (Clinical role in rural service)

- How do you feel about the LP groups? Would you run them again or return to individual LP? Why?

Probe(s): What do you see as the strengths or limitations of group LP?

Question 5: (SP Skills)

- I wonder if you could reflect on what skills you think an SP might need to ruin LP groups effectively.

Probe(s): Behavior management? Group leadership? Multi-tasking? Strong LP Skills?

Thank you for your time. Do you have any questions that you would like to ask of me?

Author Nicole Rappell

Generalist Speech Pathologist
Byron Bay Community Health
nicole.rappell@ncahs.health.nsw.gov.au

Final Report June 2015

Rural Research Capacity Building
Health Education and Training Institute:
Rural and Remote Portfolio

HETI
HEALTH EDUCATION & TRAINING INSTITUTE

NSW GOVERNMENT Health
Northern NSW Local Health District