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Preliminary Studies on Efficacy of Prolonged Nasal Cul-De-Sac with High Pressure Speech Acts (P.i.N.C.H.) on Hypernasality

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ABSTRACT
Prolonged Nasal Cul-De-Sac with High Pressure Speech Acts (P.i.N.C.H.), a technique to treat hypernasality, was developed upon the basis of four physiological principles of velopharyngeal function. Preliminary experimental and clinical studies were conducted to determine the efficacy of P.i.N.C.H. in decreasing nasalance in 5 non-cleft palate subjects with velopharyngeal incompetence over a 3-week to 22 month period of time. Results revealed statistically significant decreases in nasalance for posttreatment measures immediately after treatment as well as over several months. It was concluded that P.i.N.C.H. warrants further investigation.

INTRODUCTION
The purpose of this research paper is to examine preliminary efficacy findings of a treatment technique for hypernasality called "Prolonged Nasal Cul-De-Sac with High Pressure Speech Acts" or "P.i.N.C.H.". This technique, first presented in 2002 and, again, in 2003, has, to date, not been described in the literature.[1,2]

THE P.i.N.C.H. METHOD
P.i.N.C.H. consists of having patients with hypernasality occlude their nares using nose-plugs or their fingers continually (without interruption) for prolonged periods of time of at least 40 minutes. During this nares-closed condition (also known as nasal cul-de-sac condition), the patients read aloud or repeat word lists (appendix A), and sentences and paragraphs (appendix B) loaded with high pressure oral phonemes such as affricates, fricatives and plosives, and voiced phonemes (vowels). Patients who have limited phonology are required to produce any words or syllables within their repertoire that are loaded with high pressure phonemes and voiced phonemes.

FOUR PHYSIOLOGICAL PRINCIPLES OF VELOPHARYNGEAL TREATMENT
The P.i.N.C.H. technique is based on 4 principles of treatment for velopharyngeal incompetence (VPI). The first principle is to increase velopharyngeal function by introducing positive pressure into the oral cavity. By closing the nares of a person with VPI, oral pressure is increased.[3] This principle was generated from research findings that linked a reduction in velopharyngeal activity or Peterson-Falzone et al's term of "velopharyngeal surrender" to an antecedent reduction in oral pressure.[4-7] This means that a reduction in oral pressure is followed by reduced velopharyngeal function. Conversely, by introducing positive pressure to the oral cavity, velopharyngeal function increases.[8-15] This relationship is associated with a specific regulatory system that is sensitive to changes in oral pressure.[4,16,17] Other modalities such as electrical stimulation, tactile stimulation, and muscle training through biofeedback do not trigger this regulatory system.[3,18-26]

The second principle of treatment suggests that in order for improved velopharyngeal function to carry over into speech, treatment stimuli should be speech acts. Even though non-speech acts such as blowing, sucking, swallowing, gagging, and whistling may elicit increased velopharyngeal port closure, generalization from these non-speech acts into speech would not occur.[8,10,22,27,28]

The third principle indicates that the speech acts as treatment stimuli should not include retracted sounds such as pharyngeal and glottal phonemes. These non-oral sounds produced postero-inferiorly to the velopharyngeal port fail to recruit velopharyngeal participation so that the velopharyngeal mechanism appears to be, as described by Henningsson and Isberg, "grossly impaired".[29-33]

The fourth principle refers to studies where an increase in subglottal pressure resulted in increased velopharyngeal closure.[6, 34, 35] In addition, it was suggested that increases in subglottal pressure associated with phonatory vocal fold adduction could also cause an increase in velopharyngeal muscle activity.[35] Thus, production of voiced phonemes should facilitate an increase in velopharyngeal port closure.

The purpose of this paper is to report on the effectiveness of P.i.N.C.H., a new technique based upon the above 4 physiological principles of velopharyngeal function, in decreasing hypernasality. Efficacy of P.i.N.C.H. was examined by investigating acoustical nasalance outcomes with subjects selected exclusively for a controlled experiment study (Method I: Controlled Experiment), and with clinical patients being treated for hypernasality (Method II: Case Studies).

METHOD I: CONTROLLED EXPERIMENT

A controlled prospective pre-test, posttest experimental design was implemented by this author/researcher with 4 subjects during 6 sessions. These 6 sessions spanned 3-4 weeks. Initially, 12 volunteer subjects were selected for the experiment. These volunteers responded directly or indirectly to an advertisement posted in a university clinic requesting volunteer subjects. In exchange for their participation, subjects would be provided with a written report of their pre- and post treatment results. The 12 subjects were selected over a 3-month period. Because of attrition due to scheduling conflicts and illness, only 4 subjects were able to complete the 6-session program successfully. Six sessions were selected because it was hypothesized by this author (the researcher), that any progress would be evident within this time frame. The 3-4 week time span was selected as a convenience to the subjects and was hypothesized by the author as being sufficient time to reveal any changes. Through interview with the author/researcher, it was determined whether subjects were eligible to participate in the study.

Inclusion criteria for subject selection for the controlled experiment

Candidates for the experimental study were selected according to self reports of hypernasality with a medical diagnosis of velopharyngeal incompetence, or self reports of hypernasality and nasal regurgitation without a medical diagnosis of velopharyngeal incompetence, English being a primary language, the ability to attend for at least 40 continual minutes, the ability to follow verbal commands, and the ability to tolerate occlusion of nares for at least 40 continual minutes. Additional inclusion criteria were demonstrations of consistent hypernasality during spontaneous speech as perceived by this author / researcher, and the demonstrated ability to orally read the all non-nasal "Zoo Passage" accurately.[36]

Exclusion criteria for subject selection for the controlled experiment

Criteria that precluded participation in the experimental study were presence of oral/palatal fistulae, unrepaired cleft palate, history of repaired cleft palate, phonological processes where all plosive, fricative and affricate sounds are produced in the pharynx or larynx, bilaterally occluded nasal passages, currently enlarged tonsils or adenoids, adenoidectomy or maxillary advancement within the past 3 months, severe hearing loss, palatal lift in situ, and surgical intervention for VPI.

Procedure for the controlled experiment

At the beginning of each session, pretreatment, baseline nasalance scores were obtained using the Kay Elemetrics Nasometer with nares open.[36] Each subject was required to read the "Zoo Passage" which contains only non-nasal sounds, at comfortable loudness, pitch inflection and rate levels.[36] This was followed by 40 minutes of sustained nares-closed conditions. The nasal pyriform apertures were occluded with the use of nose clips or subjects' fingers that were positioned on the outer surface of each nostril causing the nares to collapse medially.

During the 40-minute nasal cul-de-sac condition, each subject produced continual speech acts in the form of 30 minutes of oral reading of wordlists (see Appendix A), oral reading of sentences and paragraphs (see Appendix B) that were loaded with nonnasal, high pressure consonants, and 10 minutes of spontaneous conversational monologues. The monologues occurred after the first 15 minutes of oral reading and before the last 15 minutes of oral reading.

Upon conclusion of the 40-minute nasal cul-de-sac condition, the nares were reopened, and nasometric measurements were taken again. Each subject was required to read the "Zoo Passage" at comfortable loudness, pitch inflection and rate levels.[36] These were the posttreatment, nares-open measurements. Prior to taking pretreatment and posttreatment measures, each subject, except for subject C, blew his/her nose to clear the nasal passages of mucous. This procedure was administered so as to control for possible nasal obstruction caused by the presence of nasal mucous. Such obstruction could result in a nasal-cul-de-sac condition, which would falsely reduce nasometric nasalance scores. Subject C did not follow this procedure as he reported that his nasal passages were always clear and free of congestion.

Instrumentation for the controlled experiment

The Kay Elemetrics Nasometer was used to measure mean percentage nasalance with nares open.[36] The "Zoo Passage" with norms of 15.53% mean nasalance +/- 4.86 was used for pre- and posttreatment measurements.[36]

For subjects A and D, calibration of the Nasometer occurred within 5 minutes of pre-and posttreatment measurements. For subjects B, and C, technical problems were suspected when calibration procedures were difficult to initiate on two occasions. During these times, calibration occurred within 15 minutes of posttreatment measurements while all pretreatment measurements and the rest of the posttreatment measurements were taken within 5 minutes after calibration. To increase reliability of measurements, calibration was repeated within two minutes of pre-and posttreatment measurements, and pre-and posttreatment measurements were repeated when technical difficulties were suspected.

Results for the controlled experiment

Subject A, B, and C attended 6 one-hour therapy sessions individually, 2 times per week, with at least one day between sessions. Subject D attended 6 one-hour therapy sessions individually, 1-2 sessions per week, with at least one day between sessions.

Subject A was a 25 year-old female with a medical diagnosis of idiopathic velopharyngeal incompetence, hypernasality, a history of nasal regurgitation and a familial history of hypernasality. Subject A had received voice therapy for vocal nodules in the past, and was judged by this author to be hypernasal.

Subject B was a 44 year-old female with a history of nasal regurgitation, "nasal sounding" speech, and chronic nasal congestion. She reported occasional swallowing difficulties on liquids. She was judged by this author to be hypernasal.

Subject C was an adult male medically diagnosed with acquired neurogenic velopharyngeal incompetence secondary to a closed head injury, 2.5 years post onset. This subject had a history of unsuccessful use of an ill-fitting palatal lift, which he no longer wore, hypernasality that interfered with intelligibility as judged by this author, and audible and inaudible nasal air emissions. He had received speech therapy for hypernasality for 30 months prior to the experimental study. P.i.N.C.H was not used and there was reportedly no apparent improvement in resonance. Just prior to the experimental study he had received two months of speech therapy with P.i.N.C.H. twice a week, whereafter there was improvement in acoustical nasalance scores.

Subject D was a 10 year-old female with a medical diagnosis of velopharyngeal incompetence associated with hypotonia, hypernasality that interfered with intelligibility as judged by this author, and nasal regurgitation. Subject D had received 5 months of speech therapy for interdentalization of sounds and for a tongue-thrust under the supervision of this author.

Table 1. Comparison of Pretreatment Percentage Nasalance Scores of the First and Last Sessions for All Subjects.

Subject	*Pretreatment % Nasalance*	*Posttreatment % Nasalance*	*Difference*	S.D. (+/-4.86)
A	25.82	21.43	-4.39	<1
B	17.35	19.16	+1.81	<1
C	29.87	38.30	+8.43	<2
D	31.56	16.24	-15.32	>3

Table 1 compares the initial pretreatment nasalance scores of the first session with those of the sixth and final session for each subject. Two of the four comparisons reflect a decrease in baseline nasalance scores over time. The decrease constituted 0.90 and 3.15 standard deviations less than the baseline scores of the first session.

The pretreatment nasalance scores and posttreatment nasalance scores for each subject, are listed in Table 2, 3, 4, and 5, respectively, and illustrated graphically in Figures 1, 2, 3, and 4, respectively. The Wilcoxon Signed-Rank Test for nonparametric designs was applied to each subject's pretreatment and posttreatment performance for all 6 sessions.

Table 2. Pretreatment and Post-treatment Nasalance Scores for Subject A.

Pretreatment % Nasalance	*Posttreatment % Nasalance*	*Difference*	*S.D. (+/-4.86)*
25.82	12.59	-13.23	>2
19.11	17.47	-1.64	<1
21.45	14.58	-6.87	>1
19.25	14.25	-5.00	>1
26.48	14.44	-12.04	>2
21.43	8.30	-13.13	>2

For subject A, the non-parametric Wilcoxon Signed-Rank Test yielded significant differences between pretreatment and posttreatment nasalance scores for one-tailed test ($T=0$, $N=6$, $p < 0.025$). Nasalance scores decreased after treatment for standard deviations of up to 2.70.

Figure 1. Pretreatment and Posttreatment Nasalance Scores for Subject

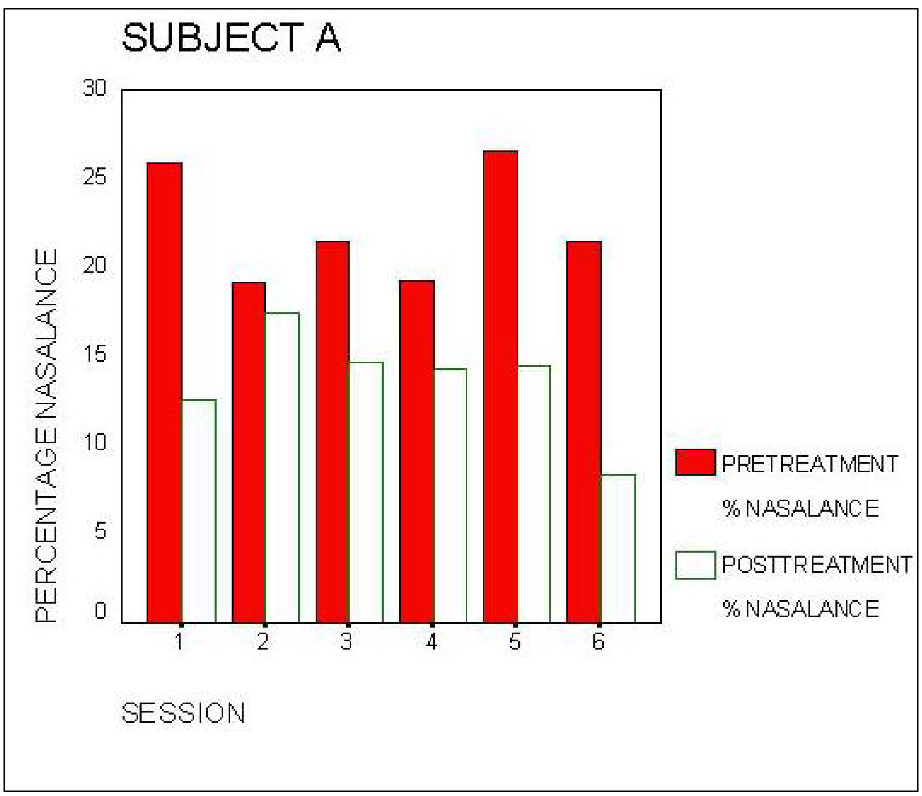


Table 3. Pretreatment and Posttreatment Nasalance Scores for Subject B.

Pretreatment % Nasalance	***Posttreatment % Nasalance***	***Difference***	***S.D. (+/-4.86)***
17.35	24.88	+7.53	<2
19.81	19.00	-0.81	<1
15.49	13.42	-2.07	<1
25.30	21.61	-3.69	<1
14.40	13.44	-0.96	<1
19.16	16.76	-2.40	<1

For subject B, the non-parametric Wilcoxon Signed-Rank Test yielded insignificant differences between pretreatment and posttreatment nasalance scores for one-tailed test (T=6, N=6) due to the increase in nasalance scores of +7.53 (1.54 standard deviations) during the first session. The Wilcoxon Signed-RankTest could not be administered to the remaining five treatment sessions as a minimal sample size of 6 is required for analysis. Nasalance scores decreased after the remaining five treatment sessions for standard deviations of up to 0.75.

Figure 2. Pretreatment and Posttreatment Nasalance Scores for Subject B.

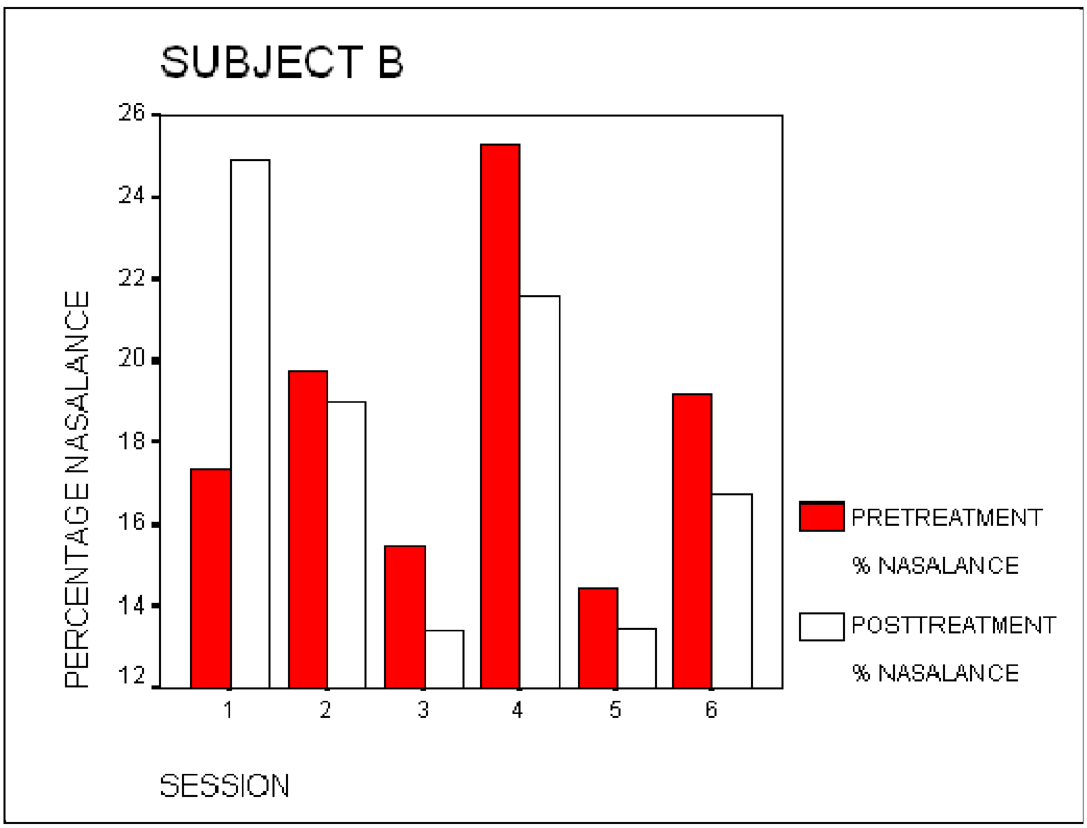


Table 4. Pretreatment and Posttreatment Nasalance Scores for Subject C

Pretreatment % Nasalance	*Posttreatment % Nasalance*	*Difference*	*S.D. (+/-4.86)*
29.87	27.19	-2.68	<1
44.75	30.17	-14.58	3
32.92	17.84	-15.08	>3
39.05	24.80	-14.25	<3
34.04	23.67	-10.73	>2
38.30	28.20	-10.10	>2

For subject C, the non-parametric Wilcoxon Signed-Rank Test yielded significant differences between pretreatment and posttreatment nasalance scores for one-tailed test ($T=0$, $N=6$, $p< 0.025$). Nasalance scores decreased after treatment for standard deviations of up to 3.10.

Figure 3. Pretreatment and Post treatment Nasalance Scores for Subject C.

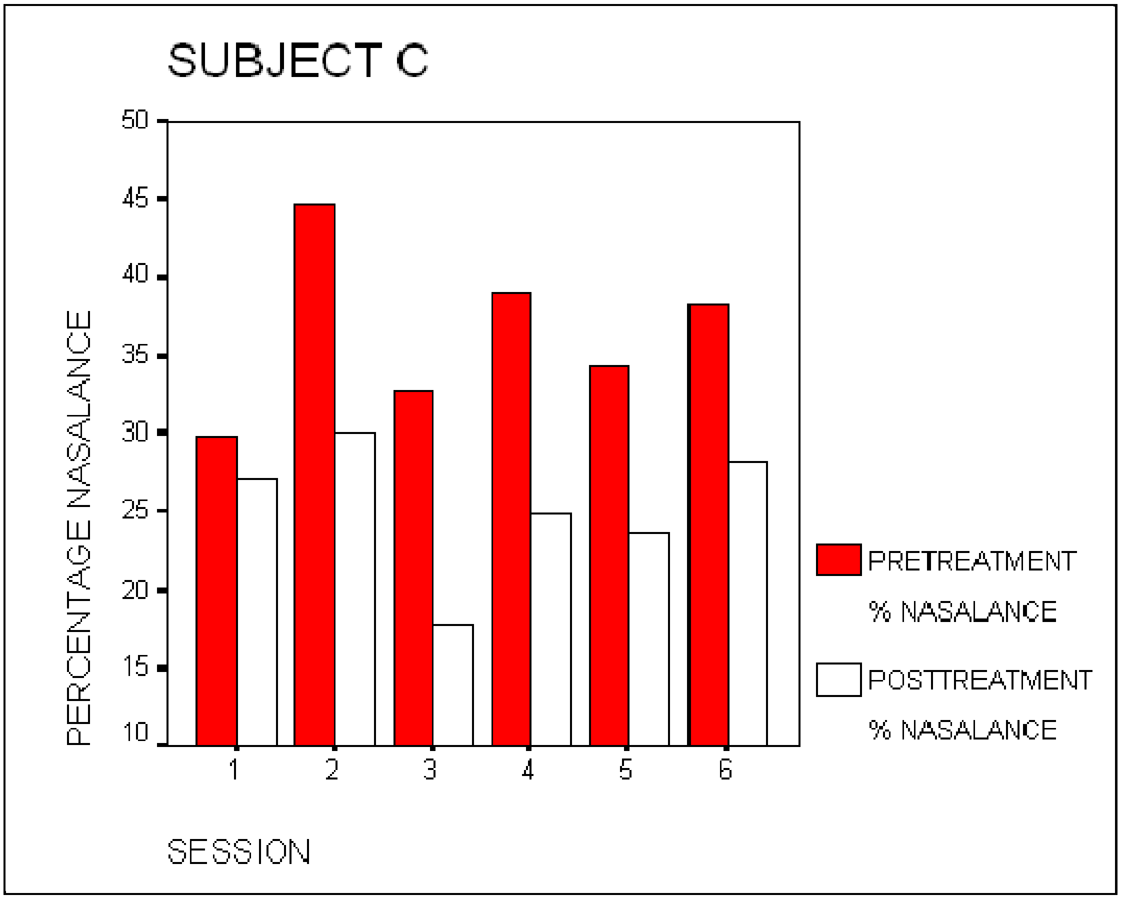
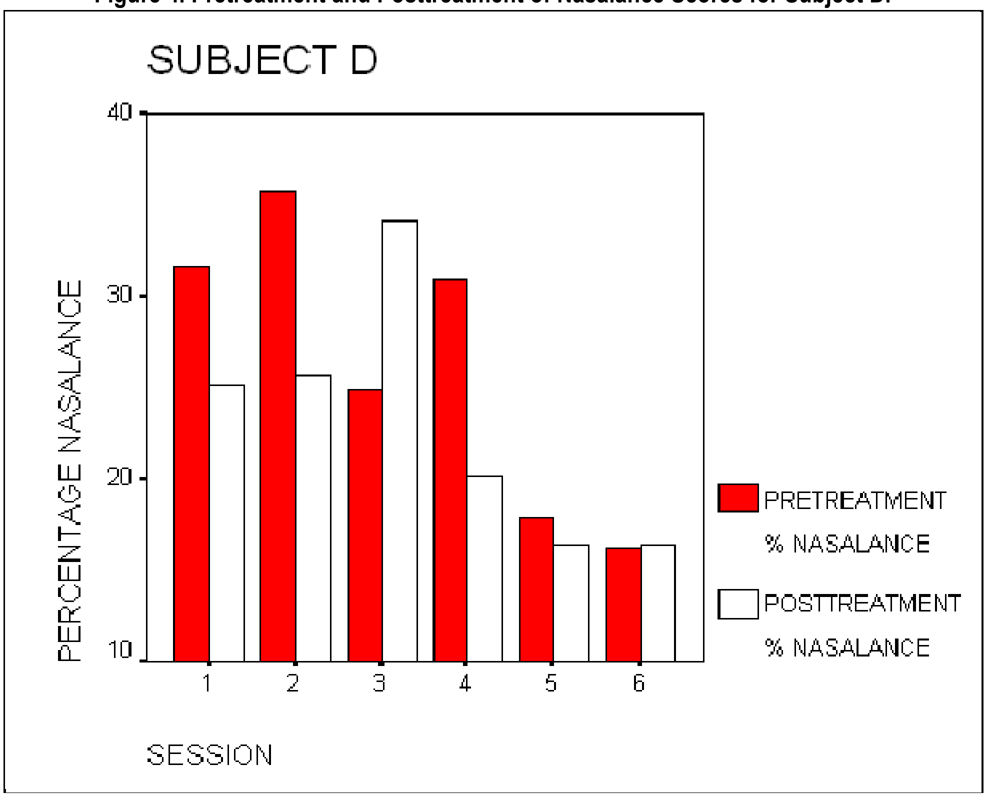


Table 5. Pretreatment and Post treatment Nasalance Scores for Subject D.

Pretreatment % Nasalance	*Posttreatment % Nasalance*	Difference	*S.D. (+/-4.86)*
31.56	25.16	-6.40	>1
35.71	25.62	-10.09	>2
24.90	34.13	+9.23	<2
30.97	20.19	-10.78	>2
17.91	16.55	-1.36	<1
16.24	16.50	+0.26	<1

For subject D, the non-parametric Wilcoxon Signed-Rank Test yielded insignificant differences between pretreatment and posttreatment nasalance scores for one-tailed test (T=5, N=6) due to the increase in nasalance scores of 9.23 and 0.26 (<2 and <1 standard deviations, respectively) during the third and sixth sessions, respectively. The Wilcoxon Signed-Rank Test could not be administered to the remaining five treatment sessions as a minimal sample size of 6 is required for analysis. Nasalance scores decreased after the remaining five treatment sessions for standard deviations of up 2.21.

Figure 4. Pretreatment and Posttreatment of Nasalance Scores for Subject D.



METHOD II: CASE STUDIES

Two patients undergoing speech therapy for hypernasality for which P.i.N.C.H. was used for 40 minutes twice a week, were studied for 22 months and 15 months, respectively. The first patient, Case study 1, had also participated in the controlled experimental study where he was labeled as “Subject C”. Procedures and instrumentation were the same as those for the controlled experimental study except for the fact that graduate students administered the treatment and collected the data under the supervision of this author, and that repeated measures of the posttreatment nasalance scores at the end of 5 consecutive treatment sessions were obtained for Case study 1.

Case study 1

Case study 1 was an adult male medically diagnosed with acquired neurogenic velopharyngeal incompetence secondary to a closed head injury, 2.5 years post onset. This subject had a history of unsuccessful use of an ill-fitting palatal lift, which he no longer wore, hypernasality that interfered with intelligibility as judged by this author, and audible and inaudible nasal air emissions. He had received speech therapy for hypernasality for 30 months prior to the study, where P.i.N.C.H. was not used, and without apparent improvement in resonance. This was followed by two months of speech therapy with P.i.N.C.H. twice a week whereafter there was an acoustical improvement in nasalance scores.

Results of Case study 1

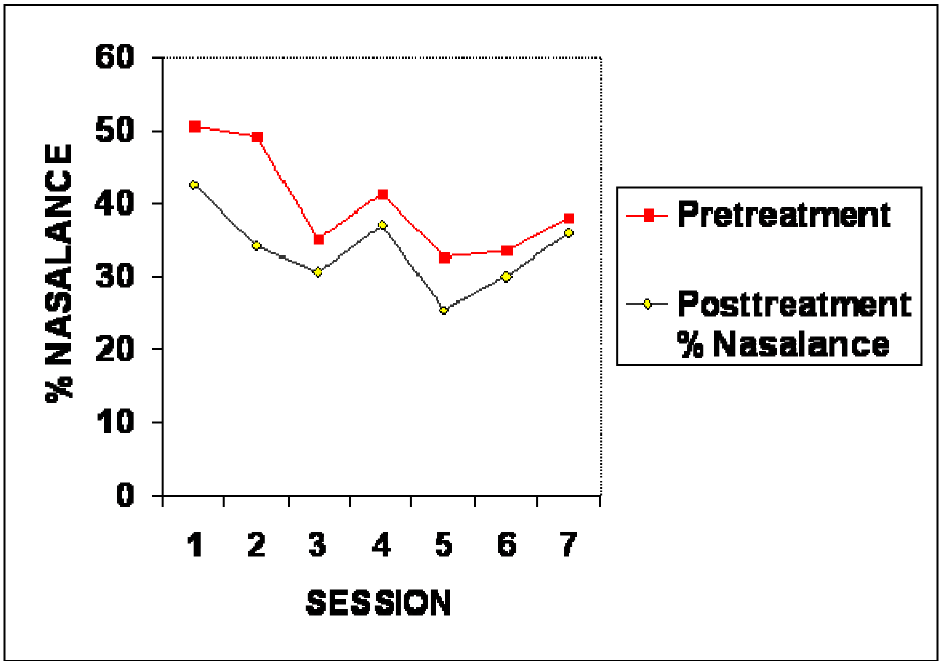
Repeated measures of the posttreatment nasalance scores at the end of 5 consecutive treatment sessions were obtained to investigate whether improved nasalance scores persisted for at least 15 minutes after the cessation of P.i.N.C.H. treatment. Results indicated that the posttreatment scores remained constant for at least 15 minutes after P.i.N.C.H. treatment. Case study 1's progress during the first 3 weeks of P.i.N.C.H. treatment are illustrated in Table 6, and Figure 5, below.

Table 6. Comparison of Pretreatment and Posttreatment Nasalance Scores over the first 3 Week Period of treatment with P.i.N.C.H.

Session	*Pretreatment % Nasalance*	*Posttreatment % Nasalance*	*Difference*	*S.D. (+/-4.86)*
1	50.74	42.72	-8.02	1.65
2	49.27	34.07	-15.20	3.13
3	35.10	30.60	-4.5	0.93
4	41.45	37.03	-4.42	0.91
5	32.67	25.49	-7.18	1.48
6	33.56	30.07	-3.49	0.72
7	38.01	36.08	-1.93	0.40

The non-parametric Wilcoxon Signed-Rank Test yielded significant differences between pretreatment and posttreatment nasalance scores for one-tailed test ($T=0$, $N=7$, $p< 0.01$). Nasalance scores decreased after treatment for standard deviations of up to 3.13. Differences in pretreatment nasalance scores also decreased over time. On 3/06/01 the pretreatment score was 50.74%. Three weeks later, after 6 treatment sessions, the pretreatment scores decreased by more than 2.6 standard deviations to 38.01%.

Figure 5. Pretreatment and posttreatment nasalance scores for Case study 1 over the first 3-week treatment period with P.i.N.C.H

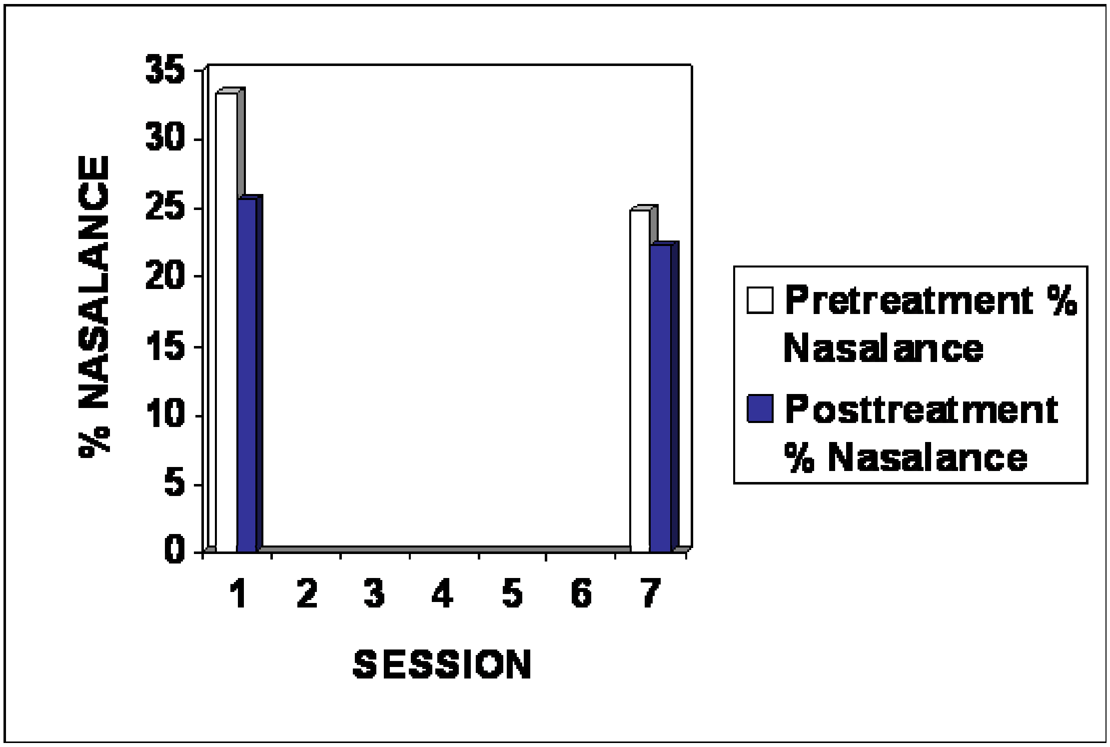


Progress over a 7-week period, 18 months after initiation of P.i.N.C.H. treatment, is displayed in Table 7, and illustrated in Figure 6, below. The table and graph illustrate that over a 7-week period of treatment sessions occurring twice a week, pretreatment nasalance scores decreased by 1.74 standard deviations.

Table 7. Comparison of Pretreatment and Posttreatment Nasalance Scores over a 7-Week Period of Regular Therapy Sessions

Week	*Pretreatment % Nasalance*	*Posttreatment % Nasalance*	*Difference*	*S.D. (+/-4.86)*
1	33.33	25.63	-7.7	1.58
7	24.89	22.25	-2.64	0.54

Figure 6. Comparison of Pretreatment and Posttreatment Nasalance Scores over a 7-Week Period of Regular Therapy Sessions.

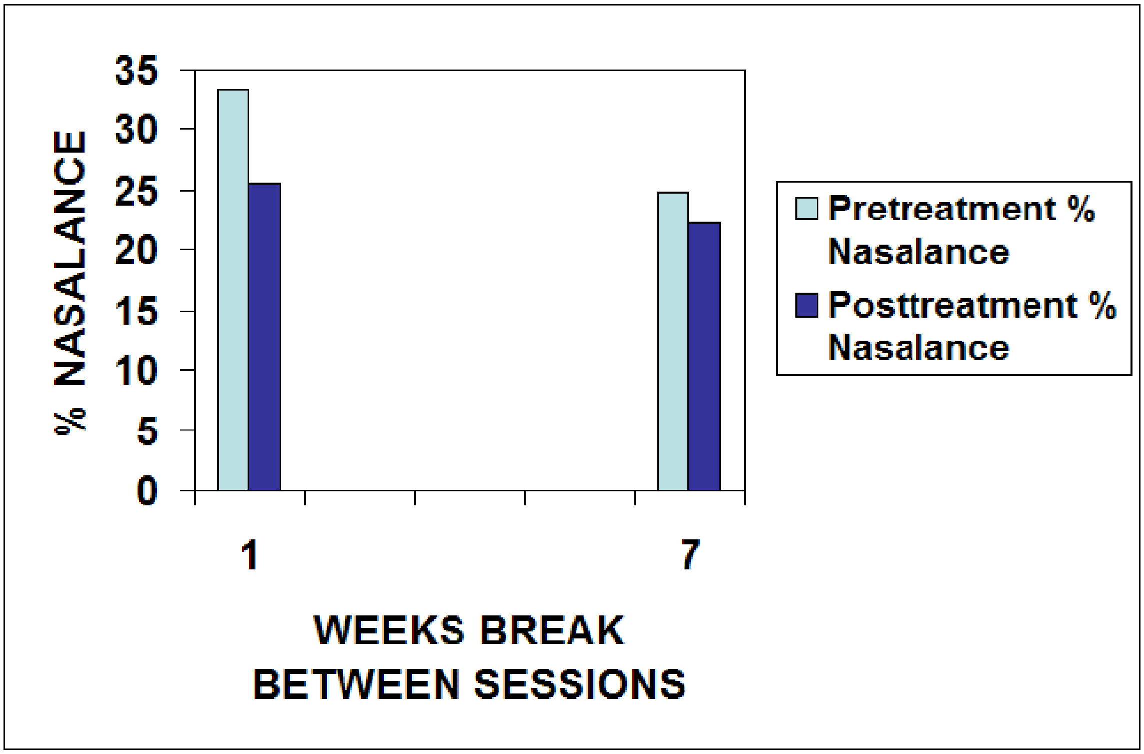


Data were also collected to determine whether improved nasalance scores were maintained after a 7-week hiatus in therapy. Table 8 and Figure 7, below, illustrate that after a 7-week break in therapy, improved nasalance scores were maintained.

Table 8. Pretreatment and post treatment nasalance scores after a 7-week hiatus from speech therapy.

Week	*Pretreatment % Nasalance*	*Posttreatment % Nasalance*	*Difference*	*S.D. (+/-4.86)*
1	24.89	22.25	-2.64	0.54
7	28.31	19.55	-8.76	1.80

Figure 7. Comparison of Pretreatment and Posttreatment Nasalance Scores before and after a 7-Week Hiatus (no speech therapy).



After a 7-week hiatus where there were no treatment sessions conducted, the pretreatment nasalance score of 28.31% was a decrease of 1.03 standard deviations from the pretreatment nasalance score of 14 weeks prior, and a slight increase of 0.70 standard deviation from the pretreatment nasalance score preceding the 7-week hiatus.

Case study 2

Case study 2 was a 9 year-old female with a medical diagnosis of velopharyngeal incompetence secondary to hypotonia, hypernasality as judged by this author, and had received 15 months of speech therapy for VPI using P.i.N.C.H., interdentalization of sounds, a tongue-thrust, and a mild morphological delay, under the supervision of this author.

Results of Case study 2

Percentage nasalance scores from the initial evaluation were compared with those of the final therapy session. The initial percentage nasalance score was 54.18% . After 15 months of P.i.N.C.H. provided 2 times per week, with 1-3 week breaks every 3 months, under the supervision of this author, nasalance decreased to 39.61 %.

Table 9. Percentage nasalance at the initial evaluation and after 15 months of P.i.N.C.H. treatment

Initial Evaluation	*>15 months of P.i.N.C.H.*	*Difference*	*S.D. (+/-4.86)*
54.18	39.61	14.57	2.99

DISCUSSION

This paper examined treatment efficacy of this author's new technique called Prolonged Nasal Cul-de-Sac on High Pressure Speech Acts (P.i.N.C.H.) on hypernasality. 1-2 This technique was generated from 4 physiological principles of velopharyngeal treatment. The first principle for treating velopharyngeal incompetence was to introduce positive pressure into the oral cavity. The second principle suggested that treatment stimuli should be speech acts. The third principle indicated that the speech act stimuli should not include retracted sounds such as pharyngeal and glottal phonemes. The fourth principle suggested that increases in subglottal pressure associated with voiced phonemes could also cause an increase in velopharyngeal muscle activity.

Efficacy of P.i.N.C.H. was examined through a controlled prospective experimental study and by following the clinical progress of two patients over a lengthy period of time. The two research designs yielded encouraging results. Nasalance scores decreased immediately after most treatment sessions using P.i.N.C.H., and over lengthy time periods. Support for further study is indicated by the consistent decreases in posttreatment nasalance scores for subjects A and C, and decreases of up to 3.10 standard deviations for individual sessions among all the subjects. Also, large decreases in nasalance scores for Case studies 1 and 2 after several months of treatment provide additional incentive to investigate this technique further.

The results of the pilot study investigating the treatment efficacy of Prolonged Nasal Cul-De-Sac with High Pressure Speech Acts (P.i.N.C.H.) are preliminary and tentative as the sample size was only 5. Also, nasal congestion may have played a role in yielding reduced nasalance scores on the nasometer even though nose-blowing was included to control for this variable. Finally, technical problems may have reduced the reliability of the data.

IMPLICATIONS

Since acoustic and perceptual measurements were used to monitor progress using P.i.N.C.H., speculations regarding its effect on velopharyngeal function cannot be made at this time. In order to determine whether P.i.N.C.H. directly affects change to velopharyngeal function, pre-and posttreatment performance should be measured using physiological evaluation procedures. EMG, videofluroscopy, nasopharyngoscopy, and aerodynamic measurements may or may not reveal physiological correlates with the P.i.N.C.H. technique.[37-40] If, with further investigation, P.i.N.C.H. is associated with improved velopharyngeal function, it may become a useful, inexpensive, non-invasive and easy-to-use tool for VPI treatment. It may be beneficial in reducing the need for surgery or prosthetics in mildly hypernasal cases, in maximizing surgical outcomes pre-and postoperatively, or in maximizing prosthetics outcomes.

Should P.i.N.C.H. be found to have a physiological correlate with velopharyngeal function, then implications for diagnostic procedures will become apparent. For example, when performing a commonly used procedure of comparing perceived resonance with and without nares occluded, it would become necessary to present the nares-open condition first.[37, 41] By doing so, potentially false negative results would be avoided. Similarly, when performing routine nasopharyngoscopic and videofluoroscopic examinations of the velopharyngeal port in the presence of fistulae, the fistula-occlusion condition should follow the fistula-open condition.

In the preliminary studies described in this paper, P.i.N.C.H. is associated with reduced nasalance in subjects with velopharyngeal incompetence. If, with further studies, P.i.N.C.H.treatment is found to be associated with improved velopharyngeal function, then P.i.N.C.H. may be beneficial in treating secondary VPI associated with oral pressure-reducing fistulae, clefts, velopharyngeal incompetence, velopharyngeal insufficiency, and deep pharynx.

APPENDIX A

WORDLIST

Word list for High-Pressure Speech Acts for “P.i.N.C.H.” (Prolonged Nasal Cul-De-Sac with High Pressure Speech Acts) Speech Therapy Technique. By: Hélène Rosman Fisher (December 2001).

Chat	Jade
Chatter	Jaded
Chatterbox	Joke
Chip	Jokester
Chipper	July
Chest	Jewelry
Chester	Just
*Chestnut	Judge
Pot	Adjudicate
Portable	Plague
Potato	****Pagent
Potato chips	*****Pagentry
Cricket	Page
Cricket bat	Pages
Crack	Goggle
Crackle	Goggles
Crackety-crack	******Eggnog
Shout	Gush
Shouted	Gash
Shatter	Catch
Shattered	Catchy
Bash	Cat
Bashed	Catty
Bush	Kitty
Bushed	Fight
Tack	Fighter
Tackle	Spot
Tact	Spite
Tactful	Spitfire
Trick	Sprite
Tricky	Dispatch
Choo-choo	Discuss
Chow	Batch
Pack	Boot
Packet	Bootstrap

**Packing	Choose
Pocket	Chose
Pocketful	Chase
Push	Chased
***Pushing	Chiseled

The following changes were made to stimuli words after completion of the research as they inadvertently contained nasal sounds

* changed to Chesterfield (May 12, 2003)
** changed to Packeted (May 12, 2003)
*** changed to Pushes (May 12, 2003)
**** changed to Pageboy (May 12, 2003)
***** changed to Pagelessly (May 12, 2003)
****** changed to Eggbeater (May 12, 2003)

APPENDIX B

SENTENCES AND PARAGRAPHS

Sentences and Paragraphs for High-Pressure Speech Acts for "P.i.N.C.H." (Prolonged Nasal Cul-De-Sac with High Pressure Speech Acts) Speech Therapy Technique. By: Hélène Rosman Fisher (December 2001).

Peter Piper picked a peck of pickled peppers.
A peck of pickled peppers Peter Piper picked.
If Peter Piper picked a Peck of pickled peppers,
Where's the peck of pickled peppers Peter Piper picked?

She sells seashells at the seashore. (Authors unknown)

Patricia chooses to chew tobacco or chat like a chatterbox or juke box.
She purposefully prefers to jog steadily over hedges or skip beside each bush.
Toto chases Trixy the pixy to school each day, particularly after breakfast.
Trevor will travel to Tokyo, Java, Chile or Czechoslovakia.

iheeto tallied the totals. Fifty, fifty-two, fifty-three, fifty-four, fifty-five, fifty-six, fifty-eight, sixty, sixty-two, sixty-three, sixty-four, sixty-five, sixty-six, sixty-eight.

Choo-choo chooses to shop for potatoes, P.J.'s, spaghetti, pastries, chopped chili, or pickled pepper pots. Quietly, Choo-choo tip-toed by sixty-six parked cars whose lights were brightly spotted with striped starbursts. The cars had aristocrats who critically looked at passers by. Spectators gasped, gossiped or giggled childishly like cockatoos after each critical stare. Perhaps each spectator could joyfully tackle the possibility that every passer by was goolish.

Gadgets, baubles, tapestry or jewelry are sold each Tuesday at the city square. Sellers, together with dealers, try to total at least sixty-six tickets per week, or sixty-eight tickets for every booth.

Eight frisky cheetahs had fifty-six chipped teeth filled with fragile jelly-like glue after breakfast. Firstly, they crushed boiled eggs. After this, they chewed twelve tater tots. This was followed by quickly cooked chocolate chip cookies fit for five frisky turkeys.

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