

**SOUTH BAYLO UNIVERSITY**

**Acupuncture for Cerebral Palsy in Children: A Case Series**

**by**

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***APPROVED BY RESEARCH COMMITTEE***



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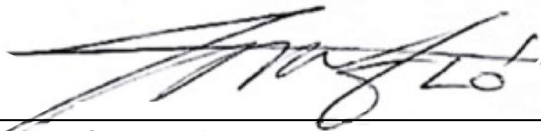
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# **Acupuncture for Cerebral Palsy in Children: A Case Series**

**Mark Yang**

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## **ABSTRACT**

**Objective:** The effect of acupuncture for the children who suffer Cerebral Palsy with multiple delays through prospective case-series study.

**Method:** 3 patients were chosen in this case series. Acupuncture was performed 3 times a week, once 10 treatments period has reached, A 10 day break was given before starting another period. Scalp acupuncture uses thicker needles which create stronger sensation (Qi), nevertheless, the damage to the scalp can also be more significant, With 10 consecutive treatments, the efficiency usually reaches its maximum. It is a good time to take a break to allow the scalp to be healed. Therefore a 10 day break is given. Needle retention on the scalp was up to 4 hours, this extends the acupuncture effect. Other needles in the body will be retained for 30 minutes if the patient can be corporated, otherwise, they will be removed after De Qi sensation is obtained. Simulations will be given at a rate of every 30 minutes for the needles on the scalp and every 10 minutes for the other needle.

**Participant:** 3 boys, **BoyA** who was a 2 years and 8 months old with Spastic CP due to the birth trauma. He had motor delay, cognitive delay, speech delay, hearing loss, vision impairment, balance issue, ADHD and Autism. **BoyB** who was 3 years old, MRI confirmed CP at birth, He was born with his brain not fully developed, or the condition lissencephaly is smooth brain without the folds. He suffered aggressive uncontrollable seizures starting at 3 months of age, All his symptoms relate to cerebral palsy, unable to talk, stand, feed by mouth, walk, floppy airway,

needs suction, oxygen, low muscle tone. **Boy C**, a four and a half year old, Spastic CP at birth with seizures, twitching shoulder, toe walking due to stiff calves, balance issues and severe fine motor delay on his right hand

**Result:** After the treatments, All 3 CP children with multiple delays had seen significant improvements.

**Conclusion:** Acupuncture has satisfactory effect in treating Cerebral Palsy children with multiple developmental delays. Acupuncture is a great option to add into their rehabilitation therapy; Nevertheless, more research and clinical trials are required before it can be fully adopted into the healing of CP children.

## TABLE OF CONTENTS

I.	INTRODUCTION	1
	OBJECTIVES	4
	LITERATURE REVIEW	5
II.	MATERIALS AND METHODS	7
III.	RESULTS	12
IV.	DISCUSSION	34
V.	CONCLUSION	37
	REFERENCE	38
	APPENDIX	41

## LIST OF TABLES

Table 1. BoyA' Developmental Evaluation Result	20
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## LIST OF FIGURES

Figure 1. Treatment Flow Diagram	9
Figure 2. Cerebral cortex, side view (Left) and scalp acupuncture areas	10
Figure 3. BoyA's Treatment result, Cognition delay	21
Figure 4. BoyA's Treatment result, Receptive Language	22
Figure 5. BoyA's Treatment result, Expressive Language	22
Figure 6. BoyA's Treatment result, Social Emotion	23
Figure 7. BoyA's Treatment result, Fine Motor	23
Figure 8. BoyA's Treatment result, Gross Motor	24
Figure 9. BoyA's Treatment result, Self Care	24
Figure 10. Left: BoyB in ICU, Right: MRI of his brain (lissencephaly, no folds)	26
Figure 11. BoyB's first visit	27
Figure 12. BoyB was watching iPad	28
Figure 13. Left: Watching TV with his Father, Right: His first Road trip to Texas	29
Figure 14. BoyB's eyes before and after the treatments	30
Figure 15. BoyC's treatment	32



## I. INTRODUCTION

Cerebral palsy occurs in two to three out of 1,000 live births (Vitrikas, K. et. al, 2020). It is caused by abnormal development of the brain. Cerebral Palsy is a group of disorders that mainly affect a patient's ability to move their muscles or maintain balance. It can occur before, during or after the birth. If it occurs after the birth it is called Acquired CP (10-15%), if it happens before or during the birth it is called Congenital CP(85-90%). There are many types of CP, the most common type of CP is Spastic(76.9%), followed by Dyskinetic(2.6%), Hypotonic (2.6%), Ataxic (2.4%) and mixed (15.4%) . Many CP patients have not only limited mobility, but also suffer from other developmental disabilities, such as intellectual disability, vision impairment, seizures, hearing loss and Aphasia. It is important to evaluate the child to find these disorders as well.

Historically, the diagnosis has been made between age 12 and 24 months but now can be made before 6 months' corrected age (Novak, I. et. al, 2017). Early diagnosis starts with a medical history and is supported by neuroimaging, standardized neurological, and standardized motor assessments. Even though technology has improved significantly over time, it is still very difficult to diagnose a child with mild symptoms. In those cases, the diagnosis has to be made when a child is older.

There are four common types of treatments for CP children in developed countries.

First, the rehabilitation therapies.

For instance: Physical Therapy, Occupational Therapy, Recreational therapy, Speech and Language Therapy.

Second: the Orthotic devices. Braces, splints and casts can be placed on affected limbs to help better movement and balance. For the children that have limited mobility and weak posture,

devices like wheelchairs, rolling walkers, and powered scooters can be very helpful. Third, medications, muscle relaxant, antidepressants, anti-seizure medicine, Botox, CBD oils. Lastly, when the symptoms are severe - surgery is usually the last choice. .

In Traditional Chinese Medicine(TCM), disorders of abnormal development in children are called “Five kinds of delay” and “five kinds of flaccidity”.

The former refers to the delay of hair growth, teeth eruption, and the ability to stand, walk and speak, and the latter - to the weakness and softness of the neck, mouth, upper and lower extremities and muscles.

Clinically, both of them usually appear at the same time.. Children who suffer from five kinds of delay and five kinds of flaccidity are commonly diagnosed with Kidney and Liver Yin deficiency.

A very famous formula called “Liu Wei Di Huang Wan” is usually prescribed for young children. Nevertheless, a thorough diagnosis is still required before prescribing the herbal formula.

Acupuncture is one of the oldest types of medical practices. It began in China and dates back to 6000 BCE. It is used to treat various diseases and conditions. In western countries, Acupuncture is mainly used for relieving pains, discomforts and other conditions. Acupuncture for Cerebral Palsy children is often not considered as a primary option.

In western society, CP rehabilitation therapies like Physical Therapy, Occupational Therapy and Speech Therapy are widely adopted and accepted by parents of CP children as well as by medical society. Those are considered as the standard rehabilitation protocols for CP populations. Unfortunately, In the United States, Acupuncture is excluded as an option.

This case report is aimed to share the progress of CP acupuncture treatment, therefore CP parents have an idea of what to expect during the treatment, also to promote acupuncture as a good option toward the recovery of the CP children.

## **OBJECTIVES**

The purpose of this case series is

1. To observe the effect of acupuncture for the children who suffer Cerebral Palsy with multiple delays in their development through prospective case-series study.
2. To demonstrate that Acupuncture is a great modality to add into the routine rehabilitation of CP children.
3. To share successful cases.

## LITERATURE REVIEW

Recently, Acupuncture has been widely adopted by Pediatric health care society . A majority of Adverse Events associated with pediatric acupuncture were usually mild and many of the serious Adverse Events might have been caused by substandard practice(Adams D et. al, 2011). Almost all of the parents have such concerns and commonly asked questions during the first visit: "Is acupuncture safe for my children?" and "Will the needles on the head damage their brain?"

For children younger than 2 years old, practitioners have to palpate frontal and posterior fontanelles, making sure they are closed properly. Practitioners also should pay attention to the shunt for those patients with hydrocephalus. Together with proper clean hygiene and a break period between treatment which allow the wound to be healed. In general, Acupuncture is very safe when performed by appropriately trained practitioners.

In this case series, most of the technique used is the Chinese Scalp acupuncture, It has been proven to be a most effective technique for treating acute and chronic central nervous system disorders (Jason Hao, Linda Hao, 2012), Chinese Scalp Acupuncture was invented by a neurosurgeon Dr. Jiao in China in 1971. He combined a modern understanding of neuroanatomy and neurophysiology with traditional techniques of Chinese acupuncture to develop a radical new tool for affecting the functions of the central nervous system(Hao et al., 2012).

Acupuncture has been recommended by the World Health Organization (WHO) as an alternative and complementary method for treating stroke and a way to increase the effectiveness of rehabilitation (Belskaya et. al, 2020). Stroke sequelae (different kinds of paralysis, motor,

speech and mental dysfunctions) and CP have one thing in common - both are caused by brain damage. The difference is - the majority of people who suffer strokes are old people, their brains are in a degenerative trend. Unlike the children with Cerebral palsy, whose brains are still growing. If acupuncture is used and helps Stroke rehabilitation, probably it should help as well in CP rehabilitation.

As we all know, Acupuncture can increase the supply of blood and oxygen to different areas of the body that may activate the process of repair, and regeneration of injured neurons in the brain (Lee et al., 2019). Acupuncture plus rehabilitation training improved gross motor function, reduced muscle spasms, and enhanced daily life activities in children with cerebral palsy(Li et al., 2018). Acupuncture combined with comprehensive rehabilitation therapy can improve cognitive function, spasticity and motor function of children with spastic cerebral palsy(Zhang et al., 2019).

It is estimated that 15% to 55% of children with CP have drooling issues. Drooling not only causes daily socialization embarrassment but also increases the workload of CP parents. It is commonly seen that parents of CP Children have to wipe their mouth and replace bibs constantly. There are many options for treating drooling, such as Surgery, medication and oro-therapy. Due to the significant side effects, more CP patients with drooling are not satisfied with current treatment options. Therefore Acupuncture is gaining increasing popularity as an alternative therapy for drooling in children with CP (Xiong W, et al., 2021). This case series demonstrates that acupuncture is a great option treating CP children with drooling issues.

## II. MATERIALS AND METHODS

### 2.1 Materials

Expert K-type needles with the size of 0.25x 30 mm (A), 0.30x30mm(B) and 0.30x40mm(C) were used, B and C are the needles for the scalp, A is for the body.

### 2.2 Methods

Treatment Frequency is 3 times per week, then rest for 10 days after 10 treatments. A 10 day break has been given before starting another period.

Scalp acupuncture usually uses thicker needles, which create stronger sensation (de Qi), nevertheless, the damage to the scalp can also be more significant.

With 10 consecutive treatments, the efficiency usually reaches its maximum. It is a good time to take a break to allow the scalp to be healed. Therefore a 10 day break is given.

After disinfection, for the scalp acupuncture, the needle(B or C) was inserted into the scalp rapidly at an angle of 15~30 degree. When the needle tips reach under the subgaleal layer, the resistance to fingers decreases. Then the needle was thrust along the standard line horizontally for 0.5-1.5 Cun. After the needle insertion, De Qi sensation is acquired. The needle was stimulated with a rotation in an angle of 180-360 degrees back and forth and with a frequency of 200 spines per minute for 30 seconds is required every 30 minutes. Needle retention was up to four hours.

Needling for other locations other than ST4 and scalp.

After insertion(0.2-0.5 Cun), needle was removed immediately after De Qi sensation was acquired, ST4 retained for 30 minutes after De Qi sensation was acquired.

Each visit was about 45 minutes, then the patient went home with the needles on his head. The parents were instructed how to rotate, remove the needles safely. They have to sign the waiver form.



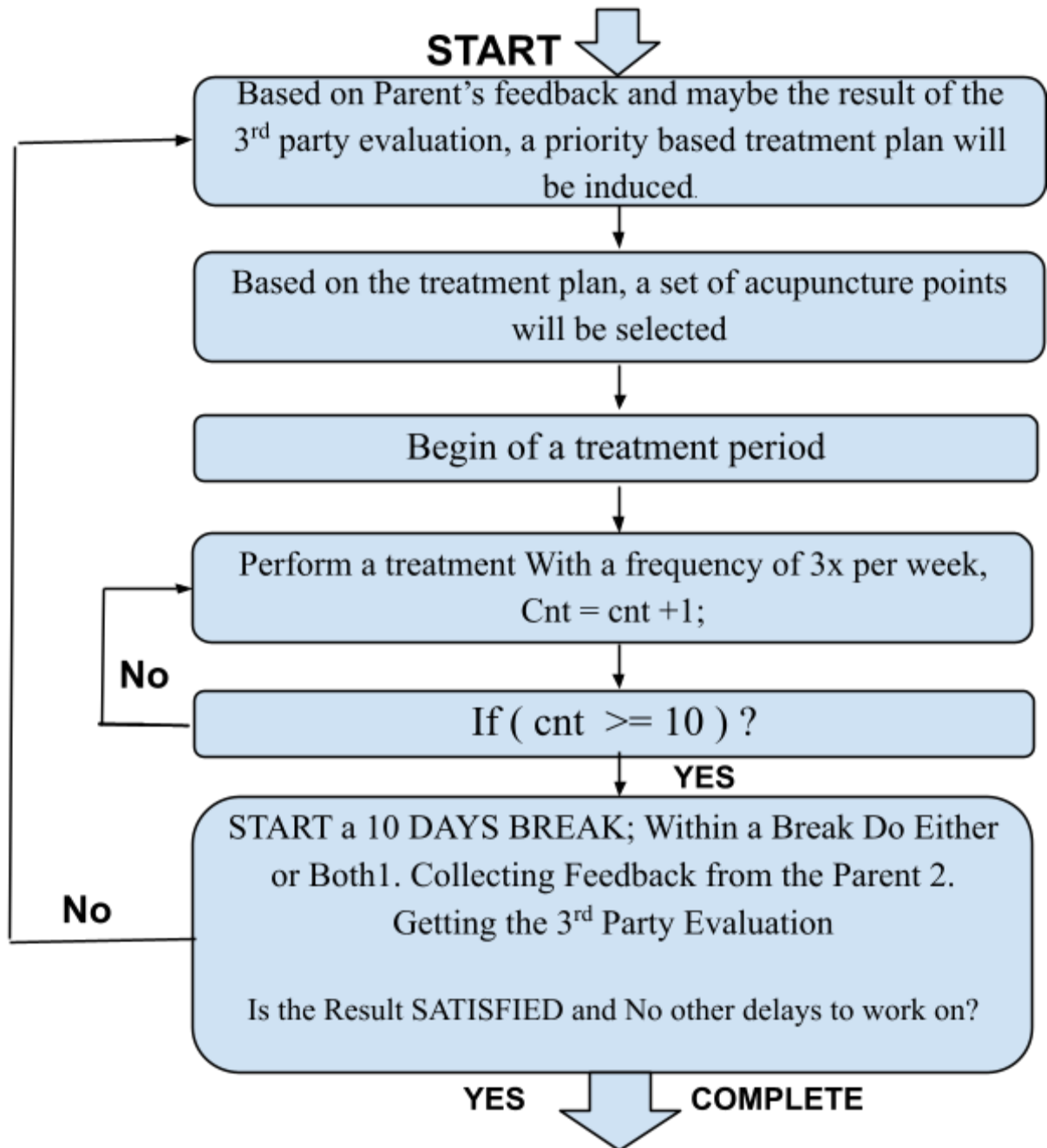


Figure 1. Treatment Flow Diagram

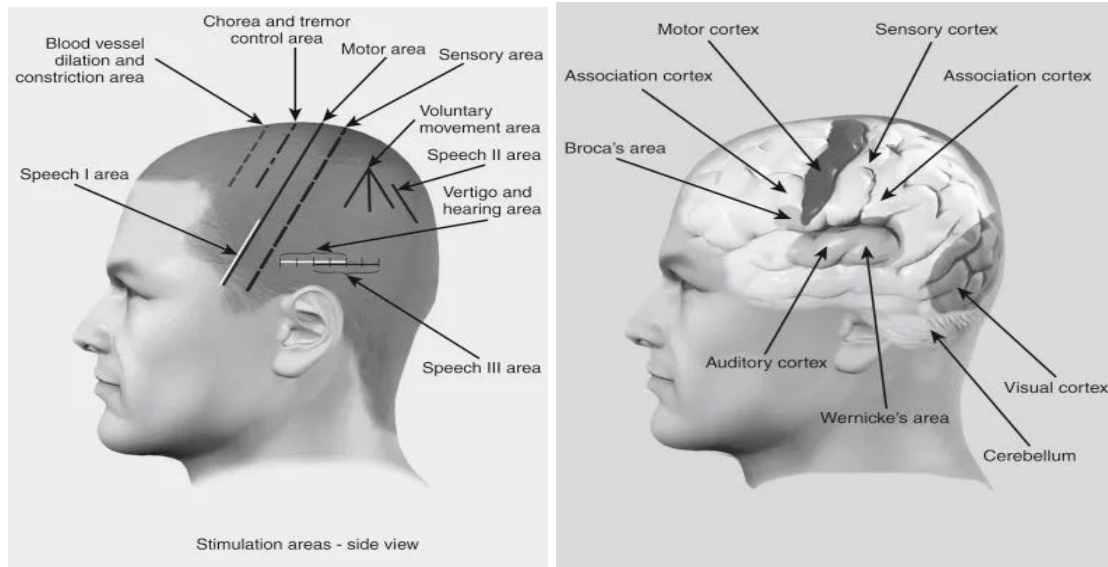


Figure 2. Cerebral cortex, side view (Left) and scalp acupuncture areas (Courtesy Dr. Jason Jishun Hao.)

### Point Selection:

**Fine and Gross Motor delay:** Motor area, Foot motor, Sensory area and usage area.

**For speech delay:** Speech 1, 2, 3 area, Anterior-tempus line , ST4, HT5 , DU15, Ren23.

**For mental disorder(ASD, ADHD):** Emotion area (2 cm away from center line and 2 cm behind hairline, 3 cm in length, inserted backward) band Heart-Liver area (2 cm behind GB15, inserted backward, 3 cm in length)

**For focus/attention:** Calm three needles. I.e. YT and GB14.

**For cognitive:** DU20, Nine Intelligence Needles (SSC, DU23, GB15, ST8), Seven Intelligence Needles(SSC, DU23, GB15), Tempus three needles. NingShen( between DU23 and YT, point downward)

**Vision:** vision area, GB16.

**Hearing:** vertigo and hearing area (also called dizzy and balance area)

**Balance:** balance area.

**Seizure:** SSC (point to DU20)

For a detailed description of each Acupuncture point please refer to **Atlas of practical science of Children Acupuncture and Moxibustion by Dr. Liu ZhenHuan**

### III. RESULTS

#### Case 1

2 years and 8 months old boy (Boy A), suffered Cerebral Palsy due to Birth Trauma, he was not breathing after birth. Since birth time , he has had noticeable hypertonia in his upper trunk, arms, torso, and upper legs. He was always stiffer and more rigid in his movements than other children, but still is mild mannered, and easygoing. His arms, legs and fists were often clenched or tight throughout the day. His speech delay was noticeable at 1.5 years old.

At 2 years 2 months, he was diagnosed with mild hypotonia Cerebral Palsy due to global developmental delays by his neurologist. He was evaluated at 2 years 2 months and found to have significant speech delay (70%), cognitive delay(56%) along with gross motor delay(40-50%), fine motor delays(24%), Social Emotional delay (64%) and self care delay (52%). Then he started Physical, Occupational and Speech Therapy, which are ongoing . After 6 months of therapy, when he was 2 years and 8 months old, his parents did not see significant improvements from traditional CP rehabilitation therapies. They decided to add acupuncture as part of his therapies.

Boy A's detailed symptoms were as follow:

**Speech delay** - He starts to speak 2 words incompletely. He can pronounce lots of simple words and imitates sounds and actions readily. He is very behind in development and this is our foremost concern. There are delays between words. His parents only understand 30 % of what he says due to his very poor articulation. Other people would only understand 10%.

**Cognitive delay** - His eyes are sluggish and with very little expression on his face. He cannot understand questions. He is doing more imitation of others, but not as much as other children of

his age. He does not readily point to objects in books that we point to, or point out things often. He is not able to do most puzzles, though he can do a simple shape sorter. He has some issues with focus and attention, and gets distracted easily even when he's in the middle of a task. His pretend play skills are still basic and simple.

**Gross motor delays** - due to stiffness in his upper torso, arms and legs, he has not been able to jump on 2 feet on the ground until 2 days ago despite 6-7 months of physical therapy. He just recently started to kick, and is now able to climb up and down stairs with some support. He is more stiff when running and walking, and he does not have good flexibility or fluidity of motion. He moves slower than other kids. His core strength is poor.

**Fine motor delays** - he also has delays in fine motor skills though has had some improvement due to occupational therapy. He needs to improve hand strength and coordination as he cannot draw a line or circle yet and mainly scribbles then loses interest in doing so.. He has some challenges with self feeding and putting things on like shoes or clothing.

**Sensory issues/toe walking/finger sucking** - He has some sensory issues and enjoys putting inappropriate things in his mouth, along with cold items. He sucks his fingers before naps and night sleep and sometimes during the day. He toewalks every day at least 40% of the day.

**Drooling** - he drools excessively and has low tone and muscle awareness in his mouth and goes through many (14) bibs a day. Even with his mouth closed drool seeps out the corners of his mouth. We are doing some oral motor exercises through OT but have not seen any improvement.

**Hearing** – he has some hearing loss in the left ear, but how much is not clear.

**Vision-** He is nearsighted

**Balance** – he has poor balance and falls a lot, mainly due to stiffness

At acupuncture treatment#40, He was diagnosed with **Autism** by his Psychiatrist.

At acupuncture treatment#53 He was diagnosed with **ADHD** by his neurologist but no longer **Autism**.

**Summary:** Boy A has many kinds of different delays in his development. I was not able to work on all of them at once, therefore, I came up with a treatment plan based on his parent's feedback and my expertise.

That is a plan for a treatment period of 10 visits. His parents gave me feedback for every treatment and a written update regarding his improvements they had seen from that period

**Observation/exam during the first visit(4/12/2021) :** Boy A was quiet and shy during the intake, his eyes were dull and sluggish, his muscles from the neck, shoulders, thighs and calves were tight. .He was not looking at me when I called his name and tried to talk to him. He could not understand questions and was not able to follow basic commands. His speech was hard to understand due to poor articulation. He wore a bib around his neck, he drooled excessively, therefore his parents needed to change a bib during the treatment. His gait was not smooth, He has poor balance, and he frequently falls down. He can not jump. His toe walking was very severe, like a ballerina. Boy A sat on his mother's lap, his mother secured his body while his father secured his head when I performed the treatment. He softly touched my arm once during the needle insertion. He barely cried and offered any resistance.

**Outcomes after the first period (first ten visits):**

Drooling reduced from 14 bibs to 1 bibs per day after 4th treatment. He started to talk for the first-time during speech therapy after 2nd treatment. He began to jump and run smoothly and faster after 6th treatment His eye contact when somebody calling his name was increased from about 10 percent of the time to about 95 percent of the time, reaction time increased by about 60-75 percent, attentiveness increased by about 50 percent (looking at books), focus increased by about 70 percent . He has been able to listen to a short book reading, point at things sometimes, turn his head when you ask to look, increased the number of words at a steady rate (maybe additional 75 words) and used more two and three word sentences (still with a delay between first and second word). Reaction time improved by 75 percent (high fives, turning head)

**Achievements after 2nd period ( second ten visits):**

He is more alert, attentive, expressing his emotions more often and regularly. He speaks in 2 words, sometimes in 3 words. He Started to use verbs, can hick higher. Fall down less. During 15th treatment, his parents reported that they took him to CCS (California Children Service), A state organization that provides CP children free PT and OT service. They had not seen him for 2 months and were surprised with his huge motor improvement. He went for a check up and at 19th treatment and his parents told me that he is no longer nearsighted nor has hearing loss.

**Achievements after 3rd period (third ten visits):**

He can run, jump, climb stairs up and down without assistance, he can draw circles, pick up small items and feed himself. Before it was a mess when he fed himself, now it is much better. He started to do different size cup stacking that he was not able to do a few weeks ago. He was able to catch a ball 2 out of 3 times during his OT session. He is more aware of surroundings, he notices when people enter or leave, once he asked “where is Dad?” when his father left the

treatment room. He said “Truck” when he saw it far away and answered the color questions correctly when his father asked him. His father was very excited when he told me that. He is now understanding questions and able to answer them correctly. His speech continues to improve, he speaks in 3 words, sounds are much clearer, articulation has improved. Previously his mother could only understand 30% of what he said, now she can understand about 70-80%. He said “take it out” (needles) loud and clear during 30th treatment. He is starting to use progressive words ING. Gaps between words are gone. I understand what he says now.

**Achievements after 4th period(the fourth ten visits):**

He was more aware, mature, talkative and goofy, having behavior changes. He was formally diagnosed with mild Autism(Aspergers) by his psychiatrist. He spoke 3-4 words, sometimes even 6 sentences. He speaks 5x more than before. He could follow my command when I asked him to jump and clap his hands. He is more goofy than before. I waved to him then he smiled and waved back, I gave him a thumbs up, he did the same to me. His eyes started to change. No longer dullness and sluggishness .

**Achievements after 5th period (the fifth ten visits, add autism treatment):**

Drooling completely stopped. He had a major leap with awareness and talking a lot more. He was doing a lot of narrating of what he sees and hears, what he’s doing, a little more pretend to play, and was imitating various sounds he hears around him even when we are not speaking to him directly or asking questions. He tried to get our attention a lot of the time and was verbalizing everything he wanted to talk about. He was not just talking a lot more with us but also in front of other people.. He waves and says hello to strangers also. He was substantially more active, opening everything in sight, running around, playing, being more daring, and



getting into trouble more. He was even more affectionate and loving, and said things like “want hug”, but he was also more strong willed, vocal about his preferences, and less willing to cooperate at times. Also he continues to toe walk daily

#### **Achievements in 6th period (sixth 10 visits):**

He could say longer sentences up to six words sometimes and sounds are more clear. He was able to sing happy birthday songs in two languages. His attention was better, he tolerated 20 minutes in activity in therapy. Getting close to finishing a more complete sentence. He talked a lot and was able to say things in different ways. Smiled more, tantrum more, he was talking more in front of new people. At the 56th treatment, I called his name, he looked at me immediately, I asked where his head and other body parts were, he was able to point at them correctly in a short time. At the 53rd treatment, He was no longer diagnosed with Autism but ADHD by his neurologist and When I entered the treatment, he said “ Dr. Mark is here” loud and clear!

#### **Achievements in 7th period**

Boy A was communicating in a more sophisticated way. He told us what he likes, what he wants using consistently 4-6 words. He’s also saying more different 4-6 word combinations instead of the same ones and communicates in new ways with more vocabulary than before. His focus was better, his eye contact was much better, and he initiated play more. He was still having about the same number of tantrums as before. He was still toe walking but a little bit less than since the last period.

#### **Achievements in 8th period (71th-75th)**

His eye contact is much better when you talk to him, he can answer 20-30% of questions during his therapy. He can talk and describe things in different ways, for example, a month ago, he could say “Red car”, now he says “**This is a car, it is red, a lot of cars outside**” articulation is much better.

Treatment is still ongoing,

**After 75 treatments,**

**Drooling** : from 14 bibs a day to no bibs at all.

**Gross Motor**: from walking slowly and stiff. Now he can run smoothly, jump back and forth,

**Fine Motor**: he can draw circles, sort objects, and eat by himself.

**Vision**: no longer nearsighted, but developed astigmatism

**Hearing**: Hearing ability was restored

**Speech**: improved from speaking 1-2 words with gaps between words and poor articulation to speak 6-7 word sentences clearly without gaps and much better articulation. Even his grandparents with hearing issues can understand him. For example, he did not know his color before the treatment. During the 3rd period, He answered a color question,he said “Red Truck” . During the 8th period he said”**This is a car, it is red, a lot of cars outside**” and “**Oh Mom, You got a new cloth, I like it** “ fluently and with good articulation.

**Cognitive**: before 10% of time, he will look at people when his name is called, now he does it 90% of time and with much faster response time. His eyes were dull, small and sluggish, now they are bright and big. Before he did not play with others, now he is friendly to strangers. He can describe his feelings in many ways, before, he had very poor attention and focus, he could sit and follow instructions for 40 minutes during his PT/OT/Speech Therapies sections, also he is

more clingier, more affectionate and aware, wants to hug and play, aware of people surrounding him. He can sing happy birthday songs in 3 languages.

Boy A had developmental evaluations at 25-th months old and 35-th months old, acupuncture treatments started at 32-nd months and is still ongoing, A huge growth spurt was discovered after acupuncture was added into his treatment protocol.

### **Outcome Measure**

At 25 months old, He was referred for a developmental evaluation from Regional Center of Orange County to assess his current developmental skills and to determine eligibility for services, this evaluation was performed using the following tests or portions of the following tests: **Peabody Developmental Motor Scale II (PDMS-II), the Receptive-Expressive Emergent Language Test-3rd Edition, Developmental Assessment of Young Children 2nd Edition (DAYC-2), Infant/Toddler Sensory Profile, clinical observation, handling, and parent interview.**

At 35 months old, his evaluation was done with DAYC-2 only.

The following Table-1 shows Boy A's developmental assessments and improvement between two assessments. Note (SS:Standard Score; WFL:within functional level)

**Table 1. BoyA’ Developmental Evaluation Result**

Developmental Function	Developmental assessment At 25 months;	Developmental assessment At 35 months;	Within 10 months, How many months of improvement was gain
<b>Cognition</b>	11 months (SS:71, 56%)	24 months(SS:84, 29%)	13 months 27% beteter
<b>Receptive Language</b>	7 months (SS:<55, 72%)	22 months(SS:76, 37%)	15 months 35% better
<b>Expressive Language</b>	8 months(SS:<55, 68 %)	24 months(SS:79, 31%)	16 months 37% better
<b>Social Emotion</b>	<b>9 months(SS:72, 64%)</b>	<b>34 months(SS:98, WFL)</b>	25 months 64% better
<b>Fine Motor</b>	<b>19-28 months (SS:5-10, 24%)</b>	<b>38 months (SS:101. WFL)</b>	10-19 months 24% better
<b>Gross Motor</b>	10-15 months (SS:3-5, 40-60%)	23 months(SS:88, 34%)	8-13 months 6-26% better
<b>Self Care</b>	<b>12 months(SS:81, 52%)</b>	<b>31 months(SS:93, WFL)</b>	19 months 52 % beteter

In the following figures 3~9:

Horizontal axis represents the actual age in month

Vertical axis represents the developmental age in month,

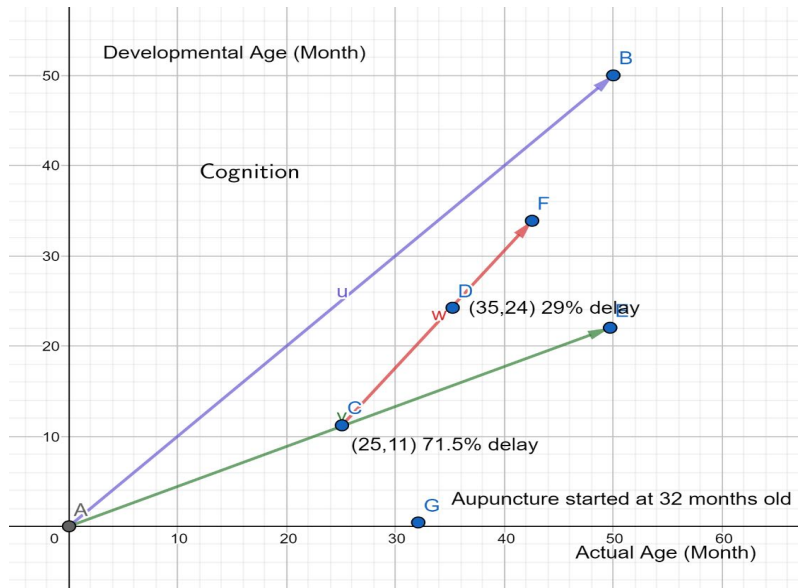
AB line is the developmental growth of a normal child,

AE line is BoyA’s possible developmental growth without acupuncture and other therapies,

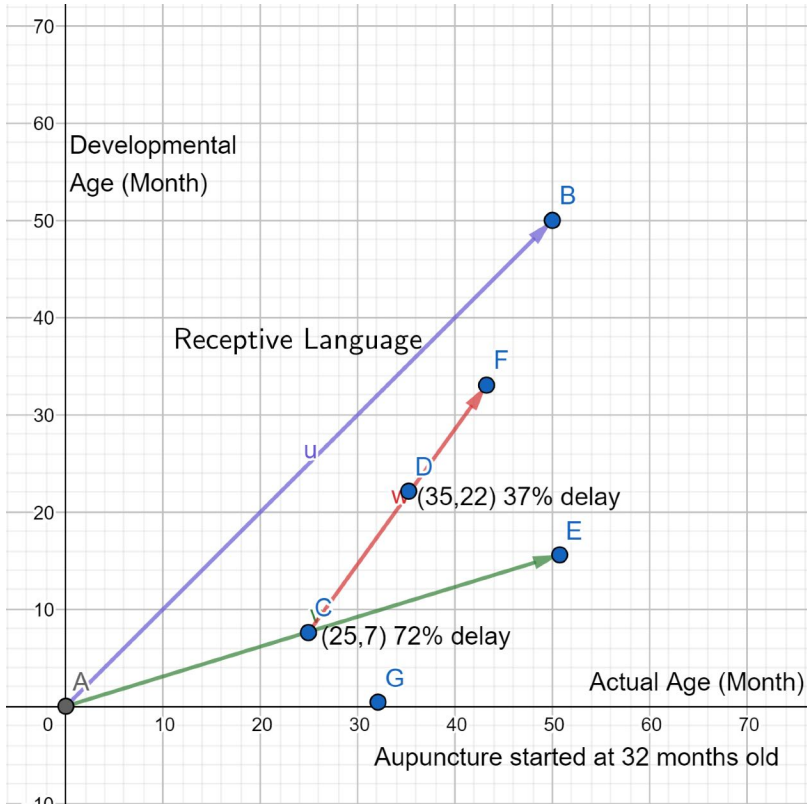
CF line is BoyA's developmental growth together with help of acupuncture and other therapies,

C point is the result of the first developmental evaluation at 25 months old,

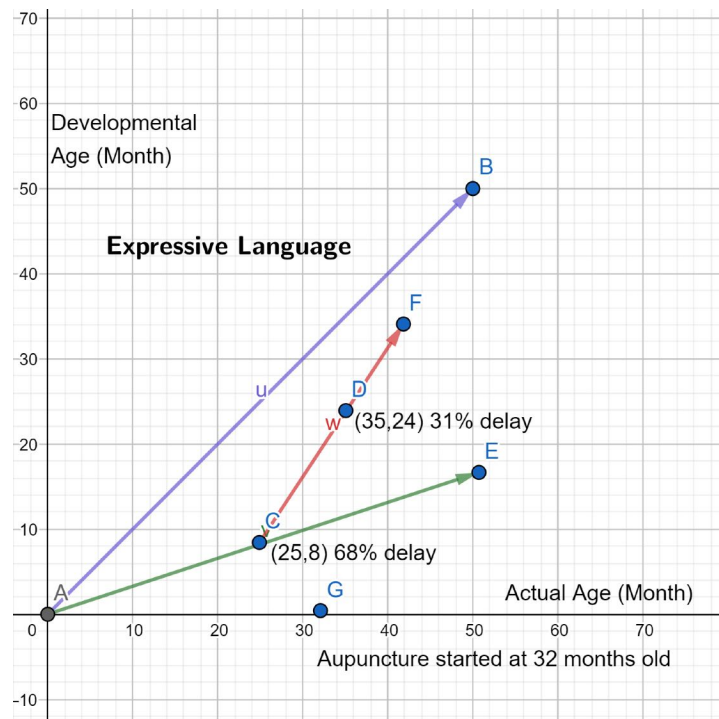
D point is the result of the 2nd developmental evaluation at 35 months old



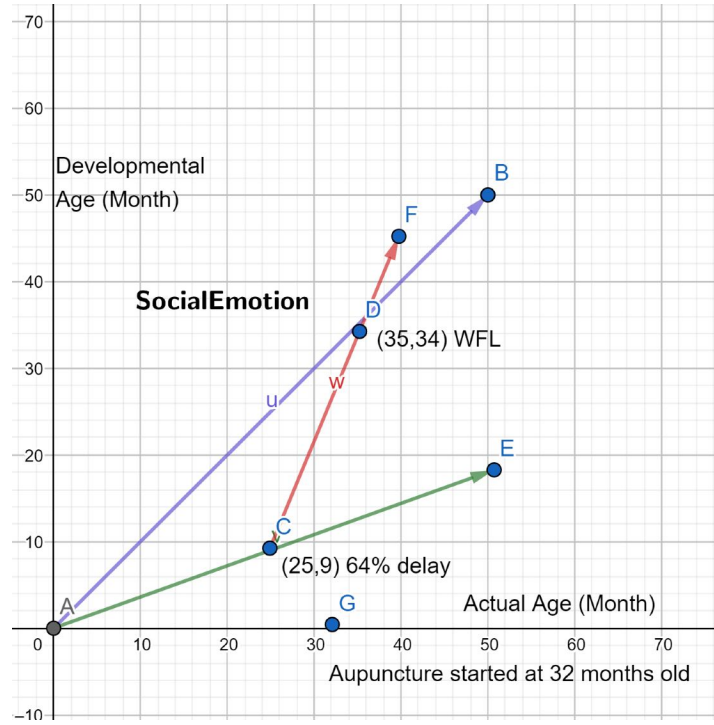
**Figure 3. BoyA's treatment result, Cognition delay**



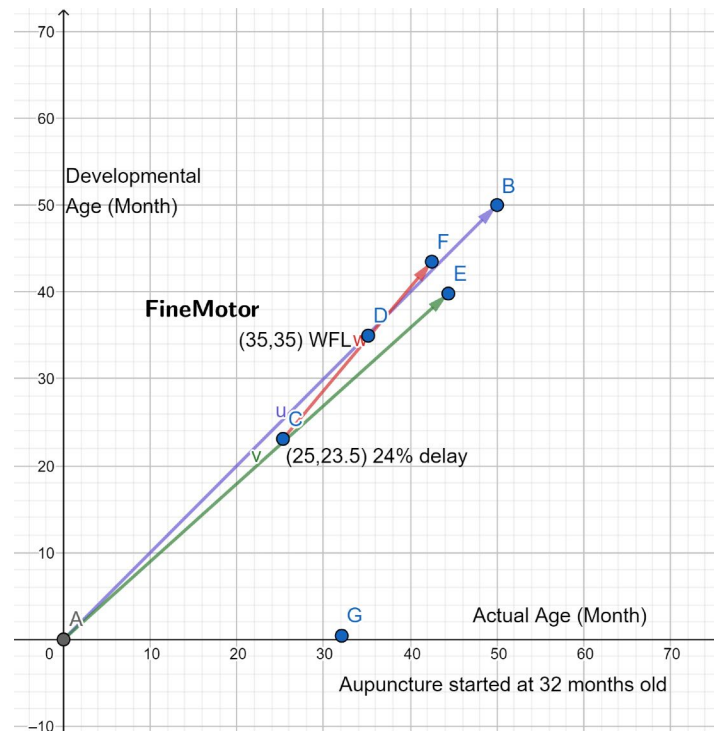
**Figure 4. BoyA's Treatment result, Receptive Language**



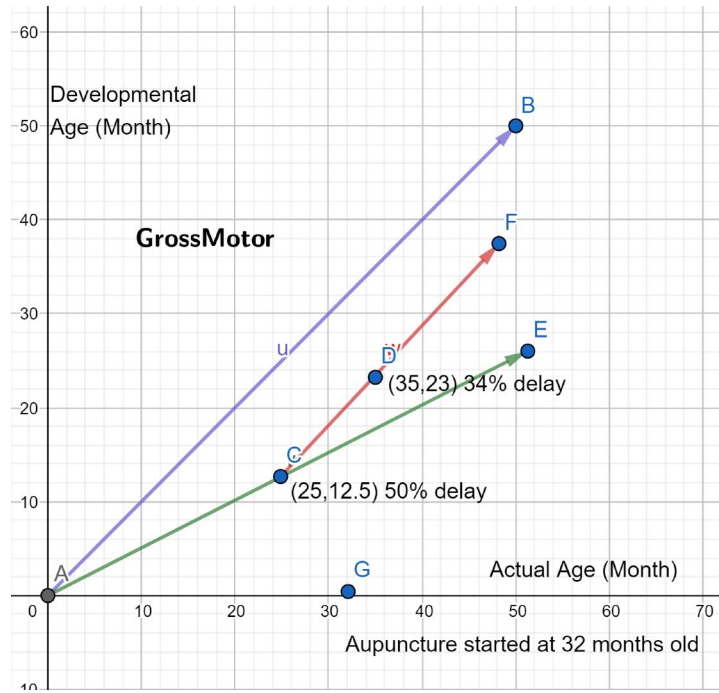
**Figure 5. BoyA's treatment result, Expressive Language**



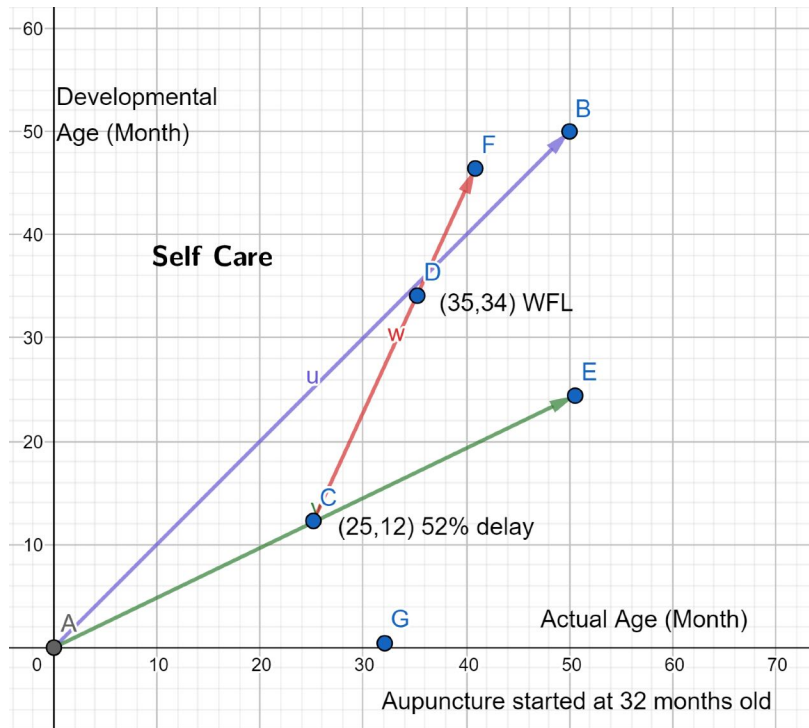
**Figure 6. BoyA's treatment result, Social Emotion**



**Figure 7. BoyA's treatment result, Fine Motor**



**Figure 8. BoyA's treatment result, Gross Motor**



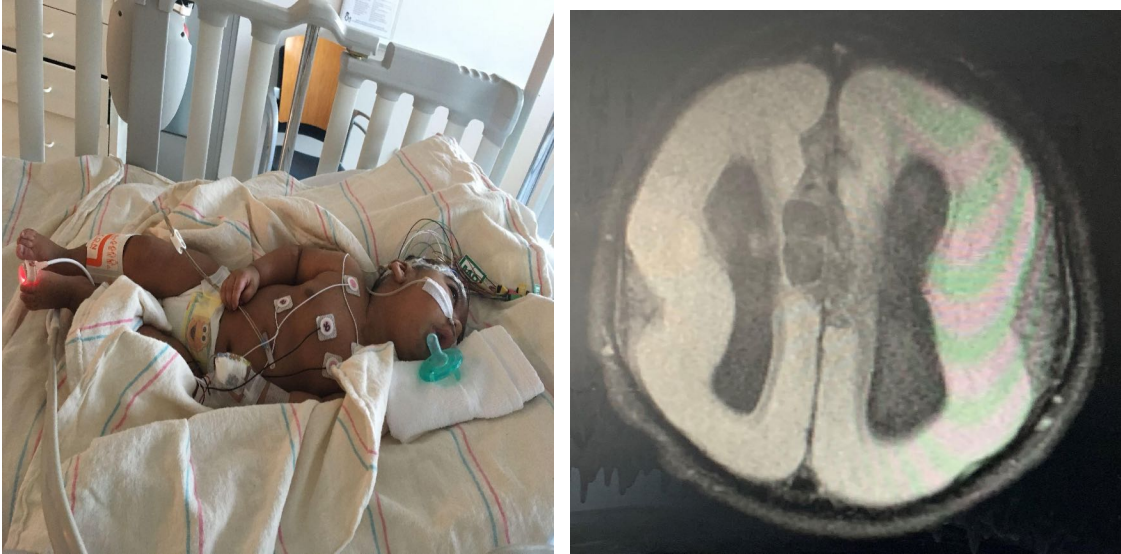
**Figure 9. BoyA's treatment result, Self Care**



From table-1 and Figure 2-8, we can see that Boy A encountered a big growth spurt after acupuncture treatments were added as part of his therapy. He caught up in 3 out of 7 areas. The most improvement were social behavior and self care, also his strongest area, the fine motor also caught up. These 3 areas (social behavior, self care and fine motor) are now within functional level in the 2nd assessment. And the cognition, expressive language and receptive language, all showed significant improvement. Gross motor also showed some improvement, however it is the hardest to improve. I have been working on BoyA's after his 2nd assessment (35 months old, with 3 months of acupuncture treatment), now I have worked on him for almost 8 months, I have seen better improvement in cognition, self care, expressive and receptive languages. However, due to the insurance changes, BoyA is not able to have the same evaluation at the same facility.

## Case 2

Boy B. A 3 years old boy, MRI confirmed CP at birth, who was a preemie and suffered injuries during utero and birth, nothing related to genetics. He was born with his brain not fully developed, or the condition lissencephaly is smooth brain without the folds. He suffered aggressive uncontrollable seizures starting at 3 months of age. He was in and out of the hospital from birth up until 2 years old. He went to over 9 different hospitals. His Mother was a desperate parent seeking any treatment to help him. Doctors gave him 3 months to live when he was born. They said he has a poor prognosis in survival. All his symptoms relate to cerebral palsy - **unable to talk, stand, feed by mouth, walk, floppy airway, needs suction, oxygen, low muscle tone, 100 percent dependent on care. Besides he was suffering from aggressive seizures and need 24/7 bedside care by parents and nurses.**



**Figure 10. Left: BoyB in ICU, Right: MRI of his brain (lissencephaly, no folds)**

**First visit (june 29th 2019)**

- Not Alert, slept a lot (drowsy),
- Had seizures several times a day,
- Used a suction machine 7-10 times per hour to suck up saliva,
- Low or no muscle tones.
- Drugs used: muscle relaxants, pain killers, anti-seizure, anti-depressant, Stool-softener and CBD oil.



**Figure 11. BoyB's first visit**

**Treatment Protocol: Same as Case 1.**

**Result (after 5th treatment)**

- More alert
- Fingers can open by itself, grab stuff
- More movement from all 4 limbs
- Can watch video by himself
- Seizure reduced to once every 10 days
- Drooling reduced significantly, Only one or two suction a day compare to 7-10 times per hour
- No drug is given. Except anti-seizure medicine when is needed



Figure 12. Left BoyB was watching iPad, his mother said: he is never interested in anything, I never got him to track or focus on anything, he is always in the air unaware of anything, Right:  
his eyes changed,

BoyB was watching an iPad and He responded to his Nurse's question by nodding on his head.  
Please refer to video link from Appendix 1

**Result (after 17 th treatment )**

- Cried out “Ouches” during 9th treatments
- Laughed after 14th treatments
- Watched TV with his Father after 15th treatments
- Started homeschool after 16th treatment (Special Education in home teaching program)

- completely seizure free (all seizure meds were removed), just CBD oil for muscle spasms.



Figure 13. Left: Watching TV with his Father, Right: His first Road trip to Texas



Figure 14. BoyB's eyes before and after the treatments

### Case 3

Boy C, A four and a half years old boy, MRI confirmed CP at birth, spastic CP with severe fine motor delay on his hand, seizures, twitching shoulder, toe walking due to stiff calves and balance issues. He was full term, An induced labor was performed because of water broke, after the water broke, His heart rate dropped, turned a regular routine into an emergency C section He was not breathing when he was born. His APGAR score was 1 at one minute,3 at 10 minutes and 4 at 14 minutes. He is sweet, shy and very clingy. He has a sweet tooth. Eating too many sweets will increase his seizure activities and shrugging shoulders. He is not taking prescription medication except CBD oil.

### First visit (6/7/2021)

Boy C was alert and very shy, Toe walking with hands raised up to his shoulder level and was not swinging. Shrugging his right shoulder involuntarily and constantly at rest, the situation worsened when his hands were active.

His shoulders and calves were stiff and were worst on the right sides.

His fine motor skill of fingers was extremely weak, especially to the right thumb and index finger, he struggled in picking up objects, having extreme difficulty tapping his thumb to index or middle finger, Flexion and extension of his fingers were weak, therefore, opening and closing his palm was not an easy task. His ability to draw, write and pick up objects were limited. Ability of using his hands was the major concern of his Mother, she wanted to get him ready for the pre-school.

His Mother mentioned that he has low energy, I believe this is related to his sleeping issue. He had difficulty falling asleep and was moving a lot after falling asleep, his seizure activity increased significantly at night. He slept with his mother, this also affected her sleeping quality.

His Mother had depression, she was also my patient, her depression got better when BoyC's condition improved.



Figure 15. BoyC's treatment

**Treatment Protocol: same as case 1.**

**Result After 20 treatments(7/30/2021):**

His Shoulder twitching went down 90%, His Hands were swinging and mostly down when walking, walking on his toes had reduced.

His fine motor skills improved significantly, He was able to pick up small objects faster. He became interested in playing Lego because he was able to put them together without frustrations. In the video link shown below, he was pickuping cheerios (The first half of the video was taken before the treatment and the second half was taken after 20 acupuncture treatments),

His seizure reduced significantly.

He and his mother were able to get a better sleep.

Also , His OT said his spasticity is gone, the *spasticity* was on the report 1.5 years ago prior to the acupuncture treatment.



BoyC's fine motor skill improvement before and after the treatments please refer to video link from Appendix 2

After 25th treatment (8/17/2021), I continued to work on him , however, there was no significant improvement, because BoyC and her mother got sick frequently and the treatments were missed.

The continuation of the treatment was broken.

Also BoyC became afraid of the needles, therefore he did not allow her mother and myself to stimulate the needles.

The treatment was stopped *after 46th treatment (11/28/2021)*

## IV. DISCUSSION

When is the best age for CP children to be treated with acupuncture therapy? To answer this question, we need to know how our brain grows. The process of healing requires good blood circulation, including our brain. Acupuncture has proved its effectiveness in stroke recovery CP and Stroke are both brain injuries. If acupuncture can help in stroke recovery, it can be helpful for CP rehabilitation.

At birth, the average baby's brain is about a quarter of the size of the average adult brain. Incredibly, it doubles in size in the first year. It keeps growing to about 80% of adult size by age 3 and 90% – nearly full grown – by age 5 (*firstthingsfirst.org*),

Brains develop in spurts called critical periods.

There are two developmental spurts.

The first occurs around age 2, with a second one occurring during adolescence. This first critical period of brain development starts around age 2 and concludes around age 7. Therefore, from 2 years old to 7 years old, I believe, this is the best window to work on CP children with acupuncture treatment for the following reasons:

1. Their brains are growing, acupuncture can facilitate brain growth.
2. At that age, most likely their fontanelles are closed. It is safe.
3. They are not physically strong, so it is easier for parents or assistants to hold them, secure their head and body during the treatment.
- 4 they are not busy with academic activities, time is more easy to find.
5. They won't remember much of the treatment when they grow up,

6. After the treatments, their behavior is the same or close to the same as other kids; they won't feel different when they start school. Therefore, when CP parents asked when it would be the best time to start acupuncture for my child? the answer is - the younger the better. Don't miss the golden window (2 to 7 years old).

If the CP patient is older than 7 years old, will acupuncture still be helpful?

The answer is yes, because the 2nd developmental spurt occurs during adolescence. In general, the younger the children are, the better results are. The older they are, the result is usually less significant.

I have been working on Cerebral palsy Children with acupuncture since 2019 (after I attended Dr. Liu ZhenHuan's pediatric acupuncture for CP/ASD/ADHD class), most of my patients have good results.

I have chosen BoyA to be the first case because his case is the only one that parents provide the 3rd party evaluation reports. From the report, we can see the improvements objectively.

I would like to summarize my experience in treating CP children (advice for CP parents).

1. Start as soon as you can, the younger the age the better the result will be, so don't wait.
2. Find an experienced pediatric acupuncturist. Not every acupuncture knows how to work with CP children.
3. Communicating with the parents, telling them what is going to happen before starting, having them prepared mentally, Acupuncture for CP children is not a pleasant experience, young patients don't understand it is good for them. It is usually a crying, yelling and fighting scene. Unlike a quiet, calm, pleasant acupuncture treatment.

4. Always come with extra hands, they can be used to secure the patient. This can shorten the needle inserting time, that is a torture to the parents and the patients, also the needles can be inserted at correct locations. When the patient is fighting really hard, needles are sometimes inserted imperfectly.
5. Making sure the needle retention time and stimulation frequency are enforced and performed as instructed by their acupuncturist, often soft hearted parents do not follow them, the needles are removed earlier and stimulation is skipped or done lightly.
6. Trying not miss the treatments, In Hübscher's research, After 72 hours, pain perception (VAS) was significantly lower in the acupuncture group compared to the sham acupuncture and control subjects(Markus Hübscher et.al, 2008), Similarly, Acupuncture effect on CP children lasts approximately 72 hours, acupuncture effect is a relay. Once a treatment is missed, the result is definitely compromised.

## V. CONCLUSION

Acupuncture works well for the CP children with multiple developmental delays. In this case series study, all three cases have multiple developmental delays.

Two out of three patients suffered from drooling, after the treatments, their drooling had completely stopped. No more bibs and saliva suction.

Two out of three patients suffered from speech delays, after the treatments, their speech ability improved. of three patients suffered seizure activities. the treatments, their seizure activities had reduced significantly.

Two out of three patients suffered from cognitive delays. After the treatments, they were more alert and aware.

All three patients suffered from motor delays, After the treatments, they were more mobile and flexible.

This case series is a great example, demonstrating how acupuncture can benefit cerebral palsy children with multiple delays.

We hope that Acupuncture will be well adapted by the Western medical society and the parents of Cerebral Palsy children. Acupuncture should be recognized as a standard treatment protocol for Cerebral Palsy Children, as much as they are counting on Physical Therapy, Occupation Therapy and Speech Therapy in the near future;

Nevertheless, more research and clinical trials are required before it can be fully adopted into CP children's healing.

## REFERENCES

1. Belskaya, G. N., Stepanova, S. B., Makarova, L. D., Sergienko, D. A., Krylova, L. G., & Antimonova, K. V. (2020). Akupunktura v profilaktike i lechenii insulta: obzor zarubezhnykh issledovaniy [Acupuncture in the prevention and treatment of stroke: a review of foreign studies]. *Voprosy kurortologii, fizioterapii, i lechebnoi fizicheskoi kultury*, 97(2), 68–77. <https://doi.org/10.17116/kurort20209702168>
2. Adams D, Cheng F, Jou H, Aung S, Yasui Y, Vohra S. The safety of pediatric acupuncture: a systematic review. *Pediatrics*. 2011 Dec;128(6):e1575-87. doi: 10.1542/peds.2011-1091. Epub 2011 Nov 21. PMID: 22106073.
3. Hao, J. J., & Hao, L. L. (2012). Review of clinical applications of scalp acupuncture for paralysis: an excerpt from chinese scalp acupuncture. *Global advances in health and medicine*, 1(1), 102–121. <https://doi.org/10.7453/gahmj.2012.1.1.017>
4. Hao, J. J., Zhongren, S., Xian, S., & Tiansong, Y. (2012). Chinese scalp acupuncture for cerebral palsy in a child diagnosed with stroke in utero. *Global advances in health and medicine*, 1(1), 14–17. <https://doi.org/10.7453/gahmj.2012.1.1.005>
5. Lee, G. E., Lee, P. T., Ran, N., & Zhou, J. (2019). Scalp acupuncture for children with cerebral palsy: A protocol for a systematic review. *Medicine*, 98(48), e18062. <https://doi.org/10.1097/MD.00000000000018062>

6. Li, L. X., Zhang, M. M., Zhang, Y., & He, J. (2018). Acupuncture for cerebral palsy: A meta-analysis of randomized controlled trials. *Neural regeneration research*, *13*(6), 1107–1117. <https://doi.org/10.4103/1673-5374.233455>
7. Novak, I., Morgan, C., Adde, L., Blackman, J., Boyd, R. N., Brunstrom-Hernandez, J., Cioni, G., Damiano, D., Darrach, J., Eliasson, A. C., de Vries, L. S., Einspieler, C., Fahey, M., Fehlings, D., Ferriero, D. M., Fetters, L., Fiori, S., Forsberg, H., Gordon, A. M., Greaves, S., ... Badawi, N. (2017). Early, Accurate Diagnosis and Early Intervention in Cerebral Palsy: Advances in Diagnosis and Treatment. *JAMA pediatrics*, *171*(9), 897–907. <https://doi.org/10.1001/jamapediatrics.2017.1689>
8. Vitrikas, K., Dalton, H., & Breish, D. (2020). Cerebral Palsy: An Overview. *American family physician*, *101*(4), 213–220.
9. Zhang, X., Che, Y. P., Li, H. F., Yin, H. W., Chen, T., Dong, Q., & Du, Y. (2019). *Zhongguo zhen jiu = Chinese acupuncture & moxibustion*, *39*(9), 940–944. <https://doi.org/10.13703/j.0255-2930.2019.09.007>
10. Xiong W, Cheng L, Tang G, Hou X, Zhu M, Lu L, Zhong Z. Acupuncture for drooling in children with cerebral palsy: A protocol for systematic review. *Medicine (Baltimore)*. 2021 Apr 9;100(14):e25393. doi: 10.1097/MD.00000000000025393. PMID: 33832131; PMCID: PMC8036064.
11. Hübscher M, Vogt L, Bernhörster M, Rosenhagen A, Banzer W. Effects of acupuncture on symptoms and muscle function in delayed-onset muscle soreness. *J Altern*

Complement Med. 2008 Oct;14(8):1011-6. doi: 10.1089/acm.2008.0173. PMID:  
18990049.



## APPENDIX

Appendix 1: <https://www.youtube.com/shorts/DeqwJjzhg>

Appendix 2: [https://www.youtube.com/watch?v=C\\_jeZf87rqw](https://www.youtube.com/watch?v=C_jeZf87rqw)

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