

KINESIO TAPING® :

A CASE STUDY FOR USE AS PART OF PATIENT POSITIONING INTERVENTIONS

Introduction

Working with patients with a variety of physical disabilities and complex positioning needs creates a challenge to find that “just right” fit when evaluating for seating and positioning equipment. Many patients require significant supports to maintain biomechanical alignment and limit the progression of postural deformities. Although we want patients to be as active as possible, with each support added the possibility for movement is decreased.^{1,2,3} How can we support opportunities for movement and strengthening while simultaneously providing supported alignment? How can we help our patients become active participants in their environment instead of passive observers? Most importantly, what can we, as clinicians, do to ensure our equipment recommendations are both functional and comfortable?

These challenges drive us to think critically, and explore new possibilities. With an ever expanding array of positioning equipment available, the options are many. Nevertheless, there are cases where the “just right” fit remains out of reach. After years of navigating this challenging process and struggling to achieve both stability and movement in a positioning system, we began to think outside of the box and explore new positioning supports. Using Kinesio Taping® to promote specific postures and desired movements in our patients was proving to have great potential by using an existing intervention in a new way as a postural support.

What is Kinesio Taping®?

Kinesio Taping® is a method of functional taping using elastic tape. There are a variety of applications to help support or hold a joint or position, increase proprioception and body awareness, and/or position a part of the body in better alignment.^{4,5,6} This tape has most commonly been used for orthopedic patients and athletes. It has gained visibility in recent years at the Olympics, as well as in many televised sporting events. The brightly colored tape adorning the shoulders of Kerri Walsh as she went for the Olympic gold has become increasingly popular and is beginning to be used more widely across settings. One such setting includes use of Kinesio Taping® for the population of complex neurologic patients.^{7,8} Kinesio Tape® may be used to promote desired alignment for daily positioning, to inhibit destructive postures, and to incorporate the benefits of dynamic supports into positioning systems for these patients.

Over the last several years, using Kinesio Taping® applications on a population of patients with cerebral palsy and other neuromuscular disorders afforded us many opportunities to observe its positive effects. We have seen a number of great success stories, and have been pleasantly surprised at the impact of this intervention. We have learned that Kinesio Taping® can be a successful intervention to achieve the goals of optimizing function in positioning equipment. The results of a taping trial often led us to make different equipment choices when Kinesio Taping® was used as an adjunct to the positioning system.

Background

Levi is one of our very young and success stories. When he entered our care, he was 2 years old with a history of prematurity and diagnoses of periventricular leukomalacia,

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cerebral palsy, hemiparesis, spasticity and cortical visual impairment. He attended group therapy sessions twice a week for two and a half hours where he received occupational, physical and speech therapies. He also attended aquatic therapy bi-weekly and received in-home early intervention services intermittently through his county. Medical interventions included oral baclofen daily and periodic Botox injections. Additionally, Levi had bilateral upper extremity splints and ankle-foot orthotics.

Seating

Prior to beginning therapy at our center, Levi had already received a Zippie® TS manual wheelchair. His seating system included a headrest, lateral trunk supports, four point anterior chest harness, pelvic belt and footrests. The supports and features of this wheelchair theoretically had everything Levi and his family should need for daily use. However, his posture in this chair was not ideal and his family did not use the equipment regularly. Levi's mother noted his posture was becoming increasingly rounded, and he was less active in this seating system than in floor positioning or a stroller. Additionally, Levi would soon be a big brother, and the breakdown and lifting of his wheelchair for transport was much more cumbersome than using a standard stroller. With visible benefits not outweighing the challenges at that time, Levi's family used the wheelchair sparingly. Our goals for seating were to assess his current posture, work on movement and strengthening, trial dynamic supports, and determine how to provide Levi with more movement

and active participation in his seating. Our hope with this plan was to increase functionality for Levi and his family to use seating equipment more regularly.

Levi presented with rounded shoulders, scapular winging, flexor posturing of his right arm, forward head posture, rounded trunk and often leaned to his right due to increased right side involvement (see Picture 1). As a result of this posture, therapists and family noted a number of deficits. Increased use of tilt was being used to help manage his rounded trunk and forward head. While tilting his wheelchair back was certainly appropriate in many situations, it was not a solution for all environments. In fact, the increased use of tilt had a number of negative functional implications for Levi. This passive positioning in his wheelchair limited his active weight shifts and ability to participate in transitional movements. It made reaching very challenging, and led to decreased opportunities for play. Visually, tilting left him staring at the ceiling which was less than ideal for his visual development, contributed to poor head and neck posture, and limited his opportunities for learning and social engagement. Finally, his rounded posture and limited ribcage mobility greatly decreased his breath support, which made talking quite challenging.

While these concerns were being addressed through therapy, it was important to find ways to address his positioning needs in all environments. Levi was a young boy who would need much equipment for daily positioning in the future. However, with equipment trials in process, a plan was needed to meet his needs using items his family could already access. The challenge became finding ways to help promote good posture and alignment in the home environment, through modifying commercially available items, or teaching new strategies for positioning. Kinesio Taping® was a helpful tool, which was trialed to assist with promoting these postures at home. Applications were used to inhibit shoulder rounding, trunk rounding and forward head posture, while concurrently supporting the shoulder girdle in better alignment. With consistent applications and parental compliance with home positioning and activities, gradual improvements in his rounded posture were noted. As he progressed, less supportive Kinesio Taping® applications were needed and different Kinesio Taping® methods to facilitate active extension, improve postures and promote desired movement patterns were utilized. In therapies and at home, it was noted Levi was more active in sitting postures, more playful and interested in toys, and more socially engaged.

In a relatively short period of three to four months from entering therapy and beginning trials of Kinesio Taping®, Levi's posture completely changed. As illustrated in Picture 2, Levi went from a forward flexed, rounded and passive posture, to a much more active and upright posture. He demonstrated decreases in trunk rounding, scapular winging, right upper extremity flexor posturing and the need for upper extremity propping and trunk supports for stability and balance. Increases were noted with extension and upright trunk posture, postural control and balance, initiation and speed of righting reactions, and sitting endurance. He also demonstrated more lower extremity weight bearing, initiation of sit to stand transitions, weight shifting and trunk rotation during reaching and play, and a better upright head posture for visual attention and social interaction.

What began as an intervention to promote desired postures in commercial equipment at home during equipment trials, led to drastic changes in posture that completely changed his equipment plan. Levi went from requiring a tilt in space wheelchair with full support, to being able to maintain upright posture in a saddle seat with less supports (see Picture 3). Instead of adding or altering supports on his wheelchair, we were able to take them away and even considered completely different types of equipment and seating.

The positive results and impact of Kinesio Taping® carried over to many other areas as well. Levi was now able to maintain a more upright trunk posture, with decreased shoulder and trunk rounding and a more open chest. This improved posture placed him in better biomechanical alignment in order to take deeper breaths. He was also learning to use his core muscles more consistently, and we began to target his core strength and ribcage mobility with Kinesio® Tape applications. The results were much more drastic than we could have imagined. Not only did he have better breath support, he was demonstrating greater endurance for sitting postures and was talking much more and much louder. When testing his breath support with his speech therapist before and after Kinesio® Tape was applied, significant improvements were noted (see Picture 4). Additionally, his mother consistently reported that he talked more, made new sounds and talked louder.

Standing and Gait

These positive impacts carried over into other facets of Levi's positioning needs, including the supports he required

for standing and gait. Before Kinesio Taping® was started, Levi presented with a crouched posture, left hip rotation and knee hyperextension, trunk rotation, uneven weight bearing through legs, and decreased control for reaching during supported standing. After Kinesio® Tape was applied, he required less support for standing, and displayed less trunk rotation and hyperextension of his left leg with improved bilateral weight bearing. Additionally, his reaching improved and he was more active in standing (see Picture 5). These changes led to different equipment choices. Levi required less supports for standing and was able to tolerate prone standers with a higher activity level and increased overall endurance.

Initially, Levi used a Pacer gait trainer with a chest prompt, pelvic seat and ankle prompts. While in this gait trainer, Levi relied heavily on the pelvic seat and leaned forward into the chest prompt during ambulation. He demonstrated a scissoring gait pattern with decreased step and stride length and relied heavily on extensor tone to initiate movement. As his trunk control improved through therapies and Kinesio Taping®, Levi was able to remove supports from his gait trainer. He was gradually able to walk without the pelvic seat and decreasing use of the chest prompt as his ability to actively use the forearm prompts improved. Within two months, Levi was demonstrating emerging skills for use of a posterior gait trainer, with only a pelvic prompt, chest strap, and handles (see Picture 6). His gait pattern improved dramatically with much less scissoring. Increases were observed in trunk extension and upright head posture, active hip and knee flexion, step length, reciprocal stepping, speed, and endurance.

Summary

Determining the right equipment to meet the positioning needs of a patient is a challenge. It is like a puzzle with many pieces to consider how to find that "just right" fit, and really see the whole picture. Considerations for dynamic positioning are a crucial part of the process, to optimize comfort and function. As clinicians, we need to use every tool in our box to achieve this goal. While Kinesio Taping® may not be a long term solution, it has proven to be very helpful for the right patient when used as an adjunct to positioning systems and interventions. As in this case with Levi, Kinesio Taping® can be a strategy to gain skills and improve posture. It can also promote desired positioning in less than ideal equipment scenarios. Furthermore, it can be helpful to simulate dynamic positioning strategies, and assist in determining equipment and supports to meet the patient's needs. When applied by a trained clinician, Kinesio Taping® can be a powerful tool and adjunct to positioning interventions, in order to achieve stability, active positioning, function, and comfort for our patients.

(CONTINUED ON PAGE 53)

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KINESIO TAPING®...
(CONTINUED FROM PAGE 52)



PICTURE 1

PICTURE 1: Early sitting posture, with significant trunk rounding in November 2012.



PICTURE 2A

PICTURE 2A: Rounded posture in seating prior to Kinesio Taping®.



PICTURE 2B

PICTURE 2B: Improved upright posture after Kinesio Taping®.



PICTURE 3

PICTURE 3: Improved postural control in February 2013, while seated in equipment with less supports.

PICTURE 4	BEFORE	AFTER
TOTAL TIME VOCALIZATIONS RECORDED	7:06 MINUTES	7:27 MINUTES
FREQUENCY OF VOCALIZATIONS	11:00 MINUTES	48:00 MINUTES
GREATEST NUMBER OF SYLLABLES PER BREATH	4:00 MINUTES	6:00 MINUTES
AVERAGE NUMBER OF SYLLABLES PER BREATH	1.45 MINUTES	1.66 MINUTES

PICTURE 4: Data taken from videotaping of speech output in one session, before and after Kinesio Taping®.



PICTURE 5A
(11/28/2012)



PICTURE 5B
(11/28/2012)

PICTURE 5A & 5B: Standing posture and manual supports, before and after Kinesio Taping® in one session.



PICTURE 6

PICTURE 6: Walking in gait trainer with less supports.