

# Pediatric OTs Love Lycra

Children with sensory disorders respond to this durable, versatile fabric

By Rhoda P. Erhardt, MS, OTR/L, FAOTA, and Heather Schmidt, MS, OTR/L

In an occupational therapy clinic in Washington State, a gravitationally insecure child climbs into a suspended four-pointed swing with multiple layers of Lycra®. As he moves through different layers, he is improving strength, balance and motor-planning skills.

A younger and more involved child, with few opportunities for exploring movement, is placed into a stand-alone structure constructed of Lycra almost daily for several months in a rehabilitation center in Mexico. He learns to bring his head, eyes and hands to mid-line, facilitating the eye-hand coordination necessary for manipulating toys.

## What is Lycra?

Lycra is a trademarked product of DuPont for Spandex (elastane) fiber. The fabric's properties vary based on the percentages of elastane used in the fiber — e.g., 80% cotton and 20% Spandex.<sup>1</sup>

While some commercial therapy Lycra products are costly, many occupational therapy practitioners fabricate their own therapeutic equipment. For example, Rosemary White, OTR/L, owner of Pediatric PT & OT Services in Seattle and Pacific NW Pediatric Therapy in Portland, Ore., created a swing from 3-4 layers of 60-inch



Top photo: A gravitationally insecure child climbs into a suspended four-pointed Lycra® swing. Inset photo: A young child is placed in a stand-alone Lycra structure to practice eye-hand coordination.

double-width Lycra sewed together with an overlock stitch on a sewing machine, then stretched and suspended from four points.

Irene Ingram, OTR, owner of Therapeutic Designs and Services in Hartsville, S.C., buys fabric remnants at a much lower cost than the commercial companies, and makes tunnels from Lycra for families to use in home programs.

## Therapeutic Value

Lycra materials are widely used to facilitate children's adaptive interactions with their clinic, school and home environments, and contribute to positive motor, social and

emotional outcomes through participation in the occupational performance domain of play.<sup>2</sup> Suspended swings, sheets/blankets, ropes, tunnels and compression clothing made from Lycra are just some of the many products that have been used in the delivery of pediatric sensory integration interventions.

Occupational therapy practitioners have designed individualized activities to facilitate these essential components of function for family-developed goals:

- Integration of primitive reflexes through elongation, activation, strengthening and grading of multiple muscle synergies throughout the body, especially in the core, to achieve refined three-dimensional movement;
- Strength and stability of the shoulders, arms and hands through grasp, weight-bearing and weight-shifting, and of the pelvis, knees and feet through weight-bearing;
- Dynamic stability with controlled mobility throughout the body, preventing fixing/holding or compensatory patterns;
- Balance and coordination through integration of vestibular and somatosensory input with each action; and
- Depth and variability of respiratory functions to support posture, self-regulation, alertness and vocalizations.

## Interviews With Experts

Six occupational therapy practitioners specializing in the treatment of children with sensory processing disorders and physical disabilities agreed to be interviewed about

why and how they use Lycra materials and equipment in their practices. The co-authors recorded and transcribed the telephone interviews and then coded the texts to extrapolate common themes and to link types of products with therapeutic activities currently used.

A frequent comment from therapists was that Lycra has become one of their favorite therapy tools for infants and children of different degrees of disability because it provides a wide range of therapeutic opportunities, from providing a cocoon-like space in which they feel extremely safe to a challenging environment where they are self-motivated to explore new movements. When asked the following questions, therapists replied:

***When did you start using Lycra and why?***

OTs reported that they have used Lycra in their clinics, in clients' homes, and in a school context for many years. Introduced to it at continuing education events or by other therapists at their place of employment, they appreciate how it lends itself to versatile, therapeutic, and play-based activities.

***Which activities with Lycra are favorites of yours, as well as children's?***

Almost all agreed that their favorites were always the activities that provided opportunities for that just-right challenge while having fun. According to Angela Schoepf, MA, OTR/L, director of rehabilitation at NorthLakes Community Clinic in Ashland, Wisc., children seem drawn to the suspended sheets and enjoy climbing in, exploring movement, and moving from layer to layer. It can be adapted in many ways for different needs.

For a child who is gravitationally insecure, Nancy Lawton-Shirley, OTR/L, owner of Points of Stillness in Hudson, Wisc., hangs one layer that almost touches the ground, puts some pillows in it, and introduces the child to a comfortable and safe experience that's possible while exploring an unstable surface. Her colleague Teresa Gillen, OTR/L, says, "That's probably the most popular piece of equipment that we use in the clinic."

Alexander Lopiccolo, COTA/L, CPT, NC, therapist at Bothell Pediatric & Hand Therapy

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in the Seattle area, says that the children's favorite activity is climbing up and down and transferring through layers in a four-pointed swing. He encourages therapists to explore their own creativity and share their discoveries. He recommends Lycra compression clothing and weighted blankets to parents because "that deep sustained pressure can help with body awareness, self-regulation, core activation, and shoulder stability."

***Can you describe the outcomes and results you've observed?***

Lawton-Shirley has observed changes such as reflex integration, more-efficient weight shifts, less gravitational insecurity, better quality of movements, and increased hand strength. On an annual trip for the Red Thread Charities, Lawton-Shirley and Gillen brought Lycra equipment to several Chinese orphanages and held training sessions about its use.

The staff had never before seen these children with sensory deprivation explore movement, play, smile and vocalize so much. They were intrigued by the joy they observed. Infants were particularly responsive while interacting with a stand-alone product created for babies.

This group of therapists considered Lycra a helpful tool to calm the nervous system when a child's arousal level causes difficulty transitioning from one activity to another. By tapping into so many sensory systems (tactile, proprioception and vestibular) that regulate emotional states, therapists have observed children achieving functional goals in the occupational performance areas of play and social participation by:

- Being motivated to play;
- Communicating wishes about play: what, when, with whom and how;
- Engaging in spontaneous, parallel and collaborative play with their peers;
- Taking turns and sharing with others.

***Are there any unique ways you have used equipment made from Lycra materials?***

Ingram constructs a vertical wall made of Lycra so that when children run into it, they are "boomeranged" back into pillows — a highly intensive proprioceptive and vestibular experience. For home programs, she secures Lycra over storage tubs, places the baby inside, and shows parents how to activate righting and equilibrium reactions by tilting the tub. According to Ingram, so much grading is possible with Lycra to meet the needs of different children at different times by varying its thickness, size, layers, position, length, diameter and weight.

***What do you consider the pros and cons for using Lycra in treatment?***

Patricia Oetter, MA, OTR/L, FAOTA, a private practitioner in San Francisco, says that the most important advantage for treatment with Lycra is that it provides "the best postural core muscle workout ever invented." She reminds therapists that humans have an intrinsic motivation to master gravity and spatial/temporal awareness, and that children find the equipment inviting and challenging.

"I don't have to do much, just watch and guide," said Oetter. Her only drawback is the issue of clinics or homes having enough space for the larger equipment.

Other therapists admit that although space requirements can be daunting, many smaller pieces, such as Lycra tunnels, could be compacted for storage. Many categorize safety as a concern, while others consider it just an issue of good clinical practice. They all agree that children need supervision while using certain equipment, in the home as well as in the clinic.

### **Online**



For a patient handout describing the best fine-motor activities for children visit [www.advanceweb.com/othandouts](http://www.advanceweb.com/othandouts) and select the Pediatric & School-based category.

**Favorite Therapy Tool**

Six OT practitioners specializing in the treatment of sensory processing disorders and physical disabilities describe Lycra as a favorite play-based therapy tool because of its versatility, adaptability and motivational qualities, as well as its low cost and durability. Activity ideas share common therapeutic themes: contributing to self-regulation and improved quality of movements through proprioceptive and vestibular input, offering opportunities for just-right motor challenges, and supporting participation in the occupational performance domains of play and social interaction. ■

References are available at [www.advanceweb.com/otreferences](http://www.advanceweb.com/otreferences)

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**Ideas for Therapeutic Activities Using Lycra®**

Category	Therapeutic Ideas for Infants and Children
Bed sheets, blankets	Sleeping under sheet tightly wrapped under mattress; weighted blanket covered with Lycra forming to body
Body socks/sacks	Pushing fabric out with arms and legs, keeping head inside, vision occluded to rely more on proprioceptive and vestibular senses
Circle bands	Standing inside the band with a group, everyone stretching it out as far as possible; playing circle games: farmer in the dell, hot potato, grey duck
Compression clothing	Wearing choice of upper-body shirts, long or short sleeves, underwear, leggings and skullcap, for lengths of time tolerated, up to all day
Stand-alone structures	Placed in different positions (supine, prone, side-lying, sitting) to encourage exploration and motor problem-solving; searching for hidden toys
Swings	Being spun with a strong rotary motion until the swing is wound as tight as possible, then unwinding when let go, spinning and twisting again in the opposite direction
Suspended fabrics	Exploring numerous movement possibilities, climbing through three or more layers
Tunnels	Crawling through tunnel on hands and knees or on stomach (army crawl); pushing a heavy medicine ball through for more proprioceptive input; crawling through inclined or suspended tunnel

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### Developing a Plan of Care

Upon admission to Kessler Institute, a patient who has sustained an SCI is evaluated by a physiatrist and other members of the interdisciplinary team, including occupational and physical therapists, all of whom are trained specifically in the treatment of SCI.

Based on this initial evaluation, an integrated plan of care with short- and long-term goals is developed and subsequently updated as warranted at weekly team meetings. The patient will also interact with other team members including a case manager, respiratory therapist, recreation therapist, dietician, psychologist or neuropsychologist, art therapist, music therapist, driver rehabilitation specialist and vocational counselor. Working together with these healthcare professionals, the primary OT and PT guide the patient to become as functionally independent as possible and facilitate a safe discharge to home.

Patients with incomplete tetraplegia can gain functional independence through rehabilitation techniques that foster normal movements of the upper and lower extremities rather than compensatory patterns. These patients experience a degree of motor and sensory return below the level of injury and can better accomplish activities of daily living with less adaptive equipment.

With conditions such as central cord syndrome, with greater impairment of the upper extremities, and Brown-Sequard Syndrome, in which one side of body is more impaired than the other, the interdisciplinary team must provide innovative treatment to achieve varying amounts of sensory and motor return.

# Emerging Function

## Innovative treatments for incomplete tetraplegia

By Barbara Garrett, PT, NCS, Janelle Carnahan, PT, DPT, ATP, and Keara McNair, MS, OTR/L

One of the most devastating conditions resulting in long-term impairment is a spinal cord injury (SCI) with significant neurological deficits. Over the past three decades, incomplete spinal cord injuries have increased dramatically, accounting for 50% of all injuries in 1991 to 66% in 2016, according to the National SCI Database.

Studies have also shown that a therapeutic focus on regaining function can be more effective for these patients than teaching compensatory movement patterns for the extremities and trunk — including therapeutic techniques that stimulate neuroplasticity,

commonly used in rehabilitation for hemiplegia after CVA.

A specialized inpatient rehabilitation program that includes such innovative therapies to promote normal functional recovery can increase the likelihood of discharge to home rather than to a long-term care or nursing facility.

The interdisciplinary inpatient SCI team at Kessler Institute for Rehabilitation in West Orange, N.J., one of 14 centers in the United States to receive federal designation as a model system for spinal cord injury treatment and research, provides a variety of interventions to facilitate neurorecovery.



### Online

For a patient handout on what to expect after spine surgery visit [www.advancweb.com/othandouts](http://www.advancweb.com/othandouts)