blood pressure, and overall movement. She then conducted a pilot study of her own—with parental consent—applying weighted vests to children with and without autism. The unaffected youngsters reported that wearing the vest made them feel sleepy, but showed no appreciable change in pulse or blood pressure, whereas the subjects diagnosed with autism demonstrated a measurable drop in both. Liotta-Kleinfeld believes this is a fruitful area for more research.

Her own study and considerable clinical experience indicate that weighted vests help children improve their school performance by reducing their motor activity. Liotta-Kleinfeld has often won teacher support by demonstrating a vest's effectiveness. She cites the example of an elementary-age boy whose written output increased significantly while he was wearing the vest. However, similar to the findings in animal trials, the vest initially increases a child's arousal and, therefore, should be put on several minutes before beginning a scheduled activity. Liotta-Kleinfeld cautions, though, that if left on more than 45 minutes the vest may produce a rebound effect.

Vests are usually kept at school where teachers use them with individual children in situations identified, but not necessarily supervised, by the OT. Teachers, in turn, give feedback to the therapist on each child's behavior.

Parental consent is required for vest use and most parents have been enthusiastic, according to Liotta-Kleinfeld. Some parents even report that their children with autism sleep better at night after the vests are used at school. Parents occasionally have borrowed vests to take home over a weekend or have made their own for home use under a therapist's guidance. Parental acceptance is a two-edged sword, however. Once the vest is out of the therapist's hands, there is no way to ensure that it is being used properly. One concern is that parents may increase the weights beyond the point where they are effective or leave the vest on the child too long.

Although the use of weighted vests is relatively new and lacks extensive research, Liotta-Kleinfeld includes it among therapeutic techniques presented to her OT students. She and **Vicki Smith,** MBA, OTR, a fieldwork coordinator at Gannon University in Erie, Pa., recently teamed up to give a short course on the effects of weighted vests on behavior. Smith, who also works as a consultant to community-based group homes for adults with developmental disabilities, used a fishing vest to create a modified weighted vest for an adult woman with severe mental retardation and scoliosis. She says that weighted vests are often successful in reducing self-stimulating behaviors among adults with developmental disabilities.

Cheri Blanchard, COTA, also has placed a variation of a weighted vest—a weighted blanket—over the shoulders of agitated elderly nursing home residents to calm them. However, most of her experience with weighted vests involves preschoolers and school age children in the Fayetteville, N.C., schools. Three OTs and three OTAs, including Blanchard, work in an extended school system and all use weighted vests selectively with children who have autism, Fragile X, Smith-Magenis, Coffin-Lowry, Tourettes, cerebellar ataxia, and other conditions that affect sensory modulation and attention.

Trial and Error

Blanchard estimates that the Fayetteville school system has 10 vests that are signed out by teachers and rotated among the children needing them. At first, the vests are calibrated to about 5% of a child's body weight, which may be gradually increased as the situation warrants. A few children, Blanchard reports, need and can tolerate as much as 25% of their body weight without imposing undue restriction on their mobility. Of course, physical condition must be taken into account; a child with joint disease would be given minimal weight, and—in this particular school system—a vest is usually not left on more than 10 to 15 minutes at a time.

Blanchard first learned about weighted vests three years ago in a workshop on sensory integration applications in the classroom. With teachers present, she chose to try out the new technique with three pre-kindergarten children with autism who were watching a video. "The results were amazing," she says; "once the vest was on, the child would sit still and attend to the video and actually interact with it by singing." Because the vests usually produce visible results from their first wearing, most teachers and parents have eagerly embraced them. However, Blanchard emphasizes that a vest is not a magic bullet working in isolation, but, rather, just one element within a total treatment context.

In the case of preadolescents, for whom a weighted vest might prove an embarrassment, Blanchard often substitutes a weighted backpack or fanny pack. One boy has done well with a camel water bag and long straw, which he is allowed to suck on in the classroom for a further calming effect. Many older kids, especially those who have higher functioning and some insight into their condition, are able to self-modulate, donning a weighted item themselves when they feel distracted. Younger children may also ask to wear a vest when they think they need it. "If a youngster resists, then the vest is probably not working for them," says Blanchard. "It's not appropriate for everyone."

Linda Gilles-Zirbes, OTR, who has used weighted items for the last six years in the Palatine, Ill., school system, agrees that not all kids respond equally. She individualizes her approach to weight use, experimenting until she finds the optimal application for each child. In addition to vests, she uses lap and shoulder weights with some youngsters and a weighted blanket on occasion. A case in point is a 9-year-old girl with cognitive deficits who often sucked her thumb, bit her hands, and scratched others. These behaviors almost vanished after Gilles-Zirbes instituted 20-minute time-outs, during which the girl was gently pushed in a net swing while wrapped in a weighted blanket. The child's school task performance improved markedly right after her time under the blanket. Gilles-Zirbes uses weights of up to 10 pounds. Too much weight, she has found, can cause a child to disconnect and stop participating altogether.

One of the many questions that have not been answered, however, is how to effectively determine how much weight is too much.

Do weighted vests represent the cutting edge of a bona fide and promising new discovery or just the latest fashion in innovative techniques? The answer awaits a more rigorous analysis of their clinical effects. **OT**