coordination, strength and mobility, and incorporated the accessory items into the VR exercise regime.

In the present study, on the first day the child was familiarized with the virtual exercise and movements. Once the child was familiarized, he was instructed to practice a VR exercise that was broken down step-by-step. Thus, movements could initially be worked on individually and then progressively integrated together toward the targeted reaching motor behavior. For the bird–ball game, designed to improve reaching, the segmental shoulder flexion and elbow extension and wrist extension motion were practised individually and later coordinated together in progressive steps to produce a successful reaching motion. The VR stimulus was randomized in terms of speed, direction, and distance. As the child advanced in ability to perform the target VR tasks and increased strength, we systematically increased resistive force by applying a light child cuff-weight around the wrist. The feedback frequency was gradually lessened. Behavioral techniques such as verbal praise, cheers, and clapping, or rewarding with toy coupons were incorporated. Initially, the child was praised for any reaching motion; as his ability improved, he was required to demonstrate gradually more accurate reaching attempts to receive a reward.

Letters to the editor

'Efficacy of botulinum toxin A, serial casting, and combined treatment for spastic equinus: a retrospective analysis'

SIR–I read this paper¹ with interest. We use all three treatment strategies for paediatric contracture of the calf muscle-tendon complex.

It would appear from this study that casting alone or in combination with botulinum toxin A is superior to toxin alone in promoting an improved joint range in these retrospectively-studied patients. However, I am not sure that the patients in each group are directly comparable as the toxin alone group had the mildest mean contractures, i.e. they only lagged by a mean of 2° short of the neutral angle at the ankle, compared with mean contractures of 5 and 6° respectively for the casting alone or casting and toxin groups respectively. Not surprisingly, the joint range achieved by the toxin alone group was less than that in the other treatment modalities.

Can the figures be reworked to show how toxin alone works for mean contractures of 5 to 6° compared with casting alone or combination treatment?

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References

1. Glanzman AM, Heakyung K, Swaminathan K, Beck T. (2004) Efficacy of botulinum toxin A, serial casting, and combined treatment for spastic equinus: a retrospective analysis. *Dev Med Child Neurol* **46:** 807–811.

'Glanzman replies'

SIR-Dr Lin brings up a good point. However, the confound that Dr Lin describes would be based on the fact that the more contracted group had a greater amount of range to gain in order to reach a normal or functional range of motion. Our data, however, showed not only that the casting groups produced a greater change but also that, on average, they had a greater posttreatment range of motion $(100^{\circ} \text{ vs } 50^{\circ})$. One could make the assertion from this that as the botox group fell short of the two casting groups in their end range, the initial magnitude of the contracture was not a significant factor contributing to the differences we saw. Certainly, a prospective trial would be able to address this issue in a more satisfactory manner through the use of randomization or stratification to control the difference in initial contracture. This was not possible in a retrospective study. We have felt here that botulinum toxin A (BTX-A) alone has not been a robust enough treatment to correct the most significant contractures. As a result of this, at our institution, serial casting has been used in addition to BTX-A to treat the most severe contractures. Because of our clinical practice our data was skewed in this way and is a reflection of the treatment choices we make.

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