INTRODUCTION
Rigid orthotic management of scoliosis has been well documented over the years based on the varying methods of design from the Boston Brace (Emans et al 1985) to the Chêneau brace (Weiss et al 2007). However in neuromuscular scoliosis the outcomes using rigid bracing have often given cause for concern, based on personal experience. Over the long term curves have continued to progress even though good orthotic rigid brace intervention has occurred. This case study describes a unique method of orthotic management enabling full movement via the effects of force panelling within a dynamic elastomeric fabric suit.

METHOD
The work did not in any way form part of a formal research project and thus ethical approval was not sought. The authors have confirmed that this is in keeping with local National Health Service requirements for the submission of case study reports.

Subject: A male child (aged 4 years old) presented with myotonic dystrophy in March 2009. Sitting X-rays indicated a left sided 70° thoracic curve with an apex at T8. Vertebral rib angles were in excess of 20° (45°) with a marked protruding pectus carinatum evident that affected his breathing. The S1 perpendicular line was to the left of his neck showing major asymmetry to the left resulting in a sharp compensatory curve in the cervical spine. He was unable to tolerate rigid or semi-rigid spinal bracing and had a history of non-compliance. He was unable to walk independently and could stand only with much spinal support. Based on previous experience the treating were keen to use a non-invasive technique due to his poor muscle tone. Surgical intervention was out of the question due to poor health.

Curves of this magnitude are difficult to treat orthotically, and corrective interventions over 50° are often used to hold spinal curves prior, to surgical interventions. A dynamic elastomeric fabric orthosis (DEFO) suit, was used to try to provide some sensation of mid-line via proprioceptive feedback coupled with three point management and counter-rotation of the spinal segments. V-shaped translation panels and counter-rotation compression bands were incorporated to initiate the corrective moments based on X-ray blueprint (Matthews & Crawford 2006).

RESULTS
Follow up sitting x-rays in March 2010 indicated that the child’s curve had reduced to 35° from 70°. The left side curve was now one vertebra lower at T9 with the S1 perpendicular line now to the right of the cervical spine, even with a marked positional pelvic asymmetry to the left. There was a 33% reduction in the lateral shift seen at the apical vertebra. The pectus carinatum was visibly reduced and the vertebral rib angles had reduced. Parents reported that he was now able to stand independently and could walk with support through his hands.

DISCUSSION & CONCLUSION
The DEFO scoliosis suit has compliance probably due to the body compression (increasing core stability) and corrective forces being much lower in point pressure, but longer in term. The child can relearn core centralisation resulting in changed balance enhancing spinal alignment and reduced energy expenditure. The left shoulder should have been encased within the suit to reduce the shoulder protraction causing further thoracic curve angle reduction. This unique orthosis uses force and enhanced proprioception to aid body image learning (Matthews et al 2009) reducing the progression to structural changes.

REFERENCES
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