This search summary contains the results of a literature search undertaken by the Lincolnshire Knowledge and Resource Service librarians in **October 2010**.

All of the literature searches we complete are tailored to the specific needs of the individual requester. If you would like this search re-run with a different focus, or updated to accommodate papers published since the search was completed, please let us know.

We hope that you find the information useful. If you would like the full text of any of the abstracts listed, please let us know.

Alison Price  alison.price@lpct.nhs.uk  
Janet Badcock  janet.badcock@lpct.nhs.uk

**Librarians, Lincolnshire Knowledge and Resource Service**  
**NHS Lincolnshire**

**Beech House,**  
**Waterside South**  
**Lincoln  LN5 7JH**
Enquiry Details
Lycra garments for cerebral palsy

Opening Internet Links
The links to internet sites in this document are ‘live’ and can be opened by holding down the
CTRL key on your keyboard while clicking on the web address with your mouse

Full Text Papers
Links are given to full text resources where available. For some of the papers, you will need a
free NHS Athens Account. If you do not have an account you can register by following the
steps at: https://register.athensams.net/nhs/nhseng/ You can then access the papers by simply
entering your username and password. If you do not have easy access to the internet to gain
access, please let us know and we can download the papers for you.

Guidance on Searching within Online Documents
Links are provided to the full text of each of these documents. Relevant extracts have been
copied and pasted into these Search Results. Rather than browse through often lengthy
documents, you can search for specific words and phrases as follows:

Portable Document Format / pdf / Adobe
Click on the Search button (illustrated with binoculars). This will open up a search window. Type
in the term you need to find and links to all of the references to that term within the document will
be displayed in the window. You can jump to each reference by clicking it. You can search for
more terms by pressing 'search again'.

Word documents
Select Edit from the menu, the Find and type in your term in the search box which is presented.
The search function will locate the first use of the term in the document. By pressing 'next' you
will jump to further references.
Do lycra garments improve function and movement in children with cerebral palsy?

Three Part Question
In [children with cerebral palsy] do [Lycra garments] improve [function and posture]?

Clinical Scenario
The mother of a 5-year-old boy with athetoid cerebral palsy complains of difficulties putting his Lycra suit on each day. She is keen to know if it actually helps improve his function and movement.

Search Strategy
Medline, EMBASE and CINAHL were searched with the terms ‘cerebral palsy’ (as keyword and exploded MESH term) AND ‘Lycra’ (as keyword and exploded MESH term ‘splints’ and ‘clothing’ from search tree).

Limits were human, English language, age (0–18 years). Only papers from 1990 onwards were searched as Lycra splints/suits were only developed in early 1990s.

The Cochrane Library yielded no relevant results.

Search Outcome
No systematic reviews were found; 66 papers were identified, but only eight were relevant to the research question. One paper was a descriptive study, crossover and recipient trial, and one was a review article including two case studies. Five papers were case series and there was one case study.

Relevant Paper(s)

<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Patient group</th>
<th>Study type (level of evidence)</th>
<th>Outcomes</th>
<th>Key results</th>
<th>Study Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blair et al, 2006</td>
<td>24 Patients (15 months to 14 years) with cerebral palsy (7 spasticity, 5 athetosis, 7 dystonia, 4 ataxia, 1 hypotonia) and 8 controls (matched by age and ability). 8 patients given Lycra suits, for 8 h/day (4 weeks' wear, 3 weeks without, 6 weeks' wear)</td>
<td>Descriptive study, crossover trial and recipient study (level 2b)</td>
<td>Care giver questionnaire, Video recording</td>
<td>Improved postural stability for group (p=0.035) and individually (p=0.003) with Lycra suit from video.</td>
<td>Lack of validated assessment tools. Unclear randomisation. Observers not adequately blinded for video assessment</td>
</tr>
<tr>
<td>Edmondson et al, 2006</td>
<td>15 Patients (2–12 years) with cerebral palsy (2 hypotonia, 6</td>
<td>Case series (level 4)</td>
<td>Improvement in gross/fine motor skills</td>
<td>Wearing Lycra suit improved function and posture. Useful</td>
<td>No standardised assessment tool used</td>
</tr>
<tr>
<td>Author, date and country</td>
<td>Patient group</td>
<td>Study type (level of evidence)</td>
<td>Outcomes</td>
<td>Key results</td>
<td>Study Weaknesses</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>--------------------------------</td>
<td>----------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>spastic/athetoid, 4 spastic/diplegia, 2 spastic quadriplegia, 1 hemiplegia with ataxia) wearing Lycra suits for 6 h/day for 12 months</td>
<td>aid to other therapies.</td>
<td>Case series (level 4)</td>
<td>Paediatric Evaluation of Disability Inventory (PEDI). Patient/Carer questionnaire Motion analysis of 5 selected children</td>
<td>11 Children had positive change in one or more PEDI domain. Statistically significant improvement in group score for self-help domain p&lt;0.01. Less significant improvement noted with care giver scores (p&lt;0.05). Practical difficulties of garments highlighted in questionnaire. Only 1 from the 12 wanted second garment</td>
<td>Small sample size with no control group. Only focused on upper limb. Heterogeneous group of children with cerebral palsy. 7 Families reported their child did not like the garment</td>
</tr>
<tr>
<td>12 Patients (2–17 years old) with cerebral palsy (7 spasticity, 4 athetoid, 1 ataxic). Wore individually tailored Lycra garments for 6 h/day for 6 weeks plus usual therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knox V, 8 Patients (3–13 years) with cerebral palsy (2 spastic quadriplegia, 2 spastic diplegia, 2 choreoathetosis, 2 dystonic quadriplegia subgroups). Wearing Lycra garment for more than 4 h for 4 weeks</td>
<td>4 Children withdrew owing to non-compliance (n=3) or wearing spinal orthosis (n=1). Children who continued to wear garments showed benefits on standardised tests and questionnaire</td>
<td>Case series (level 4)</td>
<td>Gross Motor Function Measure (GMFM). Quality of Upper Extremity Skills Test (QUEST). Parent/child questionnaire Measured at baseline and 4 weeks</td>
<td>Unable to carry out statistical analysis owing to small sample size. Lack of control group. Potential assessor bias as author was main assessor in every case except one. Lack of patient appropriate upper limb assessment tool</td>
<td></td>
</tr>
<tr>
<td>Rennie et al, 8 Patients (5–11 years) (7 with cerebral palsy, 1 with Duchenne's muscular dystrophy). Predominant impairment: 5 spasticity, 1 athetosis, 1 hypotonia, 1 weakness. Wearing whole-body Lycra garments for at least 6 h/day for 6 weeks</td>
<td>3/8 Parents would not use Lycra garment again because of practicalities</td>
<td>Case series (level 4)</td>
<td>3D Gait analysis PEDI Parental reports (lower limb) Measured at baseline and 6 weeks</td>
<td>5/8 Children showed improved gait pattern. No statistically significant improvement in PEDI scores. 7/8 Parents would not use Lycra garment again because of practicalities</td>
<td>Small sample size. Only lower limb assessed. Heterogeneous sample group</td>
</tr>
<tr>
<td>Corn et al, 4 Patients (8–16 years) with cerebral palsy (1 ataxic cerebral palsy, 3 spastic quadriplegia). 2 were new to</td>
<td>No change in quality of unilateral upper limb movement. 1 Patient had a decrease in movement with long-</td>
<td>Case series (level 4)</td>
<td>Melbourne Assessment (upper limb). Assessed at baseline and intervention</td>
<td>Within-patient trends were analysed. Study lacked large homogeneous group of subjects.</td>
<td></td>
</tr>
<tr>
<td>Author, date and country</td>
<td>Patient group</td>
<td>Study type (level of evidence)</td>
<td>Outcomes</td>
<td>Key results</td>
<td>Study Weaknesses</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>-------------------------------</td>
<td>----------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Attard J and Rithalia S,</td>
<td>2 Patients (6 and 9 years) with cerebral palsy (spastic, athetoid quadriplegia and hemiplegia). Review of Lycra body suit and glove</td>
<td>Literature review. Case study (level 4)</td>
<td>phase twice weekly. Data collection period ranged from 14 to 17 weeks</td>
<td>term use</td>
<td>Patients were required to participate in many assessments to ensure validity</td>
</tr>
<tr>
<td>Hylton N and Allen C,</td>
<td>3 Patients (10 months to 12 years) with neuromotor deficits (spastic diplegia, quadriplegia and extensor posturing/poor postural control). Use of Lycra compression bracing</td>
<td>Case study (level 4)</td>
<td>Patient/Carer attitudes</td>
<td>Reported improved walking, balance, proprioceptive awareness and ability to complete complex skills</td>
<td>No validated assessments used. Small patient number</td>
</tr>
</tbody>
</table>

Comment(s)

Lycra splints and suits are made-to-measure garments designed for an individual child's needs. It is impossible to generalise about suitability and specific designs of garments making individual assessment and prescription essential. The extent to which the garment covers the child depends on what is required and varies from a simple glove for the hand and wrist to a full body suit. The benefits of Lycra include it being flexible, breathable and non-invasive. Garments can be reinforced if greater pressure is needed for particular muscles (Attard).

No systematic reviews or randomised controlled trials of Lycra garments have been conducted. Most of the published papers in this field are case series with small patient numbers. The available studies suggest wearing Lycra garments helps to improve proximal stability and function in some children with cerebral palsy, but evidence is limited. Many of the studies include children with different types of cerebral palsy and do not use objective outcome measures such as Gross Motor Function Measure (Neville).

It is important to consider the practical difficulties of wearing Lycra garments. They are tight fitting and difficult to get on and off. Children often complain of discomfort and they cause problems when bathing and toileting. Many of these problems could be overcome by improved design and considering toileting needs carefully.

The issue of cost cannot be ignored, with some garments costing over £1000 if extra boning is required and these garments need to be replaced as children grow. It is vital to consider the individual patient and carer attitudes to wearing Lycra splints and suits. Unless they can be made more functionally attractive they will only be used for children for whom the improvements in function outweigh the disadvantages of wearing the garment. At present, evidence suggests that this would include children with athetosis, ataxia and poor truncal tone.
Involvement of families in research and development could, via focus groups, address some of the functional issues of Lycra suits. With families, appropriate outcome measures for measuring success with Lycra suits could be developed. Randomised controlled trials with more homogeneous patient groups and adequate power to identify these outcomes are required. Cost-effectiveness also needs to be addressed. More research is needed before we can implement an evidence-based approach to using Lycra garments in the management of children with cerebral palsy.

Clinical Bottom Line
Lycra garments are useful as they provide the child with improved proximal stability which enhances functional abilities (grade C).

Lycra garments are expensive and can cause problems with a child's comfort and toileting (grade C).


---

2000 - 2005
The Use of Lycra Garments in Children with Cerebral Palsy: a Report of a Descriptive Clinical Trial
Author: Knox V.
Source: The British Journal of Occupational Therapy, Volume 66, Number 2, 1 February 2003 , pp. 71-77(7)
Abstract:
This study aimed to evaluate the effects of wearing Lycra garments in children with cerebral palsy. Eight participants, aged 3 years 5 months to 13 years (male = 4, female = 4) and with a diagnosis of cerebral palsy, were recruited. A repeated measures design was used, with participants tested with the Gross Motor Function Measure (GMFM) and the Quality of Upper Extremity Skills Test (QUEST) before and after intervention. Both parents and participants recorded the perceived advantages and disadvantages of the participant wearing the Lycra garment at the end of the trial.
Each participant received a baseline test, was then provided with a Lycra garment and was re-tested once wear time was more than 4 hours per day. Four participants withdrew from the trial (discomfort from suit, n = 3; prescribed spinal jacket, n = 1). Of the remaining four participants, all showed an improvement in either GMFM or QUEST score and one showed improvement in both test scores. All but one of the eight participants recorded functional improvements when wearing their suit.
In this population, the participants showed improvements in function when wearing a Lycra garment, but problems with discomfort remained a barrier for some children to their more sustained use

Volume 12, Issue 1, Pages 1-6 (September 2000)

New and Emerging Technology
Briefing
Lycra garments for cerebral palsy and movement disorders 2002
Assessment of upper-limb function and movement in children with cerebral palsy wearing lycra garments


J H Nicholson a1 c1, R E Morton a1, S Attfield a2 and D Rennie a3

Abstract

It has recently been suggested that lycra garments are helpful for children with cerebral palsy (CP). Twelve children, with athetosis, ataxia, and spasticity, were fitted with lycra garments (Kendall-Camp UK Ltd). Scores on the Paediatric Evaluation of Disability Inventory (PEDI) scales were determined before and after wearing the garment for at least 6 hours a day for 6 weeks. Five children with motor problems representative of the whole group were investigated during a reach-and-grasp task by kinematic motion analysis; reflective markers were used with and without the garment. Carers were given a questionnaire concerning the practicalities of using the garments. All 12 children made improvements in at least one of the functional scales of the PEDI, and scores for the whole group showed significant gains (Wilcoxon $\chi^2$ test, self-help $p<0.01$; mobility $p<0.5$; social $p<0.1$). These changes were usually slight, although noticed by carers. Six children made gains of at least one scale of the caregiver assistance scores, two of the children showed losses (due to difficulties removing the garment for toileting), and four showed no change. Motion analysis indicated that (1) two children with athetosis had improved proximal stability in sitting and in smoothness of arm movements, (2) one child with ataxia had improved in proximal and distal stability, and (3) two children with spasticity had more jerky movements, although one improved in proximal stability. All children had problems in wearing the garments, including problems with toileting and incontinence of urine; the parents of only one child wanted to continue using it. Results suggest that the functional benefit of lycra garments for children with CP is mainly due to improvements in proximal stability but this should be weighed against the inconvenience and loss of independence.

An evaluation of lycra garments in the lower limb using 3-D gait analysis and functional assessment (PEDI)

D.J Rennie a, S.F Attfield a, R.E Morton b, F.J Pola, J Nicholson b

Abstract

Whole body lycra garments were assessed in eight children using gait analysis, the paediatric evaluation of disability index (PEDI), and a questionnaire of parental acceptance. Seven of the children had cerebral palsy and one Duchennes muscular dystrophy. After initial assessment and fitting of the garment, there was a 2-week introduction period followed by 6 weeks of wearing the garment for at least 6 h everyday, following which they were re-assessed. The root mean square error (RMSE) was used as a measure of variability over three separate passes through the gait laboratory and was a reference figure for gait stability. Proximal stability around the pelvis improved for five children and distal stability improved for three. Five children improved in at least one aspect of the PEDI scale. Although the parents and children detected these improvements, they did not outweigh the disadvantages of wearing the suit and as a consequence only one out of eight families considered continuing with the lycra garment.

Table of References Found for Dynamic Lycra Orthoses Literature Review

In Hierarchy of Evidence (BMJ 2001)

http://www.dmorthotics.com/docs/appendix.pdf
Dynamic lycra splinting for children with cerebral palsy
Epidemiology
Cerebral palsy affects one in every 400 children with muscle spasticity occurring in about 80% of cases. There is no cure and therapies are aimed at increasing function and reducing long term disability.
Health Technology
Description
It is believed that dynamic lycra splinting may benefit some children suffering from cerebral palsy and neuromuscular disorders such as muscular dystrophy by improving their balance, muscle control, proximal stability and movement. Dynamic lycra splints or suits consist of sections of lycra of varying thicknesses stitched together using specific tensions and directions of pull. Sometimes plastic boning is also added to give extra pressure and support. The splints are made to measure and are designed to meet the specific needs of the wearer.
They can extend to the whole body or cover only a particular area, e.g., hand and wrist. Unlike previous splints they are flexible, not rigid, designed to move with the wearer and hence referred to as dynamic. Lycra splints can be used alongside other types of splints or replace them completely. As with other splints, they are likely to be used as adjuncts to other therapies such as physiotherapy. In the UK there are three suppliers of suits, but other dynamic lycra suits, based on similar principles, are available overseas.
Safety and Patient Issues
Lycra splinting is contra-indicated when adequate monitoring and supervision are not available, there is deemed to be a lack of purposeful intent or if severe epilepsy or chronic respiratory problems are present. Problems with comfort, reflux sickness, toileting and putting on/taking off the suit have been reported. Temperature can also be an issue, particularly in summer. These factors may all impact on compliance and motivation of the child. Problems can be alleviated to some extent by carefully assessing the needs of the child when fitting the garments, considering adding more zips and altering the boning of the garments, and changing the wearing regimen in hot weather.
Flett et al. believe that despite these problems, the fit and appearance of these garments as compared to other orthoses can make them attractive to children. The long term effects of wearing lycra suits are unknown. Attard and Rithalia state that further research is required to determine how much pressure is being applied to the skin and the body and the long term effects of this pressure.
Key Points
- Dynamic lycra splinting may improve functional abilities in the short term in some children with cerebral palsy.
- Suitability needs to be decided on a case by case basis.
- Further research is required to determine the long term effects of dynamic lycra splinting and which specific patient groups might benefit.
- No published evidence on the cost effectiveness of dynamic lycra splinting was identified.
Archimedes:
Question 1 Do lycra garments improve function and movement in children with cerebral palsy?
J E Coghill, D E Simkiss
Arch Dis Child 2010;95:393-395 doi:10.1136/adc.2009.178624
[Extract][Full text][PDF]
Effects of dynamic elastomeric fabric orthoses (DEFOs) on children with cerebral palsy.
Martin J Watson, Senior Lecturer
University of East Anglia, Faculty of Health
I read with interest the article ‘Do lycra garments improve function and movement in children with cerebral palsy?’ (ADC 2010 95(5): 393-395). I encountered this paper as we are currently involved in completing a systematic review on this topic, and now checking to ensure that we have considered all recent published materials. I thought it might be useful to identify that we have been involved in a number of evaluations of these orthoses in several clinical contexts (e.g. stroke, cerebral palsy
http://adc.bmj.com/content/95/5/393.1/reply

Additional Information
Job Skin site
Had useful references, but check out who sponsors the research
http://www.jobskin.co.uk/default.aspx?pageID=524
Search Results

Table of Contents

Search History ........................................................................................................................................................... page 2


2. An evaluation of the effects of a dynamic lycra(R) orthosis on arm function in a late stage patient with acquired brain injury. ......................................................................................................................................................................... page 3

3. Lycra pressure orthoses... Attard and Rithalia's article on "A review of the use of lycra pressure orthoses for children with cerebral palsy (vol 11(3), 2004, p.120). ......................................................................................................................................................................... page 3

4. A review of the use of Lycra pressure orthoses for children with cerebral palsy... including commentary by Farmer SE, and Näslund A. .................................................................................................................................................... page 3

5. Impact of second skin lycra splinting on the quality of upper limb movement in children. .................................. page 4


7. Assessment of upper-limb function and movement in children with cerebral palsy wearing lycra garments. .................................................................................................................................................... page 5


9. The development and use of SPIO Lycra compression bracing in children with neuromotor deficits. ................. page 6

10. A study of a dynamic proximal stability splint in the management of children with cerebral palsy. .................. page 6

11. Lycra splinting and the management of cerebral palsy. ....................................................................................... page 6
Search History

1. CINAHL; CEREBRAL PALSY/; 4227 results.
2. CINAHL; lycra.ti,ab; 24 results.
3. MEDLINE; CEREBRAL PALSY/; 12946 results.
4. MEDLINE; lycra.ti,ab; 43 results.
5. MEDLINE; 3 AND 4; 6 results.
6. CINAHL; 1 AND 2; 5 results.
1. **Question 1. Do Lycra garments improve function and movement in children with cerebral palsy?**

   **Citation:** Archives of Disease in Childhood, 01 May 2010, vol./is. 95/5(393-395), 00039888
   **Author(s):** Coghill JE; Simkiss DE
   **Language:** English
   **Publication Type:** journal article
   **Source:** CINAHL
   **Full Text:** Available in fulltext at Highwire Press

2. **An evaluation of the effects of a dynamic lycra(R) orthosis on arm function in a late stage patient with acquired brain injury.**

   **Citation:** Brain Injury, 15 June 2007, vol./is. 21/7(753-761), 02699052
   **Author(s):** Watson MJ; Crosby P; Matthews M
   **Language:** English
   **Abstract:** Primary objective: The aim of this study was to assess the effect of a dynamic lycra(R) orthosis in the management of upper limb paresis in a late stage stroke patient. Research design: A single case experiment, adopting a 3-phase ABA withdrawal design (without follow-up), approximately 6-weeks per phase, intervention being delivered in the middle/B phase. Method and procedures: Assessment of arm function was carried out on a weekly basis for the 18-weeks, using a battery of upper limb tests. The subject was prescribed a tailor-made lycra(R) orthosis which was worn daily during the middle phase of the trial. Main outcomes and results: Orthosis wear appeared to result in improvements in active range of movement, self-rated function and one component of a writing test, with some suggestion of a carryover effect when treatment was withdrawn. No intervention-related changes were seen in a dressing test. Ambiguous results were seen in a further writing test and a peg board manipulation assessment. Irrespective of intervention, the subject made positive changes in scores in the majority of assessments used, throughout the 18-week period. Conclusions: The findings suggest that a lycra(R) orthosis may have some beneficial effects on upper limb function late after brain injury. Results were however equivocal, suggesting (a) that effect mechanisms may be quite complex and (b) that future evaluations may require careful construction.
   **Publication Type:** journal article
   **Source:** CINAHL

3. **Lycra pressure orthoses... Attard and Rithalia's article on "A review of the use of lycra pressure orthoses for children with cerebral palsy (vol 11(3), 2004, p.120).**

   **Citation:** International Journal of Therapy & Rehabilitation, 01 July 2004, vol./is. 11/7(340-340), 17411645
   **Author(s):** Flett PJ; Gibson S; Murchland S
   **Language:** English
   **Publication Type:** journal article
   **Source:** CINAHL
   **Full Text:** Available in fulltext at EBSCO Host

4. **A review of the use of Lycra pressure orthoses for children with cerebral palsy... including commentary by Farmer SE, and Näslund A.**

   **Citation:** International Journal of Therapy & Rehabilitation, 01 March 2004, vol./is. 11/3(120-126), 17411645
   **Author(s):** Attard J; Rithalia S
   **Language:** English
Abstract: Dynamic Lycra pressure orthoses (or garments) have been used in recent years as a treatment modality for children with motor impairment, namely cerebral palsy. Improving function is the ultimate goal of prescribing such garments, but there are other important beneficial effects, such as improving proximal stability to help posture and function. This article attempts to explain, in view of current knowledge, how and why dynamic Lycra pressure garments are used and their benefits to children who wear them, providing an outline of current theories behind their function. Two case reports are detailed and some areas for further research are identified.

Publication Type: journal article
Source: CINAHL
Full Text: Available in fulltext at EBSCO Host


Citation: British Journal of Occupational Therapy, 01 October 2003, vol./is. 66/10(464-472), 03080226
Author(s): Corn K; Imms C; Timewell G; Carter C; Collins L; Dubbeld S; Schubiger S; Froude E
Language: English
Abstract: Spasticity can have serious functional implications for children with neurological deficits. Lycra splints may be recommended by occupational therapists to manage spasticity and improve function. In this study, four children with neurological deficits were assessed for quality of upper limb movement while wearing and not wearing an upper limb lycra splint. Two participants diagnosed with cerebral palsy were long-term splint users. The other two participants had an acquired brain injury and commenced wearing their splints during the intervention phase of the study. Using a single subject research design, 7-12 baseline (non-wearing phase) and intervention (wearing phase) assessments were conducted for each child using the Melbourne Assessment of Unilateral Upper Limb Function.; The results show that one long-term user had a statistically significant decline in quality of upper limb movement during the intervention phase. One new user had a statistically significant improvement, but only on initial wearing of the splint. The results suggest that the effectiveness of Second Skin lycra splints was highly variable between individual children with spasticity.

Publication Type: journal article
Source: CINAHL


Citation: British Journal of Occupational Therapy, 01 February 2003, vol./is. 66/2(71-77), 03080226
Author(s): Knox V
Language: English
Abstract: This study aimed to evaluate the effects of wearing Lycra garments in children with cerebral palsy. Eight participants, aged 3 years 5 months to 13 years (male = 4, female = 4) and with a diagnosis of cerebral palsy, were recruited. A repeated measures design was used, with participants tested with the Gross Motor Function Measure (GMFM) and the Quality of Upper Extremity Skills Test (QUEST) before and after intervention. Both parents and participants recorded the perceived advantages and disadvantages of the participant wearing the Lycra garment at the end of the trial.; Each participant received a baseline test, was then provided with a Lycra garment and was re-tested once wear time was more than 4 hours per day. Four participants withdrew from the trial (discomfort from suit, n = 3; prescribed spinal jacket, n = 1). Of the remaining four participants, all showed an improvement in either GMFM or QUEST score and one showed improvement in both test scores. All but one of the eight participants recorded functional improvements when wearing their suit.; In this population, the participants showed improvements in
function when wearing a Lycra garment, but problems with discomfort remained a barrier for some children to their more sustained use.


Citation: Developmental Medicine & Child Neurology, 01 June 2001, vol./is. 43/6(384-391), 00121622
Author(s): Nicholson JH; Morton RE; Attfield S; Rennie D
Language: English
Abstract: It has recently been suggested that lycra garments are helpful for children with cerebral palsy (CP). Twelve children, with athetosis, ataxia, and spasticity, were fitted with lycra garments (Kendall-Camp UK Ltd). Scores on the Paediatric Evaluation of Disability Inventory (PEDI) scales were determined before and after wearing the garment for at least 6 hours a day for 6 weeks. Five children with motor problems representative of the whole group were investigated during a reach-and-grasp task by kinematic motion analysis; reflective markers were used with and without the garment. Carers were given a questionnaire concerning the practicalities of using the garments. All 12 children made improvements in at least one of the functional scales of the PEDI, and scores for the whole group showed significant gains (Wilcoxon chi2 test, self-help p<0.01; mobility p<0.5; social p<0.1). These changes were usually slight, although noticed by carers. Six children made gains of at least one scale of the caregiver assistance scores, two of the children showed losses (due to difficulties removing the garment for toileting), and four showed no change. Motion analysis indicated that (1) two children with athetosis had improved proximal stability in sitting and in smoothness of arm movements, (2) one child with ataxia had improved in proximal and distal stability, and (3) two children with spasticity had more jerky movements, although one improved in proximal stability. All children had problems in wearing the garments, including problems with toileting and incontinence of urine; the parents of only one child wanted to continue using it. Results suggest that the functional benefit of lycra garments for children with CP is mainly due to improvements in proximal stability but this should be weighed against the inconvenience and loss of independence.


Citation: Gait & Posture, September 2000, vol./is. 12/1(1-6), 0966-6362;0966-6362 (2000 Sep)
Author(s): Rennie DJ; Attfield SF; Morton RE; Polak FJ; Nicholson J
Language: English
Abstract: Whole body lycra garments were assessed in eight children using gait analysis, the paediatric evaluation of disability index (PEDI), and a questionnaire of parental acceptance. Seven of the children had cerebral palsy and one Duchennes muscular dystrophy. After initial assessment and fitting of the garment, there was a 2-week introduction period followed by 6 weeks of wearing the garment for at least 6 h everyday, following which they were re-assessed. The root mean square error (RMSE) was used as a measure of variability over three separate passes through the gait laboratory and was a reference figure for gait stability. Proximal stability around the pelvis improved for five children and distal stability improved for three. Five children improved in at least one aspect of the PEDI scale. Although the parents and children detected these improvements, they did not outweigh the disadvantages of wearing the suit and as a consequence only one out of eight families considered continuing with the lycra garment.

Citation: Pediatric Rehabilitation, April 1997, vol./is. 1/2(109-16), 1363-8491;1363-8491 (1997 Apr-Jun)

Author(s): Hylton N; Allen C

Language: English

Abstract: The use of flexible compression bracing in persons with neuromotor deficits offers improved possibilities for stability and movement control without severely limiting joint movement options. At the Children's Therapy Center in Kent, Washington, this treatment modality has been explored with increasing application in children with moderate to severe cerebral palsy and other neuromotor deficits over the past 6 years, with good success. Significant functional improvements using Neoprene shoulder/trunk/hip Bracing led us to experiment with much lighter compression materials. The stabilizing pressure input orthosis or SPIO bracing system (developed by Cheryl Allen, parent and Chief Designer, and Nancy Hylton, PT) is custom-fitted to the stability, movement control and sensory deficit needs of a specific individual. SPIO bracing developed for a specific child has often become part of a rapidly increasing group of flexible bracing options which appear to provide an improved base of support for functional gains in balance, dynamic stability, general and specific movement control with improved postural and muscle readiness. Both deep sensory and subtle biomechanical factors may account for the functional changes observed. This article discusses the development and current use of flexible compression SPIO bracing in this area.

Publication Type: Case Reports; Journal Article

Source: MEDLINE

10. A study of a dynamic proximal stability splint in the management of children with cerebral palsy.

Citation: Developmental Medicine & Child Neurology, June 1995, vol./is. 37/6(544-54), 0012-1622;0012-1622 (1995 Jun)

Author(s): Blair E; Ballantyne J; Horsman S; Chauvel P

Language: English

Abstract: This paper describes a study of the UPsuit, a proximal stability splint fabricated from Lycra, in the management of children with cerebral palsy. The splint improved posture and reduced involuntary movement immediately. The amount of functional improvement depended on the type and severity of impairments, the subject's attitude, their capacity for purposeful intent and compliance. Compromised lung function and pre-existing hypoactivity were medical contra-indications to UPsuit wear whilst a limited capacity for purposeful intent or a negative attitude restricted benefits. The Upsuit was of great value to one-quarter of subjects, but Lycra splinting may benefit a wider spectrum of persons with cerebral palsy in the form of less intrusive splints applied to the limbs.

Publication Type: Clinical Trial; Comparative Study; Journal Article; Research Support, Non-U.S. Gov't

Source: MEDLINE

11. Lycra splinting and the management of cerebral palsy.

Citation: Developmental Medicine & Child Neurology, May 1993, vol./is. 35/5(456-7), 0012-1622;0012-1622 (1993 May)

Author(s): Chauvel PJ; Horsman S; Ballantyne J; Blair E

Language: English

Publication Type: Letter

Source: MEDLINE