A RANDOMISED CONTROLLED TRIAL OF DIFFERENT INTENSITIES OF PHYSIOTHERAPY AND DIFFERENT GOAL-SETTING PROCEDURES IN 44 CHILDREN WITH CEREBRAL PALSY

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Parents, physiotherapists and teachers of children with cerebral palsy often feel that motor-skill acquisition in children could be speeded up if they had more physiotherapy, targeting particular motor skills.

We undertook a pilot study (Bower and McLellan 1992) to determine suitable ways of assessing motor skills and delivering intensive physiotherapy in children with cerebral palsy. In that study, two specific measurable short-term goals were selected for seven children before the study period. These goals were known to all those in contact with the child. A baseline period of conventional therapy was followed by an intensive period of therapy. This was in turn followed by a further baseline period, using a withdrawal ABA single-case experimental design, with seven children acting as their own controls (Hersen and Barlow 1976). The gross motor function measure (GMFM) (Russell *et al.* 1989) was used as one of the outcome measures. The rate of motor-skill acquisition increased during the period of intensive therapy and decreased when it was withdrawn. However, the pattern of gains was similar in the elements of the inventory relevant to the goals and in the elements that were not associated with the goals, suggesting that these specific interventions had a non-specific effect. This left open the question of whether the observed improvement was associated with the setting of the goals.

It has been suggested that setting a treatment goal or targeting a specific motor skill involves identifying and formulating standards of motor activity which are in advance of the child's current capacity or which retard deterioration. Goals need to be formulated in such a way that there is no doubt as to the extent to which they have been achieved when performance is reviewed (Bower and McLellan 1994*a*).

We have now undertaken a randomised controlled trial in subjects with an established diagnosis of quadriplegic cerebral palsy to establish whether the conclusions of our pilot study could be sustained: specifically (1) whether intensive physiotherapy is associated with an increase in the rate of motor-skill acquisition, and (2) whether increased precision in goal-setting is associated with an increase in the rate of motor-skill acquisition.

Method

TRIAL DESIGN

We used a 2×2 factorial design with prerandomised stratification into four treatment groups (Table I). Each group contained 11 children. In regimen 1, the subject's own physiotherapist and researcher documented the generalised

TABLE I
2 × 2 Factorial Design of Study

	Conventional therapy	*Intensive therapy*	*Total (N)*
Aims	Regimen 1 (N=11)	Regimen 2 (N=11)	22
Goals	Regimen 3 (N=11)	Regimen 4 (N=11)	22
Total (N)	22	22	44

treatment aims before giving two weeks of conventional physiotherapy. In regimen 2, the subject's own physiotherapist and the researcher documented the generalised treatment aims before giving two weeks of intensive physiotherapy (one hour of individual treatment per day, Monday to Friday). In regimen 3, specific individual and measurable treatment goals were negotiated, accurately assessed and documented for each child by the subject's own physiotherapist and the researcher before a two-week period of conventional physiotherapy. In regimen 4, specific, individual and measurable treatment goals were negotiated, accurately assessed and documented for each child by the subject's own physiotherapist and the researcher before a two-week period of intensive physiotherapy (one hour of individual treatment per day, Monday to Friday). Using this design, conventional amounts of physiotherapy in 22 children were compared with intensive amounts of physiotherapy in 22 children over a two-week period, and the use of broad generalised aims was compared with the use of specific measurable goals directed at motor skill-acquisition and known to all concerned with the child. This design also allowed the effects of using broad aims in conventional and intensive therapy to be compared with the effects of using specific measurable goals.

SUBJECTS

The number of children was calculated on the basis of our earlier findings (Bower and McLellan 1992). According to these calculations, 36 subjects would be needed to show a difference between groups of one standard deviation in the mean GMFM score with a significance level of $p<0.05$ and 80% power. The paediatric superintendent physiotherapists of 26 different health districts were approached and invited to participate in the project. 17 agreed on the basis that only those physiotherapists who were interested and had relevant caseloads should participate with one child each. Forty four 3- to 11-year-old children with an established diagnosis of quadriplegic cerebral palsy, which had been confirmed by a consultant paediatrician, were recruited from 14 different health districts across the south of England over a nine-month period. Each child had a different physiotherapist.

The children's motor functional status was classified according to the Standard Recording of Central Motor Deficit (SRCMD) (Evans *et al.* 1989) by the researcher (EB) and the child's own physiotherapist.

The children were stratified before randomisation, on the basis of functional severity alone, into one of two categories assessed using section 7 of the SRCMD. 16 children were found to be physically incapable of putting on a vest or T-shirt and unable to feed with either hand; they were assigned to the severe group (S). The remaining 28 children were allocated to the moderate group (M).

Following stratification, each child was allocated a code between 1 and 44, with the prefix S or M. Each child was then randomised into one of the four treatment regimens using a computer programme (random log) in blocks of eight, so that after every eight subjects there were two in each of the four treatment regimens. This process was undertaken by a person not otherwise involved in the trial.

To examine the effectiveness of the randomisation technique in balancing prognostic factors, we asked four questions prospectively to establish: (1) the

age of the child; (2) the length of time the child had been receiving physiotherapy before the study; (3) the length of time the child had been receiving physiotherapy from their particular physiotherapist; and (4) the number of potentially eligible children from which each of the physiotherapists had made their selection.

ASSESSMENT

Assessment of motor skill acquisition was undertaken by an independent assessor. This assessor was trained in the assessment technique, and was blind to (1) the amount of treatment being given, (2) whether treatment was directed to aims or goals, and (3) the particular motor skills targeted for treatment. A reliability study between the researcher and the independent assessor (JA) in the use of the outcome measure was undertaken before the main study.

Assessments by the independent assessor took place within three days before the start of treatment and within three days after its completion, without either the researcher or the child's physiotherapist being present.

All assessments took place in the child's usual treatment location with either a parent or a familiar carer present.

IDENTIFICATION OF GOALS OR AIMS

During the three days before the treatment period, the child's physiotherapist and the researcher recorded the aims or goals of treatment and agreed upon which of the five dimensions of the GMFM these aims or goals might be expected to change. If goals were involved, these were negotiated with parents and carers and programmes relevant to the goals suggested. Each goal was accurately assessed and documented. This process was repeated during the three days after the treatment period was completed. An example of an aim was 'to improve sitting', whereas an example of a goal was 'to sit on a child's chamber-pot holding onto the sides with both hands for one minute without falling off' to facilitate continence training. Videotape assessment was undertaken of each child's main aim or goal. The results will be the subject of a separate paper.

TYPE OF THERAPY

Throughout the trial the therapy given was described by the physiotherapists involved as being eclectic or comprising a mixture of different ingredients considered appropriate by each individual physiotherapist for each individual child and family. None of the 44 physiotherapists participating in this trial exclusively favoured one particular school of treatment over any other.

OUTCOME MEASURE

The acquisition of motor skills over the two-week period was assessed using the GMFM. This measure has a selection of 88 items arranged in five dimensions: (1) lie and roll, (2) sit, (3) crawl and kneel, (4) stand, and (5) walk, run and jump. Each of the dimensions has a different number of items. In order that each dimension contributes equally to the total score as defined by the GMFM a percentage is calculated for each dimension (child's score/maximum score $\times 100$) and a total score is obtained by calculating the mean of the five dimension scores. Russell *et al.* (1990), in their validation of the GMFM, stated that an increase of 1.825 in a child's total score was the minimum clinically important change according to the parents.

Having documented the aims or goals of treatment for each child, we were able to divide the dimensions of the GMFM retrospectively into those in which aims or goals had been set and those in which aims or goals had not been set. Consequently at the end of the study period we were able to compare progress in those dimensions of the GMFM in which aims or goals of treatment had been set with those dimensions in which aims or goals of treatment had not been set.

Results

The GMFM was administered to 10 children not included in the main study but with similar inclusion criteria. The 'limits of agreement' (Bland and Altman 1986) of the two assessors' scores when the test was administered by the researcher and scored by the researcher, and when it was administered and scored by the independent assessor, were +3.7 and −4.3. The

TABLE II
Scores from 1 (least severe) to 4 (most severe) in each treatment group in SRCMD

Functional motor skills	*Regimen 1: conventional therapy and aims*		*Regimen 2: intensive therapy and aims*		*Regimen 3: conventional therapy and goals*		*Regimen 4: intensive therapy and goals*	
	Mean	*(SD)*	*Mean*	*(SD)*	*Mean*	*(SD)*	*Mean*	*(SD)*
Head and neck	2.3	(0.64)	2.5	(0.82)	2	(0.7)	2	(0.78)
Trunk	2.5	(0.52)	2.6	(0.51)	2.6	(0.47)	2.5	(0.52)
Lower Limb	4	(0)	3.9	(0.3)	3.9	(0.3)	3.8	(0.41)
Upper Limb	3.4	(0.51)	3.4	(0.51)	3.3	(0.47)	3.4	(0.51)

(Evans *et al.* 1989) Sections 5 to 7.

TABLE III
Status of children in each treatment regimen at initial assessment

	Regimen 1: conventional therapy and aims		*Regimen 2: intensive therapy and aims*		*Regimen 3: conventional therapy and goals*		*Regimen 4: intensive therapy and goals*	
	Mean	*(SD)*	*Mean*	*(SD)*	*Mean*	*(SD)*	*Mean*	*(SD)*
Age (yrs)	6.3	(2.4)	5.5	(2.4)	5.8	(2.1)	5.6	(2.3)
Years of physiotherapy	5.4	(2.5)	4.8	(1.9)	4.4	(1.8)	3.8	(1.6)
Years of physiotherapy from current physiotherapist	1.9	(1.5)	1.9	(1.2)	1.4	(1.0)	1.5	(1.1)
Children potentially available to each physiotherapist (N)	3.1	(2.5)	5.0	(3.2)	3.1	(2.1)	5.2	(4.4)

coefficient of variation (Bland and Altman 1986) was 0.09 between the independent assessors' two sets of scores, *i.e.* when the test was administered by the researcher and scored by the assessor, and when it was administered by the assessor and scored by her.

The mean functional motor skill scores in different parts of the body are shown in Table II for children in each of the four treatment regimens. The scores are similar for each of the four groups.

Table III shows the mean ages of children in each of the four treatment regimens, the mean number of years that physiotherapy had been received by each child, the mean number of years that physiotherapy had been received from the current physiotherapist, and the mean number of potentially eligible children available to each physiotherapist. Paired *t* tests for the first three items indicated that the differences between the four groups were not statistically significant. The fourth item (mean number of potentially eligible children available to each physiotherapist) showed no significant differences between the groups using Wilcoxon signed ranks test.

Of the 44 subjects stratified, randomised and assessed, one child (M 45) sustained an undisplaced fracture of her right radius and ulna half-way through the treatment period but continued to undergo the treatment and assessments. Another child (S 27) was hospitalised between the baseline assessment and the commencement of the treatment period, which meant that this period was longer than the three days described above, but

TABLE IV

Number of aims or goals set per child

	Median	*Mean*	*Range*
Regimen 1: conventional therapy and aims (N=11)	1	1.2	1–2
Regimen 2: intensive therapy and aims (N=11)	2	1.7	1–2
Regimen 3: conventional therapy and goals (N=11)	1	1.4	1–2
Regimen 4: intensive therapy and goals (N=11)	2	1.9	1–3

TABLE V

Dimensions of GMFM in which change was anticipated, and changes in these dimensions over 2-week treatment period

	Lie and roll	*Sit*	*Crawl and kneel*	*Stand*	*Walk, run and jump*
Regimen 1: conventional therapy and aims (N=11)					
Aims set	2	4	1	4	2
Performance improved	0	2	0	1	1
Performance deteriorated	1	2	1	3	0
Regimen 2: intensive therapy and aims (N=11)					
Aims set	3	7	0	5	4
Performance improved	2	4	0	3	2
Performance deteriorated	0	1	0	0	0
Regimen 3: conventional therapy and goals (N=11)					
Goals set	1	9	0	3	2
Performance improved	1	8	0	2	1
Performance deteriorated	0	1	0	1	0
Regimen 4: intensive therapy and goals (N=11)					
Goals set	4	7	2	6	2
Performance improved	3	6	1	5	1
Performance deteriorated	1	1	0	0	0

he too continued with the treatment and assessments.

The number of aims or goals set per child in each of the four treatment regimens over the two weeks, the dimensions of the GMFM in which change was anticipated as a result of the aims or goals set, and the changes that occurred, are shown in Tables IV and V. All the aims or goals could be allocated into one of the five dimensions of the GMFM. These tables show that the distribution of aims and goals in the various GMFM dimensions was not significantly different in the four regimens. The 'sitting' and 'standing' dimensions attracted more aims and goals than 'lie and roll', 'crawl and kneel' and 'walk, run and jump'. 11 of the 28 goals of treatment were achieved at the end of the two-week period by children undergoing conventional amounts of physiotherapy, and 20 of 40 were achieved by children undertaking intensive physiotherapy.

The mean amount of physiotherapy received per child in each of the four

TABLE VI
Initial scores on GMFM (all dimensions)

	Mean	*(SD)*
All treatment regimens (N=44)	35.1	(18.9)
Regimen 1: conventional therapy and aims (N=11)	36.3	(17.9)
Regimen 2: intensive therapy and aims (N=11)	31.9	(21.5)
Regimen 3: conventional therapy and goals (N=11)	32.4	(16.2)
Regimen 4: intensive therapy and goals (N=11)	39.8	(21.2)

treatment regimens over the two weeks was as follows: regimen 1, 2.0 (range 1.0 to 3.0) hours; regimen 2, 9.2 (range 8.0 to 10.0) hours; regimen 3, 2.2 (range 1.0 to 3.0) hours; regimen 4, 9.3 (range 6.0 to 10.0) hours.

The independent assessor was required to make a forced choice retrospectively as to which treatment she believed each child had received. She allocated 10 of the children correctly, when by chance one would have expected the number to be 11, so there is no evidence that the assessor had guessed the treatment allocation.

There was a small but not statistically significant trend in the severity of the initial disability between regimen 2 (the most severe) and regimen 4 (the least severe), as shown in Table VI.

Thiryt six of the children included in the study showed an increase in their mean score of all the dimensions of the GMFM over the two-week period (Fig. 1). Only in regimen 4 (intensive therapy and goals) did no child show a lower GMFM score before than after assessment.

Figure 2 shows the mean change in each child's total score in all five dimensions of the GMFM in conventional therapy, intensive therapy, aims and goals (N=22).

Intensive therapy showed a difference of three points while conventional therapy showed a difference of 2 points over the two-week treatment period. Goals showed a difference of 3 points, and aims a difference of 2 points.

Figure 3 shows the mean change in total scores per child in all five dimensions of the GMFM in the four treatment regimens (N=11). Intensive therapy plus goals showed a change of 4 points whereas the other three regimens showed a change of 2 points over the two-week treatment period.

Figure 4 shows the mean change in total scores per child in the aim and non-aim dimensions of the GMFM in conventional amounts and intensive amounts of therapy (N=11). Intensive therapy in the aim dimensions showed a change of 4.8 points and conventional therapy in the non-aim dimensions showed a change of 2.2 points over the treatment period.

Figure 5 shows the mean change in total scores per child in the goal and non-goal dimensions of the GMFM in conventional and intensive therapy (N=11). Intensive therapy in the goal dimensions showed a change of 7.7 points and conventional therapy in the goal dimensions a change of 5 points over the treatment period.

Five of the children undertaking regimen 1, 12 of the children undertaking regimens 2 and 3 and seven of the children undertaking regimen 4 showed increases greater than 1.825 in their GMFM scores.

Analysis of the covariance showed a non-significant difference of 0.96 (95% confidence intervals −0.71 and +2.63) between intensive and conventional amounts of physiotherapy (N=22 in each group) and a non-significant difference of 0.99 (95% confidence interval −0.68 and +2.66) between goals and aims (N=22 in each group).

The only statistically significant difference was a mean of 4.3 points in favour of goal directed physiotherapy in the dimensions of the GMFM scores in which goals were set compared with aim-directed physiotherapy in the dimensions

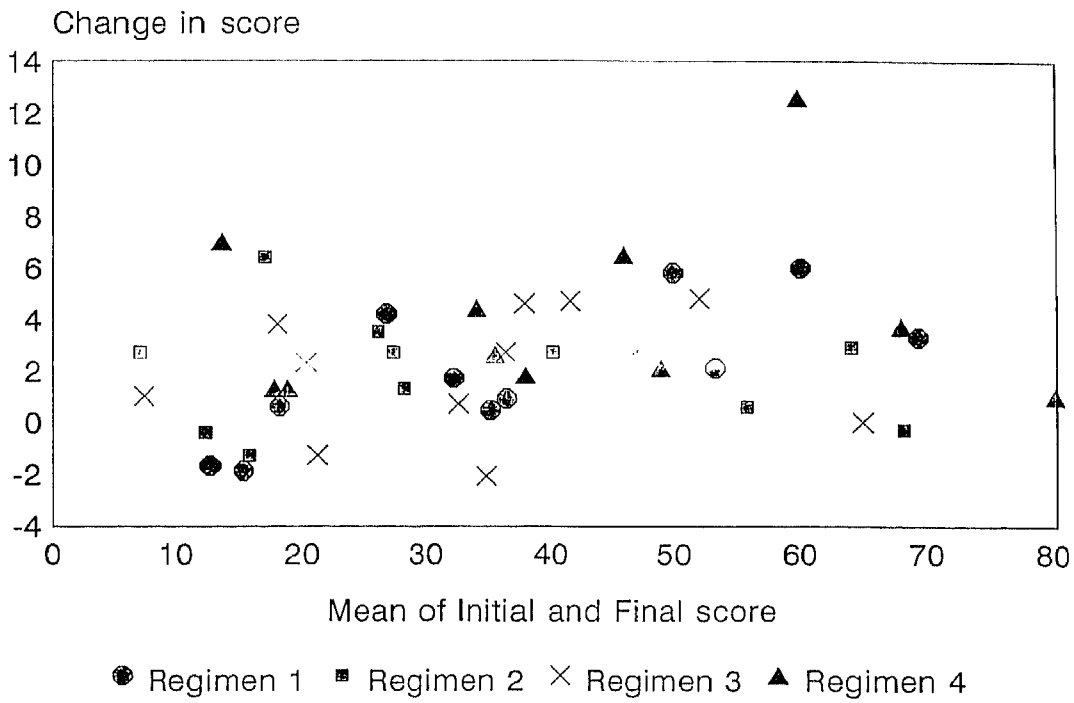

Fig. 1. Change in score against mean of initial and final scores for each child (N=44) in all dimensions of GMFM in each treatment regimen.

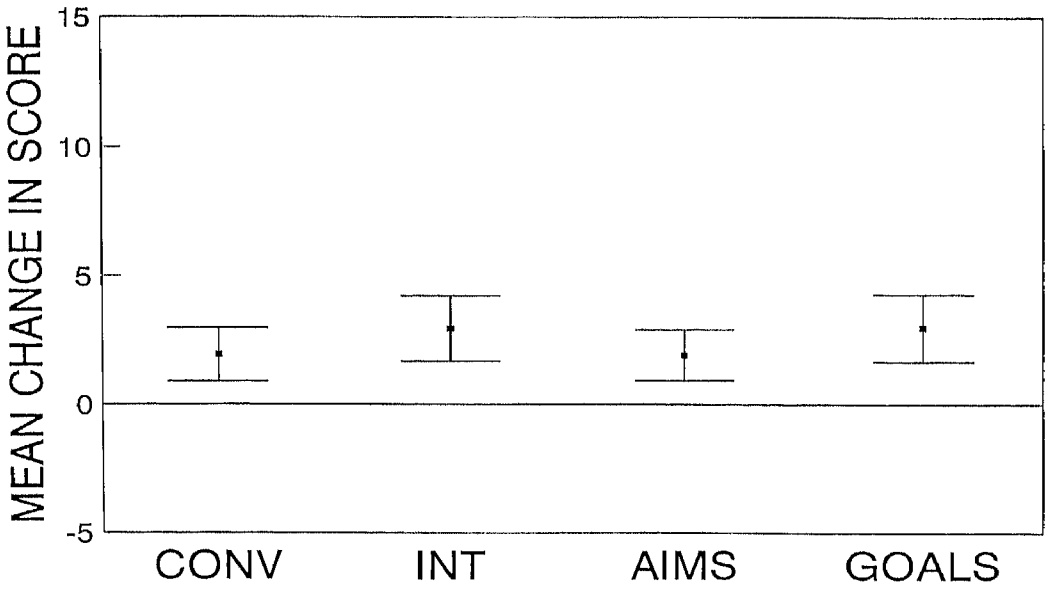

Fig. 2. Mean change in score per child (N=22) in all five dimensions of GMFM in conventional therapy, intensive therapy, aims and goals. Bars represent 95% confidence intervals of mean change in score.

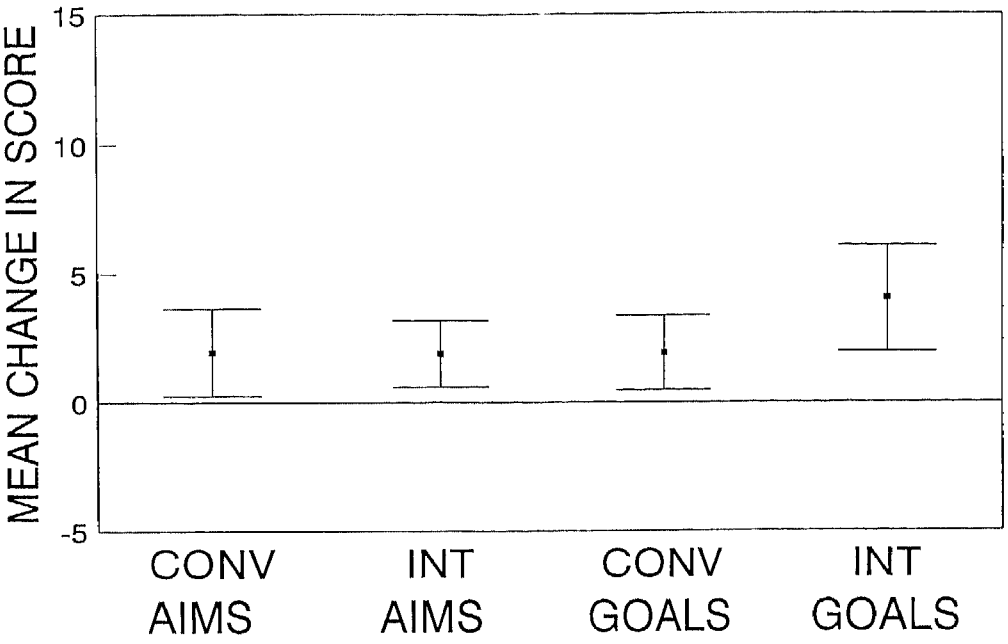

Fig. 3. Mean change in score and 95% confidence intervals in all five dimensions of GMFM in four treatment regimens.

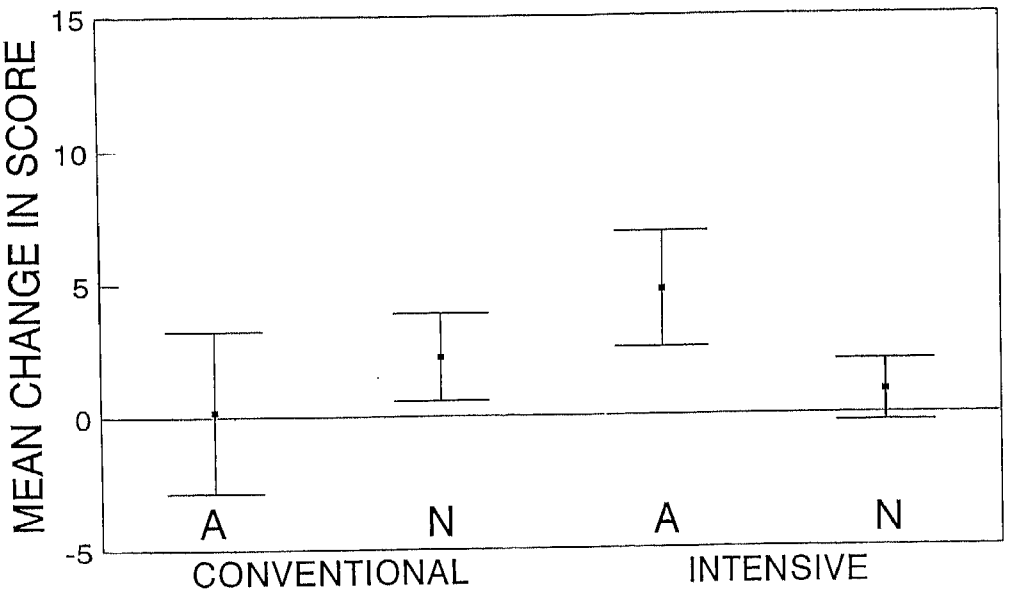

Fig. 4. Mean change in score and 95% confidence intervals in aim and non-aim dimensions of the GMFM in conventional and intensive amounts of therapy.

of the GMFM scores in which aims were set (N=22 in each group, p=0.046, 95% confidence intervals –0.134 and +8.542).

There was a difference of 4.2 points in favour of intensive amounts of physiotherapy in the dimensions of the GMFM scores in which aims and goals were set compared with conventional amounts of

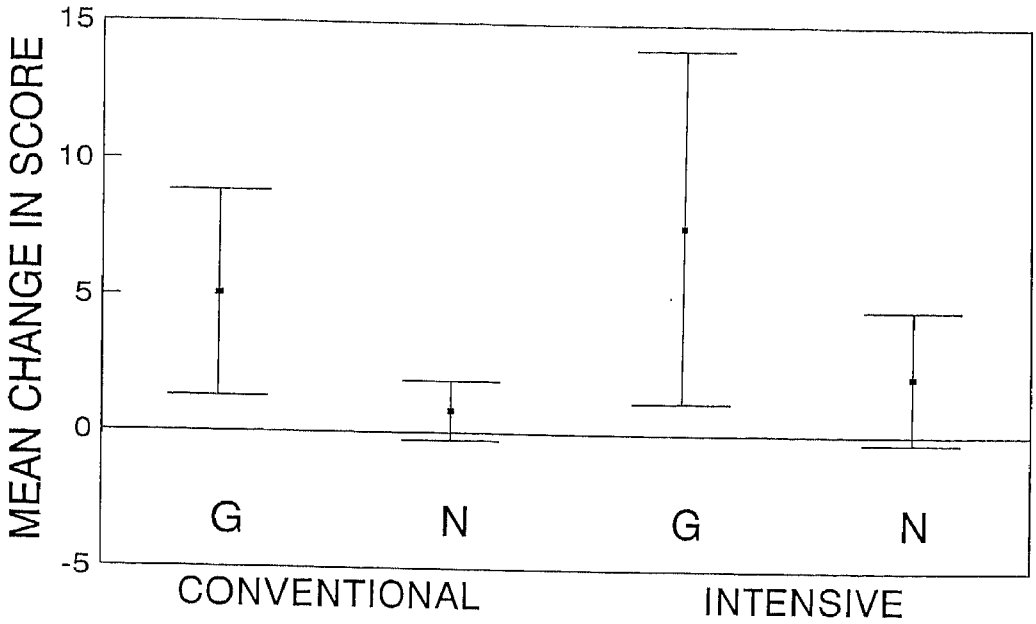

Fig. 5. Mean change in score and 95% confidence intervals in goal and non-goal dimensions of GMFM in conventional and intensive amounts of therapy.

physiotherapy in the equivalent dimensions (N=22 in each group, p=0.055, 95% confidence intervals –0.053 and +8.431).

Analysis of covariance showed no statistical significance between any of the other factors, taking the level of statistical significance as $p<0.05$.

Discussion

Trials of this sort are rarely undertaken and our enthusiasm at the start of the trial would certainly have been less if we had anticipated the practical difficulties involved. 26 different paediatric physiotherapy departments were initially approached of which 14 eventually participated in the main trial and two in the reliability study. Ethical approval was sought from 17 different ethics committees, all of which required the completion of their own individual forms. Approval time varied from under six weeks to over six months (Bower 1994). The assessment data for the reliability study was collected over a two-month period and all the assessment data for the main study was finally collected over a six-month period, making the logistics of the data collection a major undertaking. The car mileage covered by the researcher and the independent assessor in connection with this study totalled over 25,000 miles. Future trials are likely to need to include funding for the physiotherapists for any additional intensive therapy given. Some of these difficulties may have been caused by the recent reorganisation of the UK's National Health Service and the introduction of an internal market.

Parents welcomed the trial, despite the fact that they did not know at the time of recruitment which treatment regimen their child would receive.

Physiotherapy for children with cerebral palsy in the UK is often provided as a more or less continuous process from the time of identification of risk or diagnosis until school-leaving age. It is possible that short but intensive bursts of physiotherapy directed to help a child change from 'could do' a motor skill to 'does do' a motor skill, at a time when the child displays the wish to do so, may be a more appropriate use of therapy time in relation to motor-skill acquisition. Goals need to be formulated with the

understanding that physiotherapy cannot change a child from 'can't do' to 'does do', but that a physiotherapist may be able to help a child change from 'could do' to 'does do' when the child demonstrates the appropriate behaviour. As children tend to achieve skills in small stages, goals need to be formulated in small steps.

We found that the stratification and randomisation techniques worked reasonably well.

The GMFM is validated to evaluate motor change over time in children with cerebral palsy (Russell *et al.* 1989). Aims and goals selected for measurement in this study were all concerned with motor-skill acquisition and were able to be allocated into one of the five dimensions of the GMFM. In normal practice, physiotherapy for cerebral palsy targets other areas in addition to motor-skill acquisition, for example ease of handling a child, compliance with treatment and provision, and use of equipment. These areas were not investigated in this trial. The changes in motor function resulting from developing deformity caused by compensatory postures and movements used by children with cerebral palsy would be shown by the GMFM but would only become evident over much longer periods of time.

Whereas previously reported trials have included quite large numbers of subjects who failed to last the course (Bower and McLellan 1994*b*), there were none in this study: perhaps because no child received a reduction in physiotherapy treatment time, and because the study took place over a very short period of time for each child. One of our previous studies suggested that intensive physiotherapy directed at goals that could not be achieved was associated with an increase in unco-operative behaviour in some children, so care and perceptiveness need to be exercised when selecting goals for treatment (Bower and McLellan 1994*a*).

The results for the different groups of children, if not always for individual children, showed an increase in scores (albeit a very small one in some cases very small). Seventeen of the 36 set goals of treatment were achieved by the children. Twenty four of the 44 children showed increases in their total GMFM scores greater than the 1.825 estimated by Russell *et al.* (1990) as indicating a clinically important change.

The only statistically significant result occurred in the dimensions of the GMFM scores in which goals were set in goal-directed physiotherapy when compared with aim-directed physiotherapy, but intensive amounts of physiotherapy in the dimensions of the GMFM scores in which goals and aims were set showed a strong trend towards this level of statistical significance when compared with conventional amounts of physiotherapy.

Our first study (Bower and McLellan 1992) indicated that children's progress towards certain goals was accelerated during a period of intensive physiotherapy and that these skills were maintained, and in some cases improved upon, when the therapy became less frequent, provided that they were associated with daily functional activities understood by the children and not requiring increased assistance from the carers. It is therefore possible that more intensive physiotherapy than is currently available, targeted at specific goals that could be incorporated into a child's everyday routine, would accelerate the rate of motor-skill acquisition over longer periods of time. The implication of this is that the eventual level of motor skill acquired would be higher with such therapy than with current therapy. In routine clinical and educational settings, therapy is provided not for its short term benefits but for its presumed long term and cumulative effects. Our strategy in mounting this trial was to establish whether effects could be shown to be associated with short periods of different therapy. We feel that the results reported here give sufficient evidence to justify the much more prolonged trials needed to establish whether it is possible and practicable to deliver therapies of this type over longer periods of time, and whether such therapy is indeed associated with a cumulative benefit.

This study provides some support for the view that selecting specific goals for treatment rather than general aims, and providing intensive rather than non-intensive therapy, accelerate the acquisition of motor skills if continued for two weeks. We do not know whether these

gains were subsequently maintained. Nor can we say with certainty that the children would have been able to tolerate, in the longer term, treatment that was different from the treatment they were routinely receiving. These questions should be addressed in future studies.

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SUMMARY
Forty-four children aged 3 to 11 years with quadriplegic cerebral palsy were prospectively stratified and randomised into four treatment groups. The acquisition of motor skills was assessed in a 2×2 factorial design using the Gross Motor Function Measure. The two factors were conventional amounts of physiotherapy *vs* intensive amounts of physiotherapy, and the use of broad, generalised aims *vs* the use of specific measurable goals directed at motor skill acquisition. 82% of the children improved. Over the two-week period, intensive physiotherapy produced a slightly greater effect than conventional physiotherapy but the factor more strongly associated with increased motor skill acquisition was the use of specific measurable goals.

RÉSUMÉ
Essai contrôlé à distribution aléatoire de différentes intensités de kinésithérapie et différentes procédures de projet chez 44 enfants I.M.C.
Quarante-quatre enfants âgés de 3 à 11 ans et présentant une I.M.C. quadriplégique furent répartis aléatoirement en quatre groupes de traitement. Les acquisitions motrices furent évaluées selon un dessin à 2×2 facteurs, en utilisant une évaluation de la fonction motrice globale. Les deux facteurs opposaient d'une part une pratique habituelle de kinésithérapie et une pratique intensive, et d'autre part une approche globale à des projets spécifiques et mesurables de tâches motrices. Une amélioration fut observée chez 82% des enfants. Durant la période de deux semaines, la kinésithérapie intentive obtint un peu plus d'effet que la kinésithérapie conventionnelle mais le facteur le plus fortement associé à un progrès moteur fut le recours à des projets spécifiques mesurables.

ZUSAMMENFASSUNG
Eine randomisierte kontrollierte Studie von verschieden intensiven Physiotherapieprogrammen und unterschiedlichen Zielsetzungen bei 44 Kindern mit Cerebralparese
44 Kinder im Alter zwischen 3 und 11 Jahren mit Tetraplegie wurden prospektiv und randomisiert in vier Behandlungsgruppen untersucht. Das Erlernen der motorischen Fähigkeiten wurde anhand des Gross Motor Function Measure in Gegenüberstellung von jeweils zwei Faktoren beurteilt; diese waren normale Physiotherapie *versus* intensive Physiotherapie und die Anwendung breiter generalisierter Ziele *versus* spezifisch meßbarer Ziele in Bezug auf das Erlernen motorischer Fähigkeiten. 82% der Kinder zeigten eine Besserung. Über den Zeitraum von zwei Wochen brachte die intensive Physiotherapie einen etwas besseren Erfolg als die konventionelle Physiotherapie, aber die Anwendung spezifisch meßbarer Ziele war stärker mit einer Verbesserung der motorischen Fähigkeiten assoziiert.

RESUMEN
Estudio controlado randomizado de diferentes intensidades de fisioterapia y de diferentes objetivos en 44 niños con parálisis cerebral
Cuarenta y cuatro niños de 3 a 11 años con parálisis cerebral cuadriplégica fueron prospectivamente estratificados y randomizados en cuatro grupos terapéuticos. La adquisición de habilidades motoras fué evaluada en un esquema de 2×2 factores utilizando la Gross Motor Function Measure. Los dos factores eran cantidades convencionales de fisioteapia frente a cantidades intensivas de fisioterapia y el uso de finalidades amplias y generalizadas, frente al uso de finalidades especfficas medibles dirigidas a la adquisición de habilidades motoras. El 82% de los niños mejoraron. Durante un periodo de dos semanas la fisioterapia intensiva produjo un efecto ligeramente mayor que la convencional, pero el factor asociado más intensamente en la adquisición de una mayor habilidad motor, fué el uso de finalidades específicas medibles.

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