Goal Attainment Scaling (GAS) - A Valid Outcome Measure For D.C.D. Paediatric Physiotherapy?

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Background

Goal attainment scaling (G.A.S.) is an individualised criterion-referenced measure to evaluate treatment by quantifying achievement of specific goals over time. Goals are set by therapists and have a five point ordinal scale of attainment with 2 levels above and 2 below the principle goal (C.S.P.).It can be applied to a number of different areas of practice to measure outcomes (Kloseck, Bowman, Farrar, Palisano, 1993) and it has been used to this purpose in treatments for pain, mental health, community health and paediatric rehabilitation. The authors implemented this system in 2007 as part of their evaluation of physiotherapy intervention for children with Developmental Co-ordination Disorder (D.C.D.).

Purpose

The purpose of the study was to evaluate the use of goal attainment scaling (G.A.S.) as an outcome measure in our physiotherapy practice for children with DCD.

Method

This was a quantitative study. Results were analysed using Microsoft Office Excel 2003 spreadsheet.

24 children with a diagnosis of D.C.D. were included in the study. All had completed a course of physiotherapy involving 8 individual weekly treatment sessions supplemented by a daily home programme whilst attending treatment. The home programme was reduced over the following 3 months. Parental consent had been given prior to assessment and treatment. No ethical permission was required as treatment took place in a private physiotherapy clinic.

A physiotherapy assessment of motor skills was carried out and the scores used for G.A.S.

The authors chose 50% as the principle goal as previous experience has shown this to be a realistic expectation. Therefore, on the 5 point ordinal scale the following applied.

-2 (no change)	**-1** (+25%)	**0 – expected** (+50%)	**+1** (+75%)	**+2** (+100%)

A score/scale crib sheet was calculated to save time so that for each individual score a scale could be easily extrapolated. Where the task was timed the exact figures were used, where counted figures were rounded up.

Examples of a child's G.A.S.

Area	Task	-2 *(no change)*	-1 *(25%)*	0 *(50%)*	+1 (75%)	+2 *(100%)*	Actual score	GAS score
Active Trunk Extension	*Aeroplane*	10	12.5	15	17.5	20	30	+2
Flexion	*Curl up*	16	20	24	28	32	16	-2
Shoulder control	*wheelbarrow*	14	18	21	25	28	74	+2
Pelvic control	*Right leg* *Left leg*	3 5	3.75 6.25	4.5 7.5	5.25 8.75	6 10	20 24	+2 +2
Proximal control	*Right arm/left leg* *Left arm/right leg* *Right arm & leg* *Left arm & leg*	2 2 3 3	2.5 2.5 3.75 3.75	3 3 4.5 4.5	3.5 3.5 5.25 5.25	4 5 6 6	28 28 22 18	+2 +2 +2 +2
Hopping (forwards)	*Right leg* *Left leg*	10 7	13 9	15 11	18 12	20 14	40 42	+2 +2
Ball skills	*Throw & catch* *Bounce & catch*	1 1				2 2	3 5	+2 +2
Eye foot co-ord(trapping)	*right* *left*	2 3		3	 5	4 6	4 5	+2 +1
Bilateral integration	*Alternate hand/foot tap*	21	26	32	37	42	22	-2
Spatial awareness	*(no. of cones NOT touched/jumped)*	6	8	9	11	12	10	0
Organisational skills	*Making sandwich*	3	4		5	6	5	+1
s/t memory	*4 tasks shown/told*	1				2	2	+2
Symmetrical integration	*(jump forwards)*	2		3		4	10	+2

Total G.A.S. = +28 /20 Average: +1.4

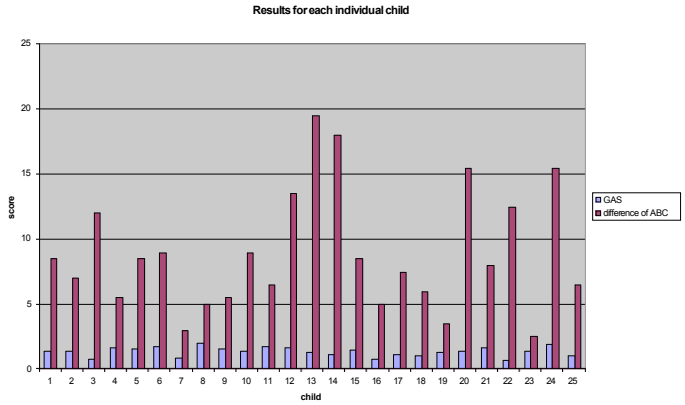
Example of the crib sheet devised

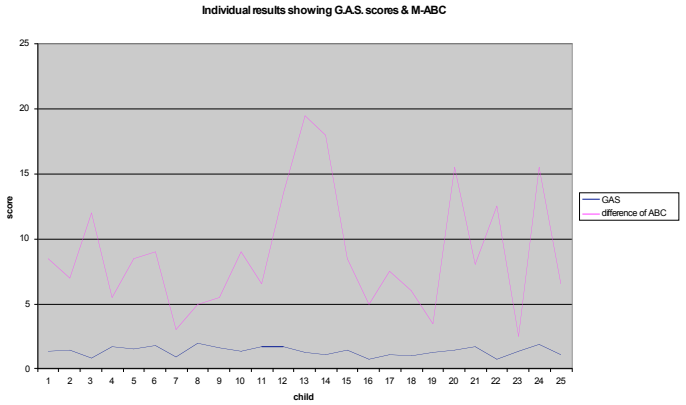
-2 *no change*	-1 *(25%)*	0 *(50%)*	+1 *(75%)*	+2 (100%)
0				
1	1.25	1.5	1.75	2
2	2.5	3	3.5	4
3	3.75	4.5	5.25	6
4	5	6	7	8
5	6.25	7.5	8.75	10
6	7.5	9	10.5	12
7	8.75	10.5	12.25	14
8	10	12	14	16
9	11.25	13.5	15.75	18
10	12.5	15	17.5	20
11	13.75	16.5	19.25	22
12	15	18	21	24
13	16.25	19.5	22.75	26
14	17.5	21	24.5	28
15	18.75	22.5	26.25	30
16	20	24	28	32
17	21.25	25.5	29.75	34
18	22.5	27	31.5	36
19	23.75	28.5	33.25	38
20	25	30	35	40
21	26.25	31.5	36.75	42
22	27.5	33	38.5	44
23	28.75	34.5	40.25	46
24	30	36	42	48
25	31.25	37.5	43.75	50

The Movement A.B.C. was also completed to provide a standardised comparison of change. All children were re-assessed at the end of the 5-month treatment period using the same assessment methods.

Findings
Improvement with motor skills was indicated using both G.A.S. and M-ABC.

	G.A.S.	M-ABC – impairment score	M-ABC – Percentile
Range of change	+0.7 to +1.77	3 to 19.5	0 to 93
Average	+1.36	8.88	39.04





Discussion
Although both systems confirmed that the children made progress, the results did not correlate with each other. The authors surmised that the reason for this was that G.A.S. evaluates different aspects of progress than M-ABC. The authors found that there were many advantages using the G.A.S.:

- ✓ Specifically measures those skills and areas that intervention aimed at changing
- ✓ Organises and focuses treatment
- ✓ Clarifies aims
- ✓ Other staff can carry out the scoring
- ✓ Parents and referrers reported they could easily identify with the scoring
- ✓ Progress can be tracked in a number of areas
- ✓ The use of the calculated score sheet enabled the therapists to quickly identify and complete the G.A.S. scores for analysis

An average G.A.S. score was used for all patients. T-scores were not used as it was not considered to be relevant for our purpose. However, t-scores have been calculated by Cardillo for up to 8 goals should statistical evaluation be desired by those using the system.

Conclusions
Both systems confirm improvement indicating that G.A.S. is a valid tool for our practice. The differences in the results provide evidence that G.A.S. and Movement ABC measure different aspects of motor development and skills and therefore both measures will continue to be used. G.A.S. can be used to show improvement in areas other than motor skills, which commonly affect children with D.C.D. (e.g. spatial awareness, working memory and organisational skills). It is easy and quick to use and readily understood by parents and other professionals. It requires no training and there are no cost implications.

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