

Goal Attainment Scaling (GAS) in rehabilitation

Some early personal experiences

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- Measuring effectiveness of brain injury rehabilitation poses major problem due to the heterogeneity of patients deficits and desired outcomes. Particularly at the level of participation goals very much dependent on individuals lifestyle and aspirations, and standardised measures become increasingly difficult to apply. (Hum J, Kneebone J, Cropley M. Clin.J. Rehab. 2006)

- So the success of rehabilitation may judged how the desires of client could be achieved.
- What can GAS offer as an outcome measure in rehabilitation
- communication and collaboration between multidisciplinary team members as they meet together for goal-setting
- patient involvement
- It is not an outcome measure per se, but a measure of the achievement of intention
- The most important step in GAS is the setting of clearly defined priority goals, agreed by client and the team
- Goals should be SMART (specific, measurable, achievable, realistic and timed)
- Goals may be weighted

How is GAS rated?

If the patient *achieves* the expected level, this is scored at 0.
 If they achieve a *better* than expected outcome this is scored at:
 +1 (*somewhat better*)
 +2 (*much better*)
 If they achieve a *worse* than expected outcome this is scored at:
 -1 (*somewhat worse*) or
 -2 (*much worse*)

Goals may be weighted to take account of the relative importance of the goal to the individual, and/or the anticipated difficulty of achieving it.

Goal Attainment Scaling: Proq 1996 Turner Slides

Goal Attainment Scaling (GAS) Record Sheet

Patient Name:..... Age:..... Hospital No:.....
 Discharge date:..... Keyworker:.....

	Patient stated goal	SMART goal	Imp	Diff	Baseline	Achieved	Variance (Describe achievement if differs from expected and give reasons)
1.			0	0	<input type="checkbox"/> Some function	<input type="checkbox"/> Yes	<input type="checkbox"/> Much better
			1	1	<input type="checkbox"/> None	<input type="checkbox"/> A little better	<input type="checkbox"/> As expected
			2	2	<input type="checkbox"/> None (as bad as can be)	<input type="checkbox"/> No	<input type="checkbox"/> Partially achieved
			3	3			<input type="checkbox"/> Same as baseline
							<input type="checkbox"/> Worse
2.			0	0	<input type="checkbox"/> Some function	<input type="checkbox"/> Yes	<input type="checkbox"/> Much better
			1	1	<input type="checkbox"/> None	<input type="checkbox"/> A little better	<input type="checkbox"/> As expected
			2	2	<input type="checkbox"/> None (as bad as can be)	<input type="checkbox"/> No	<input type="checkbox"/> Partially achieved
			3	3			<input type="checkbox"/> Same as baseline
							<input type="checkbox"/> Worse
3.			0	0	<input type="checkbox"/> Some function	<input type="checkbox"/> Yes	<input type="checkbox"/> Much better
			1	1	<input type="checkbox"/> None	<input type="checkbox"/> A little better	<input type="checkbox"/> As expected
			2	2	<input type="checkbox"/> None (as bad as can be)	<input type="checkbox"/> No	<input type="checkbox"/> Partially achieved
			3	3			<input type="checkbox"/> Same as baseline
							<input type="checkbox"/> Worse

6

How is the overall GAS score calculated?

Normally 3-4 goals are identified, which are incorporated into the single GAS score.

Overall Goal Attainment Scores are then calculated by applying a formula:

$$\text{Overall GAS} = 50 + \frac{10 \sum (w_i x_i)}{[(1-p) \sum w_i^2 + p(\sum w_i)^2]^{1/2}}$$

Where:

w_i = the weight assigned to the i th goal (if equal weights, $w_i = 1$)

x_i = the numerical value achieved (between -2 and +2)

p = the expected correlation of the goal scales

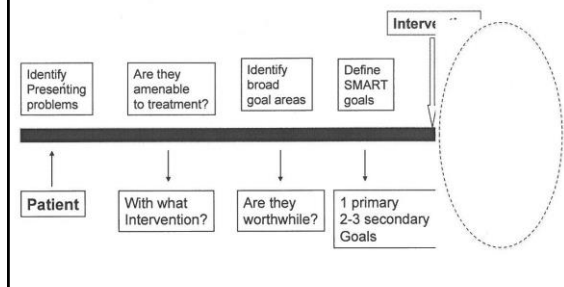
For practical purposes, according to Kirusek and Sherman, p most commonly approximates to 0.3, so the equation simplifies to:

$$\text{Overall GAS} = 50 + \frac{10 \sum (w_i x_i)}{\sqrt{(0.7 \sum w_i^2 + 0.3(\sum w_i)^2)}}$$

Goal Attainment Scaling: Prof Lynne Turner Stokes.

The GAS light model:

Goal setting is an integral part of clinical decision-making in rehabilitation. There are 6 key steps:



Six key steps in decision-making and records needed to inform GAS-light

Key steps	Clinical decision-making	Record
1. What are the pt's principal presenting problems?	Which, if any, are amenable to treatment with BoNT-A?T?	Key problem areas to address: <input type="checkbox"/> Pain <input type="checkbox"/> Passive function (caring for limb) <input type="checkbox"/> Active function <input type="checkbox"/> Mobility <input type="checkbox"/> Involuntary movement <input type="checkbox"/> Impairment (eg range of movement)) <input type="checkbox"/> Other:
2. What do you expect to be able to achieve with BoNT-A?T?	Is this likely to be worthwhile? a) to the patient b) value for money Will you offer treatment?	If so, broadly define: Primary goal for treatment Secondary goals (limit to 2-3 max)
3. Is the team and the pt/family agreed on the expected outcome?	If not, can use GAS 5-point scale to negotiate realistic outcome for key goal areas	SMARTen goals as reasonably possible: Relate to a specific function and define • expected level of achievement* by • intended date (usually 3-4 mths) Goal weighting** is optional, but may be useful for qualitative interpretation
4. How will outcome be assessed?	Decide which, if any, outcome measures to use.	Baseline values of chosen measures eg • Baseline GAS scores for each goal • spasticity – Modified Ashworth Scale • goal-related parameters*
5. Plan treatment	Decide what muscles to inject Make arrangements for therapy and follow-up review	Record procedure: • muscles injected, agent and doses • use of EMG/stimulation
6. Review	Have the goals been achieved? What, if any, further treatment is necessary?	Record level of achievement for each goal Enter in software to derive GAS T score

The GAS-light verbal scoring system is shown below:

At Baseline		With respect to this goal do they have?		
At Outcome:	Yes	Some function	<input type="checkbox"/>	-1
		No function (as bad as they could be)	<input type="checkbox"/>	-2
	No	A lot more	<input type="checkbox"/>	+2
		A little more	<input type="checkbox"/>	+1
		As expected	<input type="checkbox"/>	0
Was the goal achieved?	No	Partially achieved	<input type="checkbox"/>	(-1)
		No change	<input type="checkbox"/>	-1
		Got worse	<input type="checkbox"/>	-2

Computerisation	
-1	
-2	
+2	+2
+1	+1
0	0
(-1)	-1
-1	-2
-2	