Goal Attainment Scaling

Clinical Utility and Training Methods

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Speaker Names: Amber Sheehan, Karen Harpster, Jen Angeli

1. Disclosure of Relevant Financial Relationships

   We have no financial relationships to disclose.

2. Disclosure of Off-Label and/or investigative uses:

   We will not discuss off label use and/or investigational use in my presentation.
Grab your phone. In the internet browser, type: kahoot.it
https://kahoot.com/welcomeback/

https://create.kahoot.it/login
Learning objectives

- Synthesize the literature on GAS training and clinical utility
- Describe pilot effort to train therapists on GAS utilization, per best available evidence
- Propose best practice for GAS standardization
- Discuss feasibility of implementation
First, we get on the same page.

1. Goal Attainment Scaling = GAS
2. GAS is a criterion-referenced measure that helps us to quantify a degree to which personal goals are achieved.
3. It was developed in 1968 and was first used in mental health.
4. It is becoming more popular in rehabilitation health, as an index of intervention efficacy.
The GAS parts

- Document a set of *patient*-identified goals
- Identify the construct of change that matters most to the patient/family
- Observe/discuss/document current performance on each goal
- Agree upon a desired short term outcome
- Discuss what performance looks like if it is a little better than the desired short term outcome, or much better than the desired short term outcome.
For example:

I want to ride my bike to the end of Victory Avenue (0.5 miles).

<table>
<thead>
<tr>
<th>Performance</th>
<th>Interpretation</th>
<th>GAS interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed MS150</td>
<td>Much better than expected</td>
<td>+2</td>
</tr>
<tr>
<td>Rode to park for new zipline (1 mile)</td>
<td>Better than expected</td>
<td>+1</td>
</tr>
<tr>
<td>See above</td>
<td>Short term goal</td>
<td>0</td>
</tr>
<tr>
<td>Rode to Joe’s house for dinner (3 houses down)</td>
<td>Progress, but did not achieve goal</td>
<td>-1</td>
</tr>
<tr>
<td>Cannot ride bike</td>
<td>Baseline level of performance</td>
<td>-2</td>
</tr>
</tbody>
</table>
Extra parts

- Weight each goal for importance (patient/caregiver) and difficulty (therapist)
- Put it all in a big formula that will calculate a T score.
- Use the T score or change in T scores to interpret

If all of the goals met the expected level of achievement, the GAS T score will be 50. If the patient does:

<table>
<thead>
<tr>
<th>If the patient does:</th>
<th>Expected range for the GAS T score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much better than expected</td>
<td>&gt;60</td>
</tr>
<tr>
<td>Better than expected</td>
<td>50-59</td>
</tr>
<tr>
<td>Less well than expected</td>
<td>40-49</td>
</tr>
<tr>
<td>Much less well than expected</td>
<td>&lt;40</td>
</tr>
</tbody>
</table>

or Minimal Detectable Change = 10 points
What’s nice about GAS

- It’s patient-centric
- It provides a single, objective summary of performance
- Progress reflects meaningful change in a prioritized area
What’s not nice about GAS

• It’s hard to learn.
• It feels like it’s not clinically feasible.
• It’s only valid if you follow the rules, particularly those associated with scaling.
What we learned about GAS in a systematic review

The methodological application of goal attainment scaling in pediatric rehabilitation research: a systematic review.

Harpster K, Sheehan A, Foster EA, Leffler E, Schwab SM, Angeli JM.

1. Is it being used in pediatric rehab?  
2. What’s the rigor of published pediatric studies employing the GAS?  
3. Is GAS a responsive outcome measure?
• 51 studies in pediatric rehab were included in our review
• They weren’t very strong with respect to rigor and quality
• Despite this, GAS appeared to detect meaningful change in ~ 60% of studies
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• They weren’t very strong with respect to rigor and quality.

• Despite this, GAS appeared to detect meaningful change in ~ 60% of studies.
### Levels of Evidence from Sackett*

<table>
<thead>
<tr>
<th>Level</th>
<th>Type of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Large RCTs with clear cut results</td>
</tr>
<tr>
<td>II</td>
<td>Small RCTs with unclear results</td>
</tr>
<tr>
<td>III</td>
<td>Cohort and case-control studies</td>
</tr>
<tr>
<td>IV</td>
<td>Historical cohort or case-control studies</td>
</tr>
<tr>
<td>V</td>
<td>Case series, studies with no controls</td>
</tr>
</tbody>
</table>

*Adapted from Sackett DL. Rules of evidence and clinical recommendations on the use of antithrombotic agents. Chest 1989;95:

- Higher Sackett levels = more rigorous study design
• 17 quality criteria that group broadly into categories describing:
  – content validity of the scale
  – reliability of scale construction
  – reliability of scale rating
  – additional items related to training and examiner bias
• Higher quality scores = greater validity in GAS application
• See handout for criteria!
Quality summary

• Of the 51 studies included, less than half (19 studies) were categorized as Sackett levels I, II, or III.
• Average quality score = 4.57 points (/17)
  Individual studies lost the most points for failure of Goal Attainment Scaling scales to adhere to the criteria of:
  - unidimensionality (1/51)
  - time-specificity (3/51)
  - reliability of scale construction-equidistance of levels (3/51)
  - inter-rater reliability (4/51)
Why does it matter?

• GAS T scores may inflate (and indicate progress) simply because of bias introduced from failure to create valid and reliable scales.
What did we do?
Our Goal:

• To utilize the GAS as an objective outcome measure with a high level of reliability in clinical practice
  – Start with episodic care summer programs
  • Clinic-based GAS session

http://www.acmsoft.com/Services/think-big-start-small.html
• Level of parent and child involvement
• Video tape GAS performance vs no video
• Documentation
• Setting the construct of change
Develop a process

• Video tape all GAS goal performances
• Watch videos during team meetings
  – Develop documentation (importance, difficulty, level of change, etc)
• Review goals using GAS checklist
• Review GAS levels with caregivers

http://www.10minutebiztools.com/Startup-Trial-and-Error.html
GAS in Research: Refine the process even further

- Independent teams
  - COPM/treatment team
  - GAS team
- Training to ensure specificity of COPM goal
  E.g. “John runs back and forth and puts holes in his socks” → “John will sit for 5 minutes to complete a fine motor task”
- Develop a script to elicit meaningfulness of goals
What happened next: Therapist Training

• Developed a training manual, based on current evidence
  – includes procedures and criteria for scale construction, scoring, and interpretation of outcome data
• Provide formal training
  – Introduced the training manual and demonstrate application via case study
  – Trainees independently review materials and construct a scales based on the same video
  – Review scale with each trainee using quality criteria to promote adequate interrater reliability
What happened next: GAS Visit via telehealth

• GAS scales are developed by 2 independent raters based on video taped performance of goals
  – GAS scales compared for sameness
    • Child scored on both
  – GAS checklist implemented
  – Feedback given regarding scale construction within 1 week of GAS completion
GAS through telehealth....

• Volume control
• Test video call with caregiver
  – Ensure they understand how to use technology, camera angle, etc.
• Make sure the caregiver knows the child needs to be present for session
GAS through telehealth....

• Make sure the supplies for the goals are readily available
• Making sure the video stays on the child during goal completion
• Considering an informal scale to capture how much assistance the caregiver needs to participate in co-creation of scale – seems to be impacting validity of the scales we create
of doing GAS through telehealth

- Materials usually readily available
- Natural environment
- Generalization occurs naturally
- Empowering the caregiver
Criteria for GAS appraisal

• Eliminated items
  – Goals specific to aim of intervention
  – Pretest score same across all goals/ patients
  – Specification of follow up time
  – Adequate therapist training
  – Report of inter-rater reliability
  – Report of examples of goals and scaling

• Added items suggested by other sources
Results thus far

- 2/5 trained therapists had no prior GAS background
- Telehealth goal scaling completed with 6 patients, each by one of 3 therapists
  - Average 9.4/15 scaling quality criteria met
  - After feedback provided, no additional sessions yet to assess potential change in quality
  - Two trained therapists have not yet had a goal scaling session scheduled
Results thus far, cont.

• Most easily achieved criteria
  – Mutually exclusive goals
  – All five levels defined
• similar to the literature
Results thus far, cont.

- Other easily achieved criteria
  - Scale uni-dimensionality
  - Verification of pre-intervention performance
  - Equidistance of scale levels
    - frequent absence in the literature, achieved here due to initial training and study design
Future plans

• Study design
  – Confirm post-test scale score with caregiver
Future plans

• Study design
  – Determine interrater reliability by correlating the ratings of the original goal scaler with a second rater on 20-30% of goals (Krasny-Pacini et al., 2017; King et al., 1999)
Future plans

• Reporting results
  – Adequate example of goals and scaling reported
  – Results in literature were most commonly stated as:
    • a raw post-intervention T-score (27 of 51 studies)
    • change in T-score (3 of 51)
    • number or % of goals that were achieved (i.e., at or above the “0” level on the scale; 23 of 51 studies)
    • effect size (4 of 51)
Zip Coat

• Goal: Mom would like Peter to be able to zip his coat independently
• Construct of Change: Level of independence
Let's Practice
Zip Coat

- Goal: Mom would like Peter to be able to zip his coat independently

<table>
<thead>
<tr>
<th>2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:</td>
</tr>
<tr>
<td>0:</td>
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<tr>
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-2: Needs help with engaging zipper and stabilizing coat to pull up zipper
Zip Coat

- Goal: Mom would like Peter to be able to zip his coat independently

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Zip Coat

- Goal: Mom would like Peter to be able to zip his coat independently

<table>
<thead>
<tr>
<th>2: Engaging and pull up zipper while the coat is on</th>
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<td>1: Engage and pull up zipper with coat on the table</td>
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<tr>
<td>0: Stabilize coat and pull zipper up with coat on</td>
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<td>-1: Stabilize coat and pull up zipper with coat on the table</td>
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References
