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SPECIAL COMMUNICATION

Implementing Goal Attainment Scaling as a Person-Centered Measurement Tool to Direct Care and Evaluate Outcomes in Neurorehabilitation Settings

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Abstract

The purpose of this Special Communication is to describe barriers and facilitators to implementing goal attainment scaling (GAS) as a patient-centered measurement tool in neurorehabilitation settings. The experiences of 3 distinct neurorehabilitation settings that implemented GAS to enhance person-centered care and measure person-centered goal attainment are described: a neurorehabilitation service at an inpatient rehabilitation facility; an intensive outpatient program serving military service members, veterans, and first responders with a history of mild to moderate traumatic brain injury; and an outpatient clinic serving adolescents and adults with recent history of mild traumatic brain injury. Each setting instituted different methods to implement GAS yet experienced commonalities in barriers and facilitators to implementation and adoption. Experiences were thematically organized using the normalization process theory (NPT), a framework that supports the design and evaluation of clinical process implementation. Barriers clustered in the NPT domains of coherence and cognitive participation, including factors such as staff training requirements, time required to implement, and challenges related to shifting program philosophies. Implementation was facilitated by actions taken in collective action and reflexive monitoring domains, such as integrating processes into workflows, leveraging technology for team communication and measurement, and completing regular audits and staff feedback. Patient-centered measurement tools, such as GAS, provide a framework for capturing patient priorities, enhancing the relevance of care plans, and ensuring treatment goals align with individual patient needs. Evaluating GAS implementation using the NPT provides direction to future clinical implementation efforts, which should continue to integrate clinical experiences with those of the persons served.

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Person-centered care (PCC) models prioritize patient preferences and active involvement in decision-making, using collaborative approaches to support patient engagement, improve outcomes, and increase patient satisfaction.[1] Interdisciplinary team models, which support care coordination and emphasize overlapping areas of expertise among disciplines, and transdisciplinary team models, where team members share responsibility for addressing clinical concerns across disciplines, are common team frameworks that support delivery of PCC. Although more challenging to implement and sustain, transdisciplinary approaches tend to be more conducive to PCC because they more effectively facilitate a whole-person approach through role flexibility, enabling team

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members to holistically integrate the patient's unique strengths, needs, and preferences into the care process.[2]

In neurorehabilitation, goal setting is used to guide treatment planning and measure progress,[3] thus person-centered goal (PCG) setting based on principles of person-centered measurement (PCM)[4] is a critical component of PCC. PCGs focus on participation and patient-driven outcomes that are likely to improve quality of life, with less emphasis on measurement of changes in impairment or problem reduction.[5] In traditional models, goal setting, measurement of progress, and treatment are clinician-driven. In contrast, PCM models place the patient at the center, encouraging active participation in care plan development and outcomes measurement.[6]

Goal attainment scaling (GAS) is a reliable PCM tool for assessing PCGs.[7] GAS uses a 5-point scale to measure meaningful change in PCGs,[8] creating an individualized measurement tool for each patient. PCGs are developed and scaled a priori with specific benchmarks representing levels of attainment, resulting in objective measures of progress. Changes on the scale can be converted to a standardized *t*-score, facilitating outcome measurement across individuals.[8] GAS has been shown to be feasible for neurorehabilitation across a variety of settings and populations, both civilian and military.[9-12] Applying GAS to PCGs aligns with PCM principles[4] in that it (1) develops a scale using the patient's words so that it is comprehensible and meaningful; (2) is transparent, as both patient and provider have the same information related to goal attainment; (3) is patient-driven in that the goals and scale are developed based on patient priorities; (4) is co-created by the patient and provider; and (5) is holistic, addressing any aspect of a person's life that is meaningful and important to them. Furthermore, the integration of individualized frames of reference enhances PCM by grounding evaluation in the patient's own definitions of success and by considering factors unique to the individual, thereby supporting a precision health framework that respects personal variability.

Despite this value, it is unclear how often GAS is implemented in neurorehabilitation programs, or what factors influence adoption. One framework that may be useful to examine GAS implementation is the normalization process theory (NPT), a framework for understanding how new practices, interventions, and technologies are integrated into health care systems,[13] as it particularly focuses on the work individuals and groups do to normalize changes within their everyday operations.[14] This theory is useful in tracing factors influencing the adoption and sustained use of new practices in complex systems, with diverse representation, and the need for coordinated efforts. For example, Doig et al[13] examined GAS implementation using the NPT, finding that a mindset shift toward prioritizing patient preferences was as important as team practices and organizational integration to sustained GAS use.

In this Special Communications paper, we apply the NPT to examine barriers and facilitators to the implementation of GAS across 3 neurorehabilitation settings, examining GAS implementation at multiple levels—that of the individual, teams, and system—to provide interpretable and actionable direction toward improving uptake of PCM. We conclude by discussing future directions, both to facilitate use of GAS in neurorehabilitation programs, and to direct research toward further understanding approaches to reduce barriers to implementation and adoption of PCM more broadly.

List of abbreviations:

CCC	**Complex Concussion Clinic**
EHR	**electronic health record**
GAS	**goal attainment scaling**
NPT	**normalization process theory**
OT	**occupational therapist**
PCC	**person-centered care**
PCG	**person-centered goal**
PCM	**patient-centered measurement**
PT	**physical therapist**
SAI	**Sheltering Arms Institute**
SHARE	**SHARE Military Initiative**
SLP	**speech-language pathologist**

Methods

Settings

Three distinct neurorehabilitation settings separately implemented GAS to support patients, care partners, and providers in co-creating care plans and measuring outcomes. Before implementation, leaders in each setting identified gaps and needs; however, program readiness to implement GAS was not formally assessed. All 3 programs completed pilot testing of GAS implementation to measure PCGs. Currently, 2 of the programs—the SHARE Military Initiative (SHARE) and Complex Concussion Clinic (CCC)—have fully scaled and adopted the implementation.

Sheltering Arms Institute

The SAI in Richmond, VA is an inpatient rehabilitation facility, with 4 specialized services: multispecialty (eg, orthopedic injuries, amputation), complex care (eg, spinal cord injury, burns), stroke, and brain injury. Treatment teams include core clusters of physical therapists (PTs), occupational therapists (OTs), and speech-language pathologists (SLPs), with physiatrists, nurses, case managers, psychologists, therapeutic recreation specialists, and dietitians serving across multiple clusters.

SAI aimed to demonstrate a transdisciplinary model but found few options to objectively measure team cohesion and collaborative progress toward PCM. To address this, a pilot project was initiated with 2 aims: (1) develop an electronic health record (EHR) application to facilitate GAS documentation and PCG progress visualization (fig 1), and (2) train a rehabilitation team in GAS and evaluate implementation across multiple services. Two rehabilitation teams—multispecialty and stroke—underwent 3 training sessions focused on GAS background, practical application to case examples, and documentation using the EHR application.

After the training, 2 sequential GAS trials were conducted. Each trial involved recruiting a patient upon admission, scaling from 3 to 5 PCGs across disciplines, documenting progress throughout the inpatient stay, consultation with trial monitors, and debriefing after discharge. During initial evaluations with different disciplines, potential PCGs were identified and scaled. Upon completion of the evaluations, the team conferred to review gaps/overlaps in PCGs. PCGs were then finalized with patients by their third session, recorded in the EHR, and scored 3 times per week.

SHARE military initiative

The SHARE at Shepherd Center in Atlanta, Georgia, is an intensive outpatient program serving military service members,

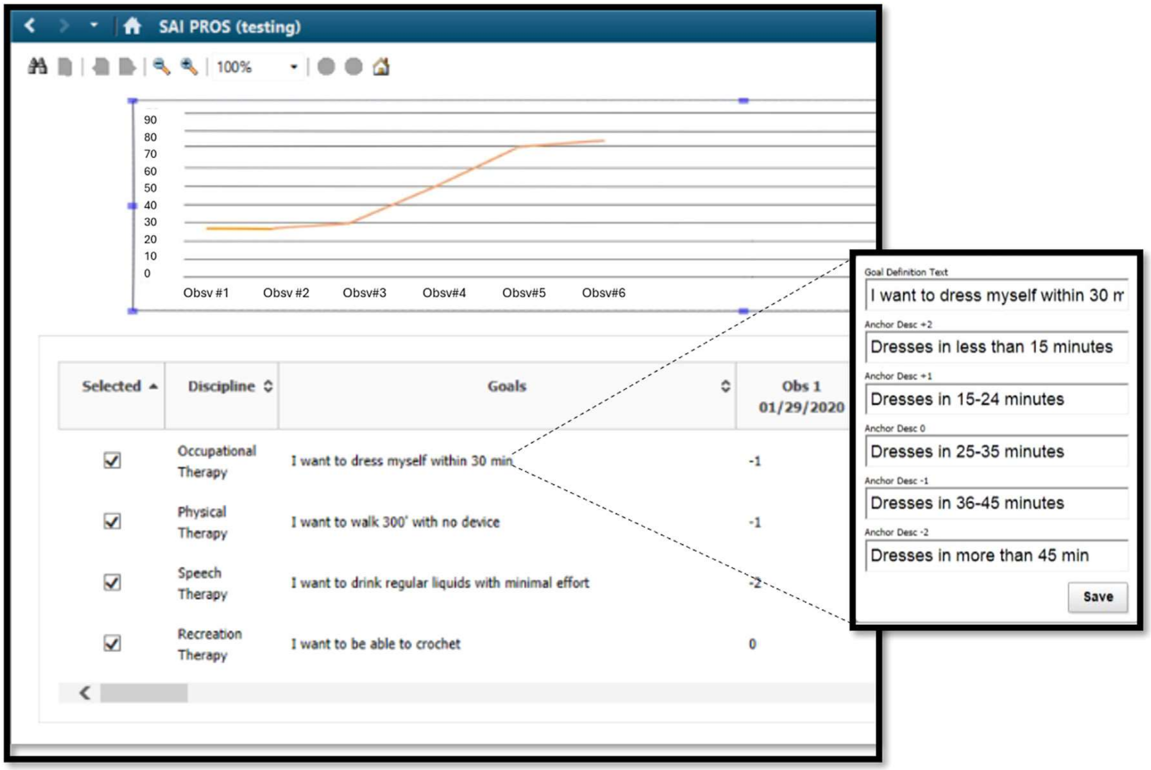

Fig 1 SAI GAS application. Screenshots of the EHR application developed by SAI to facilitate GAS goal development, documentation, and progress visualization, illustrating key features of the tool used for implementation.

veterans, and first responders with a history of mild to moderate traumatic brain injury, typically in the chronic phase of recovery (ie, >6mo postinjury).[9] Participants engage in ≤6 hours of individual and group therapy daily, 5 days per week, delivered by an interdisciplinary team comprised of case managers, nursing, OTs, PTs, SLPs, neurology or physiatry, psychology, and therapeutic recreation specialists, with additional services like vocational counseling, peer support, and chaplaincy as needed based on patient goals.

GAS was implemented as part of a broader effort to enhance PCC and PCM across Shepherd Center's brain injury programs. The initiative aimed to (1) assess PCC strengths and opportunities via review of literature, patient outcomes and satisfaction data, and focus group feedback; and (2) integrate person-centered transdisciplinary team goals. Each program anchored care around team-based PGCs measured by GAS, and operational processes were hardwired to support this approach. Before implementing GAS, participants set PCGs, but the goals were not formally scaled or measured, and processes were not in place to support the use of PCGs to direct care plans.

Participants in SHARE identify 1-to-3 PCGs and co-create GAS scales with their SLP. The interdisciplinary team collaborates to assess facilitators and barriers to goal attainment and to design comprehensive, person-centered treatment plans driven by PCGs. Individual disciplines establish discipline-specific short- and long-term goals to support PCG attainment. Plans of care are tailored to participants' strengths, challenges, symptoms, resources, comorbidities, and contextual factors. Throughout treatment, team members link interventions to PCGs and conduct intermittent status reviews with the patient. At discharge, the patient collaborates with the SLP to rate their goal attainment.

Complex Concussion Clinic

The CCC at Shepherd Center is an outpatient specialty clinic serving adolescents and adults with recent mild traumatic brain injury.[15] Care is provided by an interdisciplinary team, which may include physicians (neurologist or physiatrist), athletic trainers, case managers, PTs, OTs, SLPs, psychology, and vocational counseling. Patients are first evaluated by the physician, who then refers them to therapy services based on their unique needs. A typical plan of care consists of a 1-hour treatment session each week per provider for a period of 1-3 months.

Initially, CCC clinicians each wrote discipline-specific PCGs rated as "met" or "not met," but there was no structured process to guide clinicians to co-create PCGs with patients or to describe expected levels of goal attainment. CCC is housed in the same building as SHARE, and several CCC staff experienced with team-based GAS processes at SHARE proposed implementing GAS in the CCC. A process improvement workgroup then piloted GAS implementation before it was later adopted more permanently. The workgroup aimed to (1) improve PCG outcomes across disciplines, (2) evaluate GAS implementation methods, and (3) test selected processes for effectiveness and sustainability. After small-scale testing and process refinement by the workgroup, the full team was trained.

Pilot testing resulted in improved PCM. Feedback from the interdisciplinary team suggested all CCC patients should set 1-to-3 team-based PCGs and that GAS implementation would foster a more cohesive approach to care. A weekly team huddle was introduced to discuss PCGs and assign responsibility for co-creating scales with each patient. Goals were set and scaled within the first 3 sessions with the assigned rehabilitation provider, who then recorded them in

Table 1 Program data reviewed.

Data Type	Data Source	Purpose
Direct observation	Insights gained through participation in staff training sessions, patient goal setting meetings, and interdisciplinary team, project, and leadership meetings	Quality improvement and implementation plan adaptation
Stakeholder feedback	Informal feedback from staff, patients, and care partners regarding their experiences with GAS implementation	Evaluation of acceptability and identification of improvement opportunities
Organizational metrics	Supplementary organizational data, as available, including SHARE program patient satisfaction survey data collected pre/postimplementation and CCC program changes in PCG attainment	Program evaluation
Reflexive accounts	Reflexive discussions among authors to evaluate the implementation process and identify key elements while appraising challenges and successes in each setting	Identification of shared and unique implementation challenges and successes
NPT toolkit	A 16-item assessment of the degree of representation of NPT constructs in integrating and/or implementing a complex intervention	Structured implementation evaluation
Semistructured interviews	Interviews were recorded and transcribed. Field notes were recorded after each interview and were later reviewed with site representatives to confirm accuracy and aid interpretation	Implementation evaluation; data synthesis across sites

the EHR. Like SHARE, goals were used to guide interdisciplinary team rounding on patients, and each team member addressed discipline-specific goals in support of PCGs. Patients then rated their goal attainment at discharge from each discipline's service.

Data sources

Data sources are described in table 1. All data except semistructured interviews were collected during implementation and used to inform continuous quality improvement at each site. Sites did not follow a uniform protocol for collecting data. Here, we review that quality data across sites using the NPT to describe how implementation varied and was facilitated or limited. An author who was not involved in implementation reviewed the data sources, and had a representative from each site complete the online NPT Toolkit assessment[16] and a semistructured interview probing for facilitators and barriers related to each of the 4 NPT constructs.

Analysis

For this analysis, we adopted a multicase approach, focusing on 3 neurorehabilitation settings where GAS was implemented to instantiate

Table 2 NPT constructs and examples in health care settings NPT construct.

NPT Construct	Description	Rehabilitation Examples
Coherence	Describes the sense-making work that individuals and groups engage in to understand the new practice. It involves defining and organizing its components, and ensuring it aligns with the existing context and is perceived as valuable.	Clinicians, administrators, and patients have a clear understanding of the new practice and its benefits.
Cognitive participation	Involves the relational work that people do to enroll and engage others in the new practice. This includes building a collective commitment to the practice, fostering effective collaboration, and ensuring that all stakeholders are willing to invest their time and resources.	Involved parties feel able and capable of successfully implementing the change (eg, self-efficacy and locus of control), and thus motivated to maintain it.
Collective action	Refers to the operational work individuals and groups do to enact the new practice, including allocation of resources, division of labor, and development of new workflows and processes. Effective collective action ensures that new practices are carried out efficiently, and that members understand and can enact their individual and collective roles within an interdisciplinary team.	Development of new procedures, reorganizing care pathways, identifying new communication tools, or integrating new technologies into existing systems.
Reflexive monitoring	Includes the appraisal work individuals and groups do to assess and evaluate the new practice. This includes monitoring outcomes, identifying areas for improvement, and making necessary adjustments. Reflexive monitoring may also directly monitor the other 3 NPT constructs, providing ongoing recursive guidance around addressing needs related to team coherence, cognitive participation, and collective action.	Delivery of the change (ie, fidelity or consistency of implementation), but may also address patient outcomes, or how use of the change in practice resulted in change to patient care, satisfaction, or outcomes.

PCM into clinical practice. A rapid content analysis approach was used to identify factors influencing implementation across data sources,[17,18] which were mapped to an implementation framework.[19] The NPT provided a structured approach to organizing and interpreting the PCM aspects of GAS implementation. NPT consists of 4 core constructs that explain how new practices become normalized in health care or rehabilitation contexts: (1) coherence, (2) cognitive participation, (3) collective action, and (4) reflexive monitoring.[14] Table 2 describes NPT constructs with examples in health care. Preliminary factors were shared with the team, sorted into NPT constructs as either barriers or facilitators, then reviewed and refined, with additional exemplars added as needed. This informal feedback from program representatives was not systematically gathered, analyzed, or verified, and is presented here as a synthesis only.

Results

Programs followed a similar implementation process to adapt GAS to their unique population, setting, and workflows. Decisions faced by each program during implementation planning were sorted into NPT constructs, as summarized in table 3. Overlap was identified in *Cognitive Participation* and *Collective Action*, as all program representatives described how roles and the scope of goal decisions were driven by underlying beliefs about PCM and the purpose of implementing GAS, particularly its effect on team and patient engagement. For example, all program representatives felt that GAS supported collaborative teamwork and did so best if goals were shared across disciplines. Having overarching goals supported this vision of teamwork but required implementation planning to address team communication needs.

Similarly, factors across all 3 programs related to implementation contexts, mechanisms, and outcomes[20] were sorted by NPT constructs and then organized by the process of implementation. Program representatives' ratings of saturation across these constructs from the NPT Toolkit are illustrated in figure 2 and factors identified across data sources are summarized below. Where appropriate, PCM principles are addressed, but in general, programs viewed GAS activities as making PCM principles actionable and concrete.

Coherence across programs for PCC

In line with the NPT construct of *Coherence*, representatives from all 3 programs highlighted the role of interdisciplinary (SHARE, CCC) or transdisciplinary (SAI) teamwork as driving the selection of GAS to focus the team on providing high-quality PCM and PCC. At SAI, providers felt GAS's inherent transdisciplinary nature prompted providers to consider how they could support patient progress beyond their individual scopes of practice. Similarly, at SHARE, PCGs became central to team discussions and treatment planning, which provided a unified framework to align team efforts and think holistically about patient needs, rather than operating in discipline-specific lanes. At the CCC, although PCC was already viewed as a core tenet of care, implementing GAS was viewed as instantiating PCM beliefs into replicable processes that would improve the quality and consistency of that care. Together, these shared beliefs align with the NPT construct of *Coherence*, showing that GAS was valued for unifying team PCM efforts and elevating collaboration.

Despite starting from the same foundational PCM beliefs, implementation approaches varied across settings. NPT constructs addressed during piloting (SAI, SHARE, and CCC) and final roll-out processes (SHARE and CCC) are summarized in figure 3, which provides an overview of how normalization efforts were sequenced during implementation at each site. Narrative descriptions below are organized after that process.

Sheltering Arms Institute

SAI received a grant to support embedding GAS measurement into the EHR, providing real-time data visualizations of PCG progress. This led the team to center implementation around the NPT construct of *Reflexive Monitoring*, incorporating measurement into daily workflows. The tool generated *T*-scores from GAS data, providing an objective measurement of the patient's overall progress. Clinicians tracked and analyzed PCGs, which encouraged frequent, serial measurements, in line with the PCM principle that data be comprehensible and timely. This was viewed as an improvement over traditional measurement approaches that rely primarily on assessments at admission and discharge, allowing care to be adjusted in response to GAS ratings.

However, real-time PCG monitoring raised questions about how often measurement is necessary to support patient progress without overburdening patients and staff, particularly when there was not enough opportunity between measurements to observe all PCG-related activities, leading to ambiguous results. At other times, frequent measurements showed that modifications might be needed to better support the patient's participation-focused goals, such as protecting time for therapeutic recreation activities. Unfortunately, other needs, such as addressing medical issues or meeting discharge planning benchmarks, often took priority. In NPT terms, although measurement was systematic, it inconsistently allowed for care to be adjusted based on results.

SAI experienced strengths in *Cognitive Participation*, with providers seeing GAS as meaningful to their daily work. *Collective Action* efforts focused on integrating GAS activities into daily workflows, including team meetings. However, barriers were encountered in getting full participation from all disciplines, as the team struggled to integrate the system with medical staff workflows. Physicians preferred to track goals outside of the medical record, and differing nursing schedules limited interaction between the primary team as well as the GAS measurement and visualization tool. Workability was also limited by concurrent traditional clinician-established rehabilitation goals, so GAS was perceived as duplicative of the established workflow.

Reflexive Monitoring tools and workflows were incorporated into training materials, which included both theoretical and hands-on components to operationalize the goal writing and scaling process, encouraging strong *Coherence* in team members. Although the training was well received, staff struggled with scaling nuances inherent to the GAS approach of translating holistic, patient-driven goals to co-create a PCM, particularly in making goal scale levels equidistant and describing levels at scale ends. Instead, staff were more accustomed to thinking in terms of binary progress (eg, achieved or not achieved).

As shown in figure 2, few NPT constructs reached the saturation that may have been necessary to achieve maintenance of GAS. The GAS workload and *Collective Action* processes added burden not offset by gains in other areas, such as observed patient benefit (*Reflexive Monitoring*) or adjustments to the intervention reflecting patient needs and preferences, which may improve the intervention (*Cognitive Participation*). SAI differed from the other 2 programs in that it was the only program to report its pilot activities here, rather than using the pilot to revise and redeploy the GAS intervention again. Future efforts may work toward aligning

Table 3 GAS implementation planning as explained by NPT components.

Element	NPT Component	Key Considerations	SAI Implementation	SHARE Implementation	CCC Implementation
Who sets and scales the goals?	Cognitive participation	• Will the patient, care partners, or both set the goals? • Should goals be over-arching team goals, or individualized by discipline (discipline-specific, eg, physical therapy)?	Patient sets goals with at least 3 disciplines who determine overlap to identify a main goal. Discipline-specific goals aimed at achieving the main PCG goal are created in the SAI EHR application with representation of a single T-score.	Patient and SLP set and scale PCGs addressed by the team. Team reviews and provides feedback before SLP and patient finalize the scale.	Patient and one member of team (OT, PT, SLP, or psychology) set and scale PCGs addressed by the team. Team reviews and provides feedback before a team member and patient finalize the scale.
	Collective action	Which clinicians will lead this process?			
How and when are goals set/ measured?	Collective action	• What is the process for goal setting (timing, collaboration)? • How often will goals be measured? • Who is responsible for conducting measurements?	Occurs within the first 3 d of inpatient admission. Goals are measured 3 times weekly by each team member until discharge.	Occurs via patient report at admission and discharge with feedback from the team; again at 6 mo and 12 mo post.	Occurs via patient report at admission and discharge with feedback from the team. Patient rates/ rerate goal attainment during final session with each discipline.
Communication and collaboration	Collective action	• How will information about progress and barriers be shared among the team? • What tools or technologies will support communication?	Weekly team meetings, Cerner EHR using a custom tool allowing for visualization of score and progression. Team members relate treatment activities to goals and periodically review progress with patient.	Weekly team meetings, Epic EHR Team members relate treatment activities to goals and periodically review progress with patient.	Team meetings, Microsoft Teams channel, Epic EHR Team members relate treatment activities to goals and periodically review progress with patient.
	Cognitive participation	How will these updates guide treatment and patient collaboration?			
Documentation and reporting	Reflexive monitoring	• How will PGCs and progress be documented? • What systems or tools will track progress and outcomes? • How will data be reported back to patients and stakeholders? • Will there be regular audits of the goals (eg, quality, completion, or periodic evaluations)?	PCG identification begins during evaluation, and the GAS scale is completed by the third visit. Each team member enters their discipline-specific information into the EHR. Clinicians discuss results with the patients and show progress visualization.	PCG and GAS scale are established within first 2 wk of intensive outpatient program. Case manager enters into medical record and patient is provided with written print out.	PCG identification begins during evaluation, and the GAS scale is completed by the third visit. The team member leading PCG setting with the patient enters it into the EHR. Patients are provided with email or print out.

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Table 3 (*Continued*)

Element	NPT Component	Key Considerations	SAI Implementation	SHARE Implementation	CCC Implementation
Training and reliability	Coherence	• What training will staff need to write PGCs and implement GAS? • How will the GAS process (eg, goal setting, scaling, and ratings) ensure reliability? • How will new staff be onboarded to the GAS process?	Two in-person training sessions during the pilot. Sessions were recorded and slides available in a shared location for reference. Project team provided feedback on PCG and GAS scales as needed. Debriefing occurred with teams for a shared learning experience.	Training videos and handouts. Champions further orient new staff after video review and provide new SLPs with feedback on PCG GAS scales. Champions also conduct quality audits 1-2 times yearly and provide education for staff based on results of audits.	Training videos and handouts. Champions further orient new staff after video review and provide new OTs, PTs, SLPs, and psychology providers with feedback on PCG GAS scales. Champions also conduct quality audits 1-2 times yearly and provide education for all staff based on results of audits.

Fig 2 Presence of NPT construct across sites. The NPT toolkit radar plots illustrate the strength and presence of each NPT construct as assigned by implementation leaders at each site based on program representative perspectives and attitudes at the time of implementation. The lines in the plot delineate 16 segments, 4 per construct. Areas further from the center may indicate greater normalization of that construct.

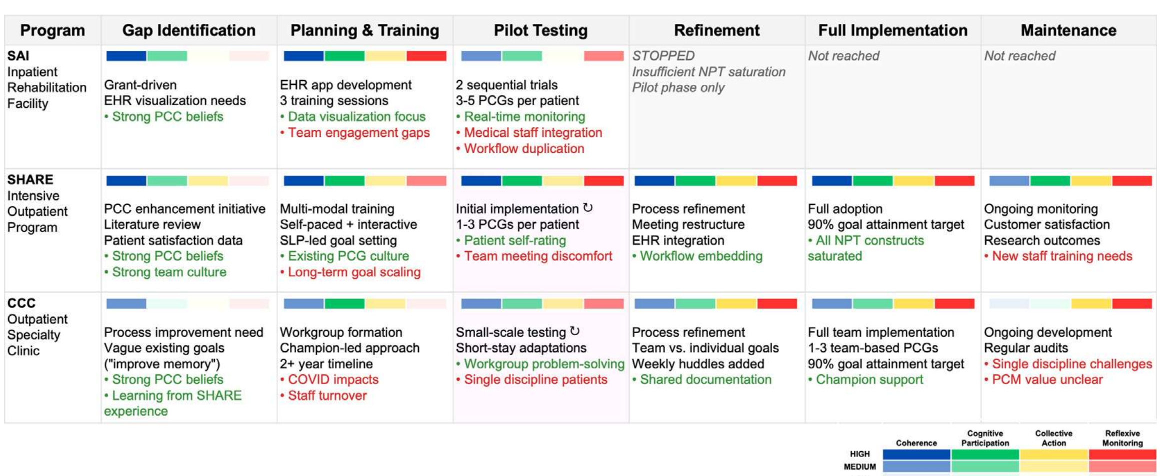

Fig 3 GAS implementation: NPT-guided process across 3 neurorehabilitation settings. The timeline-based implementation table represents the implementation processes across all 3 settings. Refinement cycles are indicated by iteration symbols (↻), and construct intensity indicators show how each NPT domain developed over time.

an entire team around GAS (rather than individual team members), so that all patients and processes are shifted entirely to the new system, rather than a smaller, piecemeal approach.

SHARE military initiative

SHARE implemented GAS as part of a broader initiative to enhance PCC practices, driven by strengths in *Cognitive Participation*. Initial efforts focused on shifting practices from a clinician-driven approach to embracing PCM principles, emphasizing co-created holistic participation and activity goals, rather than impairments. Clinicians embraced the concept of self-assessment, empowering patients to have transparent access to understanding and monitoring their own progress, serving as the final decision-makers in rating their goal attainment. This also represented a significant philosophical shift toward PCM principles, as the clinicians would no longer be the sole arbiters of the patient's progress. Instead, rehabilitative activities would be centered around the value of the patient's perception of their achievements, both in describing real change, but also supporting self-efficacy toward the rehabilitative process.

From there, SHARE addressed *Collective Action* components, operationalizing GAS processes into workflows. The program was able to capitalize on existing processes, including a culture of interdisciplinary teamwork and use of PCGs. Because goal setting is an executive function skill, SLPs were selected to set and scale goals with patients and then incorporate input from other team members. Weekly medical team meetings were restructured to focus on PCG progress and barriers, rather than detailed descriptions of discipline-specific activities, resulting in increased efficiency of team meetings and more collaborative discussions. In this way, having comprehensible and timely goals benefited not only patients, but team functioning as well. Because goals were transparent and co-created, patients could rate their own progress using GAS, giving the team a shared sense of ownership over PCG attainment. However, some clinicians felt uncomfortable with reduced information sharing in team meetings as the focus shifted to PCGs. In effect, shifting toward patient rather than team-driven goals also required team members to relinquish some control. A more concrete challenge was encountered when integrating GAS into the EHR to ensure goals were accessible to the full team without duplicating documentation.

For *Coherence*, training was designed to address knowledge, process, and philosophical components in a series of combined self-paced and interactive modules. Clinicians first reviewed slide shows and watched webinars on PCG setting measured by GAS, followed by one-on-one discipline-specific training and ongoing coaching. This ongoing guidance was particularly important, as PCGs by their nature introduce a wide range of options for operationalization. For example, goals were especially challenging to set and scale when they related to long-term plans that extended beyond the treatment timeframe. The team had to gain comfort with setting "more than expected" or "much more than expected" levels of goal attainment that were not achievable within the program's duration, while still identifying realistic, achievable "expected" levels for the patient to work toward. Specifically, GAS is often designed so that "expected" progress is moving one step up from baseline, even though the scale may extend 2-3 levels above baseline. In effect, just as patients needed to be educated to understand that progress was expected to continue after discharge, clinicians also had to become comfortable with the current episode of care setting the stage for longer term goal achievement. Clinicians worked to ensure discipline-specific goals were aligned with PCGs, so that each discipline could understand how they were contributing to what was meaningful for each patient.

For *Reflexive Monitoring*, SHARE set a benchmark that ≥90% of PCGs are met at the "Expected" level or higher, and they evaluated customer satisfaction related to PCC. The program also conducted research to track patients' progress on the goal attainment scale over time, even after program completion, evaluating the role of transition support in patients maintaining or continuing to make gains toward their goals.[20] On the implementation side, program leaders monitored progress and identified challenges through regular discussions with the team. They also closely tracked team meetings to ensure the focus remained on PCGs, rather than reverting to the previous discipline-specific reporting. Additionally, program leaders reviewed documents to ensure PCM principles guided patient conferences, so that patient strengths, barriers, and recommendations were consistently communicated collaboratively between patients and teams.

As shown in figure 2, ≥1 component of each of the 4 NPT domains was fully addressed at SHARE. Relative strengths are shown in *Collective Action*, meaning that GAS is well integrated into daily work activities both individually and collectively. An area of relative need is individual training (*Coherence*), demonstrating that even in well-established programs, ongoing education around PCM—for new staff as well as existing staff—is needed for implementation fidelity.

Complex Concussion Clinic

In contrast to the SAI approach of centering implementation around *Reflexive Monitoring*, the CCC employed *Cognitive Participation* through forming a process improvement workgroup led by clinicians familiar with GAS. This workgroup piloted the new goal setting processes to refine the approach and identify potential challenges before rolling it out to the broader team. Using key individuals to define the work; advocating to leadership for needed resources, staffing, or process changes; and building networks across constituents around an intervention are all components of *Cognitive Participation*, which allowed buy-in not just to the philosophy of PCM and GAS (*Coherence*), but the practice of it. The workgroup's efforts occurred over an extended time period spanning >2 years for planning, piloting, and full implementation. This effort addressed both preparatory activities—such as developing training materials, planning scaling and measurement processes for patients with varied lengths of stay with either one or multiple services—and maintenance activities, including having workgroup members serve as PCM champions and monitor outcomes. The implementation process was slowed by staff turnover and the effect of COVID, as the work was undertaken during the height of the pandemic.

When developing their training, some content was focused on differentiating GAS from the existing clinic PCG process, which supported *Coherence*. Existing goals were not refined or scaled but simply captured the patient's desires about their care. These goals could be vague and lacked clarity in how they might be addressed (eg, "improve my memory" or "I want my life back"). Training, therefore, addressed not only how to co-create and scale goals with patients but also a mindset shift that co-creating measurable, attainable goals could reinforce (rather than act in opposition to) PCM principles, making holistic goals more comprehensible and timely. This helped set patient expectations and supported satisfaction with their care, which offset the increased time and effort needed for setting goals, participating in shared documentation systems, and managing team communication. The final training plan included both self-paced and interactive components, including presentation slides and recorded webinars, followed by observation by the champions for feedback. A common challenge was determining the proper application of GAS for patients with shorter lengths of stay. The workgroup problem-solved by providing examples of meaningful, attainable goals in these cases, such as focusing on goals related to identifying resources to support self-management.

A key early decision was to shift from setting PCGs separately by discipline to having PCGs shared by the interdisciplinary team. Importantly, overarching goals were viewed as more aligned with activities and participation and more powerfully aligned with PCM principles. This led the workgroup to embed GAS into team (rather than individual) workflows. These *Collective Action* activities focused on communication, including developing a shared documentation system and establishing specific communication channels for goals. The group advocated with leadership to add a weekly 30-minute team huddle to review PCG progress and discuss which discipline would lead PCG scaling with new patients. These team huddles also reinforced understanding of GAS and PCM, particularly for new staff.

These actions similarly fed *Reflexive Monitoring*, which supported shared weekly team review of patients for adjustments to care. This also allowed the workgroup to track issues such as latency of goal scaling as patients entered the program, or providing support to clinicians who were unsure how to scale a goal or counsel a patient toward appropriate expectations for goal attainment. From a programmatic standpoint, the workgroup tracked goal attainment through regular audits, ensuring patients receiving ≥3 sessions had ≥1 scaled PCG and that ≥90% of PCGs were met at the "Expected" level of achievement or higher.

As shown in figure 2, the CCC described ≥3 NPT domains as being well addressed during implementation. *Coherence* was an area of relative weakness, with the team needing to continue to understand the value and role of the team in PCM, especially for cases where a single discipline provided treatment. Similarly, lower ratings in *Cognitive Participation* were displayed, with participants less confident that GAS should be a part of their workload. Monitoring and team activities appear to be critical for implementation success thus far, although continuing to use outcomes—both patient and program level—to demonstrate the value of embedding PCM into care may be an area of future growth.

Discussion

We examined the experiences associated with GAS implementation in 3 neurorehabilitation settings—inpatient rehabilitation, an intensive outpatient program, and an outpatient specialty clinic—using the NPT to identify factors facilitating and hindering normalization. Our findings reveal a complex interplay between various factors influencing the uptake and sustainability of GAS, providing insights for future implementation efforts. Implementation at each program was supported by the strong *Coherence* and belief in the value of PCM—here, delivered through GAS—in driving high-quality PCC. Although different team members were engaged in goal setting and scaling at each site, all co-created GAS goals with patients in the patient's own words and based on patient priorities. This encouraged a holistic focus addressing any aspects of life meaningful to them. In addition, GAS made goals transparent and comprehensible for team members and patients alike, allowing for ongoing monitoring and review at differing time points across programs, supporting not only patient-driven goal setting, but patient-driven measurement of progress as well.

Implementation barriers and facilitators

All 3 programs emphasized translating PCC into action through GAS applied to PCGs, with a focus on interdisciplinary collaboration. Implementation varied by site, influenced by factors such as the SAI's data visualization tool and CCC's recognition of gaps in operational procedures. This suggests that NPT constructs need not follow a specific order, but addressing all aspects enhances normalization. In addition, facilitators at one site may be barriers at others. Instead, saturation across all 4 constructs seemed to explain successful implementation.

Across programs, *Coherence*, or a mindset shift was needed to move from clinician-driven to patient-driven goals, as well as to patients measuring their own progress. Even as clinicians embraced principles of PCM, they also expressed concerns about discrepancies between patient self-assessment and clinician observations. This was addressed through targeted training in counseling and communication strategies at SHARE, with example goals and progress markers. *Cognitive Participation*, particularly where teams were distributed, or patients saw only single services, proved challenging. Ongoing tailored training and support were important for long-term success, as was facilitation of team collaboration. SHARE and CCC used existing interdisciplinary structures, whereas SAI struggled with *Collective Action* and workflow integration, especially with medical staff. In contrast, SAI's data-driven *Reflexive Monitoring* highlighted the role of data in refining practices, though balancing data collection with the burden on staff and patients remained a challenge. SHARE and CCC also benefited from regular monitoring, which supported ongoing adjustment both to patient needs and implementation gaps. In this way, embedding GAS into workflows was a key facilitator. In fact, for all programs, minimizing operational burden in adapting GAS to setting pressures promoted the adoption of PCM principles.

Implications for future directions

All 3 programs identified areas for further development, such as addressing the challenges of setting measurable goals for short-term patients (CCC) or enhancing staff participation (SAI). Each indicated a need for continuous program evaluation and development to support changes that occur at both the individual staff and organizational systems levels, particularly as programs grow and evolve. Lessons learned from GAS implementation in these 3 programs point to several potential future directions. (1) Exploring expansion of GAS implementation in neurorehabilitation settings: Our findings, along with those of previous investigations,[8] suggest GAS holds value but is challenging to implement in neurorehabilitation settings. Further investigation into GAS implementation across a broader range of neurorehabilitation populations and settings could yield insights into how GAS implementation can be operationalized, optimized, and adopted in varied contexts. (2) Adjunctive integration of other PCM tools: Future efforts should explore the development and use of additional PCM tools to assess patient involvement in goal setting. Evaluating the long-term effect of employing PCM principles on patient outcomes could deepen understanding of how GAS and other tools contribute to PCC. (3) Bolstering team cohesion: Given that successful GAS implementation relies heavily on team collaboration in neurorehabilitation, further examining the role of activities, processes, and workflows that support team cohesion could facilitate smoother adoption of GAS. Programs implementing GAS may benefit from tools to enhance team dynamics and address potential challenges to collaboration before or during the implementation phase. (4) Training and development: Incorporating PCC approaches, PCM principles, and GAS training into degree and professional training programs for health care workers could enhance early-stage understanding and foster long-term adoption of GAS in clinical practice.

Study limitations

This study is subject to multiple potential biases, including those related to investigator involvement, site selection, and variability in data quality and implementation fidelity. The authors' dual roles as both implementers and evaluators could have led to unintentional bias in their reporting, such as emphasizing successes or downplaying challenges. Their reflexive accounts and interpretations are inherently subjective and may represent individual perspectives rather than a comprehensive organizational view. The collection of informal feedback from program representatives was not systematically gathered, analyzed, or verified, which may have resulted in reliance on incomplete or inaccurate data, potentially skewing the understanding of the implementation process. Variability in data collection methods across the 3 settings could influence the comparability of findings. In addition, experiences of only 3 programs are described, and the unique characteristics of the 3 neurorehabilitation settings may further limit applicability of findings in other settings. The setting type (ie, inpatient, intensive outpatient, or outpatient specialty clinic) may have also influenced which barriers and facilitators emerged as most prominent, given differences in care intensity, team structure, and patient engagement opportunities. There was also notable variation in how GAS was implemented and documented across programs, including differences in who facilitated goal setting, how scoring was conducted, and how team communication was structured. These differences complicate cross-site comparisons and may have influenced which implementation factors appeared most salient or successful.

Given these limitations, the results and implications presented should be interpreted as context-sensitive reflections informed by 3 implementation experiences rather than broadly generalizable strategies. They may be most applicable to neurorehabilitation teams with similar structures, resources, and readiness for PCG implementation. These insights are intended to guide future implementation studies and support quality improvement efforts rather than serve as prescriptive models.

Conclusions

This effort examined GAS implementation across 3 neurorehabilitation settings using the NPT, offering insights into factors that facilitated and limited normalization of PCM. Normalization particularly hinged on philosophical shifts toward PCGs, the importance of team cohesion and responsiveness to data about patient progress and program operability, as well as integration of GAS into operational workflows. Future efforts should focus on identifying replicable implementation strategies[21] to support normalization of GAS and other PCM tools, particularly those that support robust and ongoing PCM training, foster team cohesion, and operationally integrated transparent data monitoring that benefit teams and patients alike.[1]

Keywords

Brain injuries; Brain concussion; Goals; Implementation science; Military personnel; Neurologic rehabilitation; Outcome assessment; Rehabilitation

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[1] The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

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