

Appendix 2: Examples of how to use the Goal Attainment Scaling instrument for assessing a patient's progress in attaining their treatment goals during follow-up

The Goal Attainment Scaling (GAS) instrument* is an individualized outcome measure in which goals are set and then followed over the course of a trial. The goals are personalized (i.e., people set goals according to their own needs). What is standardized is the extent of their attainment, which can be either "no change," or "much better" (or "much worse") than expected. The GAS assessment is completed in several steps:

- ① Identify a goal
- ② Define the problem in plain language
- ③ Identify potentially better and worse outcomes
- ④ Weight the goals relative to each other (this is only done for goals set by the patient or caregiver)
- ⑤ At follow-up, compare the current status with the baseline status for each goal (scale attainment)

The following 2 cases illustrate how the GAS instrument is used as an outcome measure. First, dementia-related symptoms in which improvement is desired are identified (step 1) and described precisely (step 2). Next, plausibly better and worse states are recorded (step 3). The resulting scale, scored as 0 at baseline, ranges from +2 (most positive outcome) to -2 (most negative outcome). Not all goals are equally important, so they can be weighted from most to least important (step 4), although this step can be omitted. At the baseline visit, patients and caregivers are able to review the goals set at screening and make changes, after which no changes are permitted. The GAS assessment is completed every 2 months and a score assigned after comparison of the patient's current status with his or her baseline status (step 5).

	Case 1	Case 2
	① Goal: Operate new television (function)	① Goal: Recognizing people (cognition)
	④ Weight: 4	④ Weight: 1
Goal attainment (score)		
Much better than baseline (+2)	③ Learns and remembers which buttons to use on the remote control to turn the TV on and off and to change channels	③ Has fewer difficulties keeping track of who is being talked about; maybe needs only one reminder to stay on track
Somewhat better than baseline (+1)	③ Learns and remembers the location of the manual button to turn the TV on and off; uses button instead of unplugging TV	③ Recognizes at least one familiar person when seen out of context without needing an introduction † ⑤
Baseline status (0)	② Used to turn old TV on and off and change channels by using manual controls but now cannot operate the remote for the new TV. Watches news and sports programs daily. Knows when the news and other programs are on but is unable to turn the TV on or change the channel with the remote. Watches TV if it is already on but usually does not try to change the channel. Sometimes tries to use the remote but finds all of the buttons too confusing. Pulls the plug out of the wall to turn the TV off † ⑤	② During conversation gets confused about who is being talked about (familiar relatives); might ask "Who's that, now?" 2-3 times during a single conversation. Usually recognizes people when face to face but has trouble recognizing people when seeing them out of context (e.g., will recognize a fellow parishioner at a church social but not when she sees the same person at the mall). Needs an introduction with context to recall who the person is
Somewhat worse than baseline (-1)	③ No longer tries to use the remote; instead asks others to help turn the TV on and off or change the channel	③ Does not recognize familiar people out of context, even with an introduction
Much worse than baseline (-2)	③ Stops watching TV because trying to operate it is too much of a bother	③ Is not able to recognize familiar people in context or in conversation

The extent of goal attainment is summarized by a formula that accounts for variable numbers of goals, intercorrelation of goal areas and variable weighting: Total score = $50 + \{ [10\sum(w_i x_i)] / [0.7\sum w_i^2 + 0.3(\sum w_i)^2]^{1/2} \}$, where w_i = weight assigned to the i th goal and x_i = score of the i th goal. The GAS score is thus 50 at baseline (when all goals are "0"). The score increases (> 50) with improvement and decreases (< 50) with worsening. Although personalized, treatment goals can be grouped into 5 domains: cognition, function, behaviour, leisure and social activities. ‡

*Kiresuk TJ, Sherman RE. Goal attainment scaling: a general method for evaluating community mental health programs. *Community Ment Health J* 1968;4:443-53.

†Attainment level achieved at final visit.

‡Rockwood K, Fay S, Graham JE, et al. Goal setting and attainment in Alzheimer's disease patients treated with donepezil. *J Neurol Neurosurg Psychiatry* 2002;73:500-7.