

PARO 6-month Analysis

Front Porch Center for Innovation and Wellbeing

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Executive Summary

In May 2015, seven Front Porch communities adopted PARO (www.parorobots.com), a therapy robot created in the likeness of a baby harp seal. **Sunny View, Vista del Monte, Villa Gardens, Walnut Village, Wesley Palms, Claremont Manor** and **Fredericka Manor** purchased PAROs with the support of the Sunny View Foundation, FACT Foundation, California Lutheran Homes, and Pacific Homes with training, coordination and support provided by the Front Porch Center for Innovation and Wellbeing (FPCIW). This report highlights the impact of PARO in Front Porch communities over the past six months.

Since May 2015, FPCIW accumulated a total of 920 tracking surveys from Front Porch activities and care staff, and community staff and resident feedback about the PARO program have been overwhelmingly positive. The PARO robot devices have:

- Produced calming effects for residents, in 46% of wandering and 60% of anxious behaviors
- Helped increase social behavior by 97% among isolated adults
- Helped 153 out of 193 residents (79%) stay alert from initially sleepy behavior, resulting in improved moods, socialization, and appetite
- Was used to avoid psychotropic medications in 61% of cases when medications were considered

PARO has also become a fixture of the communities that have adopted PARO. Residents and staff have named their PAROs, participated in themed social media contests, and come up with fun, clever ways to store their robot devices.

Overview

In May 2015, seven Front Porch communities adopted PARO (www.parorobots.com), a therapy robot created in the likeness of a baby harp seal. Based on the results of a pilot at Sunny View's care center and Summer House, **Sunny View, Vista del Monte, Villa Gardens, Walnut Village, Wesley Palms, Claremont Manor** and **Fredericka Manor** purchased PAROs with the support of the Sunny View Foundation, FACT Foundation, California Lutheran Homes, and Pacific Homes.

The Front Porch Center for Innovation and Wellbeing (FPCIW), which led the PARO pilot and diffused the solution throughout Front Porch, continued to support care and activities staff through regular monthly calls and measure the impact of PARO using tracking scales for resident interventions. This 6-month report highlights the impact of PARO in Front Porch communities since May 2015.

Training

FPCIW coordinated an in-service training with Mary Ellen "Corey" Tague, a licensed robot therapist who conducted two trainings via live video conference. Each community attended one of the two sessions offered in May.

Prior to training, each community identified a staff champion to recruit other staff members to attend the PARO training; each community also designated a primary trainer (who was sometimes also the community champion) who was responsible for maintaining the PARO Handbook and training other staff members on PARO.

The staff who attended training consisted of staff from Nursing, Life Enrichment, Health Services, and Marketing. Training participants were eligible to receive 1.5 hours of CEU credits for BBS and BRN certification through Front Porch's license.

The training was an hour and half long going over background, case studies, basic operations, maintenance, handing PARO with residents, and filling out tracking surveys. Each community received a PARO operations handbook developed and assembled by FPCIW to allow staff to reference protocol and training.

Adoption

Front Porch communities documented the impact of PARO through tracking surveys created and provided by the Department of Veterans Administration, Palo

Alto Health Care System (www.paloalto.va.gov). FPCIW coordinated monthly calls with the communities to share stories and applications of how staff have used PARO with residents.

PARO has generally been used in Care Centers and Summer Houses/Memory Care centers. PARO tends to be stored in the Summer House or Care Center offices, allowing PARO to be accessed by staff at all hours while keeping it safe from theft or mishandling by residents. Keeping PARO out of view from residents when not in use also helped to retain its novelty. In the Care Center settings, PARO was the center of scheduled activities such as individual room visits, group therapy, and/or coinciding with an existing activity such bingo and Music and Memory (iPods and individualized playlists).

Rather than staff presenting PARO like a toy and/or a robot, staff members have learned to treat PARO more like a pet. Each PARO received a personal name whether it was given by the staff members or a vote by the residents.

Communities were also creative in ways of storing PARO in such places as bassinets, a baby sling, pet carrier, and even a hand-built house, which was kept in the Walnut Village Summer House office and brought out on special occasions.

Staff members have been very engaged with PARO and creative with how they used PARO as a caregiving tool with residents. In addition to using PARO to help calm and cheer residents who were previously anxious and upset, PARO has been used in other ways as well:

- Helping residents reminisce of their pet or their late spouse
- Helping residents fall asleep faster
- Encouraging residents to come out of their rooms and participate in dinner or an activity
- Dressing PARO for holidays and special events
- Getting residents from Summer House and Assisted Living to come together and socialize

Family members are also engaged with PARO because they see the benefits the residents are receiving when around it. PARO has been a great conversation piece and has helped connect residents and family members after years not having much to talk about.

Program Findings

Overall, the PARO program has had a very positive impact among community staff and residents. Front Porch staff members frequently observed PARO replaced many negative behaviors with calmness, interaction with others, and bright affect (smiling, expressing happiness and affection, petting PARO).

When possible community care staff used a tracking survey for every resident for every intervention. The tracking survey listed a number of behaviors for the community staff to select from to describe the resident before PARO intervention, during PARO intervention, and 15 minutes after PARO intervention (Figure 1).

PARO ROBOT TRACKING SHEET – PER CONTACT

PATIENT INITIALS: _____ DATE (mm/dd/yy): _____ TIME (24hr): _____ DEMENTIA? (y/n)
STAFF (initial / last name): _____ DURATION OF CONTACT: _____

IMMEDIATE BASELINE BEHAVIOR (PRE-PARO) (Circle all that apply)

Anxious	Sad	Isolated	c/o Pain (unrelieved)	Pacing	Wandering
Yelling	Calm	Sleeping	Talking/interacting with others	Bright affect	

INTERVENTION BEHAVIOR (DURING PARO) (Circle all that apply)

Anxious	Sad	Isolated	c/o Pain (unrelieved)	Pacing	Wandering
Yelling	Calm	Sleeping	Talking/interacting with others	Bright affect	
Ignored Paro	New negative behavior (describe _____)				

POST-INTERVENTION BEHAVIOR (15 MINS AFTER PARO)

Anxious	Sad	Isolated	c/o Pain (unrelieved)	Pacing	Wandering
Yelling	Calm	Sleeping	Talking/interacting with others	Bright affect	
New negative behavior (describe _____)					

PRNs (Circle all that apply)

PRN considered pre Paro PRN given (pre or post) PRN avoided

ADDITIONAL COMMENTS FOR THIS SESSION:

Figure 1. Tracking survey sheet. Credit: Department of Veterans Affairs, Palo Alto Health Care System.

Following are the observed initial negative behaviors in more detail and the outcomes of the use of PARO. This report’s study outlines survey data collected from staff observations on resident behaviors.

Initial Behavior: Anxious (159 tracked cases) (Table 1)

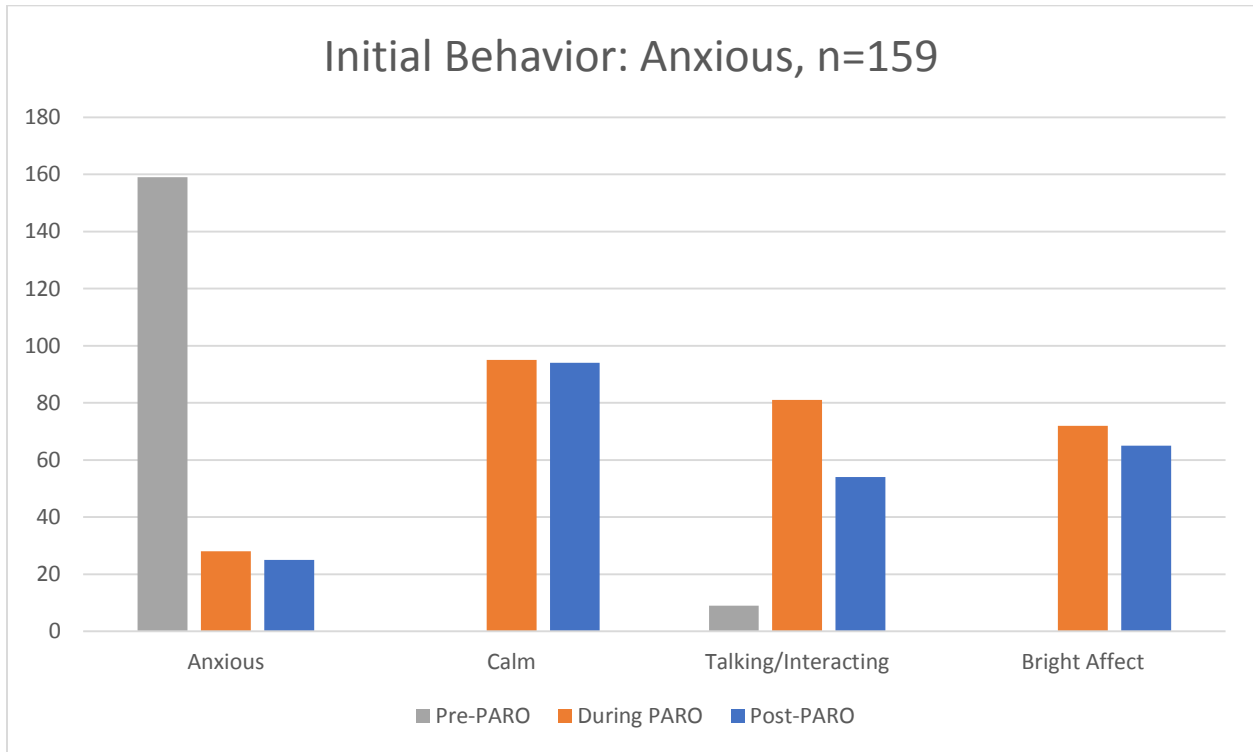


Table 1. The number of surveys where staff initially observed Anxious behaviors in residents for the PARO intervention.

It important to note there was an increase in positive behaviors such Calm, Social Interaction, and Bright Affect during and after PARO interventions replacing Anxious behaviors. In the pre-PARO intervention, there were 0 recordings of Calm and Bright Affect behavior.

Observed anxious behaviors dropped from 159 to 28 (During PARO) and 25 (Post-PARO), and of the total cases of such behavior, reports of calmness increased from 0 to 95, or a 59% change in observed calmness from initially reported anxiety; an initially anxious resident may not necessarily be calm during/after a PARO intervention, and the resident could be talking/engaged or happy as a result of PARO.

- During the PARO intervention, there was an 82% reduction in Anxious behaviors reported from the tracking surveys. 131 out of the 159 residents (82%) did not display Anxious behaviors when introduced to PARO.
- New behaviors observed during intervention:
 - Calm behaviors rose from 0 at the baseline to 95 observations,
 - Talking/Interacting with Others rose from 9 at the baseline to 81 observations, and
 - Bright Affect rose from 0 at the baseline to 72 observations.
- After interacting with PARO, the reduction of Anxiety was sustained in 134 out of the initial 159 (84%) observations reported.
- New behaviors observed post-intervention:
 - Calm behaviors sustained at 94 observations
 - Talking/interacting observed in 54 observations, and
 - Bright affect occurred in 65 observations.
- Quotes:
 - “Resident was anxious to leave. Once she saw Blossom in her costume, she sat down and started commenting how cute PARO looked she seemed calm after.” CC, Claremont Manor (CM) Summer House, 10/21/2015
 - “Resident absolutely loved Charlie. She was very affectionate towards PARO and was engaged. She did not question whether PARO was real or fake, but rather embraced its company.” RN, Vista Del Monte (VDM), 06/03/2015
 - “BL was yelling and on the anxious side. We gave her Marshmallow and she seemed to calm down instantly. She held him like a baby.” BL, Walnut Village (WV) Summer House 09/08/2015

Initial Behavior: Wandering, n=145 tracked cases (Table 2)

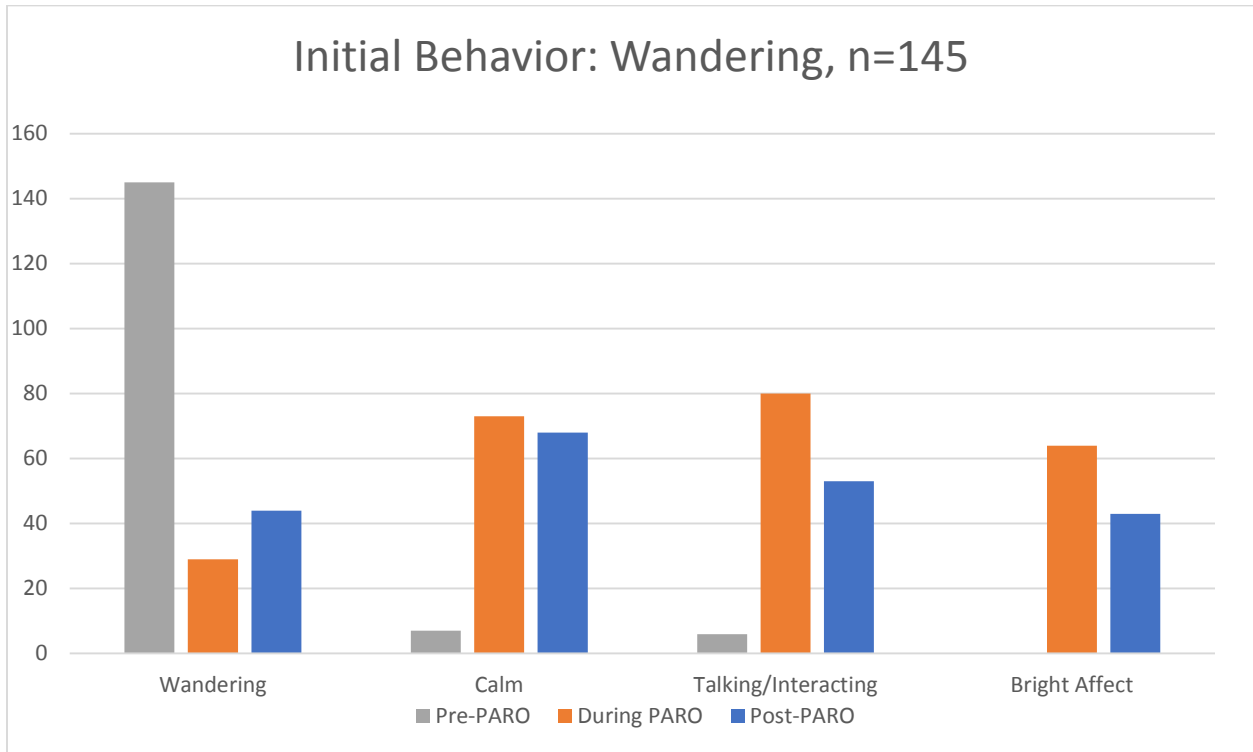


Table 2. Number of tracking surveys that reported residents with Wandering Behavior. Pre-PARO intervention, there were 0 observations of residents with Bright Affect.

- During PARO intervention: 116 residents stopped wandering when introduced to PARO, a decrease of 80% in Wandering behavior.
- New behavior observed during PARO intervention:
 - 73 observations of Calm behavior (7 observations at baseline), or a total of 66 newly-observed Calm behavior out of 145 wandering cases (46%)
 - 80 observations of Talking/Interacting with Others (6 observations at baseline), and
 - 64 observation of Bright Affect (0 observations at baseline).
- Post-Intervention, the elimination of Wandering behavior sustained by 30%.
- New behaviors observed post-intervention:
 - 68 observations reported Calm behavior,
 - 53 observations of Talking/interacting with others, and

- 43 observations of Bright Affect
- Quotes
 - “EB was exhibiting combative behavior and wandering. I gave her Marshmallow and it seemed to instantly calm her. She was petting him and talking.” EB, WV Care Center, 06/25/2015
 - “He was engaged with Lily. I observed a calming effect. So relaxed will use when resident tends to wander.” BL, Fredericka Manor (FM) Care Center, 07/08/2015
 - “The resident was wandering and was anxious to leave. Once we had her sat down, we place PARO on her lap and she started to talk to her. She was very relaxed post-PARO and remained seated as she interacted with the RA's.” CC, CM Summer House, 8/18/2015

Initial Behavior: Pacing, n=87 tracked cases (Table 3)

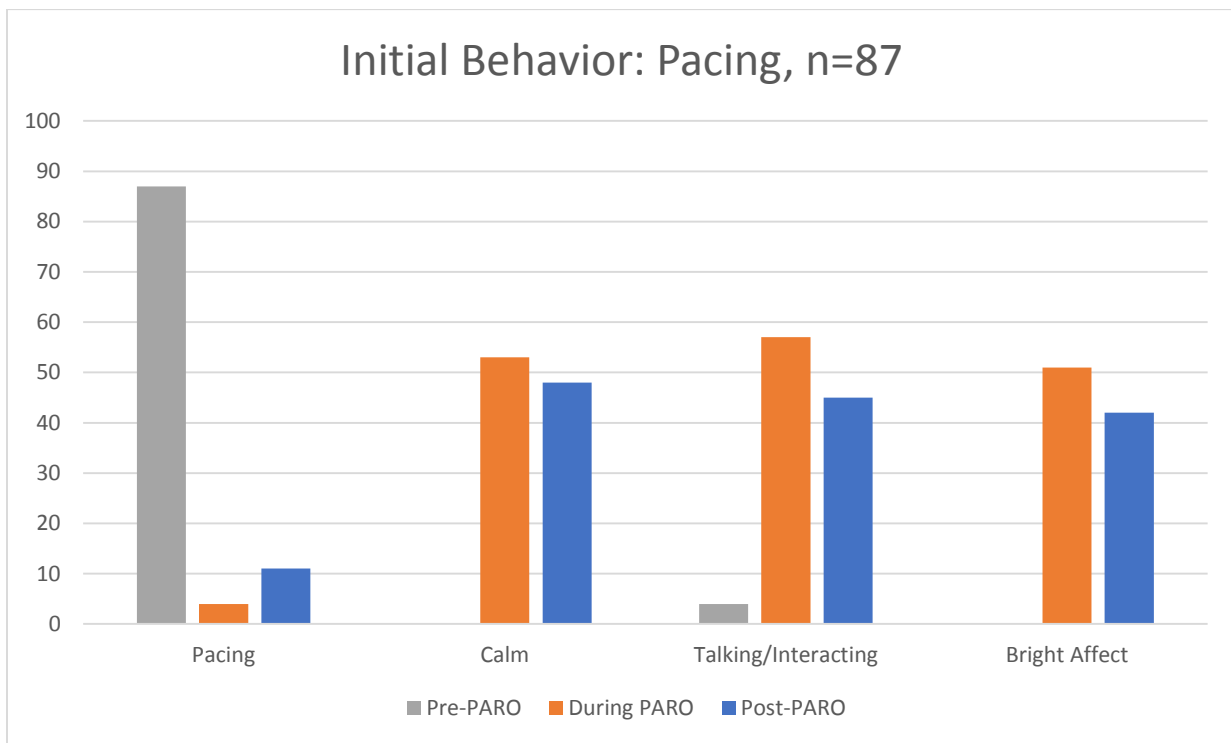


Table 3. Residents with Pacing behavior. During PARO intervention, recordings of Pacing behavior is nearly eliminated with 83 out of 87 residents stopped pacing. Pre-PARO intervention, there were zero recordings of Calm and Bright Affect behavior.

- During the PARO interventions: 83 residents stopped Pacing, a 95% decrease in the behavior.
- New behaviors during PARO Intervention:
 - 53 observations reported Calm (0 observations at baseline),
 - 57 observation reported Talking/Interacting with Others (4 observations at baseline), and
 - 51 observations reported Bright Affect (0 observations at baseline),
- Post-intervention: 76 out of the initial 87 cases continued to report no Pacing.
- New behaviors were largely sustained post-intervention:
 - 48 observations of continued Calm behavior,
 - 45 observations of Talking/Interacting, and
 - 42 observations reported Bright Affect.
- Quotes:
 - “They were pacing so I brought the PARO out with the brush and had them ‘groom’ PARO. Only one resident went to sleep and the other two were calmed down, less anxious.” WV Summer House, 06/06/2015
 - “This was a group activity before dinner time. Resident was restless and was pacing in and out of the dining room, trying to go back to her room. Staff was able to redirect and calm her down with snowball. She loved petting and talking to Snowball.” AM, Wesley Palms (WP) Summer House, 7/21/15
 - Resident was pacing around most of the morning. Once Blossom was handed to the resident, she once was calm and seemed to be enjoying herself outside the patio. CC, CM Summer House, 9/22/2015

Initial Behavior: Sad, n=136 tracked cases (Table 4)

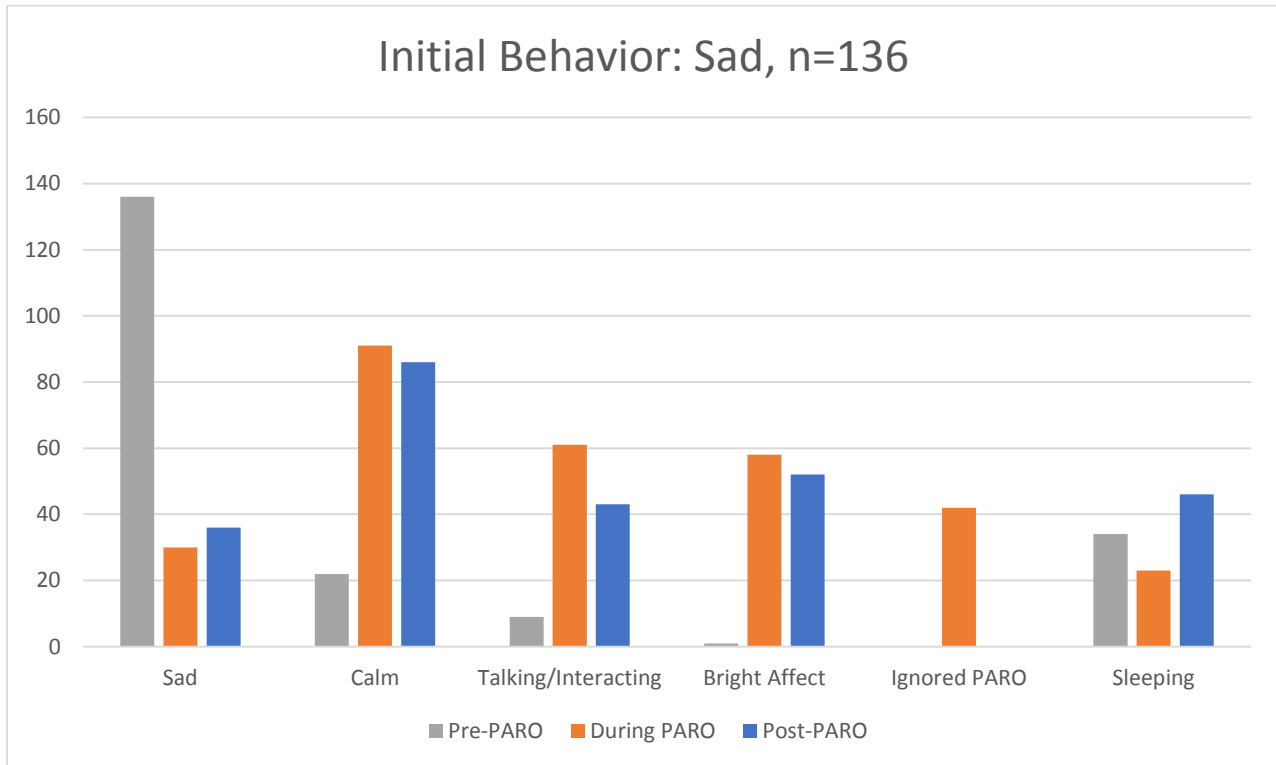


Table 4. The number of surveys for residents who were observed to be sad pre-PARO. 106 residents were reported to no longer be Sad when introduced to PARO.

Though PARO helped some residents calm down (67% during PARO, 63% sustained) and made them feel happier (43% with PARO, 38% sustained), there was also a tendency for other residents to ignore PARO during the intervention (31%).

Sleeping can either be seen as a negative or positive behavior depending on the situation. There were a prevalent number of surveys that observed residents falling asleep post-intervention. It is likely PARO may have calmed residents to fall asleep.

- New behavior during PARO intervention:
 - 91 observations reported Calm (22 observations at baseline),
 - 61 observations reported Talking/Interacting (9 observations at baseline),
 - 58 observations reported Bright Affect (1 observation at baseline), and

- 42 observations reported residents ignored PARO. It is not clear why residents ignored PARO—perhaps PARO is less effective among some residents who initially exhibit sad behavior, but we do not know why.
- Post-intervention: Observations of Sad behavior remained low at 36 out of the 136 initial cases.
- New behavior post-intervention:
 - Calm behavior reported in 86 observations,
 - 52 observations reported Bright Affect,
 - 43 observations reported Talking/Interacting with Others, and
 - Sleeping was a new behavior that became prevalent after the PARO intervention. There were 46 observations of residents sleeping* (34 observations at baseline, 23 observations during PARO intervention).
- Quotes:
 - “Patient knew that PARO/Charlie was not real, but still really enjoyed and benefitted from the interaction.” HS, Vista Del Monte Memory Care, 6/11/15
 - “DE was crying, Marshmallow brought to her. She continued to cry and began to be calm, was brushing and talking. PRN not given. No more sadness noted 1 hr after.” DE, WV Summer House, 6/7/15
 - “Resident started crying during her interaction with PARO. Stated that "those were lots of joy". She didn't want to let go of PARO. She started reminiscing about her childhood pet.” AM, WP Summer House, 5/28/15

Initial Behavior: Isolated, n=168 tracked cases (Table 5)

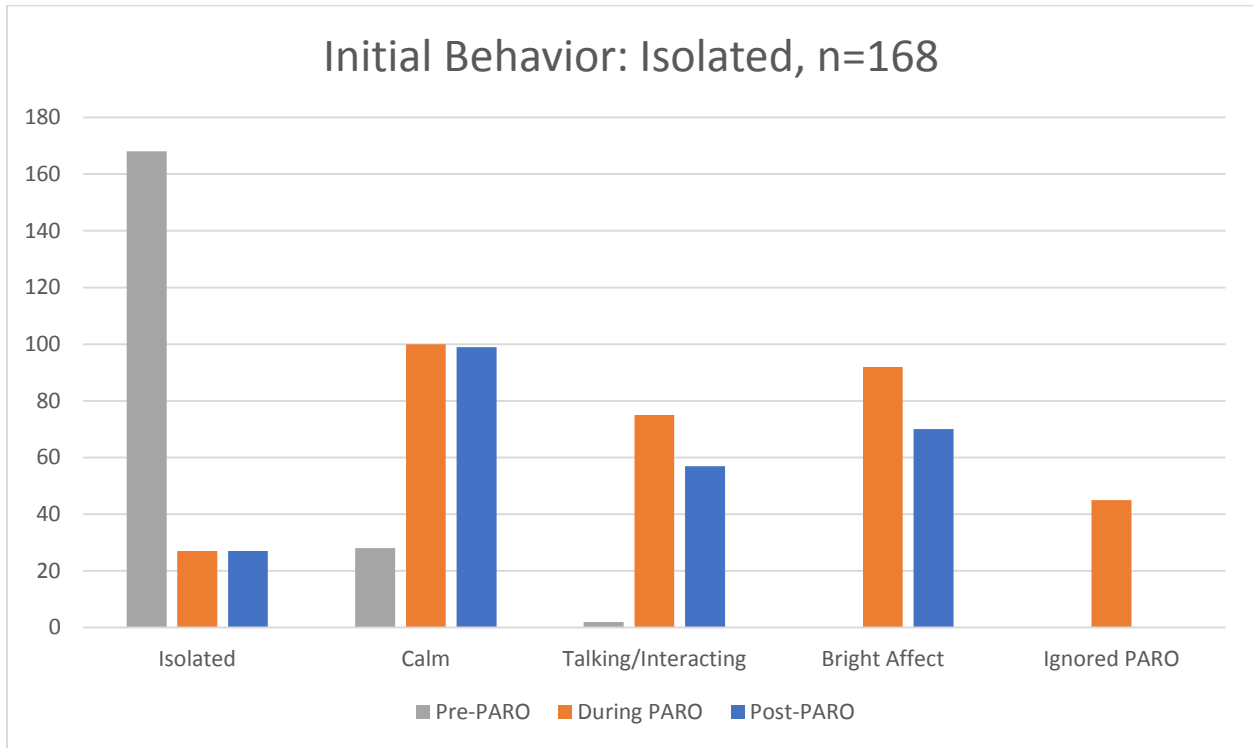


Table 5. Residents with Isolated behavior. Residents who were isolated during PARO intervention, continued to be isolated after PARO intervention. Pre-PARO Intervention there were zero recordings of Bright Affect behavior.

- 141 residents were reported no longer isolated when staff introduced PARO, an 84% decrease.
- New behavior during the intervention:
 - Talking/Interacting among reported isolated behaviors increased from 2 at baseline to 75, an increase of 97%.
 - 100 observations reported Calm behaviors (28 observations at baseline),
 - 75 observations reported Talking/interacting with others (2 observations at baseline),
 - 92 observations reported Bright Affect (0 observations at baseline), and
 - 45 observations reported Ignoring PARO. Based on anecdotal feedback, some residents who had initial isolation behavior also

tended to ignore PARO; nonetheless, a decrease in observed initial isolation from 168 to 27 observations (84%) is a significant result.

- Post-intervention, there continued to be an 84% decrease in Isolation. The 27 residents who were reported Isolated during PARO intervention continued to be isolated after PARO intervention. Staff members reported the residents who did not like PARO or avoided PARO were the ones who were isolated, suggesting a correlation between isolation behavior and disinterest with PARO.
- New behavior post-intervention:
 - Calm behavior sustained at 99 observations
 - Talking/interacting in 57 observations, and
 - 70 observations reported Bright Affect
- Quotes:
 - “Resident tends to keep to herself in her room. However, when she visits with Olaf, her face expressions change and seems happy to see him.” BF, VG Assisted Living, 8/7/15
 - “TS was isolated-refused to participate - insisting on leaving. Once PARO was placed in arms TS calmed - soothed PARO and petting PARO's back in calming matter. After TS enjoyed in activity and provided feedback.” TS, WV Summer House, 8/20/15
 - “Resident was in her room refusing to come out for dinner...Staff gave her PARO (Snowball) and the resident stated petting and singing to both her toy and snowball. Resident eventually agreed to come out for dinner.” CN, WP Summer House, 8/15/15

Initial Behavior: Sleeping, n=193 tracked cases (Table 6)

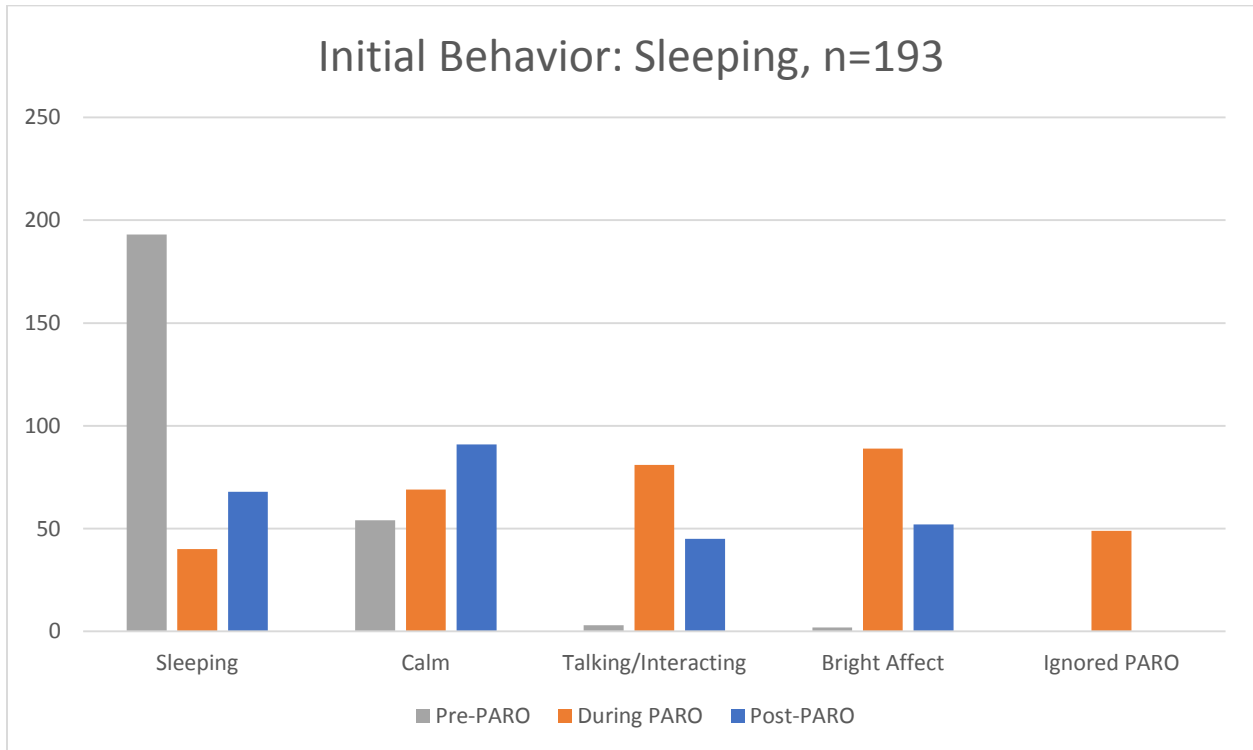


Table 6. Reports of Sleeping behavior. Though a handful of residents went back to sleep after PARO intervention, it is important to note that their quality of sleep may have improved with calmer moods. With residents who were sleeping, it was likely some residents were reported to Ignore PARO during the intervention.

- Sleeping behavior was prevalent in Assisted Living Resident (43%).
- During PARO intervention, 153 resident woke up, a 79% decrease
- New behavior during PARO intervention:
 - 69 observations reported Calm (54 observations at baseline),
 - 81 observations reported Talking/interacting with others (3 observations at baseline),
 - 89 observations reported Bright affect (2 observations at baseline), and
 - 49 observations reported Ignored PARO. It's unclear why PARO was ignored in 25% of observations; perhaps residents eventually fell asleep or were too tired to acknowledge PARO.
- Post-intervention 68 residents would go back to sleep

- New behavior post-intervention:
 - Calm behavior increased to 91 reported observations
 - 45 observations reported Talking/interacting with others, and
 - 52 observations reported Bright Affect.
- Quotes:
 - “Lily wakes up resident, she has a real big bright effect.” – AC, FMCC 10/19/15
 - “LB was sleeping... brought over marshmallow, she smiled and pet him for a while.” – LB, WV Summer House, 9/25/15
 - “Resident seemed tired and not very interested in engaging on activities taking place outside. Once I brought Blossom out, she was more than willing to go outside and participate. She was in a talkative mood and was smiling with other residents.” – JS, CM Summer House, 8/25/15

Replacement of PRN Medications

In the tracking survey, there was a question if PARO’s interaction has helped staff avoid the use of PRN medications. PRNs were rarely given to the resident during PARO intervention. Of the 920 surveys, only 85 surveys reported PRNs were given pre- or post-PARO (9%).

It is important to note that Life Enrichment staff facilitated most of the PARO interventions and did not track PRN medications since they do not dispense the medications. In the 920 surveys, 557 reported that PRNs were not needed when PARO was used (61%). For the staff who tracked PRN medication during resident’s usual times when PRNs are dispensed, 138 surveys reported that PRNs were avoided (15%).

Thus of the total cases when PRNs that were considered (223), the use of PARO avoided the use of medications in 138 instances, or in 61% of cases.

Technical Issues

Since the deployment of PARO there have been no technical and mechanical issues reported by the communities. The PARO’s design is durable and has withstood handling and abuse. Per PARO’s manufacturer, AIST, they do not have much data on repairs because there have been very few maintenance requests.

Conclusion

Based on the last 6 months of data collection from the 7 Front Porch communities who adopted PARO back in May, we find PARO has been a very effective tool in not only reducing negative behaviors, but also transforming them to more uplifting and engaging behaviors. These positive behaviors have visibly sustained with the residents after PARO has been taken away. Based on the interactions with community staff members via e-mail, phone calls, and in-person conversations, we have found unanimity and strong consensus that PARO is an effective care tool for their residents living with dementia and physical challenges. The community staff members found plenty of opportunities and applications to use PARO with their residents from creating reminiscence about their pet or their loved one, cheering them after a sad day, improving their quality of sleep, or helping them get out of their room for dinner.

Since the diffusion, we also find a reduction in dispensing PRN medication since PARO provides immediate calming effects to residents who have anxious and disruptive behaviors.