Overview of Research Evidence for Teepa Snow’s Positive Approach® to Care  
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Teepa Snow’s extensive professional background and personal experiences related to dementia, led to the development of a care philosophy called Positive Approach® to Care, or PAC. Through PAC training, caregivers gain a better understanding of dementia and dementia related behaviors, and learn positive communication and care partnering techniques that will change the way they approach and interact with someone affected by dementia. These learned techniques are designed to improve day-to-day experiences and quality of life for residents, staff, and family members.

PAC is a program compiled of more than 30 years of peer-reviewed research from neurology, psychiatry, the social sciences, and adult learning. For example, PAC is founded on the fact that instead of working with what is commonly called memory loss, we accept that people living with dementia are experiencing brain failure—an eight to 20 year progressive, irreversible, terminal disease. We accept that brain failure encompasses changes beyond simply memory loss, and that as such, they are doing the best they can. We accept that it is our job to help people LIVE with brain failure. Buell and Colemen (1979) demonstrated this brain failure principle:

**Brain Failure**

Brain failure: As far back as 1979, Buell and Colemen noted that, in what was then referred to as “senile dementia” (average age, 76.0), dendritic trees were less extensive than in adult brains, largely because their terminal segments were fewer and shorter. Cells with shrunken dendritic trees were found in all brains. These data suggest a model of aging in the central nervous system in which one population of neurons dies and regresses and the other survives and grows. (Buell & Coleman, 1979).


**Using the Positive Approach to Care’s Hand-under-Hand® as a Means of Helping People Eat**

From studies such as the above early study about dementia, the field of research on dementia has progressed to studying individual interventions to help people living with dementia go about their daily lives more successfully. One study has been conducted to directly study Teepa’s Hand-under-Hand assistance technique:

An experimental study was conducted to compare three techniques, direct hand (DH) and hand over hand (HOH) feeding, and Hand-under-Hand™ (HuH) assistance with eating, and their impact on meal intake. The hypothesis was that HuH™ would provide a motor cue, allowing people living with dementia to feel in control, therefore elicit fewer resistive behaviors (defined as, for example, turning head away, clamping mouth shut) and increasing meal intake. Results indicated that the mean time spent providing assistance did not differ significantly: DH (42.4 min; SD = 9.2), HuH (44.1 min; SD = 9.3), and HOH (45.2 min; SD = 9.2). Mean meal intake (% eaten) was greater for DH (67%; SD = 15.2) and HuH (65%; SD = 15.0), with both significantly greater than HOH (59.9%; SD = 15.1, p < 0.002). On average, resistive behaviors were more frequent with HOH (8.3; SD = 1.8) relative to DH (8.0; SD = 1.8, p = 0.0412) and HuH (7.7; SD = 1.8, p = 0.0014). In short, times required by Research Assistants were consistently similar among the three techniques, demonstrating feasibility of all techniques in a busy care environment. Meal intake was highest with DH and HuH; and these two techniques required less time than HOH. Most importantly, HOH elicited the most, while HuH elicited the least amount of resistive behaviors (Batchelor-Aselage, Amella Rose & Bales in Handbook of Clinical Nutrition and Aging, Eds. Bales, Locher & Saltzman, 2015).
Other Research On Brain And Functioning Changes

The following are a series of topics we teach in PAC and their related scientific support:

**Changes in vision:** One of the most highly rated content areas of PAC training is how Teepa describes changes to a person’s visual perception in dementia. Little research has been done on the changes reported in vision for those living with dementia. However, one source that covers 1. the general pathology of Alzheimer’s with regard to vision, 2. the ocular and visual features described in the literature, and 3. the pathological changes in the visual system associated with symptoms, is a review of the literature from 1989 to 2009 (Armstrong, 2009). One study found that those with more advanced dementia exhibited greater reductions in visual sensitivity (Trick, Trick, Morris, & Wolf, 1995). Two studies found that 50% of patients reveal problems with object recognition (Cogen, 1987; Ceccaldi, 1996).

**Hippocampal atrophy:** It was demonstrated that hippocampal volume was smaller in persons with a clinical diagnosis of Alzheimer’s disease (AD) compared to those with no cognitive impairment ($P = 2.6\times10^{-7}$) or mild cognitive impairment ($P = 9.6\times10^{-7}$). Additionally, hippocampal volume was related to multiple cognitive abilities assessed proximate to death, with its strongest association with episodic memory (Dawe, Bennett, Schneider, & Arfanakis, 2011).

**Short-term memory impairment:** Teepa talks about the ability to retain short-term memory when moving from one place to another. Specifically, location-based event structure influences how well people perform on prospective memory tasks (O’Rear & Radvanskey, 2018). This is quite easily seen in the differential performance on a memory task between subjects with they walked through a doorway as opposed to walking the same distance without a doorway (Radvanskey & Copeland, 2006).

**Language changes:** AD, the most common form of dementia is characterized by early episodic memory decline (e.g., amnesia), consistent with early neuropathology targeting the medial temporal lobes, with additional deficits in language and semantic knowledge, abstract reasoning, executive functions, attention, and visual-spatial abilities that contribute to decline in everyday function (Salmon and Bondi, 2009).

**Executive control:** Reduced performance on neuropsychological testing of executive function correlated significantly with an increasing degree of frontal white matter changes detected by diffusion tensor imaging (DTI) in the AD group, while no such correlation was observed for the controls (Sjöbeck, Elfgren, Larsson, Brockstedt, Lätt, Englund, & Passant, 2010).

**Subcutaneous/fat pad diminishes:** Our program supports a Hand-under-Hand hold to protect the hand of the person living with dementia, as well as to guide and provide “care-with” rather than giving “care to”. Studies show a slow, progressive redistribution of fat in the elderly, with subcutaneous fat on the limbs tending to decrease and intra-abdominal fat to increase. The former is reflected in a decline in calf, thigh, triceps, and biceps skinfolds (Chumlea, et al., 1989).
Sensory-Motor strip and the progression of affected areas of the brain: Considerable evidence and discussion exists in the literature regarding changes in the sensory motor strip. The motor strip sits just behind the frontal lobe in the brain and controls sending and receiving messages about movement (arms, shoulders, legs, etc.). The sensory strip lies immediately behind the motor strip. It sends and receives messages about what you are feeling, as well as interprets smell and taste. In the pre-clinical stages of dementia, when impairments in episodic memory are occurring, the sensory-motor strip generally remains in tact. In the early clinical stage, deficits occur in episodic memory, verbal abilities, visuospatial functions, attention, and executive functions. Again, though, while these deficits can affect choices and reaction time that can affect functions like balance, the sensory-motor strip is, again, not generally directly affected. Finally, however, in advanced AD, cognitive dysfunction including deficits is global, and the brain's association cortices are severely affected. In some cases, though, sensory-motor performance may be well preserved; for many, however, preservation of the sensory and motor strips is not the case (Almkvist, 1996; Braak & Braak, 1995).

These deficits in the sensory motor strip (specifically gait and balance) have been known for some time, wherein shorter step length, lower gait speed, lower stepping frequency, and greater step-to-step variability, were noted in people living with AD, versus controls. These findings were consistent with the understanding that in AD, transcortical pathways participating in the integration of gait are damaged. This “may help to explain the increased incidence of falls in patients with brain failure” (Visser, 1983, p 296).

In spite of this finding that the sensory motor strip does not appear to be as gravely affected until the late-clinical state, a study showed that about three years after diagnosis, 50% of Alzheimer patients reported problems in walking, and of these 33% were classified as non-ambulatory (Alexander, Mollo, Giordani et al., 1995). One explanation is a study that discusses gait apraxia, in which there may be a sub-set of people living with dementia who are experiencing the inability to initiate or perform the process of walking, despite normal power and coordination of the legs when tested in the seated or lying position (Meyer & Barron, 1960). The researchers found that 40% of the participants with Alzheimer's disease (N=65) performed below cut off on the assessment of walking skills; one third of the patients performed below cut off on the upper limb apraxia test.


Research On Retention of Rhythm and Music

Musical memory has long been associated with the temporal cortex (Penfeild & Perot, 1963) and in the temporal lobes (Samson & Zatorre, 1991; Peretz, 1996; Samson & Peretz, 2005.) However, encoding and recognition of musical experiences involves both the right and left temporal lobes: the right temporal lobe structures play a critical role in the formation of musical memory for recognition, whereas left temporal lobe structures are more involved in the explicit retrieval of melodies (Samson & Peretz, 2005).

A 2015, two-part study looked at why musical memory can be preserved in Alzheimer’s disease (AD). The authors used fMRI to collect brain responses to a) music unknown to the person, b) recently known within an hour of the study, and c) long-known music. The results showed that the regions associated with musical memory are relatively spared in AD, and thus may explain the preservation of musical memory (Jacobsen, Stelzer, Fritz, Chetelat, La Joie & Turner, 2015).


Research On How We Learn, Why Teach As We Do, And How We Change Behavior

Beyond the scientific support of the content, our learners report that our workshops and trainings feel so engaging and different from traditional lectures and even entertaining trainings. All PAC trainings and workshops are conducted with learning objectives using three areas of research to support behavior change: Adult Experiential Learning Cycle (AELC), Multiple Intelligences, and Implementation Science.

**AELC**: Our teaching uses the AELC, primarily based off Jeffrey Cantor's work. As a reference, we like his book Delivering Instruction to Adult Learners (1992). Cantor talks about research citing about a 10% retention rate (of information) from lecture and about a 20% retention rate from reading. So, the traditional approach of "Train and Hope" that behavior change happens is no longer acceptable to PAC; retention rates of valuable, expensive caregiver time requires a much higher retention rate than 20%.

**Multiple Intelligences**: We also systematically incorporate all the different multiple intelligences, as described by Dr. Howard Gardner (1983), a professor of education at Harvard. He argued that the traditional notion of intelligence based on I.Q. (what's your intelligence?) was not adequate in describing that which is considered
smart. Rather, he proposed that there are multiple ways in which people can be intelligent. We use this notion to guide our training to hit on ALL ways learners can learn in order to allow for anyone to be successful.

**Implementation Science:** Incorporating an evidence-based practice into multiple sites or large organizations to ensure sustainability provides challenges to any implementation. As such, the PAC program requires guidance from the emerging field of Implementation Science. Implementation Science is the use of methods to promote systematic uptake, establishment, and maintenance of the treatment into routine mental health practice (Eccles & Mittman, 2006). This concept of implementation in health services research is outlined in the comprehensive synthesis of the literature on successful intervention research involving implementation by the work of Fixsen, Naom, Blase, Friedman & Wallace, 2005). The advantage of the Fixsen model lies in its specificity; it provides specific detail on how to implement evidence-based practices. Fixsen and his colleagues determined the use of seven critical elements of a successful implementation: 1) staff selection to determine appropriate staff to attend the in-service, 2) pre-service training on the specific evidence-based practices, 3) expert consultation and coaching of staff and administration to carry out their newly acquired skill, 4) staff evaluation to assess the use and behavior change desired regarding the trained skill, 5) program evaluation to assess and provide feedback on key aspects of the performance of the organization around the new skill, 6) facilitative administrative supports to insure data collected are fed back to administration to focus and inform decision making, and 7) systems intervention to identify financial, organizational, and human resources required to support the work of the practitioners. Only with the use of all seven core components in planning and implementation can success be ensured.


**Growing Research on PAC at the Programmatic Level**

The PAC Program, like many programs, is comprised of dozens of individual, testable theories and interventions—as described above. Scientific testing of a multi-faceted program of this level is particularly challenging due to its complexity. That being said, recent pilot studies of the PAC training programs have shown a number of successful implementations to support the use of the PAC Program and the PAC Certified Independent Trainer or PAC Certified Independent Coach.

**Feasibility Study in the PAC Trainer and PAC Coach Certification Programs.** In 2014, Teepa worked with faculty at the University of Pittsburgh’s Institute of Evaluation Science at the Graduate School of Public Health, to begin to gather feasibility data on the PAC Trainer Certification program—a train-the-trainer program. The feasibility study had two goals: 1) determine if a critical component of the dementia care skills in PAC—namely the Positive Physical Approach™—was an approach that could be successfully measured and evaluated, and 2) if a trainer other than Teepa Snow could actually teach staff to do the PPA™ technique. The data collected resulted in program evaluation with the following findings:

1. **PAC Trainer Instruction Resulted in Staff Satisfaction, Dementia Knowledge, and Program Utility:**
   Nursing and non-nursing staff who completed the PAC training achieved at least an 80% (5 out of 6) on the knowledge questions about dementia. Further, response to the questions on the utility of PAC were overwhelmingly positive, including questions such as how the program would help them to do your job, how likely was it that they would use what they have learned, and two questions about the instructor’s efficacy and knowledge. These strong findings, in combination with the high staff
satisfaction (M=4.5 out of 5), the report noted “There was little doubt the program training was highly regarded by the staff who participated.”

2. **PAC Trainer Instruction Resulted in Nursing Staff Uptake of the Positive Physical Approach™**: The staff were taught the Positive Physical Approach™ (PPA) in the training, followed by three, recorded PPA interactions reviewed by a PAC Trainer. An independent researcher video recorded 115 instances of staff approaching residents on the unit during the normal course of their day. The recordings were reviewed by independent coders using a standardized scoring sheet. Error in inter-rater reliability was less than 5%. Six of the 12 steps occurred in 75% of the interactions (range: 64% to 93%). In the analysis, four of the steps were seen in 10% or less of the interactions. While staff reported considerable amount of the training information was naturally passed from the experimental to the control units in this facility, the experimental sites still performed better than the comparison sites (executed steps 54.4% verses 46%).

Chorba, C., Ricci, E., Bear, T., & Edmunds, H. (July 2015). *Positive Approach to Care: Asbury Heights*. The Evaluation Institute, Department of Behavioral and Community Health Services, Graduate School of Public Health, University of Pittsburgh.

**Pilot Study in 12 Indiana Nursing Homes.** Following this feasibility study, the University of Southern Indiana took up the pilot study of the program in 2016, with a grant from the Indiana State Department of Health. Dr. Katie Ehlman led the USI research team, with PAC providing the service delivery. The first of five papers from the program is currently in press.


Additional evaluations are being conducted on a larger scale, two with CMS penalty funds in Indiana and Oregon, on the effects of the implementation of the PAC Trainer and Coach Certification programs, in which learners are taught to train the PAC Program. Both programs using CMS penalty funds are showing skills acquisition on the part of the learners, and two NIH research applications submitted to continue to build the empirical base of the PAC program. Peer reviewed journal articles are currently being prepared for submission.

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1 For the sake of disclosure, the author and primary contact of this white paper, Dr. Beth Nolan, left her faculty position to join PAC as an employee at the end of 2014. However, she did so following the design and execution of the study, recusing herself from any data analysis or reporting. Her colleagues at the Evaluation Institute took up these data, conducted the analysis, and completed the report. Further, the primary author on this report, Courtney Chorba, MPH, subsequently also joined PAC in 2017.