

## A Logic Model of a Dementia-specific Program of Equine-assisted Activities

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Insufficient descriptions of *what* comprises animal-assisted interventions and *why* and *how* they are presumed to work pose significant challenges to their replication and further scientific development. The purpose of this study was to construct a comprehensive research-based logic model describing a promising program of equine-assisted activities for older adults with Alzheimer's disease and related dementias. Logic models can advance scientific development of innovative programs by elucidating their critical elements. Employing the qualitative method of directed content analysis, we conducted secondary analyses of previously collected interviews of five providers and fieldnotes of each programmatic session. Employing quantitative direct observational methods, we conducted secondary analysis of eight previously collected hour-long videotapes of four older adults with dementia during the program. The resulting logic model from our secondary analysis of mixed methods data elucidated the program's purpose, assumptions, programmatic activities, and outcomes, plus congruent linkages across these elements. These findings can guide replication of the program in multiple research and practice contexts and support its future scientific development. Next research steps include evaluating short- and long-term outcomes beyond participants' direct experiences of the program, clarifying the program's optimal dosages, and ensuring fidelity of its implementation. This logic model may also help to inform scientific development of other animal-assisted interventions.

*Keywords:* Equine-assisted activities, dementia, quality of life, logic model

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Acknowledgments: With permission, the authors would like to gratefully acknowledge Hearts and Horses Therapeutic Riding Center, Seven Lakes Memory Care, and the Temple Grandin Equine Center for their ongoing support of this research. Furthermore, the authors would like to thank the Carl and Caroline Swanson Foundation for generously funding this study.

The study reported herein sought to advance the scientific basis and replication of an innovative multifaceted program of equine-assisted activities for older adults with Alzheimer's disease and related dementias. This program was designed to enhance the quality of life (QoL) of older adults with dementia. Preliminary proof of concept that the program was associated with participants' improved QoL has been established (Fields, Bruemmer, Gloeckner, & Wood, 2018). The program constitutes a type of animal-assisted intervention (AAI). AAI is a broadly used term that describes the integration of various species of animals to help benefit human health and well-being (American Veterinary Medical Association, 2018).

AAIs incorporating birds, cats, dogs, fish, and horses have emerged for people with dementia over the past 20 years. Some of these AAIs have also shown promise for enhancing outcomes in persons with dementia related to their emotional experiences and mood, social interactions, and physical activities (Wood, Fields, Rose, & McLure, 2017; Yakimicki, Edwards, Richards, & Beck, 2018). Although studies of AAIs that incorporate horses with this population are sparse, researchers have reported improved outcomes in mood and other dementia-specific indicators of QoL such as communication and participation in activities (Dabelko-Schoeny et al., 2014; Fields, 2018; Fields, Wood, & Lassell, 2019). Fields et al., (2019) previously studied the program that is the focus of this paper, which they described as comprising a *complex intervention*.

While no exact line distinguishes simple from complex interventions, complex interventions are characterized by several distinctive elements (Craig et al., 2013). For instance, some elements of complexity pertain to the existence of multiple interacting components as the intervention is

being implemented. Other elements pertain to the high degrees of flexibility, tailoring, and skilled behavior that are required of providers to ensure that they deliver an intervention safely and effectively. Still other elements of complexity pertain to the range and sophistication of the measured outcomes of an intervention. In the early scientific development of a complex intervention, the Medical Research Council recommended that researchers describe the intervention's interacting components and model its processes and outcomes onto a logic model (Craig et al., 2013; Moore et al., 2015).

Simply described, a *logic model* visually displays the logic of an intervention by identifying its salient elements and interconnecting its key activities and desired outcomes, among other programmatic components such as guiding assumptions and resources (McLaughlin & Jordan, 2004; WK Kellogg Foundation, 2004). Logic models are especially useful in describing the elements and processes of complex interventions in the health sciences (Moore et al., 2015). Specific to older adults, for instance, health professionals and researchers have developed logic models of an elder abuse forensic center (Navarro, Wilber, Yonashiro, & Homeier, 2010), of recommended practices for integrating mental health services within chronic disease prevention and health promotion programs (Lando, Williams, Williams & Sturgis, 2006), and of a community-based program for recruiting volunteers among older urban African Americans (Chadiha et al., 2011). Logic models such as these function as guiding scientific and practice-based frameworks that help to describe, replicate, and refine promising complex interventions (Lando et al., 2006). Elucidating the logic model of a complex intervention is also foundational to subsequent assessment of the

intervention's efficacy and effectiveness (Moore et al., 2014).

The literature on AAIs for people with dementia shows intermittent attention to prevalent components of logic models; especially, the assumptions, inputs, activities, outputs, and outcomes of an intervention (WK Kellogg Foundation, 2004). *Assumptions* in a logic model encompass the beliefs, ideas, and principles that define how and why an intervention is thought to change or benefit people and the community to accomplish its purpose. Related to assumptions, for example, it has been presumed that horses are therapeutic because of their social, non-judgmental, and vulnerable nature, and their abilities to be in-tune with their environments (Burgon, 2011; Karol, 2007; Porter-Wenzloff, 2007). *Inputs* are the financial, human, organizational, and community resources required to implement an AAI and support the quality of its implementation (WK Kellogg Foundation, 2004). Related to inputs, Nordgren and Engström (2012) identified a flat-coated retriever, experienced nurse, and dog handler as resources needed to implement their study of a canine-assisted intervention. *Activities* encompass the processes, tools, events, technology, and actions that are integral to the implementation of an intervention (WK Kellogg Foundation, 2004). Related to activities, Dabelko-Schoeny et al. (2014) identified grooming activities that involved braiding, brushing, and combing the horse's hair their study of an equine-assisted therapy for people with dementia. *Outputs* are the direct products that the program provides to the participants, such as the size and scope of services or number of participants reached (e.g. number of residents, or dosage) (McLaughlin & Jordan, 2004; WK Kellogg Foundation, 2004). Related to outputs, Olsen et al. (2016) indicated that their canine-assisted intervention consisted of 30-minute weekly sessions that were provided over 12

weeks to 41 participants. *Outcomes* refer to changes in the behavior, knowledge, skills, status, or levels of functioning of participants in a program (WK Kellogg Foundation, 2004). Improved engagement during activities of daily living and decreased depression and apathy have been identified as outcomes for older adults with dementia who were involved in a canine-assisted intervention (Friedmann et al., 2015).

The above-described areas of attention suggest that researchers have elucidated aspects of AAIs that correspond with specific components of a logic model. At the same time, studies of AAIs often lack comprehensive descriptions of *what* comprises their respective interventions and *how* they are thought to work (Wood et al., 2017); these gaps pose challenges for subsequent replication and further scientific development (see Moore et al., 2014). To our knowledge, moreover, no research-based logic model has been published of an AAI for people with dementia. Hence the purpose of this study was to develop a logic model describing a promising program of equine-assisted activities for members of this population. By developing this logic model, we hope to provide an empirical basis upon which the program can be replicated across multiple research and practice contexts and also further developed scientifically. We asked these questions:

1. What was the purpose of the dementia-specific program of equine-assisted activities and on what assumptions was it based?
2. What resources facilitated implementation of the program?
3. What occupational opportunities (activities) were offered during the program?
4. What were the program's outputs?
5. What were the outcomes of the program in relation to each occupational opportunity?

## Methods

### Design

We conducted a descriptive, secondary analysis of data from a mixed methods study, herein referred to as the parent study; this study examined the influence of the program of equine-assisted activities on the QoL of older adults with dementia (Busselman, Wood, Hooper, & Bruemmer, 2017; Fields et al., 2018, 2019). A secondary analysis involves analyzing previously collected data for a purpose different from the original study (Cheng & Phillips, 2014). For our secondary analysis, we used previously collected qualitative and quantitative data from the parent study to richly describe the equine-assisted activities program using a logic model framework. A mixed methods approach is often situated in the philosophy of pragmatism (Creswell & Plano, 2017). Pragmatists find truth in solving practical problems to best answer their research questions, substantiating the use of a wide range of research methods (Cherryholmes, 1992; Huber, 1973; Shaw, Connelly, & Zecevic, 2010). Guided by this philosophy, we sought to bridge the divide between research and community-based AAs by using a logic model to describe the program in order to guide future refinement and replication in other contexts.

### Setting and Sample

The parent study was conducted at two sites that included a PATH Intl. certified therapeutic riding center and a long-term care (LTC) facility. Research participants in the parent study were purposively recruited and included direct service providers and older adults with dementia. Providers had to meet two inclusion criteria: (a) a frontline provider or facility administrator and (b) history of in-depth involvement with the program. Two providers were from the LTC facility who regularly attended program sessions. The other three providers delivered the program of equine-assisted activities and held

certifications in therapeutic riding from PATH Intl. Older adults with dementia had to meet the following inclusion criteria: (a) 45 years or older, (b) able to ambulate with minimal assistance from a caregiver (by walking or wheelchair), (c) stable regimen of medications (including psychotropic medications), (d) diagnosed with mild-moderate stage dementia (e) resident at a participating LTC facility for four weeks or longer prior to the study, (f) not allergic to horses, (g) English-speaking, and (h) interest in horses. Approval from the Institutional Review Board of Colorado State University was obtained. All participants and their legally authorized representatives provided informed consent.

### Data Collection

Five direct service providers took part in individual interviews in the parent study. These interviews were semi-structured, ranged from 30-60 minutes, and were audio-recorded and transcribed. Interview data were collected to learn about providers' perceptions of positive and negative influences of the program on the QoL of older adults with dementia. Research team members recorded field notes after each session to describe what occurred. In addition to the interview and field note data, four older adults with dementia were videotaped during the program. These older adults had been selected for videotaping because they evidenced a range of dementia severity from mild to moderate. Videotaped data were collected for the purpose of documenting QoL outcomes for the older adults with dementia. Videotaping occurred across four sessions, resulting in 16 hours of video data.

### Data Analysis and Trustworthiness

To answer research questions one through four, we uploaded the previously collected interviews and field notes into NVivo ([www.qsrinternational.com/nvivo/home](http://www.qsrinternational.com/nvivo/home)), a

qualitative data analysis software. For secondary analysis of these data, we then used the method of directed content analysis. Content analysis is considered a basic form of qualitative description, providing the facts of an event and the meaning attributed to the event by participants in “everyday language” (Sandelowski, 2000, p. 336). Content analysis differs from other qualitative methods in that it is pragmatically informed by an existing body of knowledge on a topic or event and the experiences of the research team, versus phenomenological and hermeneutical traditions (Neergaard, Olesen, Andersen, & Sondergaard, 2009). Further, content analysis allows for the subjective interpretation of text using a “systematic classification process of coding” to help identify themes (Hsieh & Shannon, 2005, p. 1278). When using *directed content analysis*, researchers apply a deductive approach to incorporate qualitative codes established in previous research in order to more thoroughly describe an event. We created a priori parent codes that corresponded to each component of a logic model defined in this paper’s introduction (i.e., purpose and assumptions, inputs, activities, and outputs). We then mapped data from the parent study onto these codes, while also developing and applying relevant sub-codes. For example, the code, *Assumptions*, contained the sub codes horse and nature connection, social participation,

and holistic experience. (Supplementary materials contain names and definitions of all codes and sub codes).

We used the strategies of triangulation, peer-debriefing, and negative case analysis to ensure trustworthiness of findings resulting from this secondary analysis (Savin-Baden and Major, 2013). Triangulation consisted of revisiting interviews and field notes to ensure consistency with emerging logic model findings. Weekly peer-debriefings were held among researchers to reach consensus and ensure consistent interpretation of the data. Finally, we conducted negative case analysis to search for any conflicting accounts of the program evident in the interview and field note data.

To answer research question five, we uploaded videotape data into Noldus Observer XT 13 ([www.noldus.com](http://www.noldus.com)), a behavioral analysis software. We selected eight hour-long videotapes for secondary analysis because they had been previously coded for dementia-specific indicators of QoL using a direct observational measure, the Activity in Context and Time (ACT) (Wood, 2005). Table 1 presents these codes and definitions. These indicators of QoL reflected the actual activities of participants during the program and their concomitant expressed affects.

Table 1  
*Parent Study Codes and Definitions using the Modified Activity in Context in Time*

Domain: Sub domain	Code	Definition	Indicator Category
Time Use: Gaze	Engaged gaze	Sustained intentional scanning, watching, or visually orientating to some person, event, object or physical environmental attribute in the absence of agitation or distress.	Positive
	Unengaged gaze	No evidence of attention to something in environment; eyes can be open.	Negative
	Eyes closed	Eyes are closed.	Negative
	Sitting	In a seated position.	Neutral

Time Use: Position and Movement	Stairs	Ambulating up or down stairs.	Positive
	Standing	Standing in an upright position.	Positive
	Walking	Ambulating across an area (regardless of assistance or ambulation device). Participant must be continuously walking with less than a five second pause to be coded as walking.	Positive
	Sitting on horse	Seated on a saddled horse, regardless of whether the horse is moving or not.	Neutral
	Lying down	Reclined or lying down.	Negative
Time Use: Communication	Yes communication	Any active exchange of information that is either verbal or nonverbal, that can include physical contact, physical gestures, spoken language, or turn taking.	Positive
	No communication	There is no evidence of an exchange of information.	Neutral
Time Use: Participation	Yes Participation	Active sustained engagement in activities that are appealing or acceptable to an individual and not externally coerced or driven.	Positive
	Modifier: Put on or take off helmet	Putting on or taking off riding helmet or hat; participation in putting helmet on is complete when the chin strap is closed and the helmet is adjusted	Positive
	Modifier: Ride the horse	Riding the horse inside or outside, can be sitting on the horse, but does not include mounting. Includes games, the sensory trail, and obstacle courses such as weaving in and out of cones or walking over ground poles.	Positive
	Modifier: Mount or dismount	Process of getting off the horse that begins when the participant is physically touching the horse or tack with intent to get on the horse. Mounting ends when the horse begins to move forward out of the mounting block. Dismounting begins when the participant begins to swing their leg or move off of the horse. Dismounting ends when the participant has two feet on the ground.	Positive
	Modifier: Pet	Using hands or arms to stroke the horse (not using any type of equipment such as a brush). Activity begins when the participant touches the horse and ends when the series of stroking the horse has ended.	Positive
	Modifier: Groom	Grooming the horse with some type of equipment (i.e. brush); activity begins when participant touches horse with a brush and ends when the series of brush strokes has ended.	Positive
	No Participation	Absence of participation in activity.	Neutral

Apparent Affect	Anger	Clenching teeth, grimacing, shouting, yelling, cursing, berating, pushing, physical aggression or implied aggression such as fist shaking, pursed lips, narrowed eyes, or knit brow.	Negative
	Anxiety/Fear	Furrowed brow, motoric restlessness, repeated or agitated movement, facial expression of fear or worry, withdrawal from other, tremor, tight facial muscles, calls repetitively, hand wringing, leg jiggling, or eyes wide.	Negative
	Interest	Eyes following object, intent fixation on object or person, visual scanning, facial, motoric, or verbal feedback to other, eye contact maintained, body or vocal response to music, turn body or move toward person or object.	Positive
	Pleasure	Smiling, laughing, stroking, touching with "approach" manner, nodding, singing, arm or hand outreaching, open-arm gesture clapping, any signs of warmth or affection towards a person or horse.	Positive
	Sadness/Depression	Cry, tears, sigh, mouth turned down at corners, eyes/head turned down and face expressionless, wiping eyes.	Negative
	No Apparent Affect	No movement of eyes, face, or body.	Negative
Agitation	Yes Agitation	Inappropriate verbal, vocal, or motor activity that is not judged by the outside observer to result directly from needs or confusion of the individual; agitated behaviors are always socially inappropriate and can manifest as 1) abuse or aggression towards others, 2) appropriate behavior performed with inappropriate frequency, or 3) inappropriate according to social standards for the specific situation (most frequently manifestations are restlessness, pacing, complaining, repetitive sentences or questions, negativism, constant requests for attention, and cursing or verbal expression).	Negative
	No Agitation	Absence of agitation behaviors.	Positive
Missed observations	Missed observation	Occurred anytime a participant was blocked from view for more than ten seconds and could apply to any code.	Neutral

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Note. Gaze and participation definitions were based on Wood's (2005) definitions. Apparent Affect definitions were based on Lawton, Van Haitsma, and Klapper's (1996) and Lawton, Van Haitsma, and Perkinson's (2000). Definitions of agitation were based on Cohen-Mansfield, Marx, and Rosenthal (1989).

Our secondary analysis of these videotapes involved coding them for occupational opportunities. As defined for the purpose of this coding, *occupational opportunities* encompassed the options that were offered to participants to engage in specific activities throughout each session of the program (Wood, Lampe, Logan, Metcalfe, & Hoesly, 2017). To honor participants' preferences for activities, staff and volunteers always presented these opportunities as options rather than as requirements or expectations. Codes for occupational opportunities were created through an iterative process of watching videotape data, generating initial codes, modifying these codes, creating new ones, and reaching consensus on all existing codes until we met saturation. Table 2 illustrates these codes and definitions. We used a continuous sampling approach in Noldus, where one occupational opportunity code was assigned for every second of time (see Noldus Information Technology, 2016). An occupational opportunity began when it was offered to a participant with dementia and ended when it was no longer available. For example, we started coding the opportunity of petting when a handler led a pony within reach of a participant with dementia and ended when the pony was no longer within reach. Researchers coded missed observation if a participant with dementia was blocked from view.

The nesting function in Noldus allows researchers to merge data from two separate coding strands of the same video with the option of inserting one coding strand within another (Noldus Information Technology, 2016). Hence, after completing coding for occupational opportunities, we used the nesting function in Noldus to merge previously coded indicators of QoL within the

coded occupational opportunities. We used this nesting function to document how proffered occupational opportunities (e.g., the opportunity to ride the horse) did or did not overlap with participants' actual activities in response to the opportunities (e.g., actually mounting and riding the horse versus walking away from the horse). We then used the analysis function in Noldus to generate frequencies and durations of each occupational opportunity and its corresponding indicators of QoL across all program sessions. Percentages of each code for the total program duration were calculated using a formula in Excel and were then mapped onto the logic model. For example, the most prevalent identified occupational opportunity, observing, offered older adults' opportunities to talk with people and also to watch horses and people interact before or after their own opportunities to interact with a horse. This opportunity accounted for 54% of the total duration of the program. During observing, participants demonstrated an engaged gaze (i.e., a positive indicator of QoL) 93% of the time; we then mapped these findings onto the logic model.

To ensure trustworthiness of this coding process, two researchers underwent extensive training in Noldus. Inter-coder reliability was calculated based on two hours of all videotaped data, or 20%. A kappa coefficient of 0.82 was achieved indicating nearly perfect agreement (Viera & Garrett, 2005). Two subsequent checks for drift reliability were also completed among the secondary-analysis study team.

### **Results**

Findings from our secondary data analysis are mapped onto the logic model framework (Figure 1) and described in the subsequent sections.

Table 2

*Secondary Data Analysis: Occupational Opportunity Codes and Definitions*

Code	Definition
Grooming	The opportunity to groom a horse began when a participant (who was not mounted on a horse) was within reaching distance of a horse and grooming tools were available for use. Grooming the horse ended when the participant no longer had a grooming tool in his or her hand and began walking away from the horse.
Observing	Observing was defined solely by the fact that participants were sitting on the bench or in a chair, facing the activities that were ongoing. Hence observing offered opportunities to watch horses and people involved in the program, and to survey many and oftentimes dynamically interacting elements of its equine environment.
Petting	The opportunity to pet a horse began when a horse was within reaching distance of a participant (who was not mounted on a horse) and there were no physical barriers hindering the participant from petting the horse. The opportunity ended when the horse was no longer within reaching distance of the participant.
Riding	The opportunity to ride a horse began when a participant was standing on the mounting platform and the horse began walking between the blocks towards the rider. The rider would then be assisted by program volunteers and staff to mount the horse. Riding included games such as cones, obstacle courses, walking over poles, reaching for rings or a toy, etc. This opportunity ended when the participant had dismounted, defined as having both feet on the ground, and began walking away from the horse.
Transitions	The opportunity of transitions began when a participant ended an occupational opportunity by walking to the next one. This opportunity included chances to put on or take off a helmet, which were previously coded as participation. Transitions ended when the participant entered a different occupational opportunity.

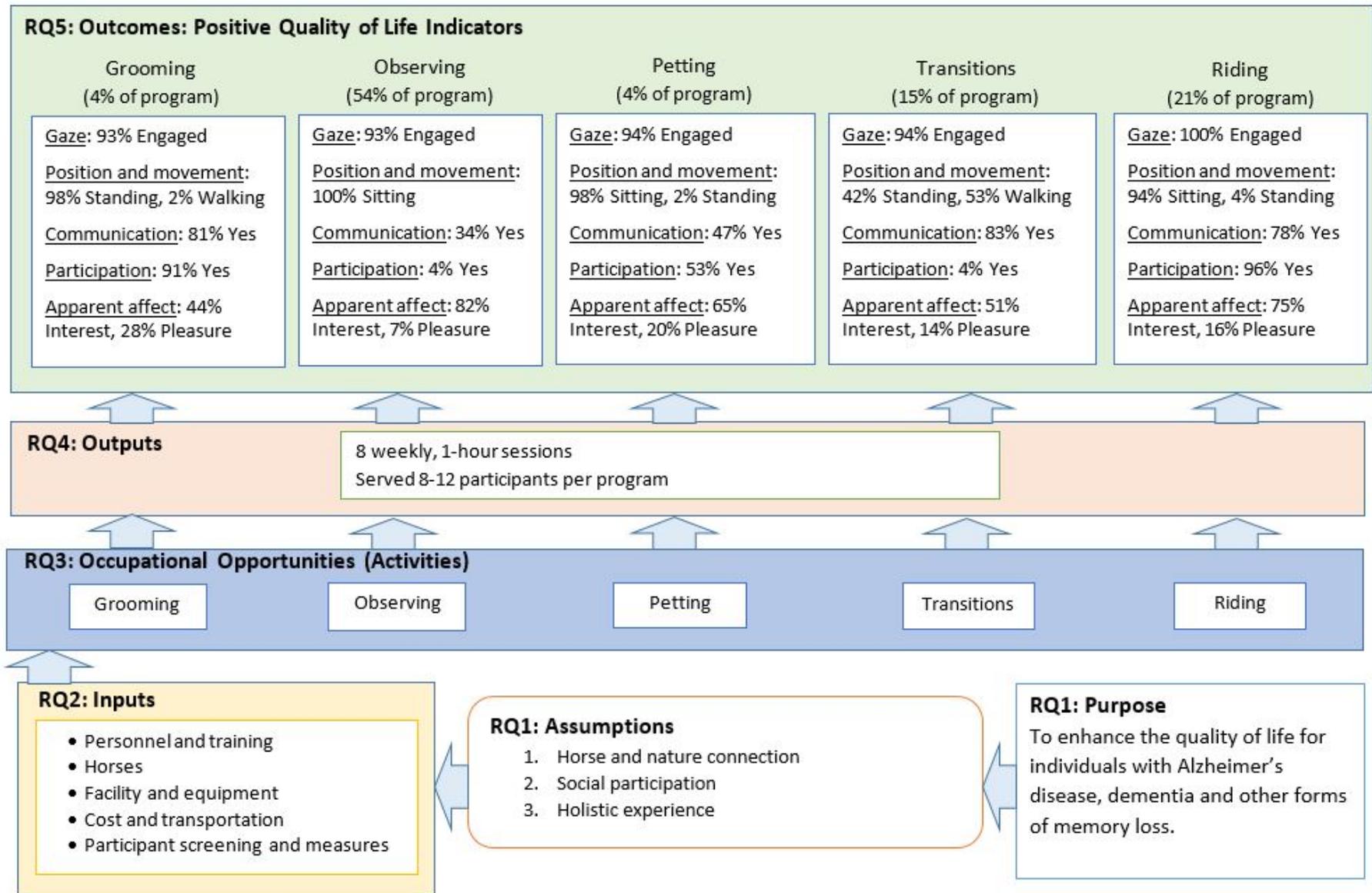
*Note.* Each occupational opportunity was unique and mutually exclusive, meaning that one occupational opportunity could be assigned at a time. Transitions were not a program activity, however, in order to capture every moment of time, transitions were coded to cover the amount of time traveling between activities

### **Purpose and Assumptions**

The stated purpose of the dementia-specific program of equine-assisted activities was to improve the QoL of people with Alzheimer's disease and related dementias. Consistent with this purpose, providers hypothesized that specific qualities of the program favorably influenced older adults' QoL. Namely, providers posed that shared activities among older adults and horses fostered social connections and participation. Grooming, for instance, created opportunities for older adults to get to know a volunteer on a one-on-one basis and also to become

acquainted with a horse. Additionally, providers reported that horses evoked rich sensory experiences and the natural setting of the therapeutic riding center rekindled prior positive memories of horses and nature, helping to uplift older adults' emotions. Furthermore, providers believed that experiences of the program as a whole enhanced older adults' QoL. For instance, many components of the program synergistically gave rise to simultaneous positive experiences for participants, such as connecting with a horse, re-living previous memories in nature, socializing, and being physically active.

Figure 1 Logic Model of a Dementia-specific Program of Equine-assisted Activities



Note. No negative quality of life indicators were observed. Percentages in each category do not add up to 100% due to missed observations.

## Inputs

**Personnel and training.** The Director of Special Activities at the therapeutic riding center was responsible for managing the program, overseeing paperwork, and establishing and maintaining collaborative partnerships between the therapeutic riding center and participating LTC facilities. This role involved visiting each LTC facility in which older adults in the program lived, learning about the facility's care approach, and addressing any miscommunication or conflict that arose. Two therapeutic riding instructors certified by the Professional Association of Therapeutic Horsemanship, International (PATH Intl.) led the program and were assisted by volunteers. Volunteers generally held a 3:1 ratio with older adults for riding activities and a 1:1 ratio for ground activities including grooming and observing. All activities occurred concurrently where volunteers and therapeutic riding instructors presented opportunities to participate in activities to each participant throughout the duration of the program. Riding was selectively presented to older adults who had been cleared by their physician. A therapeutic riding instructor directed riding activities while two side-walkers and a horse leader accompanied the older adults. Groundwork activities, such as petting and grooming, were facilitated by a volunteer. Specific training was provided to volunteers for the roles of barn-worker, horse-leader, and side-walker. Volunteer responsibilities included program set-up and implementation. For example, volunteers arranged seating in the arena and gathered equipment prior to each session. Volunteers implemented the program by interacting with the older adults and adhering to safety procedures, such as helping the older adults' put-on riding helmets.

**Horses.** In accordance with the standards of PATH Intl.

([www.pathintl.org/quick-links/standards-manual](http://www.pathintl.org/quick-links/standards-manual)), all horses utilized in the program underwent a rigorous screening and training process. Therapeutic riding instructors selected horses to deliver the program based on (a) narrow to normal width, (b) slow and steady movement, (c) tolerance for imbalanced riders, and (d) comfort being surrounded by four to five people. Horses with a narrow to normal width were chosen as a precaution for older adults' hips. Three horses and one pony participated in the program. All were mares with the following ages and breeds: a 14-year-old Spanish Barb/Quarter Horse, 18-year-old Halfinger, 21-year-old Appaloosa, and a 15-year-old Shetland/Welsh pony.

**Facility and equipment.** The program occurred at a premier accredited therapeutic riding facility, the highest level of accreditation possible through PATH Intl. A PATH Intl. certification requires the facility to uphold industry standards for safety and administration of equine-assisted activities. The therapeutic riding center is located on the outskirts of the Rocky Mountains in Loveland, Colorado with scenic views of the foothills. Resources utilized during the program included an indoor arena, handicap accessible mounting ramp, and an outdoor sensory trail. Materials for groundwork included benches and chairs facing the ongoing activities. Grooming equipment involved a hitching post for the horses, standard halters, lead ropes, and grooming buckets with two to four brushes each. Equipment and tack utilized during riding included a standard riding helmet, western saddles, saddle pads, bridles, and, in some cases, colored reins clipped to a halter. Materials for games during riding included colored rings, cones, ground poles, basketball hoop, and a ring tree. The outdoor sensory trail, located at the base of the foothills of the Colorado Rockies, included wooden logs, ground

poles, jump standards, barrels, and a bridge.

**Cost and transportation.** Cost of the program included administration fees for participant screenings, meetings, volunteer and staff trainings, as well as the cost of each session. Costs were based on program frequency and duration in accordance with each LTC facility's needs. Most commonly, a LTC facility would enroll in a four-week program with hour-long sessions. However, some LTC facilities attended weekly sessions, spanning eight weeks. LTC facilities were responsible for transporting older adults via bus.

**Participant screening and measures.** To begin the program's screening process, a participant's healthcare proxy was required to complete an enrollment packet that included a physician's consent (see Appendix A). The enrollment packet contained background information on the participant's history with horses as well as a list of contraindications involving medical conditions that would deem them unsafe to participate in the program, such as a spinal cord injury. Once older adults passed the initial screening process, riding instructors traveled to the LTC facility to complete an in-person evaluation of each potential participant. The screening involved wearing a riding helmet and sitting on a barrel to assess the older adults' hip flexibility. Riding instructors determined whether the older adult was able to ride comfortably, and assessed their ability to follow directions, respond to cues, and safely mount and dismount. During this screening, staff looked to see if the older adult was interested in participating in the program and if they demonstrated signs of distress, pain, agitation, or potentially dangerous behaviors to help determine if the older adult was appropriate for the program. Furthermore, riding instructors began to formulate which program activities would best suit each participant. Staff from the LTC facility such

as nurses and therapists were encouraged to attend the screening to answer questions related to older adults' health and functional abilities. Upon passing both screening phases, older adults were officially enrolled as participants in the program. Currently, therapeutic riding instructors do not utilize a standardized outcome measure to document outcomes of the program.

### **Occupational Opportunities**

**Ground experiences.** Four distinct occupational opportunities to interact with horses on the ground were offered to participants: observing, grooming, petting, and transitioning from one activity to another. During the opportunity for observing, participants sat in a chair with a back or on a bench, facing the ongoing activities in the indoor arena. Observing involved opportunities to socialize with volunteers or other participants, watch the horses and ongoing activities of the program, and survey the equine environment in which the program occurred. Volunteers and staff in the program also presented participants with opportunities to groom, pet, and ride a horse. If a participant expressed interest in any of these opportunities, a volunteer would assist them in putting on a helmet prior to participating. Grooming involved opportunities to brush a horse, comb a horse's mane, and become acquainted with the horse and volunteers. During this opportunity, volunteers and program staff helped participants successfully sequence and complete grooming tasks by offering simple steps and tactile cues. For example, a staff member would guide a participant's hand to brush the horse's neck. The opportunity to pet a horse or pony was presented while participants were seated on the bench. Staff led a miniature pony to participants, providing the opportunity to engage in petting. Petting created opportunities for conversations with staff, volunteers, the horse or pony, and other older adults. Transitions

occurred when volunteers escorted participants from one activity to the next.

**Riding experiences.** Two providers described riding as the most challenging activity, posing the highest risk. Offering the opportunity to ride involved having a therapeutic riding instructor accompany participants onto the mounting platform and the horse into the mounting area. If participants chose to ride, then two therapeutic riding instructors on either side of the ramp would assist them to mount the horse. Once the participant mounted the horse, the horse was led out of the mounting platform. The horse leader checked the participant's weight distribution and guided the instructors to adjust the stirrups if necessary. Next, two side-walkers accompanied the participant on either side of the horse, to ensure safety during riding activities. The horse leader and the side-walkers instructed the participant on riding techniques such as steering with reins and giving the horse verbal commands such as "walk." Riding included games involving upper body exercises, steering around cones and barrels, throwing balls into a basketball hoop, placing rings on a ring tree, and riding over ground poles. Typically, five of 12 participants, who had been cleared by their physician, chose to ride each session. Riding lasted roughly 15 minutes to avoid fatigue and began in an indoor arena, and weather permitting, included riding outside over obstacles on the sensory trail. Therapeutic riding instructors assisted participants in dismounting using either a crest or croup technique as described in the PATH Intl. riding instructor manual ([www.pathintl.org/images/pdf/resources/Evaluator%20Update%20pdfs/Riding-on-site-Workshop-Manual.pdf](http://www.pathintl.org/images/pdf/resources/Evaluator%20Update%20pdfs/Riding-on-site-Workshop-Manual.pdf)).

### **Outputs**

Outputs of the program included eight-weekly sessions, lasting approximately one hour. All four older adults who

participated in the video observations attended the entirety of each of the four video-taped sessions. Furthermore, videotape data aligned with providers' reports of serving 8-12 participants per program. The program began by serving one local LTC facility. Currently, the program collaborates with four local care agencies, ranging from LTC to adult day programs for people with dementia and is offered in the spring, summer, and fall seasons.

### **Outcomes**

All occupational opportunities were associated with high levels of positive and neutral QoL indicators pertaining to time use (gaze, position and movement, communication, participation) and apparent affect and agitation (Figure 1). No negative QoL indicators were observed at any time throughout the program. Therefore, each occupational opportunity supported older adults' QoL, demonstrating congruence with the purpose of the program.

With respect to opportunities provided on the ground, observing was most pervasively offered in the program and also associated with the highest frequencies of an observed positive affect of interest. Thus, while not actually interacting with horses during the opportunity called observing, older adults watched and showed interest in various activities going on around them while sitting on the bench. Opportunities to groom a horse, pet a horse, or transition from one activity to another were offered for much shorter durations than opportunities for observing. Yet these opportunities were also distinctively linked with particular positive QoL indicators. Namely, the opportunity to groom a horse was related to the greatest proportions of time that participants spent standing and communicating with the horse or volunteers, the second greatest proportion of time spent participating in the offered opportunity (grooming), and the greatest frequencies of an observed positive affect of

pleasure. Therefore, grooming supported indicators of QoL related to an uplifted emotional state, communication, and the use of participants' physical capacities. Grooming seemed to offer opportunities for more complex engagements than petting and observing, in that participants often simultaneously groomed and talked to their horses while also conversing with other nearby people. The opportunity to pet a horse was linked to the second greatest levels of the observed affect of pleasure. Petting was accessible to all older adults with varying physical abilities and occurred while older adults were seated. Like grooming, petting demonstrated variances in positive and neutral QoL indicators, such as an uplifted emotional state, communication, and participation in a short period of time. Lastly, the opportunity to transition from one activity to another was linked to the greatest proportions of time that older adults spent walking and communicating with people and horses.

The opportunity to ride a horse was the second most pervasively offered opportunity. Three of the four older adults who were video-taped during the program had previously been cleared for riding, all of whom chose to ride once given the opportunity. This opportunity was associated with the greatest proportions of time that older adults spent with an engaged gaze and actively participated in all the opportunities offered; namely, mounting a horse, riding the horse while oftentimes doing various other activities such as games or obstacle courses, and dismounting a horse. Riding was also linked to large proportions of time spent communicating with the horse, therapeutic riding instructor, and horse handlers. This opportunity offered the longest bouts of time where older adults were observed to engage in more complexly layered activities simultaneously. For example, older adults were observed to communicate with staff and

the horse, while demonstrating an engaged gaze, and following directions to participate in riding, such as steering the horse around cones.

### **Discussion**

Findings from this study align with the Medical Research Council's recommendation that researchers describe an intervention's interacting components and model its processes and outcomes onto a logic model in the early phases of scientific development (Craig et al., 2013; Moore et al., 2015). As next developed, the logic model resulting from this study depicts *what* comprised the purpose, assumptions, programmatic activities, and outcomes of the program of equine-assisted activities for older adults with dementia; it illustrates congruent linkages across these components; and it suggests a foundational understanding of *why* and *how* the program worked. For these reasons, the logic model can serve as a guiding framework to replicate and refine the program across multiple sites (see Moore et al., 2014). This research-based logic model can also help to justify further scientific investment in developing the program and clarify next research steps.

Creating the logic model allowed us to make providers' assumptions describing *why* the program worked explicit. Providers, who assumed that the many elements of the program synergistically contributed to the positive QoL experiences of participants, emphasized in particular connections with horses and nature and social participation as mechanisms of change. Much literature pertaining to AAIs support these assumptions. For example, investigators of AAIs have drawn from Wilson's biophilia hypothesis (Kellert & Wilson, 1993), which assumes that humans are hardwired to connect with animals and nature (Beck & Katcher, 2002; Beetz, 2017). Furthermore, being in nature has been connected with positive emotional states in older adults with

dementia (Duggan, Blackman, Martyr, & Van Schaik, 2008) and linked to health (Kaplan, 1995; Kuo, 2015).

Providers in this study also credited the experience of getting to know a horse as enhancing the QoL of older adults who participated in the program, a presumption that aligns with the fairly widely expressed view that the horse-human bond can elicit positive outcomes (Burgon, 2011; Dell et al., 2011; Yorke, Adams, & Coady, 2008). Other researchers of AAIs have similarly assumed that interactions with animals can help to facilitate social connections, serve as a non-threatening topic of conversation (Hunt, Hart, & Gomulkiewicz, 1992; Wells, 2009), and provide social support (Gee, Mueller, & Curl, 2017). Providers in the current study also assumed that the sensory experience of engaging with a horse and nature favorably influenced positive outcomes of QoL. In like fashion, Dabelko-Schoeny et al. (2014) posed that the multi-sensory experience of being around a horse and a farm can contribute to positive outcomes in older adults with dementia.

The assumption of providers that many programmatic components as a whole helped to enhance participants' QoL was reflected in how they delivered programmatic activities. For example, the screening process allowed therapeutic riding instructors to collaborate with LTC staff to select older adults who were interested and able to safely participate in the program. The different roles of personnel (e.g. therapeutic riding instructor, side-walker), their respective training processes (e.g. staff training on dementia care) and availability of different types of equipment (e.g. mounting platform) were all needed to deliver the program safely. These inputs, which made it possible to deliver the occupational opportunities during the program and implement the entire program safely, collectively contributed to

realizing the program's purpose of enhancing older adults' QoL.

Other examples of the holistic nature of the program pertained to the delivery of specific programmatic elements. To honor each participant's preferences and needs, providers offered a dynamic array of possible interactions with horses rather than prescribing a set of group activities. This method of offering opportunities is congruent with Kitwood's (1997) person-centered approach to dementia care, one in which caregivers honor each person's preferences by providing choices. Accordingly, because providers in the present study intentionally offered different ways to watch or engage with horses throughout the session, the resulting logic model emphasized *occupational opportunities* rather than *activities*, a common element in logic models (see W.K. Kellogg, 2004). Use of the term, occupational opportunity (Wood et al., 2017), in the model underscores the importance of providing possibilities for action. Detailed descriptions of *how* each occupational opportunity was implemented may also help to guide future replication and evaluation of the program. Wood et al., (2017) noted that AAI studies targeting older adults with dementia provide little description of the intervention and instead focused on outcomes, such as improved mood and decreased negative behaviors. The providers' description of each occupational opportunity in the present study may possibly serve as a template for elucidating the elements and implementation processes of other dementia-specific animal-assisted interventions, thereby addressing a crucial step in scientific development.

Lastly, the logic model that resulted from this study linked providers' assumptions about why the program worked with their programmatic activities and also associated indicators of QoL exhibited by participants in the program. Nested within

each occupational opportunity, for instance, were the specific ways in which participants responded to the opportunities, showing that all five occupational opportunities had distinct value as gauged by participants' positive expressions of engagement, interest and pleasure. Hence, each occupational opportunity was shown to be distinct by variations in positive and neutral indicators of QoL among participants with varying levels of cognitive and physical abilities. For example, participants with more severe cognitive deficits were provided with simple directions and tactile cues during grooming, such as guiding their hands to brush the horse's neck. Participants with limited mobility were offered the occupational opportunity of petting a horse while seated on the bench.

### **Directions for Future Research**

Findings from our logic model revealed several areas for future research. Namely, there are needs to explicate a more in-depth theory of change; investigate factors that pose risk to or protect program implementation and outcomes; examine fidelity of implementation and optimal dosages of the program; document short and long-term outcomes beyond the immediate experiences of participants during the program; and document the impact of the program on the local community.

Researchers should investigate the missing linkages of *how* providers' proposed mechanisms were active in producing outcomes of QoL during the program. Simplistic depictions of causal relationships are weaknesses associated with logic models (Rogers, 2008)—especially those created during the early phases of development. However, the Medical Research Council underscores the importance of first describing an intervention to determine *what* ingredients are present, identifying which ones are presumed to bring about change, prior to testing causal explanations (Craig et

al., 2013; Moore et al., 2015). Therefore, the developed logic model can be refined to illustrate complex pathways to QoL outcomes through future causal testing to build a more in-depth theory of change (see McLaughlin & Jordan, 2004; Moore et al., 2014).

We suggest a process evaluation as a next step for the future research of the program. A process evaluation guided by a logic model can help illuminate which ingredients are active and how they produce change within a complex intervention, building a more in-depth theory to drive future research (Moore et al., 2014). The Medical Research Council provides guidance on key components of a process evaluation framework (Moore et al., 2015). Relying on this guidance, we suggest these next research steps: (a) external factors that may protect or pose risk to participants' outcomes or the success or failure of the program in multiple contexts could be assessed through interviews of volunteers, therapeutic riding staff, family members and other care partners, among other stakeholders, and (b) the program's fidelity, or its quality and consistency in implementation, could be assessed using checklists of observed core components of the program. Assessment of fidelity would help to ensure that future replications of the program will be of a high quality. During replication of the program, researchers should also examine the program's fidelity, or its quality and consistency in which each occupational opportunity is implemented. Fidelity could be assessed using checklists of observed core components of the program (Steckler & Linnan, 2002). Assessment of fidelity would help to ensure that future replications of the program will be of a high quality and is crucial during a full-scale evaluation, such as a randomized controlled trial (see Moore et al., 2014).

Future research should examine dosage as a next step. The outputs of the program illustrated by the logic model, provide an understanding of the dosage, format of delivery, and the number of participants reached. The delivered product of eight weekly sessions to 8-12 participants delivered immediate outcomes of positive and neutral indicators of QoL. However, it is unknown what the most effective dosage and format of delivery (individual, small group, large group, etc.) of the program is, based upon a person's stage of dementia. This unknown is also reflected in the AAI literature with variances in dosage and delivery formats across participants with varying stages of dementia (see Yakimicki et al., 2018). For example, Thodberg et al. (2016) found that individual visits with a dog twice a week over six weeks increased pro-social behaviors for older adults with mild to severe dementia. In contrast, Olsen, Pedersen, Bergland, Enders-Slegers, and Ihlebæk's (2016) canine-assisted intervention delivered twice a week for 12 weeks in small group format (3-7 people) found significant improvements in QoL in older adults with severe dementia, but not for those in the mild to moderate stages. Hence, more research of the program is needed to examine the most effective dosage based on the older adults' stage of dementia.

Other next steps concern short-term outcomes of one to three years and long-term outcomes of four to six years, plus community impact. Both levels of these outcomes could be explored qualitatively through interviews of with family members or other care partners, or quantitatively using dementia-specific measures such as Dementia Quality of Life Instrument (Mulhern et al., 2013). Lastly, the program's impact at a level of the local community could be captured by conducting interviews with still other stakeholders such as community leaders or individual and

corporate donors to the program. Addressing each of these areas for future research, will advance the scientific merit of the program and inform the development of other dementia-specific AAIs.

### **Limitations**

A limitation of our secondary analysis was that the qualitative interviews were originally conducted for a purpose other than developing a logic model. Therefore, interview questions were not designed to elicit responses for the desired logic model components, meaning the data were fitted to the logic model retrospectively. However, McLaughlin and Jordan (2004) highlight that logic models can be created retrospectively for existing programs to guide future evaluation. Furthermore, our sample was not inclusive of the full range of participants served by the program. Our study captured findings for older adults in the mild to moderate stages of dementia and did not include those with mild cognitive impairment or those in the late stages of the disease. Lastly, we did not include the perspectives of informal care partners who could have illustrated additional program characteristics due to the limited scope of the parent study.

### **Conclusion**

While AAIs are growing in popularity for older adults with dementia, their scientific development remains in early phases. Specifically, AAIs for this population lack a thorough description of what occurs during these types of interventions, posing challenges for their replication and subsequent evaluation. We therefore developed a logic model of a promising program of equine-assisted activities to describe *what* the program is and *why* and *how* it works. The developed logic model elucidated the program's essential components and processes, and its most immediate outcomes as measured by directly observed indicators of older adults' QoL, while they were engaging in the program.

This logic model provides a basis for replication and further refinement of the program across multiple sites. It is our hope that the logic model may serve as a guide for

preliminary scientific development of other AAIs whose purpose is to also enrich the QoL of people with dementia.

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## Appendix A

# HEARTS & HORSES

*Therapeutic Riding Center*



*est. 1997*

Welcome!

Thank you for your interest in Hearts & Horses, a non-profit therapeutic horsemanship program, which creates a supportive and dynamic environment for the development of children and adults with disabilities living in our area. Through the teaching of horsemanship skills, physical, psychological, cognitive, behavioral, and communication goals are achieved and personal strengths are emphasized.

Children and adults with a wide array of disabilities including cerebral palsy, autism, and other spectrum disorders, sight and hearing deficits, multiple sclerosis, Down syndrome, emotional, developmental and learning disabilities find success in meeting their goals thanks to the powerful interaction with a horse. At present, we have an average of 150 riders per week participating in equine assisted activities at Hearts and Horses.

Physicians, therapists, teachers and friends may refer participants to Hearts & Horses. Our highly trained instructors and therapists design individual lesson plans for each participant tailored to their ability level and goals. Through a variety of equine-related activities, our participants realize many benefits that include greater confidence, self-awareness, increased balance, muscle strength and self-esteem.

Hearts & Horses offers a year-round program that includes group riding lessons and one-on-one intensive therapy with a licensed physical or occupational therapist.

To find more information about enrolling in an upcoming session at Hearts & Horses, please call 970-663-4200 or via email: [info@heart sandhorses.org](mailto:info@heart sandhorses.org)

Sincerely,



Jan Pollema  
Executive Director



## EXPLANATION OF PROGRAM SERVICES, PARTICIPANT ELIGIBILITY AND POLICIES

**\*\*KEEP FOR YOUR REFERENCE\*\***

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### PROGRAM SERVICES

**Therapeutic Riding (Ages 4 and up)** –Therapeutic riding lessons are equestrian skill based lessons for individuals with disabilities. The focus of the lessons is skill development and progression while improving the rider's physical, cognitive, emotional and/or social skills. Lessons are taught by a Professional Association of Horsemanship International (PATH Intl.) Certified Therapeutic Riding Instructor and assisted by volunteers. Helping the participant reach their full potential is of paramount importance. The length of the lessons includes mounting and dismounting in addition to any pre or post mounted horse care planned by the instructor. Partial scholarships may be available based on family's financial need.

- ♥ **Group Classes** - 3-6 participants; generally one hour in length. Participants will engage in pre-mounted and post-mounted horse care (if appropriate). Participants are scheduled by age, skill level and availability.
- ♥ **Private Lessons** - Private lessons are typically 30-45 minutes in length depending on the needs and abilities of the participant. Due to arena space, private lessons are rare and only available with prior approval only.
- ♥ **Un-mounted Activities** - For participants who may be unable to ride a horse, un-mounted activities may be available.

**Hippotherapy (Ages 2 and up)** - Hippotherapy is a clinical, physical or occupational therapy using the horse as the modality and is administered by a licensed occupational, physical, or speech therapist. The horse's movement promotes active responses in the client and facilitates activation of postural control, balance, motor and sensory systems. Participants who have movement, speech and/or motor deficits can benefit from Hippotherapy.

*A physician's prescription for physical therapy and/or occupational therapy with Hippotherapy is required.* Hippotherapy fees are \$75 per 30 minute session and are to be paid to the therapist at each treatment session. This service may qualify for insurance reimbursement. At this time Hearts & Horses does not bill through insurance, so any reimbursement must be processed through the individual's insurance, by the individual and is solely their responsibility.

### TO GET STARTED

1. Contact Hearts & Horses for a Participant Intake Interview and schedule a short visit to Hearts & Horses.
2. Read carefully the Participant Enrollment Packet, which also includes a Physician Assessment.
3. Please complete the Participant Enrollment Packet and have your physician complete the Physician's Assessment.
4. Set up evaluation once forms are returned to Hearts & Horses.
5. After the evaluation we will discuss our services and your goals to determine the right placement in a class (if appropriate) and new participants can register for the next upcoming session during the open registration period.

**New Participants: Once all completed forms are returned to Hearts & Horses along with a \$35 evaluation fee, you will be contacted to schedule an evaluation. If it is determined that a physical or occupational therapist is needed, there will be a \$45 evaluation fee. If the evaluation fee is a hardship, scholarship funds may be used to help offset the cost.**

Prior to and during the evaluation, we will ensure that our program is appropriate for you and that there are no contraindications to your participation in mounted equestrian activities.

Un-mounted equestrian activities are also available for those unable to ride.

**\*ALL enrollment forms must be updated annually in January.**



## EXPLANATION OF PROGRAM SERVICES, PARTICIPANT ELIGIBILITY AND POLICIES

**\*\*KEEP FOR YOUR REFERENCE\*\***

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### ELIGIBILITY GUIDELINES AND DISCHARGE POLICY

**Minimum Age:** Therapeutic Riding – 4 years of age; Hippotherapy – 2 years of age. There is no maximum age for services at Hearts & Horses, as long as the Participant has no physical or medical contraindications.

**Weight Maximums:** Due to safety considerations for staff, participants and volunteers, we may not be able to accept a participant into the program who weighs over 170 pounds.

**Postural Control:** Riders over 60 pounds must be able to maintain a sitting position; at least by holding on with one hand.

**Discharge Policy:** Hearts & Horses strives to provide the safest possible conditions for participants, volunteers and employees. The acceptance, and continued participation, of a participant in our program depends on the availability of instructors, volunteers and suitable horses and is based on our determination that we can safely accommodate the participant. Hearts & Horses adheres to precautions and contraindications for participants established by the Professional Association of Therapeutic Horsemanship International (PATH Intl.). Hearts & Horses retains the right to refuse any participant that we cannot safely accommodate. Participants must inform us of changes in health status.

### SAFETY RULES & GUIDELINES

Our program has an excellent safety record. Please observe these safety rules.

- ♥ If weight of participant is over 170 pounds, please let us know. For safety considerations, we may not be able to accept participants over 170 pounds.
- ♥ Children must be supervised at all times; please do not leave children unattended or allow them to run and play loudly.
- ♥ Parents must stay on the property during their child's lesson.
- ♥ Dogs and smoking are not allowed on Hearts & Horses property.
- ♥ Do not visit the horses without permission and supervision, including entering the horses stalls.
- ♥ Please observe quietly; your family members and friends are always encouraged to visit. When lessons are in progress or horses are out, guests are required to remain in the appropriate spectator area.
- ♥ Our horses and volunteers should be treated kindly - they work very hard for us all.
- ♥ Please drive slowly and park in designated areas.

### ATTIRE AND EQUIPMENT

- ♥ Appropriate clothes are long pants and appropriate shoes for being around horses, preferably hard soled boots with a low heel. No sandals, flip flops, or Crocs please! Dress for comfort and according to the weather. Wear close-fitting clothing for safety as well as comfort. Loose or baggy clothing can get caught and tangled in equipment. No dangling jewelry is permitted.
- ♥ All participants are required to wear an ASTM/SEI approved Equestrian helmet when near/on horses. If you don't have your own helmet, Hearts & Horses will provide you with one. Should you choose to purchase your own, we can recommend several tack shops in our area.

### SCHOLARSHIP INFORMATION

If you need financial assistance, we have a limited number of partial scholarships available for those who qualify. It is our policy to keep our services accessible, so please contact the Program Coordinator if you need assistance to help cover the cost of your lessons. **\*A scholarship application which MUST INCLUDE verification of your income (ex: tax return) must be submitted by the registration deadline of the session you wish to register for.**



## EXPLANATION OF PROGRAM SERVICES, PARTICIPANT ELIGIBILITY AND POLICIES

**\*\*KEEP FOR YOUR REFERENCE\*\***

Page 3 of 3

### VOLUNTEERS

Hearts & Horses instructors are assisted by a team of incredible volunteers. They groom and tack the horses and help the participant during class. Many volunteers help in other aspects of the organization, from facility maintenance, to office work, to fundraising. If you or someone you know is interested in volunteering, please refer them to the volunteer page on our website for further information. Please remember to thank your volunteers.

### CANCELLATION POLICY

Hearts & Horses will hold classes inside to allow riding during adverse weather conditions. However, if any conditions arise that may create unsafe circumstances in which to hold class, classes may be cancelled. The safety of our participants, volunteers and equines is of utmost importance! **\*Refunds or credits are not issued for classes that are cancelled for circumstances beyond Hearts & Horses control.** Classes may be cancelled due to the following:

- ♥ Larimer County is on accident alert status or weather conditions have the potential to deteriorate significantly by the end of class time.
- ♥ Extreme winds, heat (above 95) or cold (below 20)

### ATTENDANCE AND PROMPTNESS

- ♥ Regular attendance is important! Please call if you cannot make your scheduled time as soon as possible (24 hours is ideal) so that we do not have horses, volunteers and instructors waiting for you. **Two "no call/no shows" in a session may result in you being asked to forfeit your spot to someone on the waiting list.** Hearts & Horses does not refund money for classes that you must cancel.
- ♥ Please arrive on time or a few minutes early for your class. We will make every effort to accommodate each rider; however, late arrivals may result in not being able to ride that day. A rider that arrives 15 minutes or more after the start of their class will not be allowed to ride.

### THANK YOU!

Thank you for taking the time to review our policies and procedures, which are designed to provide our participants with a safe, effective and enjoyable environment. We encourage your input and suggestions. Please feel free to forward comments to Jan Pollema, Executive Director, at 970-663-4200 or email: [jan@heartsandhorses.org](mailto:jan@heartsandhorses.org)

**\*Please keep this information (pages 1-3) for your reference.**



## 2016 HEARTS & HORSES REGISTRATION FORM

This writable PDF form can be saved and emailed  
Register by Mail, email, fax or in Person

Session		Session Dates	Registration Begins	Registration Deadline	Price: 1.5 HR Group	Price: 1 HR Group	Price: 30 min Private	Price: 45 min Private
Winter	8 Weeks	Jan 11-Mar 5	11/20/15	12/11/15	\$360	\$240	\$320	\$400
Spring	8 Weeks	Mar 21-May 14	2/5/16	2/19/16	\$360	\$240	\$320	\$400
Summer	8 Weeks	Jun 6-Aug 6	4/15/16	4/29/16	\$360	\$240	\$320	\$400
Fall	8 Weeks	Aug 20-Oct 17	7/1/16	7/15/16	\$360	\$240	\$320	\$400
Holiday	6 Weeks	Nov 2-Dec 17	9/23/16	10/7/16	\$270	\$180	\$240	\$300

Participant's name \_\_\_\_\_ Weight (Please call if over 170#) \_\_\_\_\_ Height \_\_\_\_\_ Age \_\_\_\_\_  
 Responsible Party \_\_\_\_\_ Female Head of Household?  Yes  No For grant reporting purposes only  
 Phone(s) \_\_\_\_\_ Email Address \_\_\_\_\_  
 Mailing Address \_\_\_\_\_ City \_\_\_\_\_ Zip \_\_\_\_\_  
 Emergency Contact Name & Phone \_\_\_\_\_  
 Has participant's medical status changed? (seizures, etc?)  Yes  No If yes, please describe below:

<b>PROGRAM (CHECK ONE)</b> <input type="checkbox"/> THERAPEUTIC RIDING <input type="checkbox"/> CHANGING LEADS <input type="checkbox"/> HIPPO THERAPY <input type="checkbox"/> HEARTS & HORSES FOR HEROES (VETERANS)	<b>TYPE OF LESSON (CHECK ONE)</b> <input type="checkbox"/> GROUP <input type="checkbox"/> 30 MIN. PRIVATE <input type="checkbox"/> 45 MIN. PRIVATE <small>* (PRIVATE LESSONS BY PRIOR ARRANGEMENT ONLY)</small>	<b>Returning Participants</b> <input type="checkbox"/> I would prefer to keep my current day/time. <input type="checkbox"/> I need to change my class; List your availability in the box → <input type="checkbox"/> I am a NEW participant; List your availability in the box →	<b>Availability:</b> <div style="border: 1px solid black; height: 80px; width: 100%;"></div>

**Method of Payment (Please check one)** \*Payment or arrangement for payment must be made at the time of registration.

Please specify amount paid: \$ \_\_\_\_\_ Checks can be made payable to Hearts & Horses

Check# \_\_\_\_\_ OR  Cash \*Please hand deliver to Hearts & Horses Office (M-F 9:00 am-5:00 pm)

Credit Card \*Call office or pay online at [www.heartsandhorses.org](http://www.heartsandhorses.org) If paying online, please attach your receipt.

Paid for by other agency or benefactor \*Please note you are still responsible for securing payment

Name of agency/contact person/address/phone \_\_\_\_\_

I have 2016 scholarship forms on file. I understand that funds are limited.

**Office Use Only:** Date Received \_\_\_\_\_ Initials \_\_\_\_\_



**2016 Enrollment Packet – Hippotherapy & Therapeutic Riding**  
**(Page 1 of 5)**

**In order to ensure coordinated care, Hearts & Horses staff and volunteers may be provided with information about participant’s abilities/disabilities.**

Participant’s Name \_\_\_\_\_ Birthdate \_\_\_\_\_ Age \_\_\_\_\_  
Weight \_\_\_\_\_ (Please call if weight over 170#) Height \_\_\_\_\_ Sex \_\_\_\_\_ Grade \_\_\_\_\_  
Parent / Caregiver / Self (please circle) Name \_\_\_\_\_  
Email \_\_\_\_\_ Phone \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ Zip Code \_\_\_\_\_  
Income Range (for grant purposes – kept private and confidential):  Less than \$30,000  \$30,000 to \$47,000  
 Above \$47,000  Decline to Answer  
Ethnicity (for grant purposes – kept private and confidential): \_\_\_\_\_  Decline to answer  
Client Goals: Personal \_\_\_\_\_  
School \_\_\_\_\_  
Family \_\_\_\_\_  
Horsemanship \_\_\_\_\_  
Strengths and Abilities \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Presenting Problems/Concerns \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Primary Diagnosis \_\_\_\_\_  
Secondary/Tertiary Diagnoses \_\_\_\_\_  
\_\_\_\_\_  
Physical Disabilities/Limitations \_\_\_\_\_  
\_\_\_\_\_  
Allergies to medications or foods \_\_\_\_\_  
\_\_\_\_\_





## 2016 Enrollment Packet – Hippotherapy & Therapeutic Riding (Page 3 of 5)

### RELEASE OF LIABILITY

Name of Participant \_\_\_\_\_

### WARNING

**Under Colorado Law, an equine professional is not liable for an injury to or the death of a participant in equine activities resulting from the inherent risks of equine activities, pursuant to section 13-21-119, Colorado Revised Statutes.**

### RELEASE AND INDEMNIFICATION

I am aware that any activities involving horses are hazardous and I am voluntarily participating in these activities with knowledge of the danger involved, and hereby agree to accept any and all risks of injury, including death, and damage to property arising from participation. I **hereby promise not to sue, and hereby release**, to the fullest extent permitted by law, Hearts & Horses, Inc. and its agents, officers, directors, members, representatives, instructors, volunteers, coordinators, insurers, independent contractors, therapists and employees (collectively the "Released Parties"), from, **and hereby waive**, all claims of whatsoever kind that may be asserted against the Released Parties for personal injury and property damage arising from or in connection with participation in equine activities, and from the condition of the real property and personal property used in connection with such equine activities. By way of example, and not in limitation, this Waiver and Release includes releasing and waiving claims based upon: any negligent acts or omissions of the Released Parties and any other person; contract; warranty; premises liability; products liability; subrogation; contribution; and loss of consortium or loss of society.

**I also hereby agree to indemnify, defend, and hold and save harmless the Released Parties** from any claims, damages, expenses and costs incurred of whatsoever nature (including by way of example, and not in limitation, attorney fees and expenses), which may be made against or incurred by the Released Parties, arising from or in connection with my participation, including without limitation, any claims made by me or any other person.

**It is intended that this Release and Indemnification shall release the Released Parties from, and waive, any and all claims, and indemnify the Released Parties, to the greatest extent allowed by law.** In the event for any reason a Court determines that any portion of this Release and Indemnification is not enforceable, that provision shall be modified so as to give it the greatest effect allowed by law, or if it cannot be so modified shall be severed and the balance of the Release and Indemnification shall be given the greatest force and effect available under law. Furthermore, in the event that notwithstanding this Release and Indemnification, it is determined that any Released Party has any liability for any claim, in no event shall the liability exceed the amount of \$500 in total aggregate for all claims arising from or in connection with my participation.

**I acknowledge that by signing this document I am waiving important legal rights.** I also acknowledge that the Released Parties would not allow me to participate in equine activities unless I have agreed to the waivers, releases, indemnifications and limitations contained in this Release and Indemnification. I acknowledge that the Released Parties are relying upon these provisions as a primary material consideration for allowing my participation in equine activities. I acknowledge and agree that the terms hereof are binding upon me, and my heirs, successors, representatives, insurers, and assigns.

If signing on behalf of another person, I represent and warrant to the Released Parties that I am the parent or legal guardian with the capacity to execute and make the foregoing waivers and indemnifications on behalf of such person; and I further acknowledge and agree that I am also personally bound by and make the releases and waivers as above set forth, and that I am jointly and severally liable for the indemnifications to the Released Parties.

Signature \_\_\_\_\_

Signature of adult participant or parent/guardian/caregiver of minor participant

Date \_\_\_\_\_



**2016 Hearts & Horses – Physician Assessment and Health History**  
**(Page 4 of 5)**

\_\_\_\_\_ Date of Birth \_\_\_\_\_ Age \_\_\_\_\_ Gender  M  F  
 Name of Participant \_\_\_\_\_

**TO BE COMPLETED BY PHYSICIAN**

Height \_\_\_\_\_ Weight \_\_\_\_\_ Date of Last Tetanus Shot \_\_\_\_\_

Mobility:  Independent  Assistive Device \_\_\_\_\_

Primary Diagnosis \_\_\_\_\_ Date of Onset \_\_\_\_\_

Secondary Diagnosis \_\_\_\_\_ Date of Onset \_\_\_\_\_

Seizures  No  Yes Type \_\_\_\_\_ Date of last seizure \_\_\_\_\_

Shunts/Impants: \_\_\_\_\_

Past/Prospective Surgeries (include dates and reasons) \_\_\_\_\_

\_\_\_\_\_

**PLEASE LIST ALL CURRENT MEDICATIONS**

1. \_\_\_\_\_ Taken for: \_\_\_\_\_

2. \_\_\_\_\_ Taken for: \_\_\_\_\_

3. \_\_\_\_\_ Taken for: \_\_\_\_\_

**In order to safely provide this service, Hearts & Horses requests that you please note that the following conditions may suggest precautions and contraindications to equestrian activities. Therefore, when completing this form, please indicate whether these conditions are present and to what degree.**

**Orthopedic**

Atlantoaxial instability (include neurologic symptoms)  
 Coxarthrosis  
 Cranial defects  
 Heterotopic Ossification/ Myositis Ossificans  
 Joint subluxation/dislocation  
 Osteoporosis  
 Pathologic fractures  
 Spinal Joint Fusion/Fixation  
 Spinal Joint instability/Abnormalities

**Medical/Psychological**

Allergies  
 Animal Abuse  
 Cardiac Conditions  
 Physical/Sexual/Emotional Abuse  
 Blood Pressure Control  
 Dangerous to Self or Others  
 Exacerbations of Medical Conditions (e.g. RA,MS)  
 Fire Setting  
 Hemophilia  
 Medical Instability  
 Migraines  
 PVD  
 Respiratory Compromise  
 Recent Surgeries  
 Substance abuse  
 Thought Control Disorders  
 Weight Control Disorder

**Neurologic**

Hydrocephalus/shunt  
 Paralysis due to spinal cord injury  
 Seizure  
 Spina Bifida/Chiari II Malformation  
 Tethered cord/Hdromyelia

**Other**

Age - Under 4 years  
 Indwelling Catheters/Medical Equipment  
 Medications – e.g., Photosensitivity  
 Poor Endurance  
 Skin Breakdown

**\*Next Page**





## 2016 Hearts & Horses – Physician Assessment and Health History (Page 5 of 5)

**When complete with ALL signatures, please return BOTH pages of this form**

\_\_\_\_\_ Date of Birth \_\_\_\_\_ Age \_\_\_\_\_ Gender  M  F  
Name of Participant

**As thoroughly as possible, please indicate current or past difficulties/symptoms in the following systems/areas that apply (include surgeries).**

Area	No	Yes	Comments
Auditory			
Visual			
Tactile/Sensory			
Speech			
Cardiac			
Circulatory			
Integumentary/Skin			
Immunity			
Pulmonary			
Neurologic			
Muscular			
Balance			
Orthopedic			
Allergies			
Learning Disability			
Cognitive			
Emotional/Psychological			
Pain			
Other			

**\*\*\*FOR PARTICIPANTS WITH DOWN SYNDROME\*\*\***

An annual neurological exam to exclude Atlantoaxial instability is required for all participants with Down Syndrome over the age of three. Please provide the following information:

Date of Exam \_\_\_\_\_ Results of Exam \_\_\_\_\_

Given the above diagnosis and medical information, this person is not medically precluded from participation in equine-assisted activities and/or therapies. I understand that Hearts & Horses, Inc. will weigh the medical information indicated above against any existing precautions and contraindications before accepting this person for mounted equestrian activities. Therefore, I refer this person to Hearts & Horses for ongoing evaluation to determine eligibility for participation.

**Physician Name/Title** \_\_\_\_\_ MD DO PA NP Other \_\_\_\_\_

**Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Address** \_\_\_\_\_

**Phone** \_\_\_\_\_ **License/UPIN Number** \_\_\_\_\_

## Supplementary Materials

Table 3.

*Definitions of qualitative codes and sub codes.*

Codes and sub codes	Definitions
Purpose	Text clearly stating the mission or purpose of the program.
Assumptions	Text describing the beliefs, ideas, and principles that define how and why the program is thought to change or benefit older adults with dementia (see WK Kellogg Foundation, 2004).
Horse and nature connection	Comments describing older adults' positive behaviors by being around horses and the natural environment during the program. Includes phrases involving the sensory aspects of interacting with horses and nature (e.g. sights, smells, touch) and tapping into previous memories of being with horses and in nature.
Social participation	Phrases related to attributing the benefits of the program to social interactions and connections.
Holistic experience	Text explaining older adults' positive behaviors by detailing the interdependence of the different experiences available in the program.
Inputs	Text describing the financial, human, organizational, and community resources required to implement the program (see WK Kellogg Foundation, 2004).
Personnel and training	Phrases describing the roles of the therapeutic riding center staff and volunteers and the training they received.
Horses	Phrases describing the horses including their breed, age, personality, and their roles in the program.
Facility and equipment	Phrases describing the therapeutic riding facility and the equipment used during the sessions.
Cost and transportation	Text describing the cost of program sessions and how the LTC facilities brought older adults with dementia to program sessions.
Participant screening and measures	Descriptions of the screening process for older adults with dementia to be enrolled in the program as well as text describing the measures used to document older adults' outcomes.
Occupational Opportunities	Text describing the options that were offered to participants to engage in specific activities throughout each session of the program (see Wood et al., 2017).
Ground experience	Phrases referring to activities offered off of the horse.
Riding experience	Text describing activities that occur when mounted on horseback.
Outputs	Text describing the direct products that the program provided to the participants, such as the size and scope of services or number of participants reached (e.g. number of residents, or dosage) (McLaughlin & Jordan, 2004; WK Kellogg Foundation, 2004).