

**Immersive technology  
for a longer, healthier,  
more connected life**

**Data Deck**

# The Rising Demographic

As of 2018, Americans 50+ account for 35% of the population, but control 83% of total household wealth.

56 cents of every dollar spent in the US is attributed to an older adult (50+). This is expected to rise to 61 cents by 2050.

Barely 50% of baby boomers report prioritizing leaving behind an inheritance.

40% of retirees would have continued working if given the opportunity. 30% would return to work for the right job.

# The Impact of Social Isolation

As much as 43% of adults ages 60 and older experience frequent or intense loneliness

Lonely seniors are at increased risk for cardiovascular disease, hypertension, infections, and premature cognitive decline.

Research has shown that social isolation is as detrimental to one's health as smoking 15 cigarettes a day.

**Social isolation is associated with \$6.7b in additional Medicare spending each year.**

(an average additional \$1608 per socially isolated senior)



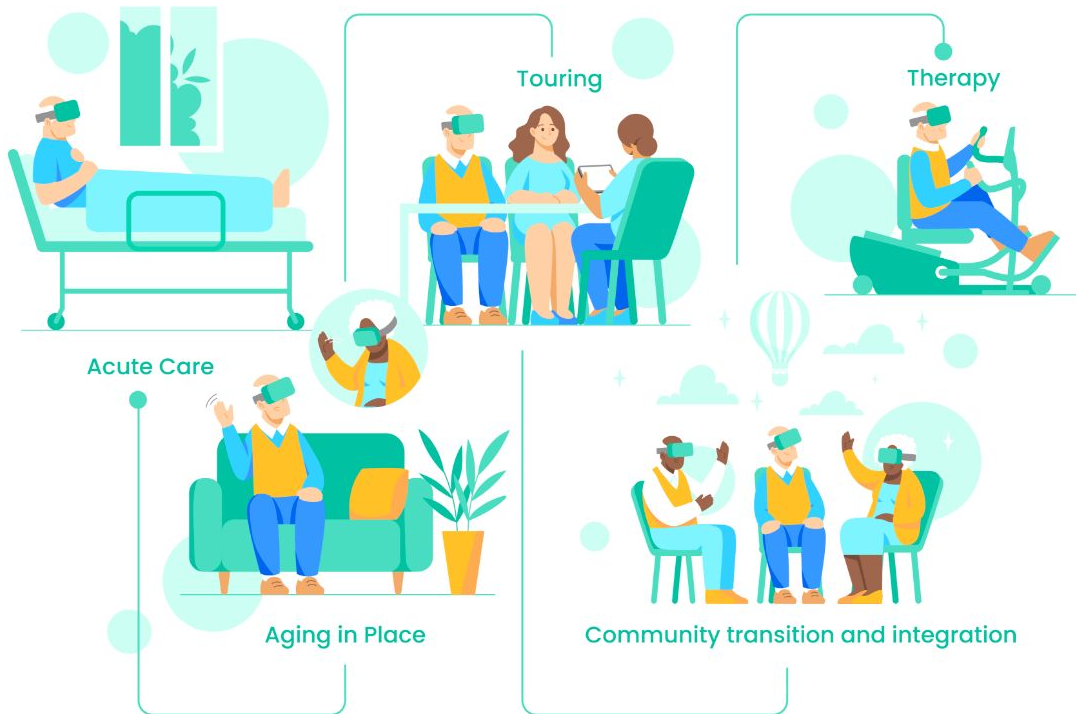
Social isolation is reaching epidemic level numbers across the world, especially in the senior population.

## 30% increase in mortality

**50%** Increased risk of dementia

**29%** Increased risk of heart attack

**32%** Increased risk of stroke



From hospitals and rehab clinics to senior living communities and hospice organizations...

Rendeвер is changing the way we experience the aging process.

We're integrating stronger social structures that survive each phase, for each invested party and caregiver.



# Outcomes Oriented with a Clinical Future for Scale



Redefining  
SENIOR  
LIVING



23

Research-Proven  
Outcomes

We don't sponsor these studies.

Research Partners



# Key Findings

## Improved Mental Health

- Depression scores
- Mental Health Index
- Anxiety
- Stress

## Improved Physical & Functional Health

- Mobility & Physical Function
- Pain
- Fall Risk
- Fatigue

## Improved Social Health

- Social Network Scores
- Interpersonal Trust
- Global, Peer, Family, and Self Connection

**Extremely Positive UX - all ages and cognitive abilities, NPS = 71.4**

## Publications:

[Lin, 2017](#)

[Lin, Lee, Lally, Coughlin, 2018](#)

[Cook et al. 2020](#)

[Friedman et al., 2021](#)

[Affi et al., 2021](#)

[Affi et al., 2022](#)

[Niemiec, Martinez, 2023](#)



“After just two weeks using the Rendever platform consistently, residents’ perceived **overall health improved significantly**, and they also felt **improvements in their social and physical well-being**.

When compared to fellow residents who had been following the same programming on a flat screen TV, the group using Rendever’s virtual reality platform had a **significant change in depression scores**, and reportedly **felt significantly more trusting** following the two week period.”



[Lin X. MIT Libraries Archives. 2017](#)

[Lin, Lee, Lally, Coughlin. 2018](#)



# What are the QoL Outcomes of a Group Rendeвер Experience for Assisted Living and Independent Living Residents?

**METHOD:** Participants rated their levels of connectedness, hassles, uplifts and pain on a 10-point scale before and after their first use of the VR, and a month after participation. Positive and negative comments were obtained from participants in writing after the first session and a month later through a focus group.



The Goodman Group  
*Moments matter. Live them well.™*

Forty-four residents participated in at least one VR session (age range: 54-103 years).

Among the 39 participants who completed the questionnaire before and after the first session, there was a statistically significant (paired t-test):

- ↓ **Decrease in pain**  $p < 0.001$
- ↓ **Decrease in hassles**  $p < 0.001$
- ↑ **Increase in uplifts**  $p = 0.03$
- ↑ **Increase in feeling connected to other residents**  $p = 0.07$

# First 90 days of Rendeвер in the community

Goals: minimum of 3 Rendeвер experiences/week, minimum 2 RendeверLive® sessions/week  
repeat participation from residents, engage family members to submit content



## Community-Reported Outcomes:

### 1 - Reduced social isolation

- increased engagement and socialization
- increased mood

### 2 – Increased resident engagement and satisfaction

- increased attendance, repeat attendance, participation in RendeверLive sessions
  - increase in social behaviors after the VR experiences with other residents and staff
- resident satisfaction rose with increases in family engagement through the family portal

### 3 – Increased staff confidence and efficiencies

- provided a “go-to” solution for compelling activities, cognitive exercises, live programming
- stimulated emotional connection and meaningful conversation between staff and residents
- provided respite from anxiety or just a long day



# What Happens to Mood after Residents Share Just One Rendeвер Session Together?



CENTER FOR INNOVATION  
AND WELLBEING

30 residents - Collected pre- and post-surveys before and after 1, 30-min session together

Outcome measure: **Multidimensional Mood State Questionnaire (MDMQ)1** – Short Form A

Results:

Feelings of being...

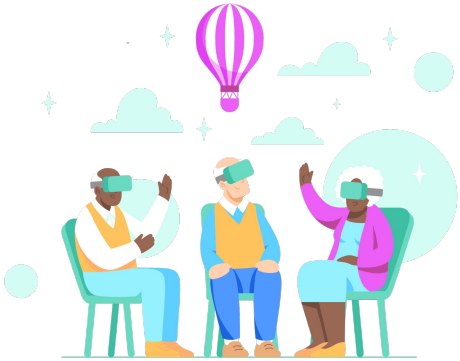
Energetic	↑	87%
Great	↑	19%
Composed	↑	30%
Rested	↑	19%
Relaxed	↑	13%
Uneasy	↓	40%

- 78% agreed they would want to try VR again.
- 65% felt engaged during the experience.



Just eight weeks after rolling out Rendeвер:

**On average, residents felt 33% more satisfied with their community.**



**Plus:**

- 36% more included within their senior living community
- 52% increase in self-reported physical health
- 37% increase in self-reported memory
- 30% increase in their interest in participating in activities
- 25% improvement in their ability to do things for fun
- 28% increase in their feelings of personal freedom
- 25% improvement in how they felt about the future

# Overcoming Social Isolation, Improving Social Health

## 100% of residents sig improved their social network score

- Significant improvement in Lubben Social Network Score  
from an average of **16.7** → **23.5** (Scale: 0 to 30)
- Significant improvement in Overall Social Connection Index Score  
from an average of **51.8** → **74.1** (GHIS Scale: -100 to 100)

Composed of:

- **Global:** Improved from an average of **34.3** → **71.3**  
83% felt significantly more connected to the rest of the world
- **Peer:** Improved from an average of **59.5** → **78.1**  
67% felt significantly more connected to other residents
- **Self:** Improved from an average of **46.6** → **71**  
67% felt significantly more connected to themselves  
Reflects improvements in autobiographical memories and feelings of autonomy



# Overcoming Social Isolation, Improving Social Health



## Making real relationships in Rendeveer

For example:

### Before Rendeveer

How many other residents do you socialize with at least once a month?

0	0%
1	0%
2	14%
3 to 4	29%
5 to 8	43%
9 or more	14%

How often have you gotten out of your apartment to attend social meetings,...

Less than Monthly	0%
Monthly	0%
Few times a month	14%
Weekly	14%
Few times a week	57%
Daily	14%

### After Rendeveer

How many other residents do you socialize with at least once a month?

0	0%
1	0%
2	0%
3 to 4	0%
5 to 8	29%
9 or more	71%

How often have you gotten out of your apartment to attend social meetings,...

Less than monthly	0%
Monthly	0%
Few times a Month	0%
Weekly	0%
Few times a week	14%
Daily	86%

# The Power of Positive, Shared Experiences in Rendever

## The Neurological Implications of Improving Social Health



Neurologically, when we are having **positive social interactions**, **Dopamine** (neurotransmitter for **energy** and motivation) and **Oxytocin** (neurotransmitter for bonding and **trust**) are released in the brain and the **same pleasure network** responsible for pleasure from food is activated. (Tomova et al, Nature Neuroscience, 2020).

Behavioral evidence that positive social interactions were happening, including when the VR headsets were off, and were sustained over the 9 weeks:

- 24% increase in the level of **Trust** between residents
- 29% increase in **Enthusiasm** for life
- 23% increase in **Energy** levels
- 27% increase in **Pleasure from Food**



# Improving Mental Health

## Residents are significantly happier after Rendeвер

In the Neurology clinic, the question most indicative of depression is:

### Are you looking forward to anything?

Before Rendeвер.....14% of residents were looking forward to something

After Rendeвер.....67% of residents were looking forward to something



### Significant improvement in Depression Index Score

Improved from an average of 50.1 → 71.7

GHS Scale: -100 to 100

67% of residents had a significant improvement (>2 SEM) in their Depression Index Score

See it in  
action!

# User Experience

**NPS = 71.4**

User Age

- range: 85-95 yrs

- average: 89.9 yrs

2/3 living w cognitive impairment

1/3 cognitively healthy



User Experience	Min rating	Max rating	Mean ± Standard Error
<b>Immersion and Use</b>			
To what degree was it like being in the real world?	75	100	<b>86.7 ±4.4</b>
How engaging was the VR experience?	50	100	<b>77.5 ±7.0</b>
To what extent did you feel like you got involved in the experience?	50	90	<b>72.5 ±5.6</b>
How comfortable were you while using VR?	70	95	<b>79 ±4.3</b>
How easy was it to use VR?	80	100	<b>96 ±4.0</b>
<b>Negative User Experience</b>			
To what degree did you feel nauseous while using VR?	0	0	<b>0 ±0</b>
How anxious did you feel while using VR?	0	0	<b>0 ±0</b>
How confused did you feel while using VR?	0	50	<b>16.7 ±10.5</b>
Resident's average of all negative UX items	0	16.7	<b>5.5 ±3.5</b>
<b>Positive User Experience</b>			
How enjoyable was your virtual reality experience?	70	90	<b>78.6 ±3.3</b>
How much fun was your interaction with the other residents?	50	100	<b>78 ±8.2</b>
How uplifting was your VR experience?	50	90	<b>70.8 ±6.9</b>
How rewarding was your VR experience?	60	80	<b>71.7 ±3.3</b>
How connected did you feel to the other residents who participated in the VR activities with you?	50	95	<b>75.8 ±6.5</b>
How satisfied are you with your VR experience	70	90	<b>80 ±4.2</b>
Average of all positive UX responses	67.8	87	<b>77.3 ±2.7</b>

GHIS Scale: -100 to 100

# Community Moments

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[Maplewood](#) Senior Living in CT

[Vi](#) at Bentley Village in FL

[Riverspring](#) Health NYC

[Hebrew Homes](#) of RiverSpring in NJ

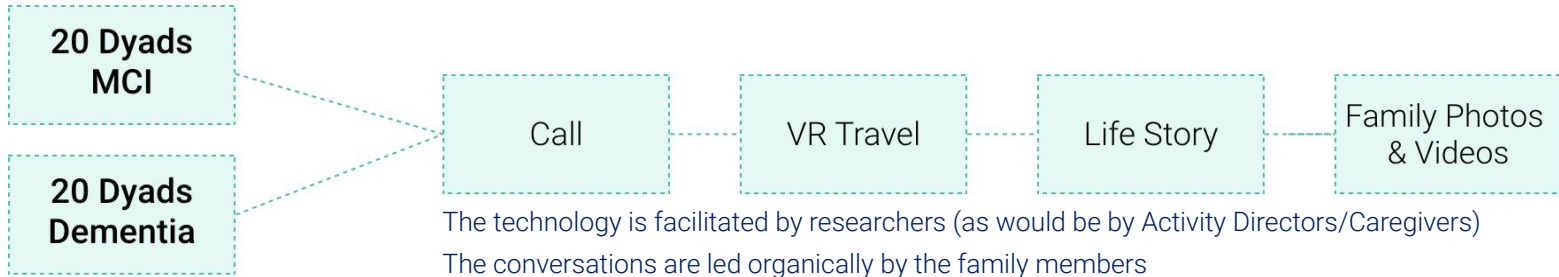
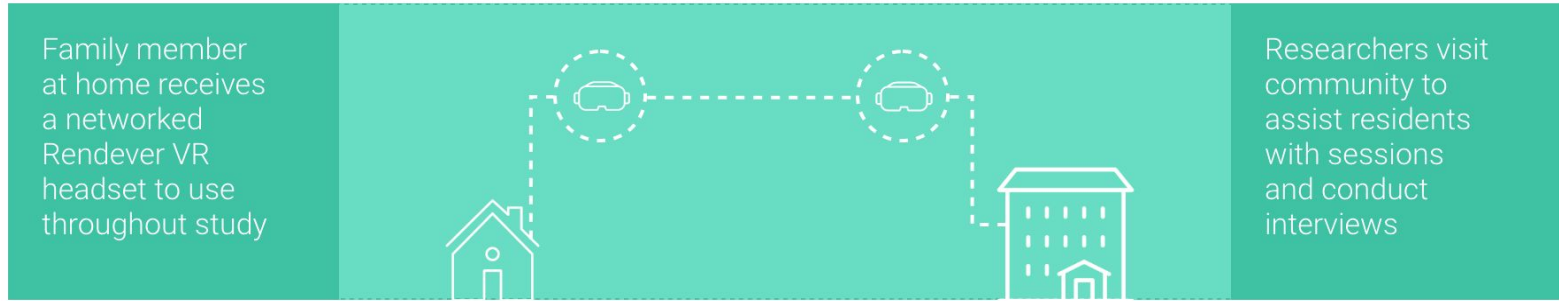


Press Coverage Worth Watching



# NIH/NIA STTR Phase I – Feasibility Study

## Connecting families living with dementia



# Engagement



## Biometric Computerized Coding of Kinesics

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We found the highest level of kinesic engagement with residents with dementia while viewing their life story (e.g. revisiting their childhood home)

# MEAN USER EXPERIENCE

	T2 Travel	T3 Life Story	T4 Photos/Video	Total
Pleasant	9.15	8.90	9.32	9.09
Fun	9.33	8.86	8.90	9.03
User Satisfaction	8.50	8.36	8.71	8.52
Unpleasant	1.44	1.298	1.24	1.32
Nauseous	1.29	1.29	1.10	1.21

Note. Response scale ranges from 1 to 10. User experiences **did not differ** across VR sessions.

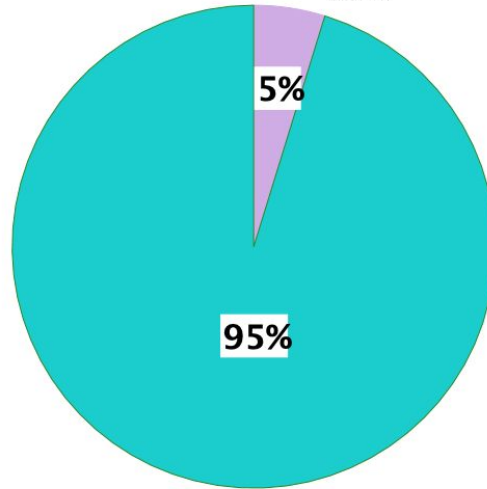


# User Experience of Rendever's Engagement Platform

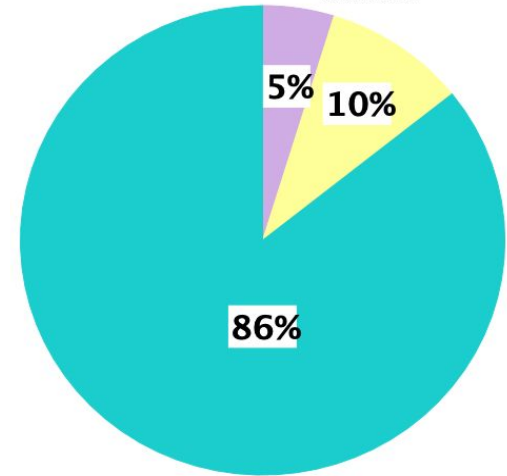
Average age of user = 83.1 yrs

- High rating: 8 - 10
  - Neutral rating: 5 - 7
  - Low rating: 1 - 4
- 1 = not at all, 10 = extremely

### Easy to Use Rendever VR?



### Overall Satisfaction With Rendever VR?

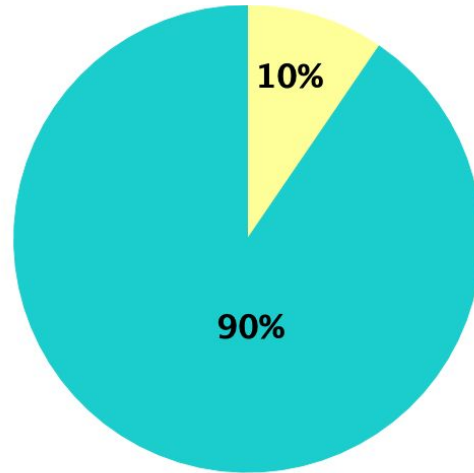


# User Experience of Rendeвер's Engagement Platform

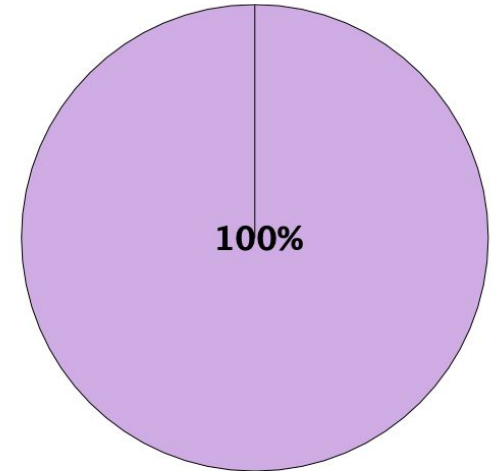
Average age of user = 83.1 yrs

Percentage of Users With high/neutral ratings of all Positive User experiences

- High rating: 8 - 10
  - Neutral rating: 5 - 7
  - Low rating: 1 - 4
- 1 = not at all, 10 = extremely



Percentage of Users With low ratings of all Negative User experiences



# MEAN QUALITY OF LIFE RELATIONSHIP w FAMILY MEMBER

	Baseline	T2 Travel	T3 Life Story	T4 Photos/Video	Baseline to VR	Scale
Positive Emotions	3.37 <sub>a</sub>	3.88 <sub>b</sub>	3.54	3.91 <sub>b</sub>	p=.003	1-5
Negative Emotions	1.72 <sub>a</sub>	1.34 <sub>b</sub>	1.38 <sub>b</sub>	1.26 <sub>b</sub>	p < .001	1-5
Quality of Life	3.11 <sub>a</sub>	3.28 <sub>b</sub>	3.31 <sub>b</sub>	3.14	p = .006	1-4
Emotional Closeness With Family Member	4.18 <sub>a</sub>	4.71 <sub>b</sub>	4.57 <sub>b</sub>	4.67 <sub>b</sub>	p = .004	1-5
Isolation From Family Member	1.54 <sub>a</sub>	1.21 <sub>b</sub>	1.27 <sub>b</sub>	1.22 <sub>b</sub>	p = .006	1-4
Satisfaction in Relationship w/ Family Member	5.00 <sub>a</sub>	5.40 <sub>b</sub>	5.37 <sub>b</sub>	5.33 <sub>b</sub>	p = .057	1-6

# MENTAL HEALTH and CAREGIVER BURDEN

## After 4 weekly Rendeвер sessions , we found significant:

**Decrease in negative emotions (PANAS) felt the week before**  $F(1,20) = 28.42, p < 0.001$   
67% had significant reductions in negative affect

**Improvement in CES-D depression scores**  $F(1,20) = 9.53, p = 0.006$   
62% significantly improved on their depression score

**Improvement in MHI-5 mental health index**  $F(1,20) = 7.77, p = 0.01$   
67% significantly improved ( $>2$  SEM) their mental health index score

**Decrease in Perceived Stress Scale score**  $F(1,20) = 6.35, p = .02$   
67% felt significantly less stressed

**Decrease in perceived care burden, Caregiver Guilt Scale**  $F(1,20) = 5.89, p = 0.025$   
67% felt a significant decrease in care burden

with Secondary Caregivers - take part in their parent's caregiving decisions and some of their direct care but live too far away to be the primary caregiver



# Caregiver/Recipient Dyadic Relationship Improvements

- 58% of people with dementia were significantly more satisfied with their relationship with their Adult Child/Secondary Caregiver after just 1 session in Rendever. ( $p=.005$ )
- 57% of all older adults reported their Quality of Life significantly improved after sharing their life story in Rendever w their Adult Child/Secondary Caregiver ( $p=.005$ )

# Primary Caregiver ~ Recipient Moments

(from users, not study participants)

CG/CR Reminiscing, using Rendeвер to get to know each other, going to Grandma's

CG/CR Sharing positive experiences in Rendeвер

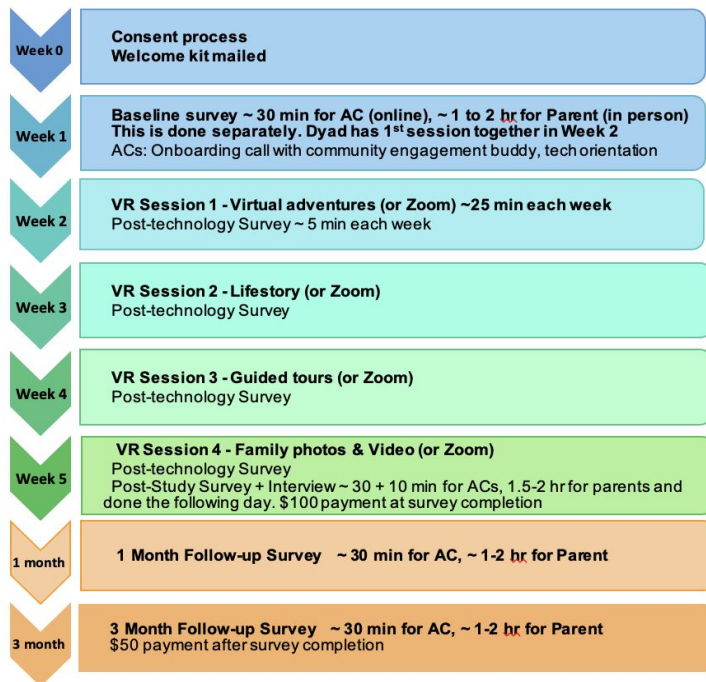


What we see

The Thrilling  RENEDEVER Experience



# NIH/NIA Phase II - RCT Efficacy Study



## Ongoing, Enrollment Completed

Similar protocol to Phase I

- Added positive control group (Zoom condition)
- 186 dyads: 101 dementia  
85 MCI
- 4 virtual visits instead of 3 (added Guided Tour to VR)
- 1-month and 3-month longitudinal follow-ups

# Thrive Study Measurements



- Social Network, objective measure
- Connection: family, community, global
- Quality of Life
- Thriving Index
- Mental Health: Depression, anxiety, loneliness, stress, coping
- Overall physical well-being, pain
- Adult child caregiver stress, burden, guilt relief

\*Study results and publications expected to start summer 2024

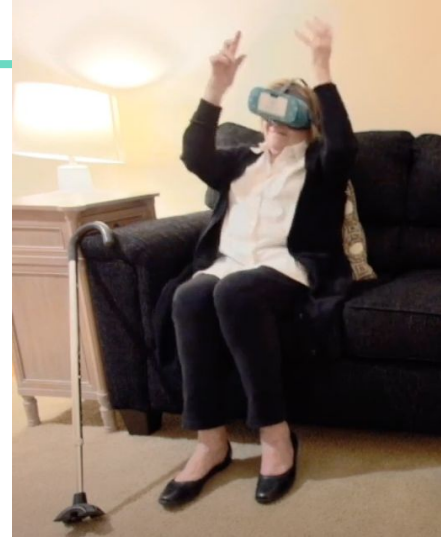


# Thrive Moments from the field

(with Thrive study participants)

[Rendever Webinar](#) on using Rendever for people living with dementia

[VOA TEK episode](#) on using Rendever to stimulate memory, UCSB



# Thrive Moments

## From the older adults/parents in the community:

"It's very good. Let me know I have a family! It's just a way to become closer."

"It just cheers me up to no end, the whole experience! Will I remember details in a week? Probably not but it brings back all these memories and is life-affirming. It just feels good... it was fun!"

"Without exception, it really made me feel good. And it made me feel better. My life this month has been difficult, medically, and to have the time to hang out with [nephew] and talk about family and see places I haven't seen in a long time, and it might be my last time I'd be able to do it. It was really, really wonderful and was a break every week in my schedule, which hasn't been much of a schedule. So, it's been a nice place to land."

"I think that for both of us, it's just a more solid knowledge of who we are, of who the other person is. I was surprised by remembering all those things from my past, but essentially what was important was sharing what we both knew with each other."

"It was a unique experience. Being here is almost like being in Groundhog Day. I look forward to sessions like this that are unique and special. It helps my experience in this community, and life in general at my age, to have an experience, something different and new!"

"We're feeling closer through having the weekly VR. It's worked for me and he has said the same to me."

## From the adult children participating from afar:

"What RendeVer enables is both people to quickly focus and align, and it triggers different sets of emotions. It's a much more vivid and impactful way to interact because it's an additional dimension that you don't have with phone or video, particularly when you're remote. I'm more than 1000 miles away from my father, so it allows us to kind of interact far more together sharing experiences versus, you know, 'what's the weather in Boston? Well, what's the weather in Houston?'"

"This is another method of doing something together. She's always been, until recently, mobile in my life. So, you can almost do active things in RendeVer rather than a more stationary phone call, like climbing Machu Picchu, for example."

"Well, it certainly enhanced my relationship with my father. What it also did is it stimulated all the memories and, I think particularly for my father who needs it, helped him remember his history and experiences that we had as a family. This is another way to bring things to life, and really make it far more kind of interactive and enjoyable, rather than me prompting, 'Hey Dad, remember that trip?' and spending five minutes trying to explain what that experience is. A picture is 1000 words, you know, it's just a different level."

"Hearing and seeing what he remembered, and put together, really made me feel closer and so touched. He really remembered so much!"

"The VR sessions made me feel good, gave me some sort of hope that, although there's not any prospect of me living close to her, I can still spend some structured quality time with her. In the beginning of the study, there was some novelty to RendeVer, a really great way to spend time together. The great time remained, and the novelty wore off, but in a good way, very normal course, like we were in a room together. It went from that excitement factor to an easy, very normal-course thing to do."



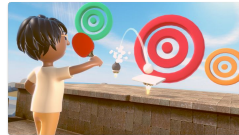
\*Study results and publications expected in Summer 2024



# RendeverFit®

**Fitness made fun.  
And impactful.**

With RendeverFit®, you can participate in customized exercise routines designed to promote strength, balance, and flexibility, all while having fun and staying engaged.



Provides physical fitness with cognitive stimulation and multi-player social engagement

After just 4 weeks with RendeveFit®:

**94% of participants improved on their TUG scores by at least 1.0 sec**



**Plus:**

48% decrease in fall worry

44% decrease in pain interference

33% decrease in loneliness

36% increase in trust of other residents

**+9% increase in movement speed**

## Significant improvements were found for all 3 functional assessments

$F(1,17)=4.356, p=.052, \eta^2=.204$

78% of residents significantly improved their time on the [TUG test](#)

$F(1,17)=39.38, p<.001, \eta^2=.842$

94% of residents significantly improved their time on the [TUG Manual](#)

$F(1,17)=17.42, p<.001, \eta^2=.506$

89% of residents significantly improved their time on the [TUG Cognitive](#)

Index of Physical Health, Abilities, and Mobility ( $\alpha = .95$ ) significantly improved,  $p=0.01$   
From 54.8 to 64.9

Residents' feelings about their physical abilities significantly improved,  $p=.01$ , from 47 to 60



18 residents  
2 sessions/wk  
4 weeks

# The Importance of Joy



CENTER FOR INNOVATION  
AND WELLBEING

**100% of users thought RendeeverFit® was fun!**

**94.1% of users had a positive composite of user experience ratings**

**67.7 = average rating for how much they liked exercising with RendeeverFit®**  
GHIS Scale -100 to +100

# RendeverFit® - 2024 Studies



## NIA a2 - AI/Tech + Aging Pilot Award with the MassAITC

- In the home setting
- Decentralized recruitment of 30 dyads: Live-in Caregiver/PT Care recipient with MCI to moderate dementia
- Outcomes: Physical and Cognitive functional tests, Pain, QoL, Mental Health, Social Health, User acceptance, User satisfaction, CG burden and stress, ML algorithms for assessment build



## National Academy of Medicine Catalyst Award

- In-patient rehabilitation to home or community, maintenance program
- 40 in-patient rehab patients
- Outcomes: Exercise compliance, Physical and Cognitive functional tests, Pain, User satisfaction



# RendeverFit® Moments

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[Marquis](#) Health Consulting Services

[Monarch](#) Healthcare Management in MN



Press Coverage Worth Watching





# VR and Pain

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## 2 modes of addressing pain

- Distraction therapy
- Relieving stress, anxiety, depression and fear which contribute to pain

# Rendever and Pain – Reducing stress, anxiety, and depression

*Phase I of the Thrive Clinical Trial on Rendever with UCSB, funded by the NIH/NIA*

**Improvement in CES-D depression scores**  $F(1,20) = 9.53, p = 0.006$

62% significantly improved on their depression score

**Improvement in MHI-5 mental health index**  $F(1,20) = 7.77, p = 0.01$

67% significantly improved ( $>2SEM$ ) their mental health index score

**Decrease in Perceived Stress Scale score**  $F(1,20) = 6.35, p = .02$

67% felt significantly less stressed

*MIT AgeLab thesis study findings on Rendever*

**Decrease in Anxiety**  $t(1,30) = -3.38, p = 0.002$

*Massachusetts General Hospital findings on Rendever and stress and tension in patients in concussion rehab, N=15*

**Decrease in Stress**  $Z = -2.12, p = 0.03$

**Decrease in Tension**  $Z = -2.84, p = 0.004$

[Afifi et al., 2022](#)

[Lin, Lee, Lally, Coughlin, 2018](#)

[Cook et al. 2020](#)

# Rendever and Pain – Distraction Opioid Reduction

- Procedure Using Rendever's Platform:
  - Initiated colonoscopy using Rendever's VR platform instead of the standard of care sedative, propofol
  - Option to opt out and request standard pain medications at any point.
- Study Participants:
  - Previously had at least 1 colonoscopy under conscious sedation.
  - 50% had diverticulitis.
  - 42% had polyps removed during previous procedures.
  - 11.5% were labeled as challenging colonoscopies by endoscopists.
- Results:
  - **96.7% completed their procedure without the request of any sedative**
  - **69.2% preferred Rendever VR over sedatives** for future procedures
  - **Average likelihood to recommend Rendever VR over sedatives: 7.4/10**
  - Average discomfort rating: 4/10
  - Average pain rating: 3.6/10
  - 46.1% found discomfort/pain comparable or less than previous experiences with sedatives (11% didn't respond)



MASSACHUSETTS  
GENERAL HOSPITAL

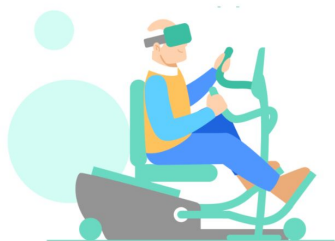
**97%**  
**OF PATIENTS  
COMPLETED  
COLONOSCOPY  
WITHOUT  
NARCOTICS**

[Friedman et al., 2021](#)

# ↓ Pain & ↑ Function

After just 4 weeks with RendeверFit®:

**94% of participants improved on their TUG scores by at least 1.0 sec**



Plus:

- 48% decrease in fall worry
- 44% decrease in pain interference
- 33% decrease in loneliness
- 36% increase in trust of other residents
- +9% increase in movement speed**



# 44%

## REDUCTION IN PAIN INTERFERENCE

Pain reduction is one of the most consistent findings across clinical research and community impact studies.

front porch

# Ongoing Healthcare / Pain Studies with Rendever



Brooklyn, NY

## GI Department

Randomized controlled trial  
(colonoscopy)

### Research Aims:

- SOC (Propofol) or Rendever
- Reduced sedative
- Increased patient satisfaction
- Reduced risk

*PI: Sam Ehrlich, PhD*

## Emergency Department

3 Randomized controlled trials

### Research Aims:

- Reduced pain - acute and chronic musculoskeletal pain
- Reduced patient anxiety
- Increased patient satisfaction
- Reduced staff stress

*PI: Sergey Motov, MD*

# Healthcare Moments

[Riverspring](#) uses Rendeвер to more safely reintegrate older adults into their homes after rehabilitation stays

[UCHealth](#) uses Rendeвер to improve patient experience in their chemo infusion units, burn units, dialysis centers, and much more

[Interior Health](#) and [Health PEI](#) deploy Rendeвер in hospitals and public long-term care nursing facilities

Wish of a Lifetime brings [George, a US veteran](#), to the Grand Canyon to check off his bucket list



[UCHealth story](#)

Press Coverage Worth Watching

